



**COMMENT RESPONSE DOCUMENT (CRD)
TO NOTICE OF PROPOSED AMENDMENT (NPA) 2011-20 (B.III)**

'Authority, Organisation and Operations Requirements for Aerodromes'

(B.III) CRD to NPA 2011-20 (B.III) – CS-ADR Book 1 and 2'

IV. CRD table of comments, responses and resulting text

(General Comments)	-
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comment	14	comment by: <i>ACI EUROPE - Airports Council International</i>
	There are chapters, which are making references to tables which are not included.	
response	<i>Accepted</i>	
	The missing tables have been inserted.	
comment	15	comment by: <i>ACI EUROPE - Airports Council International</i>
	If EASA copies ICAO tables, figures or illustrations into their documents, it should be ensured that that ICAO references are being deleted and aligned with EASA documentation.	
response	<i>Accepted</i>	
comment	16	comment by: <i>ACI EUROPE - Airports Council International</i>
	The provisions for flexibility, customised compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents. It is notably due to the fact that recommendations have been transposed to the same level as standards which has never been accepted by ACI EUROPE since it limits the needed flexibility.	
response	<i>Noted</i>	
	The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.	
comment	43	comment by: <i>ACI EUROPE - Airports Council International</i>
	ACI EUROPE appreciates the spirit of cooperation on the development of the suggested rules and the preparation of the NPA document. EASA has so far cooperated openly with the European airports and has tried to find solutions to have flexibility which is seen positively, since it is something airports requested	

	from the beginning. However, there are still some comments ACI EUROPE will address since we believe that they are crucial for a successful set of rules.
response	<i>Noted</i>

comment	44 <i>comment by: ACI EUROPE - Airports Council International</i>
	Within these requirements the responsibility of the aerodrome operator are significantly increased, it should be reminded in the NPA and all other specific measures as a general principle that the aerodrome duties have to be considered within the limit of their defined competence as referred to in Article 8 bis of Framework regulation 216/2008. More and more issue are brought under the responsibility of the aerodrome operators without additional authorities. This can be problematic in some countries.
response	<i>Noted</i>
	This comment is not addressed to CSs.

comment	45 <i>comment by: ACI EUROPE - Airports Council International</i>
	Within the EU a lot of effort has been put in place to reduce the administrative load enforced by governments. The detailed descriptions and amendments in these EASA requirements will decrease, but increase the administrative workload and administrative costs. Therefore we suggest to make the implementing rules less detailed and more like a framework and a transfer many AMC and CS into Guidance Material.
response	<i>Noted</i>
	With regard to CSs, the proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes.

comment	46 <i>comment by: ACI EUROPE - Airports Council International</i>
	The structure of the rules and cross references makes the documents complex to read and understand. In ADR.OR.E.005 operators are required to observe human factors principles and organise their aerodrome manuals in a manner that facilitates preparation, use and review. It would be advantageous, if the EASA documents would follow these principles.
response	<i>Partially accepted</i>
	The first sentence is a valid observation. The following two sentences are not applicable to CSs.

comment	<p>47 comment by: <i>ACI EUROPE - Airports Council International</i></p> <p>The provisions for flexibility, customised compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents. It is notably due to the fact that recommendations have been transposed to the same level as standards.</p>
response	<p><i>Noted</i></p> <p>The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes.</p>
comment	<p>48 comment by: <i>ACI EUROPE - Airports Council International</i></p> <p>We urge EASA to make consistency checks with regards to the usage of the contents of ICAO State Letter 41 and ensure that only SARPS which are published are used in establishing EASA documentation.</p>
response	<p><i>Noted</i></p> <p>The provisions of ICAO SL 41 will be reviewed when the proposals are mature – the exception to this is that the proposed RESA text has been adopted.</p>
comment	<p>63 comment by: <i>Amsterdam Airport Schiphol - AMS/EHAM (and D.A.A)</i></p> <p>Amsterdam Airport Schiphol and Dutch Aerodromes Association (NVL) fully support the comment and justification as submitted by ACI Europe. In addition to that, Amsterdam Airport Schiphol and Dutch Aerodromes Association (NVL) have submitted extra comments in this CRT.</p>
response	<p><i>Noted</i></p>
comment	<p>106 comment by: <i>MWEBWV Ministerium für Wirtschaft, Energie, Bauen, Wohnen und Verkehr des Landes Nordrhein-Westfalen</i></p> <p>Since all European Member States are equally contracting states of ICAO and thus bound to the ICAO convention and its annexes, a European system for aerodromes should respect the worldwide agreed principles of ICAO and refrain from creating special European conditions which jeopardize the competitiveness of the European aviation industry compared to other ICAO members.</p> <p>In Book 1 there aren't phrasing differences between "standard" and "recommended practices" in parts.</p>

So EASA NPA -Book 1 doesn't keep alive the idea of ICAO Annex 14:

Standard is any specification for physical characteristics of which is recognized as necessary.

Recommended practices are any specifications ...of which are recognized as desirable.

The ICAO Annex 14-provisions contain some standards and a lot of recommendation in order to provide the necessary flexibility caused by physical, topographical or similar limitations related to the location of the aerodrome. Primarily it is the responsibility of authorities and aerodrome-operators to handle these flexible provisions in a suitable way. IRs, AMCs and GM for AR/OR are able to guarantee authorities and operators, which are accordingly qualified.

With the herein drafted certification specifications for aerodrome design, even in combination with the suggested ADR.AR.C.025 (special condition), the existing systematic of ICAO Annexes is interrupted. Nearly all relevant recommendations of ICAO Annex 14 are transposed into a CS and consequently at eye-level of standards. The adjustment between important and minor important design-elements and figures is no more displayed.

The major flexibility provision with ADR.AR.C.025 is useless for a safe and uniform application of ICAO Annex 14 as the CSs are not provided with purposes of the respective design element. The quality of special condition and subsequently the CB is indiscriminately. If the demand of the authority and/or the aerodrome is too laxly, the resulting aerodrome-design may contain safety deficits. If the demand is too stringent, the SC may be disproportionate or the (bureaucratic) burden for adequate solutions are too high in terms of requested studies, evidences etc.

Therefore, the differentiating between Standards and Recommended Practices is of utmost importance. As this principle is not fully reflected (EASA: "The structure of European rules, however, does not come with a tool exactly mirroring the character of an ICAO recommendation"), we strongly advise that the NPA be changed/amended accordingly.

CSs in book 1 should be ammended in that way, that only the idea /background of the specification for physical characteristics is fixed and described.

CSs in book 2 (GM) should be ammended in that way, that specifications are deccribed to meet the fixed demands (book1)

In addition, to avoid any confusion between binding provisions and recommendations, in GM only the word "may" should be used.

A good example for an acceptable solution within this NPA is CS-ADR-DSN.B.030 Runway threshold and its corresponding GM. The CS describes the essentials of the threshold according ICAO-recommendations with some additional, but helpful new text. The corresponding GM contains ICAO and non-ICAO explanatory material and typical design-relevant figures.

Fundamental question:

With reference to article 6 the question is to be answered, how is to be dealt

with existing aerodromes, which could not demonstrate compliance (completely or partly) with the elements of the "Basic Regulation" and/or the "ADR-Certification-Basis" in the given period (e.g. 48 months)?

The answering of this question has a special meaning, because there is no distinction in the current NPAs and CSs between ICAO-Recommendations and ICAO-Standards. This causes an enormous (time- and cost-intensively) expenditure to investigate existing aerodromes.

The period of 48 months, specified in article 6, is not justified and possibly too short in many cases (existing airports)?

response *Noted*

The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.

The comments not related to CS/GM will be answered by the appropriate Agency responder.

comment *110* comment by: *Swedavia AB - Swedish airports (currently 11 airports)*

Within these requirements the responsibility of the aerodrome operator is significantly increased. More and more issues are brought under the responsibility of the aerodrome operators.

Within the EU a lot of effort has been put in place to reduce the administrative load enforced by governments. The detailed descriptions will increase the administrative workload and administrative costs. Therefore we suggest to make the implementing rules less detailed and more like a framework and transfer many AMCs and CS into Guidance Material.

There is a need for a consistent numbering process for all tables and figures as well as their references.

The structure of the rules and cross references makes the documents complex to read and understand. In ADR.OR.E.005 operators are required to observe human factors principles and organise their aerodrome manuals in a manner that facilitates preparation, use and review. It would be advantageous, if the EASA documents would follow these principles.

The provisions for flexibility, customised compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents. It is notable due to the fact that recommendations have been transposed to the same level as standards.

We urge EASA to make consistency checks with regards to the usage of the contents of ICAO State Letter 41 and ensure that only SARPS which are published are used in establishing EASA documentation.

Local legislation should be considered as arrangements.

The principle of the BR to be proportionate to the size, traffic, category and complexity of the aerodrome and nature as well as the volume of operations thereon (Art. 8a (6) (b) should be reflected in the Regulation.

There are chapters, which are making reference to tables which are not included.

If EASA copies ICAO tables, figures or illustrations into their documents, it should be ensured that that ICAO references are being deleted and aligned with EASA documentation.

The provisions for flexibility, customised compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents. It is notable due to the fact that recommendations have been transposed to the same level as standards.

response *Noted*

The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.

The comments not related to CS/GM will be answered by the appropriate Agency responder.

comment 259

comment by: *Avinor*

There are chapters which refers to tables which are not included in the document.

If EASA copies ICAO tables, figures or illustrations into their documents, it should be ensured that the ICAO references are being deleted and aligned with EASA documentation.

The provisions for flexibility, customised compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents. It is notably due to the fact that recommendations have been transposed to the same level as standards.

response *Partially accepted*

The missing tables have been inserted. ICAO references have been replaced by EASA references.

The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.

comment 273

comment by: *Beat Kisseleff, private*

Despite the fact that new and useful requirements have been added in the scope of aerodrome operations, a lot of material included in this NPA comes

from ICAO, especially Annex 14, Vol. I. And the ICAO amendment processes (several themes of the NPA are already in a ICAO State letter process) is not coordinated with EASA. If EASA wants to use ICAO related information, which is necessary in order to avoid a system with "one aviation world, various norms", then the Agency should either rely on easy dynamic references, like links or redefine its scope and give up the corresponding themes solely to ICAO.

response *Noted*

comment 389

comment by: *Estonian CAA*

There are chapters, which make reference to tables that are not included.

When EASA copies ICAO tables, figures or illustrations into their documents, it should be ensured that ICAO references are deleted and that such information is aligned with EASA documentation.

The provisions for flexibility, customised compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents. It is notable due to the fact that recommendations have been transposed to the same level as standards.

response *Partially accepted*

The missing tables have been inserted. ICAO references have been replaced by EASA references.

The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.

comment	<p>392</p> <p>comment by: AIRBUS</p> <p>This NPA contains several tables and figures with ICAO references instead of the EASA references. For example:</p> <ul style="list-style-type: none"> <li>• Book 1 - Figure G-1: references to Annex 14 SARPs and table numbering.
response	<p><i>Accepted</i></p> <p>The incorrect references will be amended to EASA references.</p>
comment	<p>438</p> <p>comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #1</p> <p>See comment B.I 765</p> <p>UAF NPA 2011-20 (B.I-III) Com gal 1</p> <p>Objet et portée du règlement Traduction de courtoisie</p> <p>There is a doubt about the object and the scope of the EASA regulation on aerodromes, issue of the present NPA.</p> <ul style="list-style-type: none"> <li>• Does this regulation create obligations towards other entities than the competent authority and the aerodrome operator such as local authorities or owners outside of the airport boundaries? <li>• Does the regulation creates rights for users of the airport and enables them to introduce court claims on this basis? <p>Besides, the legal applicability of others documents prepared by the EASA is uncertain. In its explanatory note (paragraph 16), the agency indicates that AMCs are non-essential and non-biding whereas the ADR.OR.A.015 is in contradiction with this affirmation: "<i>The aerodrome operator may implement these alternative means of compliance subject to prior approval by the competent authority and upon receipt of the notification</i>". This must imperatively be clarified because all comments on AMC are largely related to their juridical value.</p> <p>UAF considers that EASA's regulation should only be related to the certification of aerodromes. This position is confirmed by the fact that every specification of the NPA have been provided only in the scope of an aerodrome certification. To this end, UAF is in favour of a better delimitation of the regulation object at article 1 of cover regulation. Without such precision, the regulation would interfere with other activities which are note in the scope of competence of the EASA notably concerning ground handling, urbanism and public security.</p>
response	<p><i>Noted</i></p>

comment

439

comment by: *Union des Aéroports français - UAF*Attachment [#2](#)

See comment B.I 770

UAF NPA 2011-20 (B.I-III) Com gal 2

Responsabilité de l'exploitant

Traduction de courtoisie

The EASA regulation increases significantly the responsibility of the aerodrome operator compared to the existing situation in France. More and more missions have been put under the responsibility of aerodrome operator. The rulemaking rationale should lead to counter balance this increase of responsibilities by conferring the necessary powers to the aerodrome operator in order to assume his new responsibilities. But the EASA regulation cannot confer such powers to the operator. Indeed, the repartition of responsibilities in member States is, in some cases, conducted under constitutional rules, for example when they are affected to public authorities, is largely out of the scope of the EASA.

Moreover, some provisions relating to the missions of the aerodrome operator do not take into account the principles of subsidiarity and proportionality. The safety of air transport must be assured without altering the repartition of the missions in member States. Each member States must have the possibility to designate authorities or entities in charge of the missions mentioned in the regulation notably concerning the obligation outside of the airport perimeter. In others cases, the maintaining of competencies of public authorities is fixed by EU requirements. It is for example the case with the Directive (modified) n° 96/67/ CE dated 15 October 1996 related to the ground handling. Article 14 of this directive indicates that if the activity of a ground handler might be dependent on safety conditions of aircraft, equipment and persons, such conditions shall be defined and implemented by a public authority independent of the aerodrome operator through an agreement process. Consequently, the aerodrome operator has no power to forbid the access of a ground handler at the airport or to suspend this access for reasons related to safety. The draft of the future regulation to replace this directive does not modify this aspect (article 16 of the draft dated 16/03/2012).

Consequently, UAF suggests to insert a new article between article 2 and article 3 of the cover regulation :

Article 2 bis: "competent authorities"

Points 1 and 2 of article 3 of the cover regulation (« 1. Member States shall designate [...] No 216/2008. ») must be integrated in this new article 2 bis because they are the first rules about competent authority apart from the scope of monitoring, stricto sensu. These paragraphs are completed with the addition of the following paragraph: "When the responsibilities mentioned in the annexes of this regulation are assumed by an entity which is independent from the aerodrome operator, the competent authority shall ensure that all the essential requirements are covered and shall describe the allocation of these responsibilities in the approval terms of the certificate."

response

Noted

comment	<p>440</p> <p>comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #3</p> <p>See comment B.I 771</p> <p>UAF NPA 2011-20 (B.I-III) Com gal 3</p> <p>Nombre de spécifications de certification (CS) et de moyens acceptables de conformité (AMC)</p> <p>Traduction de courtoisie</p> <p>Many efforts have been undertaken in the European Union to reduce the administrative burden. But the text of the NPA contains a great volume of very specific rules. These provisions will considerably increase administrative burdens and costs.</p> <p>Consequently, we strongly suggest on one hand to have Implementing rules (IR) less precise and to rather describe a general framework and on the on the hand to transfer many AMC and CS into guidance material (GM). Many texts should be considered as examples to follow instead of being solutions indifferently imposed to anybody, it is even more valid knowing that many of them have no direct effects on safety.</p>
response	<p><i>Noted</i></p>

comment	<p>441</p> <p>comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #4</p> <p>See comment B.I 772</p> <p>UAF NPA 2011-20 (B.I-III) Com gal 4</p> <p>Modification de l'annexe 14 de l'OACI</p> <p>Traduction de courtoisie</p> <p>UAF appreciates the spirit of cooperation shown by EASA during the NPA process. EASA has tried to find solutions for flexibility. However, this effort is still not sufficient because the results lead to a loss of flexibility in comparison with the ICAO system. It is notably due to the fact that EASA takes up indistinctly ICAO standards and ICAO recommendations.</p> <p>UAF strongly wish that EASA deals with ICAO recommendations and ICAO standards with different manners to keep the flexibility of ICAO system.</p> <p>So UAF proposes that EASA takes as principle to consider ICAO recommendations as good practices only and transpose them into GM.</p> <p>UAF admits that, after use of this principle, some ICAO recommendations (few) could be CS or AMC, for example the recommendation related to the runway width.</p> <p>Moreover NPA reflects very partially and incompletely, the annex 14 modifications proposed by ICAO in its State letter n°41. These modifications have already been validated by the ICAO Air Navigation Commission and many</p>
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ICAO experts. It is planned that these modifications would be applicable before the entry into force of EASA regulation.

UAF urges EASA to take up the contents of ICAO State Letter 41, also to anticipate the future ICAO annex 14, which will be more based on objectives or performances to reach than prescriptive rules. Such anticipation will prevent Europe from facing an obsolete regulation from its publication.

UAF reminds that Annex 14 has been thought out in the middle of the last century for airport design when there was still space around. Nowadays, the paradigm has changed because rules should be thought for aerodrome certification in an optimisation of space and resources. Existing annex 14 SARPS reflect very incompletely this new paradigm.

N.B.: in several comments about CS and AMC, UAF indicates that it is appropriate to transfer the CS or AMC into GM. Such transfer needs to rewrite the text so that the term "should" does not appear anymore. Indeed, this term should be used only for CS and AMC in the present regulation.

response *Noted*

comment 442 comment by: *Union des Aéroports français - UAF*

Attachment [#5](#)

See comment B.I 773

UAF NPA 2011-20 (B.I-III) Com gal 5

Forme

Traduction de courtoisie

The structure of the rules and cross references makes the document complex to read and understand.

response *Accepted*

comment 443 comment by: *Union des Aéroports français - UAF*

Attachment [#6](#)

See comment B.I 774

UAF NPA 2011-20 (B.I-III) Com gal 6

Arrangements

Traduction de courtoisie

In different member States including France, public authorities have an essential role concerning airport safety and are in charge of specific powers to this end.

In France the constitutional framework implies that some missions are assumed

by a public authority such as the "préfets" who are in charge and have the power to enforce law and order on the aerodromes and also outside the aerodromes whether it is for the definition or the application of the rules. With the EASA projects, these missions will not be affected to the public authority anymore but to the aerodrome operator by the way of arrangements between itself and others entities providing services at the airport (MET, security, airlines...)

In order to facilitate the implementation of the future regulation, UAF suggests that every rule taken by a public authority, including rules adopted by the "préfets" must be considered as arrangements and this must be written in the EASA project.

response *Noted*

comment

444

comment by: *Union des Aéroports français - UAF*

Attachment [#7](#)

See comment B.I 775

UAF NPA 2011-20 (B.I-III) Com gal 7
Langue

Traduction de courtoisie

UAF draw the attention of EASA on the fact that its futures rules shall be understood by all the actors, who have to use them. Consequently, these rules shall be written in the national language of the State and not only in English.

§2.2.2 of the « Regulatory Impact Assessment » (page 15/130) giving the number of French airports entering the scope of the future EASA rules indicate that many of them are French: "Looking at the result for individual Member States, France has two peculiarities in this European picture : it has the largest number of aerodromes (159) and it is also the country with the highest number of aerodromes below the BR threshold (72 i.e. in relative share 45%...[...]" French airports are so particularly interested to know, understand and appreciate the impact of the EASA rules of this NPA.

The consultation, only in English, does not allow to French airports operators, having no sufficient translation means, to know, understand and correctly appreciate the impact of the rules proposed in this NPA. Consequently, French aerodrome operators are not able to use all their rights, which are recognized by article 6.1 of the "rulemaking procedure", applicable for the redaction and the publication of NPA: "Any person or organisation with an interest in the rule under development shall be entitled to comment on the basis of the published NPA, without discrimination on the basis of nationality".

Article 32-2 of the basic regulation (CE N°216/2008) indicates that all the translation works required for the EASA functioning are performed by the translation center of the EU.

It is also in line with ADR.OR.E.005 (i) related to the aerodrome manual. Indeed, it is indicated that the aerodrome manual shall reflect the basis certification and shall be in a language acceptable by the competent authority and understandable by everyone, who has to use it. So, IR-OPS, AMC and CS, elements of the certification basis shall be written in the official language recognized by the Member State.

Besides, this requirement of the use of the official language appears in most of national constitutions.

In consequence, the EASA regulation shall be written in French to be correctly applied on French aerodromes.

It is why, UAF ask EASA to answer to the following questions.

1. How the fact to have no French version of EASA rules could be considered as compliant with article 58-2 of the basic regulation on transparency and communication ? This article indicates that the agency ensure the public and any interested party are rapidly given objective, reliable and easily understandable information with regard to its.

2. How the fact to have no French version of EASA rules could be considered as compliant with the « Rulemaking Procedure » applicable for the redaction and publication of the NPA (§2 Explanatory Note page 5/22) ? This « Rulemaking Procedure » is the subject of the EASA Management Board Decision 08-2007 – Decision amending and replacing the Rulemaking Procedure – MB Meeting 03-2007- in application of article 52 of the basic regulation. In particular, How the fact to have no French version of EASA rules could be considered as compliant with article 6-1 of the EASA Rulemaking Procedure and article 52-1-c) of the basic regulation (“the procedures ensure ensure that the Agency publishes documents and consults widely with interested parties...”).

3. How the fact to have no French version of EASA rules could be considered as compliant with the article 22 of the Charter of fundamental rights of the European Union (2010/C 83/02) which stipulates that the European Union respects the linguistic diversity?

4. How the fact to have no French version of EASA rules could be considered as compliant with the interdiction of discrimination due to the nationality as stipulated in article 18 of the Treaty on the functioning of European Union?

5. How the fact to have no French version of EASA rules could be considered as compliant with article 342 of the Treaty on the functioning of European Union (former article 290) et of the regulation n°1 (modified) governing the languages of the European Union (in particular articles 1, 2 et 4)? These articles give the list of the official languages and the work languages of the EU institutions, including French among others. They also indicate that the r delivered by the EU institutions to a member State or at a citizen of this Member State shall be in the official language of this State and that the general texts are written in official languages.

6.If the answers to the here above questions would not be satisfactory vis-à-vis the applicable rules, how EASA plans to correct the NPA process used and to proceed for the publication of its set of rules ?

response *Noted*

comment 445

comment by: *Union des Aéroports français - UAF*

[Attachment #8](#)

UAF NPA 2011-20 (B.III) Com gal 10

Formulation "move to GM"

Traduction de courtoisie

We understand that the provisions where it is indicated that the text is

	transferred to GM ("move to GM") will not be incorporated in IR, CS or AMC. UAF will not contest the transfer of these provisions to GM.
response	<i>Accepted</i>

comment	446 comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #9
	See comment B.I 778
	UAF NPA 2011-20 (B.I et III) Com gal 11
	Références aux Guidance Materials dans les articles de l'Implementing Rules ou les Spécifications de certification
	Traduction de courtoisie For the consistency of the regulation, references to Guidance Materials (GM) must not be included in Certification Specifications (CS) or Implementing Rules (IR) and have to be developed in specific notes. Otherwise, it implies that GM has the same value as CS or IR. It shall not be the case.
response	<i>Accepted</i>

comment	454 comment by: <i>IDRF e.V. (association of regional airports)</i>
	Germany's and Europe's aerodromes are to be considered as designed for safety. The existing implementation methods of ICAO Annex 14 into national law is, as measured by the given level of safety in combination with investments and operational expenses, obviously successful. Therefore we question the necessity to state more than a simple hook from the basic regulation to ICAO Annex 14 and its subsequent Aerodrome design manuals.
	The ICAO Annex 14-provisions contain some standards and a lot of recommendation in order to provide the necessary flexibility caused by physical, topographical or similar limitations related to the location of the aerodrome. Primarily it is the responsibility of authorities and aerodrome-operators to handle these flexible provisions in a suitable way. IRs, AMCs and GM for AR/OR are able to guarantee authorities and operators, which are accordingly qualified.
	With the herein drafted certification specifications for aerodrome design, even in combination with the suggested ADR.AR.C.025 (special condition), the existing systematic of ICAO Annexes is interrupted. Nearly all relevant recommendations of ICAO Annex 14 are transposed into a CS and consequently at eye-level of standards. The adjustment between important and minor important design-elements and figures is no more displayed.
	The major flexibility provision with ADR.AR.C.025 is useless for a safe and

uniform application of ICAO Annex 14 as the CSs are not provided with purposes of the respective design element. The quality of special condition and subsequently the CB is indiscriminately, e.g. if the demand of an authority is too stringent, the SC may be disproportionate or the (bureaucratic) burden for adequate solutions are too high in terms of requested studies, evidences etc.

We are very concerned about increasing administrative and other costs without any nameable benefit for safety, resulting of the alignment of standards and recommendations.

ICAO Annex 14-provisions are exclusively for the design of optimized infrastructure for the intended respective use. Details on how to use a specific aerodrome has to be made by A/C-operation in accordance with ICAO Annex 6 and the relevant EU-regulations. According the introduction note of ICAO Annex 14, these provisions do not want to limitate or regulate the operations. In this respect the ADR.AR.C.025 is only a insufficient way of trying to follow the differentiating systematic of standards and recommendation.

Nearly all figures of ICAO Annex 14, chapter 3 and 4 (standards and recommendations!) are indiscriminately and not based on scientific findings, at most an orientation and could be verified in a lot of ways. Studies around the world showed exorbitant safety buffer (e.g. the ACRP report 51 from FAA). This is already noticed by ICAO and they try to review the figures on a risk based approach. This would also be in line with the regulation 216/2008 and 1108/2009. To set the unverified figures of ICAO Annex 14 into CSs is inadequate and tends to result in unnecessary burden and increasing costs for studies etc. We hope the European regulator is aware, that it isn't enough to copy and paste ICAO Annex 14 with small additional wordings; it is necessary to invest into accordant studies in order to verify safe, ecologic and economic reasonable figures for the design elements, which could be used all over Europe.

In the meantime we suggest to move all ICAO-recommendation-figures from CSs to guidance material. It may be an option to provide corresponding purposes for these design-criterias within the CSs.

A good example for an acceptable solution within this NPA is CS-ADR-DSN.B.030 Runway threshold and its corresponding GM. The CS describes the essentials of the threshold according ICAO-recommendations with some additional, but helpful new text. The corresponding GM contains ICAO and non-ICAO explanatory material and typical design-relevant figures.

Contrary to that, an example for an inadequate proposal within this NPA is CS-ADR-DSN.B.185 Transverse slopes on runway strips. This design-element is also based on an ICAO Annex 14-recommendation and without harming safety it would be sufficient to state the purpose of this ICAO Annex 14-recommendation in the CS ("*Transverse slopes should be adequate to prevent the accumulation of water on the surface*"). We have no indication- or accident-report in Germany (and we assume also not in Europe), which justifies any limitation, which we have to discuss in depth during the certification process. There is no need to regulate figures via a CS.

In the subsequent chapters of CS ADR DSN, B-E we have commented accordingly with details. Due to limited recourses we weren't able to comment chapter G-U in the same way. But if requested, we could do so in addition to the "normal" NPA-process. We are also aware of several figures

within marking- and light-design elements, which are simply for definition and therefore acceptable.

Relating book 2:

The GM for aerodrome design is an excellent dossier. The points are valid, very helpful for both, authorities and aerodrome operators. The GM explains some key-elements and complex interrelation in a comprehensive and traceable way. Overall we expect impulses for a better understanding of the design-elements. Some more elements could become objectives and purposes within the GM as a future task. We understand the guidance material as a living document and our association offers cooperation for further development via the European Regional Aerodromes Community - ERAC.

response *Noted*

The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.

Comments not related to CS/GM will be answered by the appropriate Agency responder.

comment 455

comment by: *Union des Aéroports français - UAF*

Attachment [#10](#)

Suite à l'impossibilité informatique de commenter le CS-ADR-DSN.A.002-Definitions sous son intitulé, vous trouverez le commentaire relatif à cet article ci-joint.

UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002

Référence: CS-ADR-DSN.A.002
Définitions

Traduction de courtoisie
UAF propose:

- either to group together all the definitions in the cover regulation of book I or in the CS of book III
- or to create a specific book for definitions.

We noticed an inconsistency between article 2 of the cover regulation (book I) and the article 2 of the CS (book III) related to definitions. Indeed, some terms are at the same time in book I and book III without being defined identically while some terms are defined only once.

response *Noted*

The definitions contained in Article 2 of the draft regulation are not the same as

those contained in the book of certification specifications, because the terms used in the draft regulation are not the same as those used in the certification specifications. Inconsistencies will be reviewed.

comment 456 comment by: *Union des Aéroports français - UAF*

Attachment [#11](#)

Suite à l'impossibilité informatique de commenter le CS-ADR-DSN.A.002-Definitions sous son intitulé, vous trouverez le commentaire relatif à la définition d'"aerodrome equipment" ci-joint.

UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « aerodrome equipment »

Référence: CS-ADR-DSN.A.002 « aerodrome equipment »

"Aerodrome equipment shall mean any equipment, apparatus, appurtenance, software or accessory, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome."

Traduction de courtoisie

Even if this definition is already in the basic regulation, we consider that it is too much detailed and it would be better to describe the equipment as a whole than piece by piece.

We suggest the following writing :

"Aerodrome equipment shall mean any equipment, apparatus or appurtenance, ~~software or accessory~~, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome."

This definition goes too far and we will have a multitude of equipments. It will create unnecessary administrative burden and uncertainty about who does what. It would be better to keep only important equipments considering that they include software and accessories.

response *Noted*

This is in the BR and cannot be changed.

comment 457 comment by: *Union des Aéroports français - UAF*

Attachment [#12](#)

Suite à l'impossibilité informatique de commenter le CS-ADR-DSN.A.002-Definitions sous son intitulé, vous trouverez le commentaire relatif à la définition de la "cleared and graded area" ci-joint.

UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « cleared and graded area »

Référence: CS-ADR-DSN.A.002 « cleared and graded area »

'Cleared and Graded Area (CGA)' means that part of the Runway Strip cleared of all obstacles except for minor specified items and graded, intended to reduce the risk of damage to an aircraft running off the runway.

	<p>Traduction de courtoisie There is an inconsistency between this definition and the definition of the runway strip. Indeed, the runway strip has two objectives: reducing damages to aircrafts in case of running off the runway and protecting aircrafts flying over the runway strip. Being a part of the runway strip, the CGA should be submitted to the same objectives, which is not the case here because it does not take into account the protection of flying aircrafts.</p>
response	<p><i>Noted</i></p> <p>The CGA definition states that it is part of the runway strip and therefore falls under the overarching definition of runway strip.</p>

comment	<p>458 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #13</p> <p>Suite à l'impossibilité infomatique de commenter le CS-ADR-DSN.A.002-Definitions sous son intitulé, vous trouverez le commentaire relatif à la définition de "clearway" ci-joint.</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « clearway »</p> <p>Référence: CS-ADR-DSN.A.002 « clearway » 'Clearway' means a defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height.</p> <p>Traduction de courtoisie We wonder who is the "appropriate authority" since it is not defined in the EASA rules. Is it the competent authority or a third authority?</p>
response	<p><i>Noted</i></p> <p>This comment is not related to the CS and will be answered in CR/AR general comments.</p>

comment	<p>459 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #14</p> <p>Suite à l'impossibilité infomatique de commenter le CS-ADR-DSN.A.002-Definitions sous son intitulé, vous trouverez le commentaire relatif à la définition de "frangible object" ci-joint.</p>
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UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « frangible object »

Référence: CS-ADR-DSN.A.002 « frangible object »

'Frangible object' means an object of low mass designed to break, distort or yield on impact so as to present the minimum hazard to aircraft.

Traduction de courtoisie

"Frangible object": what kind of impact is it ?

We propose the following modification : "Frangible object means an object of low mass designed to break, distort or yield on impact **due to an aircraft** so as to present the minimum hazard to aircraft."

We suppose that this is only an impact caused by aircraft because frangible objects are put in places where it is necessary to reduce the risk of damages in the case of an aircraft runway or taxiway excursion.

By adding "due to aircraft" we are better in link with the definition of "frangibility".

response *Noted*

This is the wording from the ICAO definition.

comment 460

comment by: *Union des Aéroports français - UAF*

Attachment [#15](#)

Suite à l'impossibilité informatique de commenter le CS-ADR-DSN.A.002-Definitions sous son intitulé, vous trouverez le commentaire relatif à la définition de "non-instrument runway" ci-joint.

UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « non-instrument runway »

Référence: CS-ADR-DSN.A.002 « non-instrument runway»

'Non-instrument runway' means a runway intended for the operation of aircraft using visual approach procedures.

Traduction de courtoisie

It is proposed:

- either to take up the ICAO Approach classification task force terms;
- or to add "only": "Non-instrument runway means a runway intended only for the operation of aircraft using visual approach procedures".

If we keep the definitions as written, we will have runways considered as infrastructure which will be at the same time « instrument runways » and « non-instrument runways ».

Indeed, the majority of the « instrument runways » are also used for visual approaches.

Regarding to the terms « instrument runways » and « non-instrument runways », it is understand that there are exclusives categories. Now, it will not be the case with such definition even if they come from the ICAO

response *Noted*

This is the ICAO definition of non-instrument runway. EASA follows the relevant

ICAO work in this area, which, however, has not been finalised.

comment 461 comment by: *Union des Aéroports français - UAF*

Attachment [#16](#)

Suite à l'impossibilité informatique de commenter le CS-ADR-DSN.A.002-Definitions sous son intitulé, vous trouverez le commentaire relatif à la définition de "runway end safety area" ci-joint.

UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « runway end safety area »

Référence: CS-ADR-DSN.A.002 « runway end safety area »

'Runway end safety area (RESA)' means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway.

Traduction de courtoisie

This definition does not take into account the works of ICAO. It should be taken into account the letter to the States n°41 that specifies the objectives of RESA as follows:

"'Runway end safety area (RESA)' means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway, and also to allow an aeroplane overrunning to decelerate and an aeroplane undershooting to continue its approach or landing."

The ICAO definition has the advantage to precise the function of RESA which is very important to carry out a safety study for ELOS or special conditions.

response *Noted*

This is the ICAO definition of RESA. EASA follows the relevant ICAO work in this area, which, however, has not been finalised.

comment 462 comment by: *Union des Aéroports français - UAF*

Attachment [#17](#)

Suite à l'impossibilité informatique de commenter le CS-ADR-DSN.A.002-Definitions sous son intitulé, vous trouverez le commentaire relatif à la définition de "runway strip" ci-joint.

UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « runway strip »

Référence: CS-ADR-DSN.A.002 « runway strip »

"Runway strip means a defined area including the runway and stopway, if provided, intended:

(a) to reduce the risk of damage to aircraft running off a runway; and

(b) to protect aircraft flying over it during take-off or landing operations.”

Traduction de courtoisie

This definition should be specified to avoid any misunderstanding by well separating the cleared and graded area (CGA) previously defined but whose objectives are incoherent with the runway strip ones.

We propose to add a definition for the portion of the runway which is not graded and which could be: « Cleared runway strip means the part of the runway strip intended to protect aircraft flying over it during take-off or landing operations ».

Indeed, the runway strip has two objectives: reducing damages to aircrafts in case of running off the runway and protecting aircrafts flying over the runway strip. Being a part of the runway strip, the CGA should be submitted to the same objectives, which is not the case here because it does not take into account the protection of flying aircrafts.

To not have two different parts of runway strip with identical objectives, it is appropriate to distinguish the graded portion from the non-graded portion of runway strip with different objectives.

response *Noted*

The CGA definition states that it is part of the runway strip and therefore falls under the overarching definition of runway strip.

comment 522

comment by: *Union des Aéroports français - UAF*

Attachment [#18](#)

Suite à l'impossibilité informatique de commenter le CS-ADR-DSN.F.370- "Isolated aircraft parking position" sous son intitulé, vous trouverez ci-joint le commentaire relatif à cet article.

UAF NPA 2011-20 (B.III) CS-ADR-DSN.F.370

Référence: CS-ADR-DSN.F.370
Isolated aircraft parking position

Traduction de courtoisie

(a) It is appropriate to transfer this provision into IR-OPS

(b) It is appropriate to transfer this provision into GM

The designation of an Isolated aircraft parking position falls within the competences of the aerodrome operator or the local authorities for safety/security reasons. Thus the (a) is an IR-OPS.

The (b) is a best practice considering that the final choice takes into account more imperatives elements outside of the safety scope.

response *Partially accepted*

Paragraph (b) had a second sentence in ICAO text. It has been moved to GM. The remainder is from ICAO design criteria; therefore, it will remain in the CS.

comment 584

comment by: *Munich Airport International*

- References to ICAO Documents within tables, figures and text need to be removed or aligned with EASA references.
- Numeration of Figures and tables needs to be consistent
- Repeating paragraphs with the same content need to be removed (e.g. DSN.H.425 (f),(g),(h) or DSN.M.760 (c))
- No proposed Amendments to ICAO Documents should be included into EASA as long as there not finally agreed by ICAO.
- There are chapters, which are making reference to tables which are not included.
- The provisions for flexibility, customised compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents although this was stated by EASA as a basis for the Rulemaking process. It is notably due to the fact that recommendations have been transposed to the same level as standards. To reflect the necessity for flexibility, customised compliance and proportionality numbers, figures and tables should be moved from CS to GM combined with adding the purpose and need for a certain design element to CS as a basis for its application.

response *Partially accepted*

Accepted: ICAO references will be amended. (H.425) duplications will be deleted. Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA, but is in the corrigendum). Table J-1 will be inserted in the NPA.

Noted: Other comments.

comment 585

comment by: *Cologne/Bonn Airport*

- - References to ICAO Documents within tables, figures and text need to be removed or aligned with EASA references.
- - Numeration of Figures and tables needs to be consistent
- - Repeating paragraphs with the same content need to be removed (e.g. DSN.H.425 (f),(g),(h) or DSN.M.760 (c))
- - No proposed Amendments to ICAO Documents should be included into EASA as long as there not finally agreed by ICAO.
- - There are chapters, which are making reference to tables which are not included.
- - The provisions for flexibility, customised compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents although this was stated by EASA as a basis for the Rulemaking process. It is notably due to the fact that recommendations have been transposed to the same level as standards. To reflect the necessity for flexibility, customised compliance and proportionality numbers, figures and tables should be moved from CS to GM combined with adding the purpose and need for a certain design element to CS as a basis for its application.

response *Partially accepted*

Accepted ICAO references will be amended. (H.425) duplications will be deleted. Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA, but is in the corrigendum). Table J-1 will be inserted in the NPA.

Noted: Other comments.

comment **848** *comment by: Zürich Airport*

The wording "should" especially within the Certification Specifications (CS) doesn't reflect the flexibility and proportionality mentioned in the Basic Regulation (EG) 1108/2009.

In the frame of ICAOs SARPS the wording "should" is used for Recommendations and therefore as a non-binding context. In contrast to the CS of EASA, they are made binding through certification basis (CB). EASA has to avoid confusion in conjunction with the wording "should".

response *Noted*

Use of 'should' provides the flexibility and proportionality that 'shall' does not. The selection of a CS (or the available mechanisms of ELOS or SC) for construction of the CB allows flexibility to meet individual aerodrome circumstances and only becomes binding when established by the NAA.

comment **856** *comment by: Zürich Airport*

Abbreviation of CS isn't clear throughout several documents from EU/EC. Within the EC No 552/2004 (interoperability of ATM network) CS stands for community specifications and are non-binding. Within the EC No 1108/2009 (Aerodromes, ATM) as well as within the EASA NPA CS stands for certification specifications and are binding throughout the certification basis (CB). Same abbreviation - same field of industry - different meanings. EASA has to make sure that confusion is avoided within the NPA.

response *Noted*

Throughout the NPA, CS means 'Certification Specification'. Many other EASA documents also use CS with the same meaning.

comment **1032** *comment by: ADP : Aeroports de Paris*

ADP (Aéroports de Paris) fully support the comments and justification as submitted by ACI Europe. In addition to those, ADP has submitted his own comments, more specifically for France and the Paris airports.

response *Noted*

comment *1046*

comment by: *Bezirksregierung Düsseldorf / Luftverkehr*

Wie in "NPA 2011-20(A) - Explanatory Note" unter Punkt 16 (dritter Spiegelstrich) ausgeführt, sind CSs nicht verbindliche Standards, welche die Grundlage für die Zertifizierung darstellen. Sofern Standards (CSs) im Rahmen einer Zertifizierung nicht erfüllt bzw. nachgewiesen werden, ist zwingend ein Nachweis (Assessment) [hier: ELoS-Verfahren] zu erbringen, das ein gleichwertiges Maß an Sicherheit mit der alternativen Methode erzielt wird, wie es mit den entsprechenden Standards (CS) erreicht werden würde.

Durch die Forderung, ein ELoS-Verfahren bei Nichterfüllung von Standards (CS) durchzuführen, werden die Standard (CS) zwangsweise zu verpflichtenden/verbindlichen Normen erklärt, was zu einen eklatanten Widerspruch hinsichtlich der Aussage "CSs sind nicht verbindliche Standards" führt.

In "NPA 2011-20(A) - Explanatory Note" wird unter Punkt 16 (letzer Absatz) weiter ausgeführt, dass "Spezial-Verfahren" (SCs) und "Standards" (CSs) auf individueller Basis für den Antragsteller (Zertifikatinhaber) als Teil des ausgestellten Zertifikats verbindlich werden. Auch dies stellt einen eklatanten Widerspruch zu der grundsätzlichen Aussage dar, das CSs nicht verbindliche Standards darstellen.

Warum die EASA in diesem Punkt von der Idee des ICAO Annex 14 deutlich abweichen möchte, ist weder begründet noch nachvollziehbar.

ICAO Annex 14 sagt aus, dass ein Standard eine Spezifikation für eine physikalische Größe ist, die aus Sicherheitsaspekten notwendiger Weise zu erfüllen bzw. einzuhalten ist. Somit stellt ein ICAO-Standard eine verbindliche Forderung dar, die quasi immer zu erfüllen ist. Nur in begründeten Ausnahmefällen kann jeweils im Einzelfall hiervon abgewichen werden, wenn gleichzeitig nachgewiesen werden kann, dass hierdurch keine nachteiligen Auswirkungen auf Sicherheitsaspekte einhergehen.

In einer zweiten untergeordneten Stufe werden in ICAO Annex 14 sogenannte Empfehlungen (Recommendations) veröffentlicht, bei denen es wünschenswert ist, wenn diese erfüllt werden. Gleichwohl liegt es in der Entscheidung der jeweils zuständigen Luftfahrtbehörden, in begründeten Einzelfällen, wenn beispielsweise ein deutlicher Sicherheitsgewinn durch Erfüllung der Maßnahme erreicht werden kann, auch die Erfüllung derartige Empfehlungen verbindlich einzufordern. Auf der anderen Seite können auch die Flugplatzbetreiber aus eigenem Antrieb auf freiwilliger Basis derartige Empfehlung erfüllen, ohne dass die jeweils zuständige Luftfahrtbehörde hier Vorbehalte geltend machen kann.

NPA 2011-20 (B.III) wird derzeit so verstanden, dass die EASA beabsichtigt, auch die "Empfehlungen/Recommendations" aus ICAO Annex 14 zu europäischen Standards (CSs) zu erklären. Dies widerspricht dem ICAO-Grundgedanken und ist entsprechend zu korrigieren. Sofern es weiterhin beabsichtigt ist, ICAO-Empfehlungen zu EASA-CSs zu erklären, so wäre in jedem Einzelfall zu evaluieren und umfangreich zu begründen, welches Maß an Sicherheitsgewinn erzielt wird, wenn ICAO-Empfehlungen zu EASA-Standards erhoben werden sollen.

Weiterhin stellt die beabsichtigte Vorgehensweise insbesondere für existierende Bestandsflughäfen eine unbillige Härte bei Verfahren gemäß Artikel 6 und 7 der Cover-Regulation dar. Es ist sowohl faktisch aber auch rechtlich kaum möglich, im Nachhinein die Erfüllung von Voraussetzungen (Standards) einzufordern, die zum Zeitpunkt der damaligen Genehmigungserteilung "lediglich" als ICAO-

Empfehlungen existierten.

As it is stated in "NPA 2011-20 (A) - Explanatory Note" (Number 16 - third mirror line), CSs are non-binding technical standards, which are used to establish the certification basis (CB). If standards (CSs) are not fulfilled and/or are not proven in the context of a certification process, a proof (Assessment) is compelling [here: ELoS-procedure], which is obtained by an equivalent measure of safety with the alternative method, how it would be reached with the appropriate standard (CS).

By the requirement to accomplish an ELoS-procedure when standards (CS) are not fulfilled, standard (CS) became compulsorily a binding character. This is a glaring contradiction concerning the statement, that CSs are non-binding standards.

Furthermore in " NPA 2011-20 (A) - Explanatory Note" (Number 16 - last sentence) it is stated, that SCs, like CSs, become binding on an individual basis to the applicant as part of an agreed CB. Also this is a glaring contradiction concerning the fundamental statement, that CSs are non-binding standards.

This EASA-approach which deviates remarkable from the idea of ICAO Annex 14, is neither justified nor comprehensible.

ICAO Annex 14 expressly states, that Standard is any specification for physical characteristics of which is recognized as necessary for safety aspects. Thus an ICAO-Standard represents an obligatory demand, which must be always fulfilled as it is. Only in justified exceptional individual cases it is possible, to deviate from an ICAO-Standard, if it can be proven at the same time, that there are no unfavourable effects on safety aspects.

In a second subordinated stage ICAO Annex 14 introduces recommended practices (Recommendations). Recommended practices are any specifications...of which is recognized as desirable if they are fulfilled. Nevertheless it is a decision of the responsible competent authority, if they decide in justified individual cases that an ICAO-Recommendation is to be fulfilled obligatorily, if the fulfilment for example pictures a clear safety gain. On the other hand the aerodrome operator is free to fulfil ICAO-Recommendations on a voluntary basis.

Currently NPA 2011-20 (B.III) is appreciated in the way that EASA intends to raise all ICAO-Recommendations to European Standards (CSs). This is a considerable contradiction to the basic idea of ICAO Annex 14 and therefore the EASA-approach should be corrected accordingly. If EASA still wants to raise ICAO-Recommendations to European CSs than EASA has to evaluate and to justify in each individual case, which measures of safety gain are obtained.

Further the intended EASA-approach is representing an inequitable hardness for existing aerodromes, which have to follow the procedures in accordance with article 6 and 7 of the cover regulation. Factual as well as judicial it would be hardly possible, to require the fulfilment of European CSs if they were only ICAO-Recommendations at that time the aerodrome-permission was issued.

response *Noted*

The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes.

comment 1062 comment by: Assaeroporti - Associazione Italiana Gestori Aeroporti

ASSAEROPORTI fully supports the comments and justifications as submitted by ACI Europe. In addition to that, ASSAEROPORTI has submitted further comments in this CRT.

In particular, based on the Italian regulation, some competencies and activities are on charge of third parties (i.e. Rescue and Fire Fighting or Air Navigation Service). For this reason local legislations should be considered as arrangements or agreements.

However the EASA regulation increases significantly the responsibility of the aerodrome operator compared to the existing situation in Italy. Consequently, we suggest to insert a reference to "competent authorities" in order to ensure their responsibilities in the certification process.

response *Noted*

These comments are not applicable to CSs.

comment *1063*

comment by: *Turin Airport - TRN/LIMF*

Turin Airport fully supports the comments and justifications as submitted by ACI Europe. In addition to that, together with ASSAEROPORTI we have submitted further comments in this CRT.

In particular, based on the Italian regulation, some competencies and activities are on charge of third parties (i.e. Rescue and Fire Fighting or Air Navigation Service). For this reason local legislations should be considered as arrangements or agreements.

However the EASA regulation increases significantly the responsibility of the aerodrome operator compared to the existing situation in Italy. Consequently, we suggest to insert a reference to "competent authorities" in order to ensure their responsibilities in the certification process.

response *Noted*

These comments are not applicable to CSs.

comment *1231*

comment by: *Zürich Airport*

Within the new proposed requirements the responsibility of the aerodrome operator is significantly increased. However the competences between airports and CAA therefore are not yet precisely defined. This disproportionality between responsibilities and competences will result in an enhanced and double effort for the CAA as well as for the aerodrome operators, accompanied with more complexity and more costs on both sides with less operating safety at the end.

response *Noted*

This comment is not applicable to CSs.

comment	1256 comment by: Zürich Airport
	<p>Although the CSs in NPA are declared as not binding by EASA Authorities, they do represent the basics for certification of the airports. Having in mind that the ICAO recommendations and notes are also supposed to become a CS, in this case the this regulation should provide more flexibility for the airport operators to achieve the acceptable level of safety per example by using other means of compliance instead of achieving the equivalent level of safety(ELOS).</p>
response	Accepted
	<p>The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.</p>
comment	1326 comment by: Zürich Airport
	<p>Due to transformation of all ICAO Recommendations and Notes to the CS at NPAs, the Agency should be aware of the problems caused through different interpretation possibility and also different expectations between Civil Aviation Authorities (CAA) and airport operators during specifying the certification basis.</p>
response	Noted
comment	1468 comment by: Euroairport Bâle-Mulhouse
	<p>Attachment #19</p> <p>Suite à l'impossibilité informatique de commenter le CS-ADR-DSN.F.370- "Isolated aircraft parking position" sous son intitulé, vous trouverez ci-joint le commentaire relatif à cet article.</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.F.370</p> <p>Référence: CS-ADR-DSN.F.370 Isolated aircraft parking position</p> <p>Traduction de courtoisie</p> <p>(a) It is appropriate to transfer this provision into IR-OPS (b) It is appropriate to transfer this provision into GM</p> <p>The designation of an Isolated aircraft parking position falls within the competences of the aerodrome operator or the local authorities for safety/security reasons. Thus the (a) is an IR-OPS. The (b) is a best practice considering that the final choice takes into account</p>

	more imperatives elements outside of the safety scope.
response	<i>Partially accepted</i>
	Paragraph (b) had a second sentence in ICAO text. It has been moved to GM. The remainder is from ICAO design criteria; therefore, it will remain in the CS.

comment	<p>1491 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #20</p> <p>See Comment B.I 1899</p> <p>ADBM - NPA 2011-20 (B.I-III) Com gal 1</p> <p>Objet et portée du règlement</p> <p>There is a doubt about the object and the scope of the EASA regulation on aerodromes, issue of the present NPA.</p> <ul style="list-style-type: none"> • Does this regulation create obligations towards other entities than the competent authority and the aerodrome operator such as local authorities or owners outside of the airport boundaries? • Does the regulation creates rights for users of the airport and enables them to introduce court claims on this basis? <p>Besides, the legal applicability of others documents prepared by the EASA is uncertain. In its explanatory note (paragraph 16), the agency indicates that AMCs are non-essential and non-biding whereas the ADR.OR.A.015 is in contradiction with this affirmation: "<i>The aerodrome operator may implement these alternative means of compliance subject to prior approval by the competent authority and upon receipt of the notification</i>". This must imperatively be clarified because all comments on AMC are largely related to their juridical value.</p> <p>ADBM considers that EASA's regulation should only be related to the certification of aerodromes. This position is confirmed by the fact that every specification of the NPA have been provided only in the scope of an aerodrome certification.</p> <p>To this end, ADBM is in favour of a better delimitation of the regulation object at article 1 of cover regulation. Without such precision, the regulation would interfere with other activities which are note in the scope of competence of the EASA notably concerning ground handling, urbanism and public security.</p>
response	<i>Noted</i>

comment	<p>1494 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #21</p> <p>ADBM - NPA 2011-20 (B.I et III) Com gal 11</p>
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Références aux Guidance Materials dans les articles de l'Implementing Rules ou les Spécifications de certification

Traduction de courtoisie

For the consistency of the regulation, references to Guidance Materials (GM) must not be included in Certification Specifications (CS) or Implementing Rules (IR) and have to be developed in specific notes. Otherwise, it implies that GM has the same value as CS or IR. It shall not be the case.

response *Accepted*

comment

1648

comment by: *Aéroport de Marseille - MRS/LFML*

Selon nous, les références aux Guidance Materials (GM) ne doivent jamais être comprises dans les Spécifications de Certification (CS) ni dans les Implementing Rules (IR) : elles doivent faire l'objet de notes spécifiques.

Dans le cas contraire, cela laisse entendre que le GM a valeur de CS ou d'IR. Ce qui n'é doit pas être le cas

response *Accepted*

comment

1649

comment by: *Aéroport de Marseille - MRS/LFML*

We understand that the provisions where it is indicated that the text is transferred to GM ("move to GM") will not be incorporated in IR, CS or AMC.

We will not contest the transfer of these provisions to GM.

response *Accepted*

comment

1653

comment by: *Aéroport de Marseille - MRS/LFML*

There is a doubt about the object and the scope of the EASA regulation on aerodromes, issue of the present NPA.

- Does this regulation create obligations towards other entities than the competent authority and the aerodrome operator such as local authorities or owners outside of the airport boundaries?

- Does the regulation creates rights for users of the airport and enables them to introduce court claims on this basis?

Besides, the legal applicability of others documents prepared by the EASA is uncertain. In its explanatory note (paragraph 16), the agency indicates that AMCs are non-essential and non-biding whereas the ADR.OR.A.015 is in contradiction with this affirmation: "*The aerodrome operator may implement these alternative means of compliance subject to prior approval by the*

competent authority and upon receipt of the notification". This must imperatively be clarified because all comments on AMC are largely related to their juridical value.

We consider that EASA's regulation should only be related to the certification of aerodromes. This position is confirmed by the fact that every specification of the NPA have been provided only in the scope of an aerodrome certification.

To this end, we are in favour of a better delimitation of the regulation object at article 1 of cover regulation. Without such precision, the regulation would interfere with other activities which are note in the scope of competence of the EASA notably concerning ground handling, urbanism and public security

response *Noted*

comment

1659

comment by: *Aéroport de Marseille - MRS/LFML*

The EASA regulation increases significantly the responsibility of the aerodrome operator compared to the existing situation in France. More and more missions have been put under the responsibility of aerodrome operator.

The rulemaking rationale should lead to counter balance this increase of responsibilities by conferring the necessary powers to the aerodrome operator in order to assume his new responsibilities. But the EASA regulation cannot confer such powers to the operator. Indeed, the repartition of responsibilities in member States is, in some cases, conducted under constitutional rules, for example when they are affected to public authorities, is largely out of the scope of the EASA.

Moreover, some provisions relating to the missions of the aerodrome operator do not take into account the principles of subsidiarity and proportionality. The safety of air transport must be assured without altering the repartition of the missions in member States. Each member States must have the possibility to designate authorities or entities in charge of the missions mentioned in the regulation notably concerning the obligation outside of the airport perimeter.

In others cases, the maintaining of competencies of public authorities is fixed by EU requirements. It is for example the case with the Directive (modified) n° 96/67/ CE dated 15 October 1996 related to the ground handling. Article 14 of this directive indicates that if the activity of a ground handler might be dependent on safety conditions of aircraft, equipment and persons, such conditions shall be defined and implemented by a public authority independent of the aerodrome operator through an agreement process. Consequently, the aerodrome operator has no power to forbid the access of a ground handler at the airport or to suspend this access for reasons related to safety. The draft of the future regulation to replace this directive does not modify this aspect (article 16 of the draft dated 16/03/2012).

Consequently, UAF suggests to insert a new article between article 2 and article 3 of the cover regulation :

Article 2 bis: "competent authorities"

Points 1 and 2 of article 3 of the cover regulation (« 1. Member States shall designate [...] No 216/2008. ») must be integrated in this new article 2 bis because they are the first rules about competent authority apart from the scope of monitoring, *stricto sensu*. These paragraphs are completed with the addition of the following paragraph: "When the responsibilities mentioned in the annexes of this regulation are assumed by an entity which is independent from the aerodrome operator, the competent authority shall ensure that all the essential requirements are covered and shall describe the allocation of these responsibilities in the approval terms of the certificate."

response *Noted*

comment 1663

comment by: *Aéroport de Marseille - MRS/LFML*

Many efforts have been undertaken in the European Union to reduce the administrative burden. But the text of the NPA contains a great volume of very specific rules. These provisions will considerably increase administrative burdens and costs.

Consequently, we strongly suggest on one hand to have Implementing rules (IR) less precise and to rather describe a general framework and on the other hand to transfer many AMC and CS into guidance material (GM). Many texts should be considered as examples to follow instead of being solutions indifferently imposed to anybody, it is even more valid knowing that many of them have no direct effects on safety.

response *Noted*

comment 1665

comment by: *Aéroport de Marseille - MRS/LFML*

AMP appreciate the spirit of cooperation shown by EASA during the NPA process. EASA has tried to find solutions for flexibility. However, this effort is still not sufficient because the results lead to a loss of flexibility in comparison with the ICAO system. It is notably due to the fact that EASA takes up indistinctly ICAO standards and ICAO recommendations.

We strongly wish that EASA deals with ICAO recommendations and ICAO standards with different manners to keep the flexibility of ICAO system.

So it is proposed that EASA takes as principle to consider ICAO recommendations as good practices only and transpose them into GM.

AMP admits that, after use of this principle, some ICAO recommendations (few) could be CS or AMC, for example the recommendation related to the runway width.

Moreover NPA reflects very partially and incompletely, the annex 14 modifications proposed by ICAO in its State letter n°41. These modifications have already been validated by the ICAO Air Navigation Commission and many ICAO experts. It is planned that these modifications would be applicable before the entry into force of EASA regulation.

AMP urges EASA to take up the contents of ICAO State Letter 41, also to anticipate the future ICAO annex 14, which will be more based on objectives or performances to reach than prescriptive rules. Such anticipation will prevent

Europe from facing an obsolete regulation from its publication. We remind that Annex 14 has been thought out in the middle of the last century for airport design when there was still space around. Nowadays, the paradigm has changed because rules should be thought for aerodrome certification in an optimisation of space and resources. Existing annex 14 SARPS reflect very incompletely this new paradigm.

N.B.: in several comments about CS and AMC, we indicate that it is appropriate to transfer the CS or AMC into GM. Such transfer needs to rewrite the text so that the term "should" does not appear anymore. Indeed, this term should be used only for CS and AMC in the present regulation.

response *Noted*

The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.

The comments not related to CS/GM will be answered by the appropriate Agency responder.

The ICAO SL 41 will be monitored and, when mature, will be considered for adoption into EASA regulations. The exception to this is that the SL 41 text relating to RESA has been incorporated into CS.

comment *1669*

comment by: *Aéroport de Marseille - MRS/LFML*

In different member States including France, public authorities have an essential role concerning airport safety and are in charge of specific powers to this end.

In France the constitutional framework implies that some missions are assumed by a public authority such as the "préfets" who are in charge and have the power to enforce law and order on the aerodromes and also outside the aerodromes whether it is for the definition or the application of the rules.

With the EASA projects, these missions will not be affected to the public authority anymore but to the aerodrome operator by the way of arrangements between itself and others entities providing services at the airport (MET, security, airlines...)

In order to facilitate the implementation of the future regulation, it is suggested that every rule taken by a public authority, including rules adopted by the "préfets" must be considered as arrangements and this must be written in the EASA project.

response *Noted*

comment 1671

comment by: *Aéroport de Marseille - MRS/LFML*

AMP draw the attention of EASA on the fact that its futures rules shall be understood by all the actors, who have to use them. Consequently, these rules shall be written in the national language of the State and not only in English.

§2.2.2 of the « Regulatory Impact Assessment » (page 15/130) giving the number of French airports entering the scope of the future EASA rules indicate that many of them are French: "Looking at the result for individual Member States, France has two peculiarities in this European picture : it has the largest number of aerodromes (159) and it is also the country with the highest number of aerodromes below the BR threshold (72 i.e. in relative share 45%...[...]" French airports are so particularly interested to know, understand and appreciate the impact of the EASA rules of this NPA.

The consultation, only in English, does not allow to French airports operators, having no sufficient translation means, to know, understand and correctly appreciate the impact of the rules proposed in this NPA. Consequently, French aerodrome operators are not able to use all their rights, which are recognized by article 6.1 of the "rulemaking procedure", applicable for the redaction and the publication of NPA: "Any person or organisation with an interest in the rule under development shall be entitled to comment on the basis of the published NPA, without discrimination on the basis of nationality".

Article 32-2 of the basic regulation (CE N°216/2008) indicates that all the translation works required for the EASA functioning are performed by the translation center of the EU.

It is also in line with ADR.OR.E.005 (i) related to the aerodrome manual. Indeed, it is indicated that the aerodrome manual shall reflect the basis certification and shall be in a language acceptable by the competent authority and understandable by everyone, who has to use it. So, IR-OPS, AMC and CS, elements of the certification basis shall be written in the official language recognized by the Member State.

Besides, this requirement of the use of the official language appears in most of national constitutions.

In consequence, the EASA regulation shall be written in French to be correctly applied on French aerodromes.

It is why, we ask EASA to answer to the following questions.

1. How the fact to have no French version of EASA rules could be considered as compliant with article 58-2 of the basic regulation on transparency and communication ? This article indicates that the agency ensure the public and any interested party are rapidly given objective, reliable and easily understandable information with regard to its.

2. How the fact to have no French version of EASA rules could be considered as compliant with the « Rulemaking Procedure » applicable for the redaction and publication of the NPA (§2 Explanatory Note page 5/22) ? This « Rulemaking Procedure » is the subject of the EASA Management Board Decision 08-2007 – Decision amending and replacing the Rulemaking Procedure – MB Meeting 03-2007- in application of article 52 of the basic regulation. In particularly, How the fact to have no French version of EASA rules could be considered as

compliant with article 6-1 of the EASA Rulemaking Procedure and article 52-1-c) of the basic regulation ("the procedures ensure that the Agency publishes documents and consults widely with interested parties...").

3. How the fact to have no French version of EASA rules could be considered as compliant with the article 22 of the Charter of fundamental rights of the European Union (2010/C 83/02) which stipulates that the European Union respects the linguistic diversity?

4. How the fact to have no French version of EASA rules could be considered as compliant with the interdiction of discrimination due to the nationality as stipulated in article 18 of the Treaty on the functioning of European Union?

5. How the fact to have no French version of EASA rules could be considered as compliant with article 342 of the Treaty on the functioning of European Union (former article 290) et of the regulation n°1 (modified) governing the languages of the European Union (in particular articles 1, 2 et 4)? These articles give the list of the official languages and the work languages of the EU institutions, including French among others. They also indicate that the r delivered by the EU institutions to a member State or at a citizen of this Member State shall be in the official language of this State and that the general texts are written in official languages.

6.If the answers to the here above questions would not be satisfactory vis-à-vis the applicable rules, how EASA plans to correct the NPA process used and to proceed for the publication of its set of rules ?

response *Noted*

comment *1718*

comment by: *Aéroports De Lyon*

La rédaction du règlement de l'AESA et des autres documents soumis à consultation ne permet pas de déterminer avec certitude l'objet et la portée juridique de ces textes.

En effet il n'est pas possible de savoir si le règlement :

- d'une part crée des obligations pour d'autres personnes que l'autorité compétente et l'exploitant d'aérodrome ainsi que leurs préposés, par exemple des collectivités locales ou des propriétaires à l'extérieur du périmètre aéroportuaire,

- d'autre part si le règlement est créateur de droits au profit des usagers qui pourraient engager des recours sur la base de celui-ci.

Par ailleurs, la portée juridique des autres documents préparés par l'AESA demeure incertaine. Ainsi, dans sa notice explicative (paragraphe 16), l'Agence indique que les moyens acceptables de conformité (AMC) ne sont pas essentiel (non-essential) et ne sont pas contraignants (non-binding). Or, la rédaction de l'ADR.OR.015 est en contradiction avec cette affirmation : l'exploitant d'aérodrome ne peut s'écarter d'un AMC, au moyen d'un moyen alternatif de conformité, que sur autorisation expresse de l'autorité compétente. Ce sujet doit impérativement être clarifié car les commentaires qui peuvent être fait sur les AMC dépendent en très grande partie de leur portée juridique.

La société Aéroports De Lyon estime que la réglementation de l'AESA ne devrait concerner que la certification des aérodromes. Pour cela, elle s'appuie sur le fait que toutes les spécifications de la NPA ne sont prévues que dans un cadre de

certification de l'aérodrome.

Aéroports De Lyon est donc favorable à ce que l'objet de la réglementation soit mieux délimité par l'article 1er du règlement d'exécution ("cover regulation"). A défaut d'une telle précision, le règlement de l'AESA viendrait interférer avec d'autres domaines échappant au domaine de compétences de l'AESA, notamment relatives à l'assistance en escale, aux règles d'urbanisme ou à la sécurité civile.

response *Noted*

comment 1719

comment by: *Aéroports De Lyon*

Le règlement de l'AESA augmente de manière significative le nombre de missions de l'exploitant d'aérodrome par rapport à la situation existante, du moins en France.

La logique réglementaire devrait amener à contre balancer cette augmentation en donnant les pouvoirs nécessaires à l'exploitant d'aérodrome pour effectuer ces nouvelles missions. Or, le présent règlement ne peut pas conférer de tels pouvoirs à l'exploitant pour l'ensemble des missions qui lui sont confiées.

En effet, la répartition des missions qui répond parfois à des exigences constitutionnelles comme c'est le cas lorsqu'elles sont attribuées aux autorités publiques, échappe en grande partie aux compétences de l'AESA.

De plus, certaines dispositions portant sur les missions de l'exploitant d'aérodrome ne tiennent pas compte des principes de subsidiarité et de proportionnalité.

La sécurité du trafic aérien doit être assurée sans bouleverser la répartition actuelle des compétences au sein de chacun des Etats. Chaque Etat doit conserver la possibilité de désigner les autorités et organismes en charge des missions visées par le règlement, notamment s'agissant des mesures qui doivent être mises en œuvre à l'extérieur du périmètre de l'aéroport.

Dans certains autres cas le maintien des compétences des autorités publiques répond à des exigences fixées par L'union Européenne. A titre d'exemple, la Directive 96/67/ CE du Conseil du 15 octobre 1996 (modifiée) qui organise l'accès au marché de l'assistance en escale dans les aéroports de la Communauté. Il résulte des dispositions de l'article 14 de la Directive précitée, que si l'activité d'un prestataire d'assistance en escale sur un aéroport peut être subordonnée à des conditions de sécurité des aéronefs, des équipements et des personnes, l'article 14 de la Directive ordonne que ces conditions soient définies et appliquées par une « autorité publique indépendante de l'entité gestionnaire de l'aéroport » au travers de la procédure d'agrément. L'exploitant d'aéroport se voit par conséquent interdire la possibilité de refuser l'accès à l'aéroport ou retirer un accès préalablement consentis à un assistant en escale au motif que son activité ne respecterait pas les critères de sécurité des aéronefs, des équipements et des personnes. Sur ce point, le projet de Règlement (référence interinstitutionnelle 2011/0397(COD)) visant à remplacer la Directive précitée n'apporte pas d'évolution et maintien la dévolution des pouvoirs d'appréciations des conditions de sécurité des de l'aéroport, des aéronefs et de personnes à une autorité indépendante de l'exploitant d'aéroport (article 16 du projet en date du 16/03/2012).

En conséquence la société Aéroports De Lyon fait la proposition de rajouter un nouvel article entre l'article 2 et l'article 3 de la « cover regulation » au livre I, développé ci-après.

Proposition

response	<p>Article 2 bis : "Autorités compétentes" Les points 1 et 2 de l'article 3 de la « cover regulation » existant (« 1. Member States shall designate [...] No 216/2008. ») sont intégrés dans ce nouvel article 2 bis car ils sont les premières règles de constitution des autorités compétentes sortant du cadre stricto sensu de la surveillance. Ces paragraphes sont complétés par l'ajout du paragraphe suivant: "Lorsque des missions indiquées dans les annexes au présent règlement sont assurées par une entité indépendante de l'exploitant d'aérodrome, l'autorité compétente vérifie que toutes les exigences essentielles sont couvertes et elle décrit la répartition des missions dans les clauses d'approbation du certificat."</p> <p><i>Noted</i></p>
comment	<p>1720 comment by: <i>Aéroports De Lyon</i></p> <p>Les recommandations de l'annexe 14 sont converties en CS, donc obligatoire. Cela pose problème concernant leur mise en application pour la majorité d'entre elles. Exemple: CS-ADR-DSN.D.245 , CS-ADR-DSN.E.365, CS-ADR-DSN.D.325, CS-ADR-DSN.F.370, CS-ADR-DSN.M.760 <u>Proposition</u>: Passer les recommandations de l'annexe 14 en GM.</p>
response	<p><i>Not accepted</i></p> <p>The BR requires that ICAO SARPs are taken into consideration.</p>
comment	<p>1722 comment by: <i>Aéroports De Lyon</i></p> <p>Si un commentaire devait être retenu dans le cadre de la consultation, se serait celui-ci: D'une manière générale, les responsabilités du gestionnaire augmentent considérablement. Problème: l'EASA ne peut conférer les pouvoirs nécessaires à l'application des missions qu'elle exige. En effet, le texte transfère des missions et les responsabilités des autorités publiques (ex: préfet, SNA) à l'exploitant ce qui n'est pas permis par le droit applicable, qui est contraire aux principes de subsidiarité et de proportionnalité et contraire à d'autres réglementations UE. Si l'EASA ne modifie pas ce texte, les exploitants français se retrouveront dans une position où la loi française sera en contradiction avec la réglementation européenne. Dans une telle situation, quelles règles faudrait-il appliquer?</p> <p><u>Solution proposée</u>: Chaque état doit avoir la possibilité de désigner les entités chargées des missions exigées par l'EASA. (Pour résumer, l'EASA dit "QUOI" et les états membres disent "QUI")</p>
response	<p><i>Noted</i></p> <p>Not for CS.</p>

comment	<p>1723 comment by: <i>Aéroports De Lyon</i></p> <p>L'utilisation de la langue anglaise freine la bonne compréhension des textes. De plus, le fait que le texte ne soit pas traduit dans les langues nationales entre en contradiction avec plusieurs règles européennes en vigueur. Exemple: EASA veille à ce que le public et toute partie intéressée reçoivent rapidement une information objective, fiable, et aisément compréhensible concernant ses travaux (Article 58-2 du règlement de base) En quoi cela est-il respecté?</p> <p>Enfin, les aéroports français représentant 26% des aéroports à certifier, il serait important d'avoir une version en langue française.</p>
response	<p><i>Noted</i></p> <p>Not for CS.</p>
comment	<p>1726 comment by: <i>Aéroports De Lyon</i></p> <p>4. La proportionnalité des mesures en fonction de la taille (trafic) et complexité de l'aéroport, annoncée dans le règlement de base n'est pas respecté. Article 8 paragraphe 6 "6. Les mesures visées au paragraphe 5: — tiennent compte de l'état de l'art et des meilleures pratiques dans le domaine de l'exploitation, — définissent différents types d'opérations d'exploitation et permettent que les exigences y afférentes et les preuves de conformité avec ces exigences soient proportionnées à la complexité de chaque type d'exploitation et au risque qu'elles impliquent, tiennent également compte de l'expérience acquise en service au niveau mondial dans le domaine de l'aviation, ainsi que des progrès scientifiques et techniques, — sont initialement élaborées, en ce qui concerne le transport commercial par avion et sans préjudice du tiret précédent, sur la base des règles techniques et des procédures administratives communes précisées à l'annexe III du règlement (CEE) no 3922/91, — reposent sur une évaluation des risques et doivent être proportionnelles à l'importance et à l'objet de l'exploitation, — permettent de faire face immédiatement aux causes établies d'accidents et d'incidents graves, — n'imposent pas aux aéronefs visés à l'article 4, paragraphe 1, point c), des exigences incompatibles avec les obligations qui incombent aux États membres dans le cadre de l'OACI,"</p> <p><u>Solution proposée</u>: Il conviendrait de nuancer les exigences en fonction de ces critères.</p>
response	<p><i>Noted</i></p> <p>Not for CS.</p>
comment	<p>1737 comment by: <i>Aéroports De Lyon</i></p>

response	<p>Les exigences chiffrées ne sont parfois pas applicable, certaines limites ne sont pas réalistes Exemple: CS ADR DSN E365</p> <p><u>Proposition</u>: Garder les principes et passer les chiffres en GM</p> <p><i>Not accepted</i></p>
comment	<p>1768 comment by: Cologne/Bonn Airport</p> <p>The saystem of standards and recommendations should be adopted by his NPA</p>
response	<p><i>Not accepted</i></p> <p>The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.</p>
comment	<p>1780 comment by: Pau Pyrénées Airport - PUF/LFBP</p> <p><u>Nombre de spécifications de certification (CS) et de moyens acceptables de conformité (AMC)</u></p> <p>A l'intérieur de l'Union européenne, beaucoup d'efforts ont été entrepris pour réduire la charge administrative.</p> <p>Or, le texte de la présente NPA comporte un nombre colossal de règles très précises.</p> <p>Les descriptions et amendements détaillés dans ces exigences de l'AESA vont accroître la charge administrative et les coûts administratifs.</p> <p>En conséquence, nous suggérons fortement que les règles d'application (IR) soient moins détaillées, qu'elles soient conçues pour fixer un cadre général et que beaucoup d'AMC et de CS soient transférés en éléments informatifs (GM). Ainsi, de nombreux textes doivent plutôt être considérés comme des exemples à suivre et non comme des solutions imposées indifféremment à tous, d'autant que beaucoup d'entre eux n'ont pas d'effets directs sur la sécurité.</p> <p><u>Traduction de courtoisie</u></p> <p>Many efforts have been undertaken in the European Union to reduce the administrative burden. But the text of the NPA contains a great volume of very specific rules. These provisions will considerably increase administrative burdens and costs.</p> <p>Consequently, we strongly suggest on one hand to have Implementing rules (IR) less precise and to rather describe a general framework and on the on the hand to transfer many AMC and CS into guidance material (GM). Many texts should be considered as examples to follow instead of being solutions indifferently imposed to anybody, it is even more valid knowing that many of them have no direct effects on safety.</p>
response	<p><i>Noted</i></p>

comment	1783	comment by: CAA CZ
response	<p>Comment provided by Karlovy Vary airport GENERALLY: The overall structure of the NPA is complicated and not user friendly. It is much more complicated and it takes much more time to get familiar and summarize all the information needed to implement particular requirement and sometimes the user can get lost jumping from Basic regulation to Cover regulation and then AR (A, B, C) through OR (A, B, C, D, E) to OPS (A, B, C) and AMC's, GM a CS.</p> <p><i>Accepted</i></p>	

comment	1784	comment by: Pau Pyrénées Airport - PUF/LFBP
<u>Objet et portée du règlement</u>		
<u>Commentaire</u>		
<p>La rédaction du règlement de l'AESA et des autres documents soumis à consultation ne permet pas de déterminer avec certitude l'objet et la portée juridique de ces textes.</p> <p>Le règlement de l'AESA ne peut pas s'opposer au droit des Etats. En effet il n'est pas possible de savoir si le règlement :</p> <ul style="list-style-type: none"> - d'une part crée des obligations pour d'autres personnes que l'autorité compétente et l'exploitant d'aérodrome ainsi que leurs préposés, par exemple des collectivités locales ou des propriétaires à l'extérieur du périmètre aéroportuaire, - d'autre part si le règlement est créateur de droits au profit des usagers qui pourraient engager des recours sur la base de celui-ci. <p>Par ailleurs, la portée juridique des autres documents préparés par l'AESA demeure incertaine. Ainsi, dans sa notice explicative (paragraphe 16), l'Agence indique que les moyens acceptables de conformité (AMC) ne sont pas essentiel (<i>non-essential</i>) et ne sont pas contraignants (<i>non-binding</i>). Or, la rédaction de l'ADR.OR.015 est en contradiction avec cette affirmation : l'exploitant d'aérodrome ne peut s'écarter d'un AMC, au moyen d'un moyen alternatif de conformité, que sur autorisation expresse de l'autorité compétente. Ce sujet doit impérativement être clarifié car les commentaires qui peuvent être fait sur les AMC dépendent en très grande partie de leur portée juridique.</p> <p>L'aéroport Pau-Pyrénées estime que la réglementation de l'AESA ne devrait concerner que la certification des aérodromes. Pour cela, elle s'appuie sur le fait que toutes les spécifications de la NPA ne sont prévues que dans un cadre de certification de l'aérodrome.</p> <p>L'aéroport Pau-Pyrénées est donc favorable à ce que l'objet de la réglementation soit mieux délimité par l'article 1er du règlement d'exécution ("<i>cover regulation</i>"). A défaut d'une telle précision, le règlement de l'AESA viendrait interférer avec d'autres domaines échappant au domaine de compétences de l'AESA, notamment relatives à l'assistance en escale, aux règles d'urbanisme ou à la sécurité civile.</p> <p>Plus généralement sur un plan politique, l'AESA se positionne sur une réglementation supra-national qui remet en question l'organisation des Etats et le rôle de leur gouvernement.</p>		

Traduction de courtoisie

There is a doubt about the object and the scope of the EASA regulation on aerodromes, issue of the present NPA.

- Does this regulation create obligations towards other entities than the competent authority and the aerodrome operator such as local authorities or owners outside of the airport boundaries?

- Does the regulation creates rights for users of the airport and enables them to introduce court claims on this basis?

Besides, the legal applicability of others documents prepared by the EASA is uncertain. In its explanatory note (paragraph 16), the agency indicates that AMCs are non-essential and non-biding whereas the ADR.OR.A.015 is in contradiction with this affirmation: "*The aerodrome operator may implement these alternative means of compliance subject to prior approval by the competent authority and upon receipt of the notification*". This must imperatively be clarified because all comments on AMC are largely related to their juridical value.

Pau Pyrenees airport considers that EASA's regulation should only be related to the certification of aerodromes. This position is confirmed by the fact that every specification of the NPA have been provided only in the scope of an aerodrome certification.

To this end, Pau Pyrenees airport is in favour of a better delimitation of the regulation object at article 1 of cover regulation. Without such precision, the regulation would interfere with other activities which are note in the scope of competence of the EASA notably concerning ground handling, urbanism and public security.

response *Noted*

comment 1787

comment by: *Pau Pyrénées Airport - PUF/LFBP*

Modification de l'annexe 14 de l'OACI

L'esprit de coopération dont a fait preuve l'AESA dans l'élaboration de la NPA a été très apprécié. En effet l'Agence a essayé de trouver certaines flexibilités pour les aérodromes. Malheureusement ces flexibilités s'avèrent insuffisantes car le projet de réglementation présenté aboutit en effet à une perte de la flexibilité procurée par le système OACI.

Ainsi le règlement reprend les normes et les recommandations de l'Annexe 14 de l'OACI de manière indifférenciée.

L'aéroport Pau Pyrénées souhaite fortement que les normes et recommandations de l'Annexe 14 ne soient pas traitées de la même manière afin de garder cette souplesse.

Aussi, nous proposons que l'AESA prenne comme principe que les recommandations de l'Annexe 14 soient considérées comme des règles de l'art et reprises comme éléments informatifs (GM).

Nous admettons cependant, qu'après application de ce principe, certaines recommandations de l'OACI (peu nombreuses) puissent être remontées en spécification de certification (CS) ou en moyen acceptable de conformité (AMC), par exemple la recommandation relative aux largeurs de piste.

Par ailleurs, la NPA reprend de manière très parcellaire et incomplète les modifications de l'annexe 14 proposées par l'OACI dans sa lettre aux Etats n°41. Or ces modifications ont reçu l'aval de la commission « navigation

aérienne » de l'OACI et de nombreux experts de cette organisation et elles doivent être applicables avant la date d'entrée en vigueur du règlement de l'AESA relatif aux aérodromes.

En conséquence l'UAF considère que l'AESA devrait reprendre globalement ces modifications afin aussi d'anticiper la future annexe 14 de l'OACI qui sera davantage fondée sur des objectifs ou performances à atteindre que sur des règles prescriptives.

Une telle anticipation évitera à l'Union européenne de se trouver confrontée à une réglementation obsolète dès sa publication.

Nous rappelons que l'annexe 14 a été pensée au milieu du siècle dernier pour la conception des aérodromes à une époque où l'espace pour créer de telles infrastructures ne manquait pas. Depuis, le paradigme a changé puisqu'il s'agit aujourd'hui d'avoir des règles pour certifier les aérodromes dans un contexte d'optimisation des ressources et de l'espace. Ce que les règles actuelles de l'annexe 14 ne reflètent que très incomplètement encore.

N.B. : dans plusieurs de ses commentaires détaillés sur les CS et les AMC, il faut déplacer tel CS en GM. Il faut comprendre aussi que cela nécessite généralement une réécriture pour que n'apparaisse plus le terme « should » qui, dans le cadre de la réglementation AESA, ne devrait être utilisé que pour des CS ou des AMC.

Traduction de courtoisie

Pau Pyrenees airport appreciates the spirit of cooperation shown by EASA during the NPA process. EASA has tried to find solutions for flexibility. However, this effort is still not sufficient because the results lead to a loss of flexibility in comparison with the ICAO system. It is notably due to the fact that EASA takes up indistinctly ICAO standards and ICAO recommendations.

We strongly wish that EASA deals with ICAO recommendations and ICAO standards with different manners to keep the flexibility of ICAO system.

So we propose that EASA takes as principle to consider ICAO recommendations as good practices only and transpose them into GM.

We admit that, after use of this principle, some ICAO recommendations (few) could be CS or AMC, for example the recommendation related to the runway width.

Moreover NPA reflects very partially and incompletely, the annex 14 modifications proposed by ICAO in its State letter n°41. These modifications have already been validated by the ICAO Air Navigation Commission and many ICAO experts. It is planned that these modifications would be applicable before the entry into force of EASA regulation.

We urge EASA to take up the contents of ICAO State Letter 41, also to anticipate the future ICAO annex 14, which will be more based on objectives or performances to reach than prescriptive rules. Such anticipation will prevent Europe from facing an obsolete regulation from its publication. We remind that Annex 14 has been thought out in the middle of the last century for airport design when there was still space around. Nowadays, the paradigm has changed because rules should be thought for aerodrome certification in an optimisation of space and resources. Existing annex 14 SARPS reflect very incompletely this new paradigm.

N.B.: in several comments about CS and AMC, it is appropriate to transfer the CS or AMC into GM. Such transfer needs to rewrite the text so that the term "should" does not appear anymore. Indeed, this term should be used only for CS and AMC in the present regulation.

response *Noted*

comment *1788*

comment by: *Pau Pyrénées Airport - PUF/LFBP*

Forme

La structure des règles et les références croisées rendent la lecture des documents complexe et difficile à comprendre.

The structure of the rules and cross references makes the document complex to read and understand.

response *Accepted*

comment *1789*

comment by: *Pau Pyrénées Airport - PUF/LFBP*

Responsabilité de l'exploitant

Commentaire

Le règlement de l'AESA augmente de manière significative le nombre de missions de l'exploitant d'aérodrome par rapport à la situation existante, du moins en France.

La logique réglementaire devrait amener à contre balancer cette augmentation en donnant les pouvoirs nécessaires à l'exploitant d'aérodrome pour effectuer ces nouvelles missions. Or, le présent règlement ne peut pas conférer de tels pouvoirs à l'exploitant pour l'ensemble des missions qui lui sont confiées.

En effet, la répartition des missions qui répond parfois à des exigences constitutionnelles comme c'est le cas lorsqu'elles sont attribuées aux autorités publiques, échappe en grande partie aux compétences de l'AESA.

De plus, certaines dispositions portant sur les missions de l'exploitant d'aérodrome ne tiennent pas compte des principes de subsidiarité et de proportionnalité.

La sécurité du trafic aérien doit être assurée sans bouleverser la répartition actuelle des compétences au sein de chacun des Etats. Chaque Etat doit conserver la possibilité de désigner les autorités et organismes en charge des missions visées par le règlement, notamment s'agissant des mesures qui doivent être mises en œuvre à l'extérieur du périmètre de l'aéroport.

Dans certains autres cas le maintien des compétences des autorités publiques répond à des exigences fixées par L'union Européenne. A titre d'exemple, la Directive 96/67/ CE du Conseil du 15 octobre 1996 (modifiée) qui organise l'accès au marché de l'assistance en escale dans les aéroports de la Communauté. Il résulte des dispositions de l'article 14 de la Directive précitée, que si l'activité d'un prestataire d'assistance en escale sur un aéroport peut être subordonnée à des conditions de sécurité des aéronefs, des équipements et des personnes, l'article 14 de la Directive ordonne que ces conditions soient définies et appliquées par une « autorité publique indépendante de l'entité gestionnaire de l'aéroport » au travers de la procédure d'agrément. L'exploitant d'aéroport se voit par conséquent interdire la possibilité de refuser l'accès à l'aéroport ou retirer un accès préalablement consentis à un assistant en escale au motif que son activité ne respecterait pas les critères de sécurité des aéronefs, des équipements et des personnes. Sur ce point, le projet de Règlement (référence interinstitutionnelle 2011/0397(COD)) visant à remplacer la Directive précitée

n'apporte pas d'évolution et maintient la dévolution des pouvoirs d'appréciations des conditions de sécurité des de l'aéroport, des aéronefs et de personnes à une autorité indépendante de l'exploitant d'aéroport (article 16 du projet en date du 16/03/2012).

En conséquence l'aéroport Pau-Pyrénées fait la proposition de rajouter un nouvel article entre l'article 2 et l'article 3 de la « cover regulation » au livre I, développé ci-après.

Proposition

Article 2 bis : "Autorités compétentes"

Les points 1 et 2 de l'article 3 de la « cover regulation » existant (« 1. Member States shall designate [...] No 216/2008. ») sont intégrés dans ce nouvel article 2 bis car ils sont les premières règles de constitution des autorités compétentes sortant du cadre stricto sensu de la surveillance.

Ces paragraphes sont complétés par l'ajout du paragraphe suivant: "Lorsque des missions indiquées dans les annexes au présent règlement sont assurées par une entité indépendante de l'exploitant d'aérodrome, l'autorité compétente vérifie que toutes les exigences essentielles sont couvertes et elle décrit la répartition des missions dans les clauses d'approbation du certificat."

Qui plus est un nombre croissant de missions équivaut à une augmentation des charges de l'exploitant. Face à ces charges, la taille de l'aéroport qui conditionne sa capacité financière, devient un critère important. Aujourd'hui, un aéroport atteint le grand équilibre aux environs d'1.5 millions de passagers. En deça de ce trafic, il ne pourra prendre en charge ces missions nouvelles qu'en augmentant ses tarifs et en perdant en compétitivité, au risque de les voir disparaître.

Traduction de courtoisie

The EASA regulation increases significantly the responsibility of the aerodrome operator compared to the existing situation in France. More and more missions have been put under the responsibility of aerodrome operator.

The rulemaking rationale should lead to counter balance this increase of responsibilities by conferring the necessary powers to the aerodrome operator in order to assume his new responsibilities. But the EASA regulation cannot confer such powers to the operator. Indeed, the repartition of responsibilities in member States is, in some cases, conducted under constitutional rules, for example when they are affected to public authorities, is largely out of the scope of the EASA.

Moreover, some provisions relating to the missions of the aerodrome operator do not take into account the principles of subsidiarity and proportionality. The safety of air transport must be assured without altering the repartition of the missions in member States. Each member States must have the possibility to designate authorities or entities in charge of the missions mentioned in the regulation notably concerning the obligation outside of the airport perimeter.

In others cases, the maintaining of competencies of public authorities is fixed by EU requirements. It is for example the case with the Directive (modified) n° 96/67/ CE dated 15 October 1996 related to the ground handling. Article 14 of this directive indicates that if the activity of a ground handler might be dependent on safety conditions of aircraft, equipment and persons, such conditions shall be defined and implemented by a public authority independent of the aerodrome operator through an agreement process. Consequently, the aerodrome operator has no power to forbid the access of a ground handler at the airport or to suspend this access for reasons related to safety. The draft of the future regulation to replace this directive does not modify this aspect (article 16 of the draft dated 16/03/2012).

Consequently, Pau Pyrenees airport suggests to insert a new article between article 2 and article 3 of the cover regulation :

Article 2 bis: "competent authorities"

Points 1 and 2 of article 3 of the cover regulation (« 1. Member States shall designate [...] No 216/2008. ») must be integrated in this new article 2 bis because they are the first rules about competent authority apart from the scope of monitoring, *stricto sensu*. These paragraphs are completed with the addition of the following paragraph: "When the responsibilities mentioned in the annexes of this regulation are assumed by an entity which is independent from the aerodrome operator, the competent authority shall ensure that all the essential requirements are covered and shall describe the allocation of these responsibilities in the approval terms of the certificate."

response *Noted*

comment 1791

comment by: *Pau Pyrénées Airport - PUF/LFBP*

Langue

Pau airport attire l'attention de l'AESA sur le fait que ses futures règles doivent être comprises par tous les acteurs qui ont à l'utiliser. En conséquence, ces règles doivent être écrites dans la langue du pays et pas uniquement en langue anglaise.

Le §2.2.2 du « Regulatory Impact Assessment » (page 15/130) donnant le nombre d'aéroports de chaque Etat Membre touchés par la NPA indique que bon nombre d'aérodromes concernés sont français: « Looking at the result for individual Member States, France has two peculiarities in this European picture : it has the largest number of aerodromes (159) and it is also the country with the highest number of aerodromes below the BR threshold (72 i.e. in relative share 45%...[...]» . Les exploitants d'aéroports français sont donc spécialement intéressés à connaître, comprendre et apprécier la portée des règles rédigées par l'AESA et soumises à consultation dans le cadre de la NPA.

La consultation, uniquement en langue anglaise, ne permet pas aux exploitants d'aéroports français, ne disposant pas nécessairement des moyens de traduction suffisants, de connaître, comprendre et d'apprécier justement la portée des règles exposées dans la NPA. Par conséquent, les exploitants d'aéroports français ne sont pas mis en mesure de faire usage de tous les droits qui leur sont reconnus par l'article 6-1 « consultation » de la « Rulemaking Procedure » applicable lors de la rédaction et de la publication de la NPA. Cet article dispose que "Any person or organization with an interest in the rule under development shall be entitled to comment on the basis of the published NPA, without discrimination on the basis of nationality".

L'article 32-2 du Règlement de Base (CE N°216/2008) prévoit que les travaux de traduction requis pour le fonctionnement de l'AESA sont effectués par le Centre de traduction des organes de l'Union Européenne.

Cela rejoint aussi la règle ADR.OR.E.005 (i) relative au manuel d'aérodrome. Il est en effet indiqué que le manuel d'aérodrome doit refléter la base de certification et doit être dans une langue acceptable de l'autorité compétente et comprise par tout le personnel amené à l'utiliser. Aussi les IR-OPS, les AMC et les CS, éléments de la base de certification, doivent, a minima, être écrits dans la langue du pays concerné.

En outre, l'exigence d'utiliser la langue officielle compréhensible par tous se

retrouve dans la plupart des Constitutions nationales.

En conséquence les règles de l'AESA relatives aux aéroports doivent aussi être écrites en français pour pouvoir être correctement utilisées sur les aéroports français.

C'est pourquoi, l'AESA doit apporter ses réponses aux **questions suivantes** :

1. En quoi l'absence de traduction en français de la NPA serait respectueuse de l'article 58-2 du Règlement de Base relatif à la transparence et à la communication ? Cet article stipule que l'Agence veille à ce que le public et toute partie intéressée reçoivent rapidement une information objective, fiable et aisément compréhensible concernant ses travaux.

2. En quoi l'absence de traduction en français de la NPA serait respectueuse de la « Rulemaking Procedure » applicable lors de la rédaction et de la publication de la NPA (§2 Explanatory Note page 5/22) ? Cette « Rulemaking Procedure » a été décidée par le Conseil d'Administration du 13 juin 2007 (EASA Management Board Decision 08-2007 –Decision amending and replacing the Rulemaking Procedure – MB Meeting 03-2007) en application de l'article 52 du Règlement de Base . En particulier, en quoi cette absence de traduction serait respectueuse de l'article 6-1 de la Rulemaking Procedure » (précité) et de l'article 52-1-c) du Règlement de Base stipulant que les procédures « garantissent que l'AESA procède à la diffusion des documents et à une large consultation des parties intéressées, ...[...] » ?

3. En quoi l'absence de traduction de la NPA, en français, serait respectueuse de l'article 22 de la Charte des Droits fondamentaux de l'Union Européenne (2010/C 83/02) qui stipule que l'Union Européenne respecte la diversité linguistique ?

4. En quoi l'absence de traduction en français de la NPA, n'enfreindrait pas l'interdiction des discriminations en raison de la nationalité stipulée à l'article 18 du Traité sur le Fonctionnement de l'Union Européenne (TFUE)?

5. En quoi l'absence de traduction en français de la NPA serait respectueuse de l'article 342 du TFUE (ancien article 290 du Traité) et du Règlement n°1 (modifié) portant fixation du régime linguistique de l'Union Européenne ? En particulier, en quoi cette absence de traduction serait compatible avec les exigences des articles 1, 2 et 4 du Règlement n°1? Les articles précités énumèrent la liste des langues officielles et des langues de travail des institutions de l'Union, dont le français. Ils prévoient également que les textes adressés par les institutions à un Etat membre ou à une personne relevant de la juridiction d'un Etat membre sont rédigés dans la langue de cet Etat. Ils stipulent enfin que les textes de portée générale sont rédigés dans les langues officielles.

6. Dans le cas où les réponses aux questions qui précèdent ne seraient pas satisfaisantes au regard du droit positif applicable, comment l'AESA entend reprendre la procédure de NPA afin d'y remédier et procéder pour la publication de ses règles ?

Traduction de courtoisie

Pau airport draw the attention of EASA on the fact that its futures rules shall be understood by all the actors, who have to use them. Consequently, these rules shall be written in the national language of the State and not only in English.

§2.2.2 of the « Regulatory Impact Assessment » (page 15/130) giving the number of French airports entering the scope of the future EASA rules indicate that many of them are French: "Looking at the result for individual Member States, France has two peculiarities in this European picture : it has the largest number of aerodromes (159) and it is also the country with the highest number of aerodromes below the BR threshold (72 i.e. in relative share 45%...[...]" French airports are so particularly interested to know, understand and appreciate the impact of the EASA rules of this NPA.

The consultation, only in English, does not allow to French airports operators, having no sufficient translation means, to know, understand and correctly appreciate the impact of the rules proposed in this NPA. Consequently, French aerodrome operators are not able to use all their rights, which are recognized by article 6.1 of the "rulemaking procedure", applicable for the redaction and the publication of NPA: "Any person or organisation with an interest in the rule under development shall be entitled to comment on the basis of the published NPA, without discrimination on the basis of nationality".

Article 32-2 of the basic regulation (CE N°216/2008) indicates that all the translation works required for the EASA functioning are performed by the translation center of the EU.

It is also in line with ADR.OR.E.005 (i) related to the aerodrome manual. Indeed, it is indicated that the aerodrome manual shall reflect the basis certification and shall be in a language acceptable by the competent authority and understandable by everyone, who has to use it. So, IR-OPS, AMC and CS, elements of the certification basis shall be written in the official language recognized by the Member State.

Besides, this requirement of the use of the official language appears in most of national constitutions.

In consequence, the EASA regulation shall be written in French to be correctly applied on French aerodromes.

It is why, EASA should answer to the following questions.

1. How the fact to have no French version of EASA rules could be considered as compliant with article 58-2 of the basic regulation on transparency and communication ? This article indicates that the agency ensure the public and any interested party are rapidly given objective, reliable and easily understandable information with regard to its.

2. How the fact to have no French version of EASA rules could be considered as compliant with the « Rulemaking Procedure » applicable for the redaction and publication of the NPA (§2 Explanatory Note page 5/22) ? This « Rulemaking Procedure » is the subject of the EASA Management Board Decision 08-2007 – Decision amending and replacing the Rulemaking Procedure – MB Meeting 03-2007- in application of article 52 of the basic regulation. In particular, How the fact to have no French version of EASA rules could be considered as compliant with article 6-1 of the EASA Rulemaking Procedure and article 52-1-c) of the basic regulation ("the procedures ensure ensure that the Agency publishes documents and consults widely with interested parties...").

3. How the fact to have no French version of EASA rules could be considered as compliant with the article 22 of the Charter of fundamental rights of the

European Union (2010/C 83/02) which stipulates that the European Union respects the linguistic diversity?

4. How the fact to have no French version of EASA rules could be considered as compliant with the interdiction of discrimination due to the nationality as stipulated in article 18 of the Treaty on the functioning of European Union?

5. How the fact to have no French version of EASA rules could be considered as compliant with article 342 of the Treaty on the functioning of European Union (former article 290) et of the regulation n°1 (modified) governing the languages of the European Union (in particular articles 1, 2 et 4)? These articles give the list of the official languages and the work languages of the EU institutions, including French among others. They also indicate that the r delivered by the EU institutions to a member State or at a citizen of this Member State shall be in the official language of this State and that the general texts are written in official languages.

6.If the answers to the here above questions would not be satisfactory vis-à-vis the applicable rules, how EASA plans to correct the NPA process used and to proceed for the publication of its set of rules ?

response *Noted*

comment

1792

comment by: *Pau Pyrénées Airport - PUF/LFBP*

Arrangements

Commentaire

Dans plusieurs pays dont la France, les autorités publiques ont un rôle essentiel en matière de sécurité aéroportuaire et disposent à cet effet de prérogatives particulières.

En France le cadre constitutionnel impose que certaines missions soient assurées par une autorité de l'Etat et c'est à ce titre que les préfets exercent des pouvoirs de police sur l'aéroport et à l'extérieur de l'aéroport, qu'il s'agisse de définir localement des règles de police ou de s'assurer de leur bonne application.

Dans le cadre des projets de l'AESA, ces sujets ne relèveraient plus de l'Etat, mais de l'exploitant d'aérodrome, en particulier par le biais d'arrangements passés entre celui-ci et les organisations fournissant des services sur l'aéroport (organismes chargés de la météo, de la sûreté, de la maintenance, transporteurs aériens...). Ce qui n'est ni possible ni souhaitable en France.

La responsabilité régalienne des Etats doit rester aux Etats. Même par la procédure d'un arrangement, un exploitant d'aérodrome ne pourra pas et ne souhaite pas "partager" la responsabilité régalienne de l'Etat français.

Traduction de courtoisie

In different member States including France, public authorities have an essential role concerning airport safety and are in charge of specific powers to this end.

In France the constitutional framework implies that some missions are assumed by a public authority such as the "préfets" who are in charge and have the power to enforce law and order on the aerodromes and also outside the aerodromes whether it is for the definition or the application of the rules.

With the EASA projects, these missions will not be affected to the public authority anymore but to the aerodrome operator by the way of arrangements between itself and others entities providing services at the airport (MET, security, airlines...)

response *Noted*

comment

1793

comment by: *Pau Pyrénées Airport - PUF/LFBP*

Références aux Guidance Materials dans les articles de l'Implementing Rules ou les Spécifications de certification

Pour des raisons de cohérence réglementaire, les références aux Guidance Materials (GM) ne doivent pas être incluses dans les Spécifications de Certification (CS) ni dans les Implementing Rules (IR) et doivent faire l'objet de notes spécifiques.

Dans le cas contraire, cela laisse entendre que le GM a valeur de CS ou d'IR. Ce qui n'é doit pas être le cas

Traduction de courtoisie

For the consistency of the regulation, references to Guidance Materials (GM) must not be included in Certification Specifications (CS) or Implementing Rules (IR) and have to be developed in specific notes. Otherwise, it implies that GM has the same value as CS or IR. It shall not be the case.

response *Accepted*

comment

1828

comment by: *DGAC Direction Générale de l'aviation civile*

Editorial comment

A guidance material only aims at describing the application of a CS in more detail. A guidance material provides descriptions or useful information but can absolutely not provide prescriptions, which is the goal of the CSs. Thus, to avoid any confusion between rules and guides, DGAC considers that the use of the words "should" is meant to CS only.

As a consequence, guidance materials using these words should be revised to use the word "may" instead.

response *Partially accepted*

The use of the word 'may' in GMs is not always appropriate. Therefore, 'should' will also be used when applicable.

comment	<p>1960 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #22</p> <p>See comment B.I 2328</p> <p>UAF NPA 2011-20 (B.I-III) Com gal 1</p> <p>Objet et portée du règlement</p> <p>Traduction de courtoisie There is a doubt about the object and the scope of the EASA regulation on aerodromes, issue of the present NPA.</p> <ul style="list-style-type: none"> • Does this regulation create obligations towards other entities than the competent authority and the aerodrome operator such as local authorities or owners outside of the airport boundaries? • Does the regulation creates rights for users of the airport and enables them to introduce court claims on this basis? <p>Besides, the legal applicability of others documents prepared by the EASA is uncertain. In its explanatory note (paragraph 16), the agency indicates that AMCs are non-essential and non-biding whereas the ADR.OR.A.015 is in contradiction with this affirmation: "<i>The aerodrome operator may implement these alternative means of compliance subject to prior approval by the competent authority and upon receipt of the notification</i>". This must imperatively be clarified because all comments on AMC are largely related to their juridical value.</p> <p>UAF considers that EASA's regulation should only be related to the certification of aerodromes. This position is confirmed by the fact that every specification of the NPA have been provided only in the scope of an aerodrome certification. To this end, UAF is in favour of a better delimitation of the regulation object at article 1 of cover regulation. Without such precision, the regulation would interfere with other activities which are note in the scope of competence of the EASA notably concerning ground handling, urbanism and public security.</p>
response	<p><i>Noted</i></p>

comment	<p>1971 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #23</p> <p>UAF NPA 2011-20 (B.III) Com gal 10</p> <p>Formulation "move to GM"</p> <p>Traduction de courtoisie We understand that the provisions where it is indicated that the text is transferred to GM ("move to GM") will not be incorporated in IR, CS or AMC. UAF will not contest the transfer of these provisions to GM.</p>
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response *Accepted*

comment 2045 comment by: *Assaeroporti - Associazione Italiana Gestori Aeroporti*

The provisions for flexibility, customised compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents. It is notably due to the fact that recommendations have been transposed to the same level as standards.

response *Noted*

The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.

comment 2074 comment by: *AIRBUS*

The CSs and associated GMs includes several "shall".
"should" is to be used for CSs, as indicated in the Explanatory Note
"may" or "is" could be used for GMs.

response *Partially accepted*

'Shall' will be edited out and replaced with 'should'. Sometimes it is more appropriate to use 'should' in GMs.

comment 2134 comment by: *SWISS AERODROMES ASSOCIATION*

According to EASA's definitions, Certification Specifications (CS) are non-binding technical standards adopted by the Agency to meet the essential requirements of the Basic Regulation. CSs are used to establish the certification basis (CB).

In this NPA and according to Art 8a, para 2.) of the Basic Regulation, it is understood that deviations from CSs may only be accepted if either an ELOS or an SC can be approved by the competent authority. As part of an agreed CB, the CSs become binding on an individual basis to the applicant. Special Conditions (SC) are non-binding special detailed technical specifications determined by the NAA for an aerodrome if the certification specifications established by the EASA are not adequate or are inappropriate to ensure conformity of the aerodrome with the essential requirements of Annex Va to the Basic Regulation. SCs, like CSs, become binding on an individual basis to the applicant as part of an agreed CB.

CSs will therefore be binding to a certain degree in this NPA, through the process leading to the agreement of a CB. This is questionable. The freedom for a Member State to deal with ICAO SARPs would no longer be the same if design criteria are CSs considered as part of a binding or partially binding process. The ICAO system has been set as it is to provide flexible means of achieving safety whilst taking due account of the local and specific limiting factors often related to geographical, physical or similar constraints. Switzerland has good examples of physical constraints and of necessary tailored solutions for aerodromes. Dealing with these constraints is a task which requires more flexibility than the proposed system of CS containing Recommendations provide.

The distinction made by ICAO between Standards and Recommendations is a crucial element of national flexibility and customized compliance. Hence, when defining a CS, a distinction must be made and use this distinction criteria. Recommendations must be expressed in another way than CS.

Acceptable Means of Compliance (AMC) are non-binding but are described by EASA as serving "as means by which the requirements contained in the Basic Regulation, and the IR, can be met." *...Both NAAs and organizations may propose alternative means of compliance... Alternative Means of Compliance proposals must be accompanied by evidence of their ability to meet the intent of the IR. Use of an existing AMC gives the user the benefit of compliance with the IR.* The use of AltMoC is burdensome and therefore not appropriate to express recommendations.

Guidance Material (GM) is non-binding explanatory and interpretation material *on how to achieve the requirements contained in the Basic Regulation, the IRs, the AMCs and the CSs.* It contains information, including examples, to assist the user in the interpretation and application of the Basic Regulation, its IRs, AMCs and the CSs. GM is appropriate to reflect the status of ICAO recommendations.

We therefore suggest to move all the ICAO recommendations from CS to GM.

We furthermore approve the use of the wording "should" in the remaining CSs containing ICAO Standards, as evidence of a necessary flexibility expressed in the working groups by the representatives of the aerodromes community.

In the process of commenting this part of the NPA, we shall not address every individual issue but only give some illustrations of the enhancement potential. Therefore and unless they achieve an acceptable level of flexibility and potential of customized compliance, non commented provisions must not be considered as agreed with by our Association and its members.

response *Noted*

The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.

comment 2152

comment by: ADP : Aeroports de Paris

Commentaire

La rédaction du règlement de l'AESA et des autres documents soumis à consultation ne permet pas de déterminer avec certitude l'objet et la portée juridique de ces textes.

En effet il n'est pas possible de savoir si le règlement :

- d'une part crée des obligations pour d'autres personnes que l'autorité compétente et l'exploitant d'aérodrome ainsi que leurs préposés, par exemple des collectivités locales ou des propriétaires à l'extérieur du périmètre aéroportuaire,
- d'autre part si le règlement est créateur de droits au profit des usagers qui pourraient engager des recours sur la base de celui-ci.

Par ailleurs, la portée juridique des autres documents préparés par l'AESA demeure incertaine. Ainsi, dans sa notice explicative (paragraphe 16), l'Agence indique que les moyens acceptables de conformité (AMC) ne sont pas essentiel (*non-essential*) et ne sont pas contraignants (*non-binding*). Or, la rédaction de l'ADR.OR.015 est en contradiction avec cette affirmation : l'exploitant d'aérodrome ne peut s'écarter d'un AMC, au moyen d'un moyen alternatif de conformité, que sur autorisation expresse de l'autorité compétente. Ce sujet doit impérativement être clarifié car les commentaires qui peuvent être fait sur les AMC dépendent en très grande partie de leur portée juridique.

ADP (Aéroports de Paris) considère que la réglementation de l'AESA ne devrait concerner que la certification des aérodromes. Pour cela, elle s'appuie sur le fait que toutes les spécifications de la NPA ne sont prévues que dans un cadre de certification de l'aérodrome.

ADP est donc favorable à ce que l'objet de la réglementation soit mieux délimité par l'article 1er du règlement d'exécution ("*cover regulation*"). A défaut d'une telle précision, le règlement de l'AESA viendrait interférer avec d'autres domaines échappant au domaine de compétences de l'AESA, notamment relatives à l'assistance en escale, aux règles d'urbanisme ou à la sécurité civile.

Traduction de courtoisie

There is a doubt about the object and the scope of the EASA regulation on aerodromes, issue of the present NPA.

- Does this regulation create obligations towards other entities than the competent authority and the aerodrome operator such as local authorities or owners outside of the airport boundaries?
- Does the regulation creates rights for users of the airport and enables them to introduce court claims on this basis?

Besides, the legal applicability of others documents prepared by the EASA is uncertain. In its explanatory note (paragraph 16), the agency indicates that AMCs are non-essential and non-biding whereas the ADR.OR.A.015 is in contradiction with this affirmation: "*The aerodrome operator may implement these alternative means of compliance subject to prior approval by the competent authority and upon receipt of the notification*". This must imperatively be clarified because all comments on AMC are largely related to their juridical value.

ADP considers that EASA's regulation should only be related to the certification

of aerodromes. This position is confirmed by the fact that every specification of the NPA have been provided only in the scope of an aerodrome certification.

To this end, ADP is in favour of a better delimitation of the regulation object at article 1 of cover regulation. Without such precision, the regulation would interfere with other activities which are note in the scope of competence of the EASA notably concerning ground handling, urbanism and public security.

response *Noted*

comment

2155

comment by: *ADP : Aeroports de Paris*

Commentaire

A l'intérieur de l'Union européenne, beaucoup d'efforts ont été entrepris pour réduire la charge administrative.

Or, le texte de la présente NPA comporte un nombre colossal de règles très précises.

Les descriptions et amendements détaillés dans ces exigences de l'AESA vont accroître la charge administrative et les coûts administratifs.

En conséquence, ADP (Aéroports de Paris) suggère fortement que les règles d'application (IR) soient moins détaillées, qu'elles soient conçues pour fixer un cadre général et que beaucoup d'AMC et de CS soient transférés en éléments informatifs (GM). Ainsi, de nombreux textes doivent plutôt être considérés comme des exemples à suivre et non comme des solutions imposées indifféremment à tous, d'autant que beaucoup d'entre eux n'ont pas d'effets directs sur la sécurité.

Traduction de courtoisie

Many efforts have been undertaken in the European Union to reduce the administrative burden. But the text of the NPA contains a great volume of very specific rules. These provisions will considerably increase administrative burdens and costs.

Consequently, ADP strongly suggest on one hand to have Implementing rules (IR) less precise and to rather describe a general framework and on the on the hand to transfer many AMC and CS into guidance material (GM). Many texts should be considered as examples to follow instead of being solutions indifferently imposed to anybody, it is even more valid knowing that many of them have no direct effects on safety.

response *Noted*

comment

2157

comment by: *ADP : Aeroports de Paris*

Commentaires

L'esprit de coopération dont a fait preuve l'AESA dans l'élaboration de la NPA a été très apprécié. En effet l'Agence a essayé de trouver certaines flexibilités pour les aérodromes. Ces flexibilités s'avèrent cependant insuffisantes car le projet de réglementation présenté aboutit en effet à une perte de la flexibilité actuelle procurée par le système OACI.

Ainsi le règlement reprend les normes et les recommandations de l'Annexe 14

de l'OACI de manière indifférenciée.

ADP insiste pour que les normes et recommandations de l'Annexe 14 ne soient pas traitées de la même manière afin de garder la souplesse du système OACI. ADP propose donc que l'AESA adopte comme principe que les recommandations de l'Annexe 14 soient considérées comme des règles de l'art et reprises comme éléments informatifs (GM).

Par ailleurs, la NPA reprend de manière très parcellaire et incomplète les modifications de l'annexe 14 proposées par l'OACI dans sa lettre aux Etats n°41. Or ces modifications ont reçu l'aval de la commission « navigation aérienne » de l'OACI et elles devraient être applicables avant la date d'entrée en vigueur du règlement de l'AESA relatif aux aérodromes.

ADP considère que l'AESA devrait reprendre globalement ces modifications.

Une telle anticipation éviterait à l'Union européenne de se trouver confrontée à une réglementation obsolète dès sa publication.

Traduction de courtoisie

ADP appreciates the spirit of cooperation shown by EASA during the NPA process. EASA has tried to find solutions for flexibility. However, this effort is still not sufficient because the results lead to a loss of flexibility in comparison with the ICAO system. It is notably due to the fact that EASA takes up indistinctly ICAO standards and ICAO recommendations.

ADP strongly wish that EASA deals with ICAO recommendations and ICAO standards with different manners to keep the flexibility of ICAO system.

So ADP proposes that EASA takes as principle to consider ICAO recommendations as good practices only and transpose them into GM.

Moreover NPA reflects very partially and incompletely, the annex 14 modifications proposed by ICAO in its State letter n°41. These modifications have already been validated by the ICAO Air Navigation Commission. It is planned that these modifications would be applicable before the entry into force of EASA regulation.

ADP urges EASA to take up the contents of ICAO State Letter 41, also to anticipate the future ICAO annex 14. Such anticipation will prevent Europe from facing an obsolete regulation from its publication.

response *Noted*

comment 2158

comment by: *ADP : Aeroports de Paris*

Commentaire

ADP (Aéroports de Paris) attire l'attention de l'AESA sur le fait que ses futures règles doivent être comprises par tous les acteurs qui ont à l'utiliser. En conséquence, ces règles doivent être écrites dans la langue du pays et pas uniquement en langue anglaise.

L'article 32-2 du Règlement de Base (CE N°216/2008) prévoit que les travaux de traduction requis pour le fonctionnement de l'AESA sont effectués par le Centre de traduction des organes de l'Union Européenne.

Cela rejoint aussi la règle ADR.OR.E.005 (i) relative au manuel d'aérodrome. Il est en effet indiqué que le manuel d'aérodrome doit refléter la base de certification et doit être dans une langue acceptable de l'autorité compétente et

comprise par tout le personnel amené à l'utiliser. Aussi les IR-OPS, les AMC et les CS, éléments de la base de certification, doivent, a minima, être écrits dans la langue du pays concerné.

En outre, l'exigence d'utiliser la langue officielle compréhensible par tous se retrouve dans la plupart des Constitutions nationales.

En conséquence les règles de l'AESA relatives aux aérodrômes doivent aussi être écrites en français pour pouvoir être correctement utilisées sur les aérodrômes français.

ADP demande à l'AESA d'apporter ses réponses aux **questions suivantes** :

1. En quoi l'absence de traduction en français de la NPA serait respectueuse de l'article 58-2 du Règlement de Base relatif à la transparence et à la communication ? Cet article stipule que l'Agence veille à ce que le public et toute partie intéressée reçoivent rapidement une information objective, fiable et aisément compréhensible concernant ses travaux.

2. En quoi l'absence de traduction en français de la NPA serait respectueuse de la « Rulemaking Procedure » applicable lors de la rédaction et de la publication de la NPA (§2 Explanatory Note page 5/22) ? Cette « Rulemaking Procedure » a été décidée par le Conseil d'Administration du 13 juin 2007 (EASA Management Board Decision 08-2007 –Decision amending and replacing the Rulemaking Procedure – MB Meeting 03-2007) en application de l'article 52 du Règlement de Base . En particulier, en quoi cette absence de traduction serait respectueuse de l'article 6-1 de la Rulemaking Procedure » (précité) et de l'article 52-1-c) du Règlement de Base stipulant que les procédures « garantissent que l'AESA procède à la diffusion des documents et à une large consultation des parties intéressées, ...[...] » ?

3. En quoi l'absence de traduction de la NPA, en français, serait respectueuse de l'article 22 de la Charte des Droits fondamentaux de l'Union Européenne (2010/C 83/02) qui stipule que l'Union Européenne respecte la diversité linguistique ?

4. En quoi l'absence de traduction en français de la NPA, n'enfreindrait pas l'interdiction des discriminations en raison de la nationalité stipulée à l'article 18 du Traité sur le Fonctionnement de l'Union Européenne (TFUE)?

5. En quoi l'absence de traduction en français de la NPA serait respectueuse de l'article 342 du TFUE (ancien article 290 du Traité) et du Règlement n°1 (modifié) portant fixation du régime linguistique de l'Union Européenne ? En particulier, en quoi cette absence de traduction serait compatible avec les exigences des articles 1, 2 et 4 du Règlement n°1? Les articles précités énumèrent la liste des langues officielles et des langues de travail des institutions de l'Union, dont le français. Ils prévoient également que les textes adressés par les institutions à un Etat membre ou à une personne relevant de la juridiction d'un Etat membre sont rédigés dans la langue de cet Etat. Ils stipulent enfin que les textes de portée générale sont rédigés dans les langues officielles.

6. Dans le cas où les réponses aux questions qui précèdent ne seraient pas satisfaisantes au regard du droit positif applicable, comment l'AESA entend reprendre la procédure de NPA afin d'y remédier et procéder pour la publication de ses règles ?

Traduction de courtoisie

ADP draw the attention of EASA on the fact that its futures rules shall be understood by all the actors, who have to use them. Consequently, these rules shall be written in the national language of the State and not only in English.

Article 32-2 of the basic regulation (CE N°216/2008) indicates that all the translation works required for the EASA functioning are performed by the translation center of the EU.

It is also in line with ADR.OR.E.005 (i) related to the aerodrome manual. Indeed, it is indicated that the aerodrome manual shall reflect the basis certification and shall be in a language acceptable by the competent authority and understandable by everyone, who has to use it. So, IR-OPS, AMC and CS, elements of the certification basis shall be written in the official language recognized by the Member State.

Besides, this requirement of the use of the official language appears in most of national constitutions.

In consequence, the EASA regulation shall be written in French to be correctly applied on French aerodromes.

ADP ask EASA to answer to the following questions.

1. How the fact to have no French version of EASA rules could be considered as compliant with article 58-2 of the basic regulation on transparency and communication ? This article indicates that the agency ensure the public and any interested party are rapidly given objective, reliable and easily understandable information with regard to its.

2. How the fact to have no French version of EASA rules could be considered as compliant with the « Rulemaking Procedure » applicable for the redaction and publication of the NPA (§2 Explanatory Note page 5/22) ? This « Rulemaking Procedure » is the subject of the EASA Management Board Decision 08-2007 –Decision amending and replacing the Rulemaking Procedure – MB Meeting 03-2007- in application of article 52 of the basic regulation. In particular, How the fact to have no French version of EASA rules could be considered as compliant with article 6-1 of the EASA Rulemaking Procedure and article 52-1-c) of the basic regulation (“the procedures ensure ensure that the Agency publishes documents and consults widely with interested parties...”).

3. How the fact to have no French version of EASA rules could be considered as compliant with the article 22 of the Charter of fundamental rights of the European Union (2010/C 83/02) which stipulates that the European Union respects the linguistic diversity?

4. How the fact to have no French version of EASA rules could be considered as compliant with the interdiction of discrimination due to the nationality as stipulated in article 18 of the Treaty on the functioning of European Union?

5. How the fact to have no French version of EASA rules could be considered as compliant with article 342 of the Treaty on the functioning of European Union (former article 290) et of the regulation n°1 (modified)

governing the languages of the European Union (in particular articles 1, 2 et 4)? These articles give the list of the official languages and the work languages of the EU institutions, including French among others. They also indicate that the r delivered by the EU institutions to a member State or at a citizen of this Member State shall be in the official language of this State and that the general texts are written in official languages.

6. If the answers to the here above questions would not be satisfactory vis-à-vis the applicable rules, how EASA plans to correct the NPA process used and to proceed for the publication of its set of rules ?

response *Noted*

comment 2340

comment by: *Turin Airport - TRN/LIMF*

The provisions for flexibility, customised compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents. It is notably due to the fact that recommendations have been transposed to the same level as standards.

response *Noted*

The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.

comment 2341

comment by: *DGAC Direction Générale de l'aviation civile*

General comments

Regulation (EC) N°216/2008 establishes that EASA produces rules and will standardise States to oversee them. However, the projects for implementing rules and associated AMCs, and certification specifications, have a wider scope than Regulation (EC) N°216/2008 and raise some important points on responsibilities:

Too many implementing rules have been produced on authorities and some are not within the scope of Regulation (EC) N°216/2008.

Regulation (EC) N°216/2008 states that "The Agency shall conduct standardisation inspections *in the fields covered by Article 1(1), in order to monitor the application by national competent authorities of this Regulation and of its implementing rules, and shall report to the Commission.*" Only a finding raised on the process to certify aerodromes could indicate a lack of resources, or a bad organisation of the State. However, no hook in Regulation (EC) N°216/2008 enables to impose an organisation to States. Moreover, this is

probably not in accordance with Lisbon treaty. This has been debated in an Aviation Group (end 2008), and the Commission had confirmed that it was not necessary to distinguish the State and the Competent authority, and that the organisation and the means of the State were up to them.

Finally, the obligations of such an authority go beyond the scope of Regulation (EC) N°216/2008 in this NPA2011-20 which regulates how the State should be organised:

- **In no case**, EASA should ask the States to have a "Management System", with additional requirements on personnel, notably functions to monitor compliance, which induces administrative burden and huge costs: this is the State competency.
- The authority regulated should be the one in charge of certification and safety oversight and be defined without prejudice to the organisation of the State: security, local planning, land use planning and environment authorities should not be mentioned in such a regulation authorities.

The responsibilities of the aerodrome operators induced by this Regulation are not in accordance with the French system too, which is probably not in accordance with Lisbon treaty. This is often due to the misuse of the word "ensure". This is a critical point, and in the indicated areas, the rules should be revised to solve this point.

Recommended practices are "desirable" for both "safety", "efficiency" and "regularity". However, most of the recommended practices within ICAO Annex 14 Volume 1 have been taken as CS, which will become binding in the aerodrome certification basis. Some recommended practices are specifications which do not contain a clear safety objective: adding them as written in ICAO Annex 14 Volume 1 in the CS is too stringent, as they will become "standards" through the certification basis, and the State will not be able to accept an ELOS as ICAO Annex 14 Volume 1 does not detail the safety objective. For all these recommended practices, it is asked: either to put them in GM, or to add in the CS the safety objective, to enable States to accept ELOS.

There is too much administrative burden in the exchanges between both:

- the aerodrome operator and the State;
- the State and EASA.

This administrative burden will induce huge costs and more staff for no real safety benefit: it is asked to modify the rules to solve this point.

response *Partially accepted*

The safety objectives suggested by DGAC have been incorporated into the CSs.

comment 2412

comment by: *Tarbes-Lourdes-Pyrénées airport*

Attachment [#24](#)

	<p>NPA 2011-20 (B.III) Com gal 10</p> <p>Formulation "move to GM"</p> <p>Traduction de courtoisie We understand that the provisions where it is indicated that the text is transferred to GM ("move to GM") will not be incorporated in IR, CS or AMC. UAF will not contest the transfer of these provisions to GM.</p>
response	<i>Accepted</i>

comment	<p>2621 comment by: <i>Swedish Regional Airport Association</i></p> <p>To avoid large consequences for many airports in Europe and to keep administration to an acceptable level, we suggest that a review of CS should be done with the aim of moving complicated issues to GM in line with ICAO regulations.</p>
response	<p><i>Noted</i></p> <p>The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.</p>

comment	<p>2687 comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i></p> <p>NPA 2011-20 (B.III) Com gal 10 Commentaires ACA</p> <p><u>Formulation "move to GM"</u> <u>Commentaire</u> Nous comprenons que les dispositions où il est indiqué que le texte est transféré en GM ("move to GM") ne figureront pas en IR, CS ou AMC.</p> <p>Le fait qu'il n'y ait pas de commentaire de notre part sur ces dispositions marque notre assentiment à ce qu'elles soient transférées en GM.</p> <p><u>Traduction de courtoisie</u> We understand that the provisions where it is indicated that the text is transferred to GM ("move to GM") will not be incorporated in IR, CS or AMC. ACA will not contest the transfer of these provisions to GM.</p>
response	<i>Accepted</i>

comment 2689

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

NPA 2011-20 (B.I et III) Com gal 11
Commentaires ACA

Références aux Guidance Materials dans les articles de l'Implementing Rules ou les Spécifications de certification

Commentaire

Pour des raisons de cohérence réglementaire, les références aux Guidance Materials (GM) ne doivent pas être incluses dans les Spécifications de Certification (CS) ni dans les Implementing Rules (IR) et doivent faire l'objet de notes spécifiques.

Dans le cas contraire, cela laisse entendre que le GM a valeur de CS ou d'IR. Ce qui n'é doit pas être le cas

Traduction de courtoisie

For the consistency of the regulation, references to Guidance Materials (GM) must not be included in Certification Specifications (CS) or Implementing Rules (IR) and have to be developed in specific notes. Otherwise, it implies that GM has the same value as CS or IR. It shall not be the case.

response *Accepted*

comment 2694

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

NPA 2011-20 (B.I-III) Com gal 1
Commentaires ACA

Objet et portée du règlement

Commentaire

La rédaction du règlement de l'AESA et des autres documents soumis à consultation ne permet pas de déterminer avec certitude l'objet et la portée juridique de ces textes.

En effet il n'est pas possible de savoir si le règlement :

- d'une part crée des obligations pour d'autres personnes que l'autorité compétente et l'exploitant d'aérodrome ainsi que leurs préposés, par exemple des collectivités locales ou des propriétaires à l'extérieur du périmètre aéroportuaire,
- d'autre part si le règlement est créateur de droits au profit des usagers qui pourraient engager des recours sur la base de celui-ci.

Par ailleurs, la portée juridique des autres documents préparés par l'AESA demeure incertaine. Ainsi, dans sa notice explicative (paragraphe 16), l'Agence indique que les moyens acceptables de conformité (AMC) ne sont pas essentiel (*non-essential*) et ne sont pas contraignants (*non-binding*). Or, la rédaction de l'ADR.OR.015 est en contradiction avec cette affirmation : l'exploitant d'aérodrome ne peut s'écarter d'un AMC, au moyen d'un moyen alternatif de conformité, que sur autorisation expresse de l'autorité compétente. Ce sujet doit impérativement être clarifié car les commentaires qui peuvent être fait sur

les AMC dépendent en très grande partie de leur portée juridique.

ACA estime que la réglementation de l'AESA ne devrait concerner que la certification des aérodromes. Pour cela, elle s'appuie sur le fait que toutes les spécifications de la NPA ne sont prévues que dans un cadre de certification de l'aérodrome.

ACA est donc favorable à ce que l'objet de la réglementation soit mieux délimité par l'article 1^{er} du règlement d'exécution ("*cover regulation*"). A défaut d'une telle précision, le règlement de l'AESA viendrait interférer avec d'autres domaines échappant au domaine de compétences de l'AESA, notamment relatives à l'assistance en escale, aux règles d'urbanisme ou à la sécurité civile.

Traduction de courtoisie

There is a doubt about the object and the scope of the EASA regulation on aerodromes, issue of the present NPA.

- Does this regulation create obligations towards other entities than the competent authority and the aerodrome operator such as local authorities or owners outside of the airport boundaries?
- Does the regulation creates rights for users of the airport and enables them to introduce court claims on this basis?

Besides, the legal applicability of others documents prepared by the EASA is uncertain. In its explanatory note (paragraph 16), the agency indicates that AMCs are non-essential and non-biding whereas the ADR.OR.A.015 is in contradiction with this affirmation: "*The aerodrome operator may implement these alternative means of compliance subject to prior approval by the competent authority and upon receipt of the notification*". This must imperatively be clarified because all comments on AMC are largely related to their juridical value.

ACA considers that EASA's regulation should only be related to the certification of aerodromes. This position is confirmed by the fact that every specification of the NPA have been provided only in the scope of an aerodrome certification. To this end, ACA is in favour of a better delimitation of the regulation object at article 1 of cover regulation. Without such precision, the regulation would interfere with other activities which are note in the scope of competence of the EASA notably concerning ground handling, urbanism and public security.

response *Noted*

comment 2704 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

NPA 2011-20 (B.I-III) Com gal 2 **Commentaires ACA**

Responsabilité de l'exploitant

Commentaire

Le règlement de l'AESA augmente de manière significative le nombre de missions de l'exploitant d'aérodrome par rapport à la situation existante, du

moins en France.

La logique réglementaire devrait amener à contre balancer cette augmentation en donnant les pouvoirs nécessaires à l'exploitant d'aérodrome pour effectuer ces nouvelles missions. Or, le présent règlement ne peut pas conférer de tels pouvoirs à l'exploitant pour l'ensemble des missions qui lui sont confiées.

En effet, la répartition des missions qui répond parfois à des exigences constitutionnelles comme c'est le cas lorsqu'elles sont attribuées aux autorités publiques, échappe en grande partie aux compétences de l'AESA.

De plus, certaines dispositions portant sur les missions de l'exploitant d'aérodrome ne tiennent pas compte des principes de subsidiarité et de proportionnalité.

La sécurité du trafic aérien doit être assurée sans bouleverser la répartition actuelle des compétences au sein de chacun des Etats. Chaque Etat doit conserver la possibilité de désigner les autorités et organismes en charge des missions visées par le règlement, notamment s'agissant des mesures qui doivent être mises en œuvre à l'extérieur du périmètre de l'aéroport.

Dans certains autres cas le maintien des compétences des autorités publiques répond à des exigences fixées par L'union Européenne. A titre d'exemple, la Directive 96/67/ CE du Conseil du 15 octobre 1996 (modifiée) qui organise l'accès au marché de l'assistance en escale dans les aéroports de la Communauté. Il résulte des dispositions de l'article 14 de la Directive précitée, que si l'activité d'un prestataire d'assistance en escale sur un aéroport peut être subordonnée à des conditions de sécurité des aéronefs, des équipements et des personnes, l'article 14 de la Directive ordonne que ces conditions soient définies et appliquées par une « autorité publique indépendante de l'entité gestionnaire de l'aéroport » au travers de la procédure d'agrément. L'exploitant d'aéroport se voit par conséquent interdire la possibilité de refuser l'accès à l'aéroport ou retirer un accès préalablement consentis à un assistant en escale au motif que son activité ne respecterait pas les critères de sécurité des aéronefs, des équipements et des personnes. Sur ce point, le projet de Règlement (référence interinstitutionnelle 2011/0397(COD)) visant à remplacer la Directive précitée n'apporte pas d'évolution et maintient la dévolution des pouvoirs d'appréciations des conditions de sécurité des de l'aéroport, des aéronefs et de personnes à une autorité indépendante de l'exploitant d'aéroport (article 16 du projet en date du 16/03/2012).

En conséquence ACA fait la proposition de rajouter un nouvel article entre l'article 2 et l'article 3 de la « cover regulation » au livre I, développé ci-après.

Proposition

Article 2 bis : "Autorités compétentes"

Les points 1 et 2 de l'article 3 de la « cover regulation » existant (« 1. Member States shall designate [...] No 216/2008. ») sont intégrés dans ce nouvel article 2 bis car ils sont les premières règles de constitution des autorités compétentes sortant du cadre stricto sensu de la surveillance.

Ces paragraphes sont complétés par l'ajout du paragraphe suivant: "Lorsque des missions indiquées dans les annexes au présent règlement sont assurées par une entité indépendante de l'exploitant d'aérodrome, l'autorité compétente vérifie que toutes les exigences essentielles sont couvertes et elle décrit la

répartition des missions dans les clauses d'approbation du certificat."

Traduction de courtoisie

The EASA regulation increases significantly the responsibility of the aerodrome operator compared to the existing situation in France. More and more missions have been put under the responsibility of aerodrome operator.

The rulemaking rationale should lead to counter balance this increase of responsibilities by conferring the necessary powers to the aerodrome operator in order to assume his new responsibilities. But the EASA regulation cannot confer such powers to the operator. Indeed, the repartition of responsibilities in member States is, in some cases, conducted under constitutional rules, for example when they are affected to public authorities, is largely out of the scope of the EASA.

Moreover, some provisions relating to the missions of the aerodrome operator do not take into account the principles of subsidiarity and proportionality. The safety of air transport must be assured without altering the repartition of the missions in member States. Each member States must have the possibility to designate authorities or entities in charge of the missions mentioned in the regulation notably concerning the obligation outside of the airport perimeter.

In others cases, the maintaining of competencies of public authorities is fixed by EU requirements. It is for example the case with the Directive (modified) n° 96/67/ CE dated 15 October 1996 related to the ground handling. Article 14 of this directive indicates that if the activity of a ground handler might be dependent on safety conditions of aircraft, equipment and persons, such conditions shall be defined and implemented by a public authority independent of the aerodrome operator through an agreement process. Consequently, the aerodrome operator has no power to forbid the access of a ground handler at the airport or to suspend this access for reasons related to safety. The draft of the future regulation to replace this directive does not modify this aspect (article 16 of the draft dated 16/03/2012).

Consequently, ACA suggests to insert a new article between article 2 and article 3 of the cover regulation :

Article 2 bis: "competent authorities"

Points 1 and 2 of article 3 of the cover regulation (« 1. Member States shall designate [...] No 216/2008. ») must be integrated in this new article 2 bis because they are the first rules about competent authority apart from the scope of monitoring, stricto sensu. These paragraphs are completed with the addition of the following paragraph: "When the responsibilities mentioned in the annexes of this regulation are assumed by an entity which is independent from the aerodrome operator, the competent authority shall ensure that all the essential requirements are covered and shall describe the allocation of these responsibilities in the approval terms of the certificate."

response *Noted*

comment 2729

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

NPA 2011-20 (B.I-III) Com gal 3
Commentaires ACA

Nombre de spécifications de certification (CS) et de moyens acceptables de conformité (AMC)

Commentaire

A l'intérieur de l'Union européenne, beaucoup d'efforts ont été entrepris pour réduire la charge administrative.

Or, le texte de la présente NPA comporte un nombre colossal de règles très précises.

Les descriptions et amendements détaillés dans ces exigences de l'AESA vont accroître la charge administrative et les coûts administratifs.

En conséquence, nous suggérons fortement que les règles d'application (IR) soient moins détaillées, qu'elles soient conçues pour fixer un cadre général et que beaucoup d'AMC et de CS soient transférés en éléments informatifs (GM). Ainsi, de nombreux textes doivent plutôt être considérés comme des exemples à suivre et non comme des solutions imposées indifféremment à tous, d'autant que beaucoup d'entre eux n'ont pas d'effets directs sur la sécurité.

Traduction de courtoisie

Many efforts have been undertaken in the European Union to reduce the administrative burden. But the text of the NPA contains a great volume of very specific rules. These provisions will considerably increase administrative burdens and costs.

Consequently, we strongly suggest on one hand to have Implementing rules (IR) less precise and to rather describe a general framework and on the other hand to transfer many AMC and CS into guidance material (GM). Many texts should be considered as examples to follow instead of being solutions indifferently imposed to anybody, it is even more valid knowing that many of them have no direct effects on safety.

response *Noted*

comment 2737 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

NPA 2011-20 (B.I-III) Com gal 4
Commentaires ACA

Modification de l'annexe 14 de l'OACI

Commentaires

L'esprit de coopération dont a fait preuve l'AESA dans l'élaboration de la NPA a été très apprécié. En effet l'Agence a essayé de trouver certaines flexibilités pour les aérodromes. Malheureusement ces flexibilités s'avèrent insuffisantes

car le projet de réglementation présenté aboutit en effet à une perte de la flexibilité procurée par le système OACI.

Ainsi le règlement reprend les normes et les recommandations de l'Annexe 14 de l'OACI de manière indifférenciée.

ACA souhaite fortement que les normes et recommandations de l'Annexe 14 ne soient pas traitées de la même manière afin de garder cette souplesse.

Aussi, ACA propose que l'AESA prenne comme principe que les recommandations de l'Annexe 14 soient considérées comme des règles de l'art et reprises comme éléments informatifs (GM).

ACA admet cependant, qu'après application de ce principe, certaines recommandations de l'OACI (peu nombreuses) puissent être remontées en spécification de certification (CS) ou en moyen acceptable de conformité (AMC), par exemple la recommandation relative aux largeurs de piste, mais de façon mesurée.

Par ailleurs, la NPA reprend de manière très parcellaire et incomplète les modifications de l'annexe 14 proposées par l'OACI dans sa lettre aux Etats n°41. Or ces modifications ont reçu l'aval de la commission « navigation aérienne » de l'OACI et de nombreux experts de cette organisation et elles doivent être applicables avant la date d'entrée en vigueur du règlement de l'AESA relatif aux aérodromes.

En conséquence ACA considère que l'AESA devrait reprendre globalement ces modifications afin aussi d'anticiper la future annexe 14 de l'OACI qui sera davantage fondée sur des objectifs ou performances à atteindre que sur des règles prescriptives.

Une telle anticipation évitera à l'Union européenne de se trouver confrontée à une réglementation obsolète dès sa publication.

ACA rappelle que l'annexe 14 a été pensée au milieu du siècle dernier pour la conception des aérodromes à une époque où l'espace pour créer de telles infrastructures ne manquait pas. Depuis, le paradigme a changé puisqu'il s'agit aujourd'hui d'avoir des règles pour certifier les aérodromes dans un contexte d'optimisation des ressources et de l'espace. Ce que les règles actuelles de l'annexe 14 ne reflètent que très incomplètement encore.

N.B. : ACA, dans plusieurs de ses commentaires détaillés sur les CS et les AMC, indique qu'il faut déplacer tel CS en GM. Il faut comprendre aussi que cela nécessite généralement une réécriture pour que n'apparaisse plus le terme « should » qui, dans le cadre de la réglementation AESA, ne devrait être utilisé que pour des CS ou des AMC.

Traduction de courtoisie

ACA appreciates the spirit of cooperation shown by EASA during the NPA process. EASA has tried to find solutions for flexibility. However, this effort is still not sufficient because the results lead to a loss of flexibility in comparison with the ICAO system. It is notably due to the fact that EASA takes up indistinctly ICAO standards and ICAO recommendations.

ACA strongly wish that EASA deals with ICAO recommendations and ICAO

standards with different manners to keep the flexibility of ICAO system.

So ACA proposes that EASA takes as principle to consider ICAO recommendations as good practices only and transpose them into GM.

ACA admits that, after use of this principle, some ICAO recommendations (few) could be CS or AMC, for example the recommendation related to the runway width.

Moreover NPA reflects very partially and incompletely, the annex 14 modifications proposed by ICAO in its State letter n°41. These modifications have already been validated by the ICAO Air Navigation Commission and many ICAO experts. It is planned that these modifications would be applicable before the entry into force of EASA regulation.

ACA urges EASA to take up the contents of ICAO State Letter 41, also to anticipate the future ICAO annex 14, which will be more based on objectives or performances to reach than prescriptive rules. Such anticipation will prevent Europe from facing an obsolete regulation from its publication.

ACA reminds that Annex 14 has been thought out in the middle of the last century for airport design when there was still space around. Nowadays, the paradigm has changed because rules should be thought for aerodrome certification in an optimisation of space and resources. Existing annex 14 SARPS reflect very incompletely this new paradigm.

N.B.: in several comments about CS and AMC, ACA indicates that it is appropriate to transfer the CS or AMC into GM. Such transfer needs to rewrite the text so that the term "should" does not appear anymore. Indeed, this term should be used only for CS and AMC in the present regulation.

response *Noted*

comment 2742 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

NPA 2011-20 (B.I-III) Com gal 5
Commentaires ACA

Forme

Commentaire

La structure des règles et les références croisées rendent la lecture des documents complexe et difficile à comprendre.

Traduction de courtoisie

The structure of the rules and cross references makes the document complex to read and understand.

response *Accepted*

comment 2748

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

NPA 2011-20 (B.I-III) Com gal 6
Commentaires ACA

Arrangements

Commentaire

Dans plusieurs pays dont la France, les autorités publiques ont un rôle essentiel en matière de sécurité aéroportuaire et disposent à cet effet de prérogatives particulières.

En France le cadre constitutionnel impose que certaines missions soient assurées par une autorité de l'Etat et c'est à ce titre que les préfets exercent des pouvoirs de police sur l'aéroport et à l'extérieur de l'aéroport, qu'il s'agisse de définir localement des règles de police ou de s'assurer de leur bonne application.

Dans le cadre des projets de l'AESA, ces sujets ne relèveraient plus de l'Etat, mais de l'exploitant d'aérodrome, en particulier par le biais d'arrangements passés entre celui-ci et les organisations fournissant des services sur l'aéroport (organismes chargés de la météo, de la sûreté, de la maintenance, transporteurs aériens...).

Pour permettre de faciliter la mise en œuvre du futur règlement de l'AESA, ACA propose que toutes les règles arrêtées par une autorité de l'Etat, y compris les mesures prises par les préfets, soient considérées comme des arrangements et demande que cela soit précisé dans le texte de l'AESA.

Traduction de courtoisie

In different member States including France, public authorities have an essential role concerning airport safety and are in charge of specific powers to this end.

In France the constitutional framework implies that some missions are assumed by a public authority such as the "préfets" who are in charge and have the power to enforce law and order on the aerodromes and also outside the aerodromes whether it is for the definition or the application of the rules.

With the EASA projects, these missions will not be affected to the public authority anymore but to the aerodrome operator by the way of arrangements between itself and others entities providing services at the airport (MET, security, airlines...)

In order to facilitate the implementation of the future regulation, ACA suggests that every rule taken by a public authority, including rules adopted by the "préfets" must be considered as arrangements and this must be written in the EASA project.

response *Noted*

comment 2754

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

NPA 2011-20 (B.I-III) Com gal 7
Commentaires ACALangueCommentaire

ACA attire l'attention de l'AESA sur le fait que ses futures règles doivent être comprises par tous les acteurs qui ont à l'utiliser. En conséquence, ces règles doivent être écrites dans la langue du pays et pas uniquement en langue anglaise.

Le §2.2.2 du « Regulatory Impact Assessment » (page 15/130) donnant le nombre d'aéroports de chaque Etat Membre touchés par la NPA indique que bon nombre d'aérodromes concernés sont français: « Looking at the result for individual Member States, France has two peculiarities in this European picture : it has the largest number of aerodromes (159) and it is also the country with the highest number of aerodromes below the BR threshold (72 i.e. in relative share 45%...[...]” . Les exploitants d'aéroports français sont donc spécialement intéressés à connaître, comprendre et apprécier la portée des règles rédigées par l'AESA et soumises à consultation dans le cadre de la NPA.

La consultation, uniquement en langue anglaise, ne permet pas aux exploitants d'aéroports français, ne disposant pas nécessairement des moyens de traduction suffisants, de connaître, comprendre et d'apprécier justement la portée des règles exposées dans la NPA. Par conséquent, les exploitants d'aéroports français ne sont pas mis en mesure de faire usage de tous les droits qui leur sont reconnus par l'article 6-1 « consultation » de la « Rulemaking Procedure » applicable lors de la rédaction et de la publication de la NPA. Cet article dispose que "Any person or organization with an interest in the rule under development shall be entitled to comment on the basis of the published NPA, without discrimination on the basis of nationality".

L'article 32-2 du Règlement de Base (CE N°216/2008) prévoit que les travaux de traduction requis pour le fonctionnement de l'AESA sont effectués par le Centre de traduction des organes de l'Union Européenne.

Cela rejoint aussi la règle ADR.OR.E.005 (i) relative au manuel d'aérodrome. Il est en effet indiqué que le manuel d'aérodrome doit refléter la base de certification et doit être dans une langue acceptable de l'autorité compétente et comprise par tout le personnel amené à l'utiliser. Aussi les IR-OPS, les AMC et les CS, éléments de la base de certification, doivent, a minima, être écrits dans la langue du pays concerné.

En outre, l'exigence d'utiliser la langue officielle compréhensible par tous se retrouve dans la plupart des Constitutions nationales.

En conséquence les règles de l'AESA relatives aux aérodromes doivent aussi être écrites en français pour pouvoir être correctement utilisées sur les aérodromes français.

C'est pourquoi, ACA demande à l'AESA d'apporter ses réponses aux **questions suivantes** :

1. En quoi l'absence de traduction en français de la NPA serait respectueuse de l'article 58-2 du Règlement de Base relatif à la transparence et à la communication ? Cet article stipule que l'Agence veille à ce que le public et toute partie intéressée reçoivent rapidement une information objective, fiable et aisément compréhensible concernant ses travaux.
2. En quoi l'absence de traduction en français de la NPA serait respectueuse de la « Rulemaking Procedure » applicable lors de la rédaction et de la publication de la NPA (§2 Explanatory Note page 5/22) ? Cette « Rulemaking Procedure » a été décidée par le Conseil d'Administration du 13 juin 2007 (EASA Management Board Decision 08-2007 –Decision amending and replacing the Rulemaking Procedure – MB Meeting 03-2007) en application de l'article 52 du Règlement de Base . En particulier, en quoi cette absence de traduction serait respectueuse de l'article 6-1 de la Rulemaking Procedure » (précité) et de l'article 52-1-c) du Règlement de Base stipulant que les procédures « garantissent que l'AESA procède à la diffusion des documents et à une large consultation des parties intéressées, ...[...] » ?
3. En quoi l'absence de traduction de la NPA, en français, serait respectueuse de l'article 22 de la Charte des Droits fondamentaux de l'Union Européenne (2010/C 83/02) qui stipule que l'Union Européenne respecte la diversité linguistique ?
4. En quoi l'absence de traduction en français de la NPA, n'enfreindrait pas l'interdiction des discriminations en raison de la nationalité stipulée à l'article 18 du Traité sur le Fonctionnement de l'Union Européenne (TFUE)?
5. En quoi l'absence de traduction en français de la NPA serait respectueuse de l'article 342 du TFUE (ancien article 290 du Traité) et du Règlement n°1 (modifié) portant fixation du régime linguistique de l'Union Européenne ? En particulier, en quoi cette absence de traduction serait compatible avec les exigences des articles 1, 2 et 4 du Règlement n°1? Les articles précités énumèrent la liste des langues officielles et des langues de travail des institutions de l'Union, dont le français. Ils prévoient également que les textes adressés par les institutions à un Etat membre ou à une personne relevant de la juridiction d'un Etat membre sont rédigés dans la langue de cet Etat. Ils stipulent enfin que les textes de portée générale sont rédigés dans les langues officielles.
6. Dans le cas où les réponses aux questions qui précèdent ne seraient pas satisfaisantes au regard du droit positif applicable, comment l'AESA entend reprendre la procédure de NPA afin d'y remédier et procéder pour la publication de ses règles ?

Traduction de courtoisie

ACA draw the attention of EASA on the fact that its futures rules shall be understood by all the actors, who have to use them. Consequently, these rules shall be written in the national language of the State and not only in English.

§2.2.2 of the « Regulatory Impact Assessment » (page 15/130) giving the number of French airports entering the scope of the future EASA rules indicate that many of them are French: "Looking at the result for individual Member

States, France has two peculiarities in this European picture : it has the largest number of aerodromes (159) and it is also the country with the highest number of aerodromes below the BR threshold (72 i.e. in relative share 45%...[...]"'. French airports are so particularly interested to know, understand and appreciate the impact of the EASA rules of this NPA.

The consultation, only in English, does not allow to French airports operators, having no sufficient translation means, to know, understand and correctly appreciate the impact of the rules proposed in this NPA. Consequently, French aerodrome operators are not able to use all their rights, which are recognized by article 6.1 of the "rulemaking procedure", applicable for the redaction and the publication of NPA: "Any person or organisation with an interest in the rule under development shall be entitled to comment on the basis of the published NPA, without discrimination on the basis of nationality".

Article 32-2 of the basic regulation (CE N°216/2008) indicates that all the translation works required for the EASA functioning are performed by the translation center of the EU.

It is also in line with ADR.OR.E.005 (i) related to the aerodrome manual. Indeed, it is indicated that the aerodrome manual shall reflect the basis certification and shall be in a language acceptable by the competent authority and understandable by everyone, who has to use it. So, IR-OPS, AMC and CS, elements of the certification basis shall be written in the official language recognized by the Member State.

Besides, this requirement of the use of the official language appears in most of national constitutions.

In consequence, the EASA regulation shall be written in French to be correctly applied on French aerodromes.

It is why, ACA ask EASA to answer to the following questions.

1. How the fact to have no French version of EASA rules could be considered as compliant with article 58-2 of the basic regulation on transparency and communication ? This article indicates that the agency ensure the public and any interested party are rapidly given objective, reliable and easily understandable information with regard to its.

2. How the fact to have no French version of EASA rules could be considered as compliant with the « Rulemaking Procedure » applicable for the redaction and publication of the NPA (§2 Explanatory Note page 5/22) ? This « Rulemaking Procedure » is the subject of the EASA Management Board Decision 08-2007 -Decision amending and replacing the Rulemaking Procedure - MB Meeting 03-2007- in application of article 52 of the basic regulation. In particular, How the fact to have no French version of EASA rules could be considered as compliant with article 6-1 of the EASA Rulemaking Procedure and article 52-1-c) of the basic regulation ("the procedures ensure ensure that the Agency publishes documents and consults widely with interested parties...").

3. How the fact to have no French version of EASA rules could be considered as compliant with the article 22 of the Charter of fundamental rights of the European Union (2010/C 83/02) which stipulates that the European Union respects the linguistic diversity?

4. How the fact to have no French version of EASA rules could be considered as compliant with the interdiction of discrimination due to the nationality as stipulated in article 18 of the Treaty on the functioning of European Union?

5. How the fact to have no French version of EASA rules could be considered as compliant with article 342 of the Treaty on the functioning of European Union (former article 290) et of the regulation n°1 (modified) governing the languages of the European Union (in particular articles 1, 2 et 4)? These articles give the list of the official languages and the work languages of the EU institutions, including French among others. They also indicate that the r delivered by the EU institutions to a member State or at a citizen of this Member State shall be in the official language of this State and that the general texts are written in official languages.

6. If the answers to the here above questions would not be satisfactory vis-à-vis the applicable rules, how EASA plans to correct the NPA process used and to proceed for the publication of its set of rules ?

response *Noted*

comment 2792

comment by: *Brussels Airport*

A general suggestion :

I'd like to see the start of a European database with all safety cases and studies that (will) have been approved by the NAA's, so that these can be used by other aerodrome operators in case they have to make a safety case for a similar subject on their own airport. This will not only help all aerodrome operators as such, but it will also help the EASA and the NAA's to keep, to maintain the same level of safety of these particular subjects, to have the same qualification of risks (Risk index) for similar subjects, etc. throughout all the aerodromes in different European countries

response *Noted*

comment 2793

comment by: *Brussels Airport*

General comment :

EASA has always stated that the Regulation may/would be not more stringent than ICAO.

The current proposed CS is a mixture of ICAO Annex 14 Standards and Recommendations what makes it sometimes very unclear and creates a risk that some local CAAs will consider current Recommendations as a Standard.

Therefore we suggest to write only ICAO Annex 14 Standards in the AMC and ICAO Annex 14 Recommendations in GM.

response	<p><i>Noted</i></p> <p>The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.</p> <p>The comments not related to CS/GM will be answered by the appropriate Agency responder.</p>
comment	<p>2795 comment by: <i>Brussels Airport</i></p> <p>General comment :</p> <p>The Regulation (NPA) should only be based on current existing ICAO Standards and Recommendations and not take proposals into account like ICAO State Letters which are not approved yet. There are some examples to find in the CS</p>
response	<p><i>Partially accepted</i></p> <p>It was considered appropriate to use the ICAO SL 41 text relating to RESA in the CS.</p>
comment	<p>2879 comment by: <i>ADP : Aeroports de Paris</i></p> <p><u>Commentaire</u> ADP (Aéroports de Paris) considère que les dispositions du règlement de base relatives à la proportionnalité des mesures par rapport à la taille, au trafic, à la catégorie et à la complexité de l'aérodrome, ne sont pas réellement transcrites dans le règlement.</p> <p><u>Traduction de courtoisie</u> ADP considers that the principle of the basic regulation to be proportionate to the size, the traffic, the category and the complexity of the aerodrome is not really reflected in the regulation.</p>
response	<p><i>Noted</i></p> <p>This comment is not applicable to CSs.</p>
comment	<p>2888 comment by: <i>SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard</i></p> <p>Attachment #25</p>

See comment B.I 3222

SEARD NPA 2011-20 (B.I-III) Com gal 1

Objet et portée du règlement

Traduction de courtoisie

There is a doubt about the object and the scope of the EASA regulation on aerodromes, issue of the present NPA.

- Does this regulation create obligations towards other entities than the competent authority and the aerodrome operator such as local authorities or owners outside of the airport boundaries?
- Does the regulation creates rights for users of the airport and enables them to introduce court claims on this basis?

Besides, the legal applicability of others documents prepared by the EASA is uncertain. In its explanatory note (paragraph 16), the agency indicates that AMCs are non-essential and non-binding whereas the ADR.OR.A.015 is in contradiction with this affirmation: "*The aerodrome operator may implement these alternative means of compliance subject to prior approval by the competent authority and upon receipt of the notification*". This must imperatively be clarified because all comments on AMC are largely related to their juridical value.

SEARD considers that EASA's regulation should only be related to the certification of aerodromes. This position is confirmed by the fact that every specification of the NPA have been provided only in the scope of an aerodrome certification.

To this end, SEARD is in favour of a better delimitation of the regulation object at article 1 of cover regulation. Without such precision, the regulation would interfere with other activities which are note in the scope of competence of the EASA notably concerning ground handling, urbanism and public security.

response *Noted*

comment

2889 comment by: *SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard*

Attachment [#26](#)

SEARD NPA 2011-20 (B.III) Com gal 10

Formulation "move to GM"

Traduction de courtoisie

We understand that the provisions where it is indicated that the text is transferred to GM ("move to GM") will not be incorporated in IR, CS or AMC. SEARD will not contest the transfer of these provisions to GM.

response *Accepted*

comment	<p>2940</p> <p style="text-align: right;">comment by: <i>Isavia</i></p> <p>There are chapters which refer to tables which are not included in the document.</p> <p>If EASA copies ICAO tables, figures or illustrations into their documents, it should be ensured that the ICAO references are being deleted and aligned with EASA documentation</p> <p>The provisions for flexibility, customized compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents. It is notably due to the fact that recommendations have been transposed to the same level as standards.</p>
response	<p><i>Partially accepted</i></p> <p>The missing tables have been inserted. The ICAO text has been amended with EASA text.</p> <p>The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.</p>
comment	<p>2944</p> <p style="text-align: right;">comment by: <i>AIRBUS</i></p> <p>CSs contain sometimes a lot of information. The CSs would be expected to focus on objectives, detailed figures could be found in the guidance material. For example taxiway separation distances (recommended practices).</p>
response	<p><i>Not accepted</i></p> <p>CSs contain design specifications and are not guidance.</p>
comment	<p>2959</p> <p style="text-align: right;">comment by: <i>Fraport AG</i></p> <p>Attachment #27</p> <p>See comments B.III 3073-3109</p> <p>This coment is done by seperat document, which is attached.</p> <p>30.04.2012 Fraport AG, Boris Wilke</p>
response	<p><i>Partially accepted</i></p> <p>From the attachment:</p> <p>Comment</p>

01 - Agreed
 02 - The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes.
 03-06 – Noted. Not directly related to CSs.
 07 - The Agency will monitor the progress of ICAO SL 41 and adopt the relevant portions into CS when the document is mature.
 08 - Only the last paragraph applies to CS. See the reply to comment 02 above.

The technical comments relating to CS/GM on pages 3-8 of the attachment are answered in the relevant CS/GM segment.

comment

2994

comment by: *Robert Shapton*

Dear Sir or Madam,

I apologise but I unable to provide comments via the CRT so please accept my apologies for this email response. First I would like to thank all those involve for all their hard work to-date to produce these documents. I will keep my comments brief.

Thank you and keep up the good work!

Best regards,

Robert Shapton
 Chief Executive
 Tailor Made Systems Limited

response

Noted

comment

2995

comment by: *IFATCA*

Comments on NOTICE OF PROPOSED AMENDMENT **NPA 2011-20 (B.III)**

Dear Madame, Dear Sir,
 IFATCA submits its comments in this form as the circa website could not be used in a meaningful way. We apologize for any inconvenience and hope you will be able to use them For any further question please do not hesitate to contact the EASA coordinator.

Yours sincerely,
 Marc Baumgartner
 EASA coordinator
 IFATCA

response

Noted

comment	2997	comment by: IFATCA
	<p>CS-ADR-DSN.F.370 – Chapter F – Isolated aircraft parking position MOVE to GM <i>IFATCA proposes to keep this element as AMC as it is very important for the safe handling of aircraft under hijack or bomb warning.</i></p>	
response	<p><i>Partially accepted</i></p> <p>Paragraph (b) had a second sentence in ICAO text. It has been moved to GM. The remainder is from ICAO design criteria; therefore, it will remain in the CS.</p>	

comment	3004	comment by: ADV -German Airports Association
	<ul style="list-style-type: none"> • References to ICAO Documents within tables, figures and text need to be removed or aligned with EASA references. • Numeration of Figures and tables needs to be consistent • Repeating paragraphs with the same content need to be removed (e.g. DSN.H.425 (f),(g),(h) or DSN.M.760 (c)) • There are chapters, which are making reference to tables which are not included. 	
response	<p><i>Noted</i></p> <p>ICAO references will be amended. (H.425) duplications will be deleted. Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA, but is in the corrigendum). Table J-1 will be inserted in the NPA.</p>	

comment	3005	comment by: ADV -German Airports Association
	<p>No proposed Amendments to ICAO Documents should be included into EASA as long as there not finally agreed by ICAO.</p>	
response	<p><i>Partially accepted</i></p> <p>It was considered appropriate to adopt into CSs the ICAO SL 41 text relating to RESA.</p>	

comment	3006	comment by: ADV -German Airports Association
	<p>The provisions for flexibility, customised compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents although this was stated by EASA as a basis for the Rulemaking</p>	

process. It is notably due to the fact that recommendations have been transposed to the same level as standards. To reflect the necessity for flexibility, customised compliance and proportionality numbers, figures and tables should be moved from CS to GM combined with adding the purpose and need for a certain design element to CS as a basis for its application.

response *Noted*

The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.

comment 3038

comment by: *MST / STR - Stuttgart Airport*

- References to ICAO Documents within tables, figures and text need to be removed or aligned with EASA references.
- Numeration of Figures and tables needs to be consistent
- Repeating paragraphs with the same content need to be removed (e.g. DSN.H.425 (f),(g),(h) or DSN.M.760 (c))
- There are chapters, which are making reference to tables which are not included.

response *Accepted*

ICAO references will be amended. (H.425) duplications will be deleted. Missing tables will be inserted.

comment 3039

comment by: *MST / STR - Stuttgart Airport*

No proposed Amendments to ICAO Documents should be included into EASA as long as there not finally agreed by ICAO.

response *Partially accepted*

It was considered appropriate to adopt into CSs the ICAO SL 41 text relating to RESA.

comment 3040

comment by: *MST / STR - Stuttgart Airport*

- The provisions for flexibility, customized compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents although this was always stated by EASA as a basis for the Rulemaking process and the implementing of the whole EASA System concerning airport safety!

- Instead the EASA-NPA will produce enormous expenses both for the authorities and the airport operators without bringing a real and positive benefit for the matter of airport safety or any sustainable improvement in comparison to the hitherto existing system especially based on ICAO!
- The cost-(safety)value ratio of the new EASA System / EASA-NPA is not acceptable.

response *Noted*

comment 3041 comment by: *MST / STR - Stuttgart Airport*

It is notably due to the fact that recommendations have been transposed to the same level as standards. To reflect the necessity for flexibility, customised compliance and proportionality numbers, figures and tables should be moved from CS to GM combined with adding the purpose and need for a certain design element to CS as a basis for its application.

response *Noted*

The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.

comment 3073 comment by: *Fraport AG*

If EASA copies ICAO tables, figures or illustrations into their documents, it should be ensured that that ICAO references are being deleted and aligned with EASA documentation.

response *Accepted*

comment 3074 comment by: *Fraport AG*

The provisions for flexibility, customised compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents. It is notably due to the fact that recommendations have been transposed to the same level as standards which has never been accepted by ACI EUROPE since it limits the needed flexibility.

response *Noted*

The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the

mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.

comment 3075 comment by: *Fraport AG*

Within these requirements the responsibility of the aerodrome operator areas significantly increased. More and more issue are brought under the responsibility of the aerodrome operators without additional authorities.

response *Noted*

comment 3076 comment by: *Fraport AG*

Within the EU a lot of effort has been put in place to reduce the administrative load enforced by governments. The detailed descriptions and amendments in these EASA requirements will decrease, but increase the administrative workload and administrative costs. Therefore we suggest to make the implementing rules less detailed and more like a framework and a transfer many AMC's and CS into Guidance Material.

response *Noted*

comment 3077 comment by: *Fraport AG*

The structure of the rules and cross references makes the documents complex to read and understand. In ADR.OR.E.005 operators are required to observe human factors principles and organize their aerodrome manuals in a manner that facilitates preparation, use and review. It would be advantageous, if the EASA documents would follow these principles.

response *Noted*

comment 3078 comment by: *Fraport AG*

The provisions for flexibility, customized compliance and proportionality given under the existing ICAO system, are not satisfactorily reflected in the NPA documents. It is notably due to the fact that recommendations have been transposed to the same level as standards.

response *Noted*

The proposed Agency explanatory note will clarify the rationale for adopting

some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.

comment

3079

comment by: *Fraport AG*

We urge EASA to make consistency checks with regards to the usage of the contents of ICAO State Letter 41 and ensure that only SARPS which are published are used in establishing EASA documentation.

response

Partially accepted

It was considered appropriate to adopt into CSs the ICAO SL 41 text relating to RESA.

comment

3080

comment by: *Fraport AG*

Germany's and Europe's aerodromes are to be considered as designed for safety. The existing implementation methods of ICAO Annex 14 into national law is, as measured by the given level of safety in combination with investments and operational expenses, obviously successful. Therefore we question the necessity to state more than a simple hook from the basic regulation to ICAO Annex 14 and its subsequent Aerodrome design manuals.

The ICAO Annex 14-provisions contain some standards and a lot of recommendation in order to provide the necessary flexibility caused by physical, topographical or similar limitations related to the location of the aerodrome. Primarily it is the responsibility of authorities and aerodrome-operators to handle these flexible provisions in a suitable way. IRs, AMCs and GM for AR/OR are able to guarantee authorities and operators, which are accordingly qualified.

With the herein drafted certification specifications for aerodrome design, even in combination with the suggested ADR.AR.C.025 (special condition), the existing systematic of ICAO Annexes is interrupted. Nearly all relevant recommendations of ICAO Annex 14 are transposed into a CS and consequently at eye-level of standards. The adjustment between important and minor important design-elements and figures is no more displayed.

The major flexibility provision with ADR.AR.C.025 is useless for a safe and uniform application of ICAO Annex 14 as the CSs are not provided with purposes of the respective design element. The quality of special condition and subsequently the CB is indiscriminately. If the demand of the authority and/or the aerodrome is too laxly, the resulting aerodrome-design may contain safety deficits. If the demand is too stringent, the SC may be disproportionate or the (bureaucratic) burden for adequate solutions are too high in terms of requested studies, evidences etc..

We are very concerned about increasing administrative and other costs without

any nameable benefit for safety, resulting of the alignment of standards and recommendations.

ICAO Annex 14-provisions are exclusively for the design of optimized infrastructure for the intended respective use. Details on how to use a specific aerodrome has to be made by A/C-operation in accordance with ICAO Annex 6 and the relevant EU-regulations. According the introductory note of ICAO Annex 14, these provisions do not want to limitate or regulate the operations. In this respect the ADR.AR.C.025 is only a insufficient way of trying to follow the differentiating systematic of standards and recommendation.

We suggest to move all ICAO-recommendation-figures from CSs to guidance material. It may be an option to provide corresponding purposes for these design-criteria within the CSs.

response *Noted*

For the last paragraph — CS — see previous replies to earlier comments.

comment

3110

comment by: *Euroairport Bâle-Mulhouse*

Attachment [#28](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) Com gal 10

Formulation "move to GM"

Traduction de courtoisie

We understand that the provisions where it is indicated that the text is transferred to GM ("move to GM") will not be incorporated in IR, CS or AMC.

AF will not contest the transfer of these provisions to GM.

response *Accepted*

comment

3111

comment by: *SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard*

Attachment [#29](#)

See comment B.I 3524

SEARD NPA 2011-20 (B.I-III) Com gal 2

Responsabilité de l'exploitant

Traduction de courtoisie

The EASA regulation increases significantly the responsibility of the aerodrome operator compared to the existing situation in France. More and more missions have been put under the responsibility of aerodrome operator.

The rulemaking rationale should lead to counter balance this increase of responsibilities by conferring the necessary powers to the aerodrome operator in order to assume his new responsibilities. But the EASA regulation cannot confer such powers to the operator. Indeed, the repartition of responsibilities in member States is, in some cases, conducted under constitutional rules, for example when they are affected to public authorities, is largely out of the scope of the EASA.

Moreover, some provisions relating to the missions of the aerodrome operator do not take into account the principles of subsidiarity and proportionality. The safety of air transport must be assured without altering the repartition of the missions in member States. Each member States must have the possibility to designate authorities or entities in charge of the missions mentioned in the regulation notably concerning the obligation outside of the airport perimeter.

In others cases, the maintaining of competencies of public authorities is fixed by EU requirements. It is for example the case with the Directive (modified) n° 96/67/ CE dated 15 October 1996 related to the ground handling. Article 14 of this directive indicates that if the activity of a ground handler might be dependent on safety conditions of aircraft, equipment and persons, such conditions shall be defined and implemented by a public authority independent of the aerodrome operator through an agreement process. Consequently, the aerodrome operator has no power to forbid the access of a ground handler at the airport or to suspend this access for reasons related to safety. The draft of the future regulation to replace this directive does not modify this aspect (article 16 of the draft dated 16/03/2012).

Consequently, SEARD suggests to insert a new article between article 2 and article 3 of the cover regulation :

Article 2 bis: "competent authorities"

Points 1 and 2 of article 3 of the cover regulation (« 1. Member States shall designate [...] No 216/2008. ») must be integrated in this new article 2 bis because they are the first rules about competent authority apart from the scope of monitoring, *stricto sensu*. These paragraphs are completed with the addition of the following paragraph: "When the responsibilities mentioned in the annexes of this regulation are assumed by an entity which is independent from the aerodrome operator, the competent authority shall ensure that all the essential requirements are covered and shall describe the allocation of these responsibilities in the approval terms of the certificate."

response *Noted*

comment 3112 comment by: *SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard*

Attachment [#30](#)

See comment B.I 3525

SEARD NPA 2011-20 (B.I-III) Com gal 3

Nombre de spécifications de certification (CS) et de moyens acceptables de conformité (AMC)

Traduction de courtoisie

Many efforts have been undertaken in the European Union to reduce the administrative burden. But the text of the NPA contains a great volume of very specific rules. These provisions will considerably increase administrative burdens and costs.

Consequently, we strongly suggest on one hand to have Implementing rules (IR) less precise and to rather describe a general framework and on the other hand to transfer many AMC and CS into guidance material (GM). Many texts should be considered as examples to follow instead of being solutions indifferently imposed to anybody, it is even more valid knowing that many of them have no direct effects on safety.

response *Noted*

comment

3113 comment by: *SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard*

Attachment [#31](#)

See Comment B.I 3526

SEARD NPA 2011-20 (B.I-III) Com gal 4

Modification de l'annexe 14 de l'OACI

Traduction de courtoisie

SEARD appreciates the spirit of cooperation shown by EASA during the NPA process. EASA has tried to find solutions for flexibility. However, this effort is still not sufficient because the results lead to a loss of flexibility in comparison with the ICAO system. It is notably due to the fact that EASA takes up indistinctly ICAO standards and ICAO recommendations.

SEARD strongly wish that EASA deals with ICAO recommendations and ICAO standards with different manners to keep the flexibility of ICAO system.

So SEARD proposes that EASA takes as principle to consider ICAO recommendations as good practices only and transpose them into GM.

SEARD admits that, after use of this principle, some ICAO recommendations (few) could be CS or AMC, for example the recommendation related to the runway width.

Moreover NPA reflects very partially and incompletely, the annex 14 modifications proposed by ICAO in its State letter n°41. These modifications have already been validated by the ICAO Air Navigation Commission and many ICAO experts. It is planned that these modifications would be applicable before the entry into force of EASA regulation.

SEARD urges EASA to take up the contents of ICAO State Letter 41, also to anticipate the future ICAO annex 14, which will be more based on objectives or performances to reach than prescriptive rules. Such anticipation will prevent Europe from facing an obsolete regulation from its publication.

SEARD reminds that Annex 14 has been thought out in the middle of the last century for airport design when there was still space around. Nowadays, the paradigm has changed because rules should be thought for aerodrome certification in an optimisation of space and resources. Existing annex 14 SARPS reflect very incompletely this new paradigm.

N.B.: in several comments about CS and AMC, SEARD indicates that it is

	appropriate to transfer the CS or AMC into GM. Such transfer needs to rewrite the text so that the term "should" does not appear anymore. Indeed, this term should be used only for CS and AMC in the present regulation.
response	<i>Noted</i>

comment	<p>3114 comment by: <i>SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard</i></p> <p>Attachment #32</p> <p>See Comment B.I 3527</p> <p>SEARD NPA 2011-20 (B.I-III) Com gal 5</p> <p>Forme</p> <p>Traduction de courtoisie The structure of the rules and cross references makes the document complex to read and understand.</p>
response	<i>Accepted</i>

comment	<p>3115 comment by: <i>SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard</i></p> <p>Attachment #33</p> <p>See Comment B.I</p> <p>SEARD NPA 2011-20 (B.I-III) Com gal 7</p> <p>Langue</p> <p>Traduction de courtoisie SEARD draw the attention of EASA on the fact that its futures rules shall be understood by all the actors, who have to use them. Consequently, these rules shall be written in the national language of the State and not only in English. §2.2.2 of the « Regulatory Impact Assessment » (page 15/130) giving the number of French airports entering the scope of the future EASA rules indicate that many of them are French: "Looking at the result for individual Member States, France has two peculiarities in this European picture : it has the largest number of aerodromes (159) and it is also the country with the highest number of aerodromes below the BR threshold (72 i.e. in relative share 45%...[...]" French airports are so particularly interested to know, understand and appreciate the impact of the EASA rules of this NPA. The consultation, only in English, does not allow to French airports operators, having no sufficient translation means, to know, understand and correctly</p>
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appreciate the impact of the rules proposed in this NPA. Consequently, French aerodrome operators are not able to use all their rights, which are recognized by article 6.1 of the "rulemaking procedure", applicable for the redaction and the publication of NPA: "Any person or organisation with an interest in the rule under development shall be entitled to comment on the basis of the published NPA, without discrimination on the basis of nationality".

Article 32-2 of the basic regulation (CE N°216/2008) indicates that all the translation works required for the EASA functioning are performed by the translation center of the EU.

It is also in line with ADR.OR.E.005 (i) related to the aerodrome manual. Indeed, it is indicated that the aerodrome manual shall reflect the basis certification and shall be in a language acceptable by the competent authority and understandable by everyone, who has to use it. So, IR-OPS, AMC and CS, elements of the certification basis shall be written in the official language recognized by the Member State.

Besides, this requirement of the use of the official language appears in most of national constitutions.

In consequence, the EASA regulation shall be written in French to be correctly applied on French aerodromes.

It is why, SEARD ask EASA to answer to the following questions.

1. How the fact to have no French version of EASA rules could be considered as compliant with article 58-2 of the basic regulation on transparency and communication ? This article indicates that the agency ensure the public and any interested party are rapidly given objective, reliable and easily understandable information with regard to its.

2. How the fact to have no French version of EASA rules could be considered as compliant with the « Rulemaking Procedure » applicable for the redaction and publication of the NPA (§2 Explanatory Note page 5/22) ? This « Rulemaking Procedure » is the subject of the EASA Management Board Decision 08-2007 – Decision amending and replacing the Rulemaking Procedure – MB Meeting 03-2007- in application of article 52 of the basic regulation. In particular, How the fact to have no French version of EASA rules could be considered as compliant with article 6-1 of the EASA Rulemaking Procedure and article 52-1-c) of the basic regulation ("the procedures ensure ensure that the Agency publishes documents and consults widely with interested parties...").

3. How the fact to have no French version of EASA rules could be considered as compliant with the article 22 of the Charter of fundamental rights of the European Union (2010/C 83/02) which stipulates that the European Union respects the linguistic diversity?

4. How the fact to have no French version of EASA rules could be considered as compliant with the interdiction of discrimination due to the nationality as stipulated in article 18 of the Treaty on the functioning of European Union?

5. How the fact to have no French version of EASA rules could be considered as compliant with article 342 of the Treaty on the functioning of European Union (former article 290) et of the regulation n°1 (modified) governing the languages of the European Union (in particular articles 1, 2 et 4)? These articles give the list of the official languages and the work languages of the EU institutions, including French among others. They also indicate that the r delivered by the EU institutions to a member State or at a citizen of this Member State shall be in the official language of this State and that the general texts are written in official languages.

6.If the answers to the here above questions would not be satisfactory vis-à-vis the applicable rules, how EASA plans to correct the NPA process used and to proceed for the publication of its set of rules ?

response *Noted*

comment	<p>3116 comment by: <i>SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard</i></p> <p>Attachment #34</p> <p>See Comment B.I 3531</p> <p>SEARD NPA 2011-20 (B.I et III) Com gal 11</p> <p>Références aux Guidance Materials dans les articles de l'Implementing Rules ou les Spécifications de certification</p> <p>Traduction de courtoisie For the consistency of the regulation, references to Guidance Materials (GM) must not be included in Certification Specifications (CS) or Implementing Rules (IR) and have to be developed in specific notes. Otherwise, it implies that GM has the same value as CS or IR. It shall not be the case.</p>
response	<p><i>Accepted</i></p>

comment	<p>3117 comment by: <i>SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard</i></p> <p>Attachment #35</p> <p>See comment B.I 3225</p> <p>SEARD NPA 2011-20 (B.I-III) Com gal 6</p> <p>Arrangements</p> <p>Traduction de courtoisie In different member States including France, public authorities have an essential role concerning airport safety and are in charge of specific powers to this end. In France the constitutional framework implies that some missions are assumed by a public authority such as the "préfets" who are in charge and have the power to enforce law and order on the aerodromes and also outside the aerodromes whether it is for the definition or the application of the rules. With the EASA projects, these missions will not be affected to the public authority anymore but to the aerodrome operator by the way of arrangements between itself and others entities providing services at the airport (MET, security, airlines...) In order to facilitate the implementation of the future regulation, SEARD suggests that every rule taken by a public authority, including rules adopted by the "préfets" must be considered as arrangements and this must be written in the EASA project.</p>
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response *Noted*

comment 3118 comment by: *ATB Aéroport Toulouse-Blagnac - TLS/LFBO*

Attachment [#36](#)

ATB NPA 2011-20 (B.III) Com gal 10

Formulation "move to GM"

Traduction de courtoisie
We understand that the provisions where it is indicated that the text is transferred to GM ("move to GM") will not be incorporated in IR, CS or AMC. UAF will not contest the transfer of these provisions to GM.

response *Accepted*

comment 3128 comment by: *Tarbes-Lourdes-Pyrénées airport*

Attachment [#37](#)

See Comment B.I 3536

NPA 2011-20 (B.I-III) Com gal 1

Objet et portée du règlement

Traduction de courtoisie
There is a doubt about the object and the scope of the EASA regulation on aerodromes, issue of the present NPA.

- Does this regulation create obligations towards other entities than the competent authority and the aerodrome operator such as local authorities or owners outside of the airport boundaries?
- Does the regulation creates rights for users of the airport and enables them to introduce court claims on this basis?

Besides, the legal applicability of others documents prepared by the EASA is uncertain. In its explanatory note (paragraph 16), the agency indicates that AMCs are non-essential and non-biding whereas the ADR.OR.A.015 is in contradiction with this affirmation: "*The aerodrome operator may implement these alternative means of compliance subject to prior approval by the competent authority and upon receipt of the notification*". This must imperatively be clarified because all comments on AMC are largely related to their juridical value.

UAF considers that EASA's regulation should only be related to the certification of aerodromes. This position is confirmed by the fact that every specification of the NPA have been provided only in the scope of an aerodrome certification.

To this end, UAF is in favour of a better delimitation of the regulation object at article 1 of cover regulation. Without such precision, the regulation would interfere with other activities which are note in the scope of competence of the EASA notably concerning ground handling, urbanism and public security.

response *Noted*

comment

3129

comment by: *Tarbes-Lourdes-Pyrénées airport*

Attachment [#38](#)

See Comment B.I 3537

NPA 2011-20 (B.I-III) Com gal 2

Responsabilité de l'exploitant

Traduction de courtoisie

The EASA regulation increases significantly the responsibility of the aerodrome operator compared to the existing situation in France. More and more missions have been put under the responsibility of aerodrome operator.

The rulemaking rationale should lead to counter balance this increase of responsibilities by conferring the necessary powers to the aerodrome operator in order to assume his new responsibilities. But the EASA regulation cannot confer such powers to the operator. Indeed, the repartition of responsibilities in member States is, in some cases, conducted under constitutional rules, for example when they are affected to public authorities, is largely out of the scope of the EASA.

Moreover, some provisions relating to the missions of the aerodrome operator do not take into account the principles of subsidiarity and proportionality. The safety of air transport must be assured without altering the repartition of the missions in member States. Each member States must have the possibility to designate authorities or entities in charge of the missions mentioned in the regulation notably concerning the obligation outside of the airport perimeter.

In others cases, the maintaining of competencies of public authorities is fixed by EU requirements. It is for example the case with the Directive (modified) n° 96/67/ CE dated 15 October 1996 related to the ground handling. Article 14 of this directive indicates that if the activity of a ground handler might be dependent on safety conditions of aircraft, equipment and persons, such conditions shall be defined and implemented by a public authority independent of the aerodrome operator through an agreement process. Consequently, the aerodrome operator has no power to forbid the access of a ground handler at the airport or to suspend this access for reasons related to safety. The draft of the future regulation to replace this directive does not modify this aspect (article 16 of the draft dated 16/03/2012).

Consequently, UAF suggests to insert a new article between article 2 and article 3 of the cover regulation :

Article 2 bis: "competent authorities"

Points 1 and 2 of article 3 of the cover regulation (« 1. Member States shall designate [...] No 216/2008. ») must be integrated in this new article 2 bis because they are the first rules about competent authority apart from the scope of monitoring, stricto sensu. These paragraphs are completed with the addition

of the following paragraph: "When the responsibilities mentioned in the annexes of this regulation are assumed by an entity which is independent from the aerodrome operator, the competent authority shall ensure that all the essential requirements are covered and shall describe the allocation of these responsibilities in the approval terms of the certificate."

response *Noted*

comment **3130** comment by: *Tarbes-Lourdes-Pyrénées airport*

Attachment [#39](#)

See Comment B.I 3538

NPA 2011-20 (B.I-III) Com gal 3

Nombre de spécifications de certification (CS) et de moyens acceptables de conformité (AMC)

Traduction de courtoisie

Many efforts have been undertaken in the European Union to reduce the administrative burden. But the text of the NPA contains a great volume of very specific rules. These provisions will considerably increase administrative burdens and costs.

Consequently, we strongly suggest on one hand to have Implementing rules (IR) less precise and to rather describe a general framework and on the other hand to transfer many AMC and CS into guidance material (GM). Many texts should be considered as examples to follow instead of being solutions indifferently imposed to anybody, it is even more valid knowing that many of them have no direct effects on safety.

response *Noted*

comment **3131** comment by: *Tarbes-Lourdes-Pyrénées airport*

Attachment [#40](#)

See Comment B.I 3539

NPA 2011-20 (B.I-III) Com gal 4

Modification de l'annexe 14 de l'OACI

Traduction de courtoisie

UAF appreciates the spirit of cooperation shown by EASA during the NPA process. EASA has tried to find solutions for flexibility. However, this effort is still not sufficient because the results lead to a loss of flexibility in comparison with the ICAO system. It is notably due to the fact that EASA takes up indistinctly ICAO standards and ICAO recommendations.

UAF strongly wish that EASA deals with ICAO recommendations and ICAO standards with different manners to keep the flexibility of ICAO system. So UAF proposes that EASA takes as principle to consider ICAO recommendations as good practices only and transpose them into GM. UAF admits that, after use of this principle, some ICAO recommendations (few) could be CS or AMC, for example the recommendation related to the runway width.

Moreover NPA reflects very partially and incompletely, the annex 14 modifications proposed by ICAO in its State letter n°41. These modifications have already been validated by the ICAO Air Navigation Commission and many ICAO experts. It is planned that these modifications would be applicable before the entry into force of EASA regulation.

UAF urges EASA to take up the contents of ICAO State Letter 41, also to anticipate the future ICAO annex 14, which will be more based on objectives or performances to reach than prescriptive rules. Such anticipation will prevent Europe from facing an obsolete regulation from its publication.

UAF reminds that Annex 14 has been thought out in the middle of the last century for airport design when there was still space around. Nowadays, the paradigm has changed because rules should be thought for aerodrome certification in an optimisation of space and resources. Existing annex 14 SARPS reflect very incompletely this new paradigm.

N.B.: in several comments about CS and AMC, UAF indicates that it is appropriate to transfer the CS or AMC into GM. Such transfer needs to rewrite the text so that the term "should" does not appear anymore. Indeed, this term should be used only for CS and AMC in the present regulation.

response *Noted*

comment 3132 comment by: *Tarbes-Lourdes-Pyrénées airport*

Attachment [#41](#)

See Comment B.I 3540

NPA 2011-20 (B.I-III) Com gal 5

Forme

Traduction de courtoisie

The structure of the rules and cross references makes the document complex to read and understand.

response *Accepted*

comment 3133 comment by: *Tarbes-Lourdes-Pyrénées airport*

Attachment [#42](#)

See Comment B.I 3541

NPA 2011-20 (B.I-III) Com gal 6

Arrangements

Traduction de courtoisie

In different member States including France, public authorities have an essential role concerning airport safety and are in charge of specific powers to this end.

In France the constitutional framework implies that some missions are assumed by a public authority such as the "préfets" who are in charge and have the power to enforce law and order on the aerodromes and also outside the aerodromes whether it is for the definition or the application of the rules.

With the EASA projects, these missions will not be affected to the public authority anymore but to the aerodrome operator by the way of arrangements between itself and others entities providing services at the airport (MET, security, airlines...)

In order to facilitate the implementation of the future regulation, UAF suggests that every rule taken by a public authority, including rules adopted by the "préfets" must be considered as arrangements and this must be written in the EASA project.

response *Noted*

comment

3134

comment by: *Tarbes-Lourdes-Pyrénées airport*

Attachment [#43](#)

See Comment B.I 3542

NPA 2011-20 (B.I-III) Com gal 7

Langue

Traduction de courtoisie

UAF draw the attention of EASA on the fact that its futures rules shall be understood by all the actors, who have to use them. Consequently, these rules shall be written in the national language of the State and not only in English.

§2.2.2 of the « Regulatory Impact Assessment » (page 15/130) giving the number of French airports entering the scope of the future EASA rules indicate that many of them are French: "Looking at the result for individual Member States, France has two peculiarities in this European picture : it has the largest number of aerodromes (159) and it is also the country with the highest number of aerodromes below the BR threshold (72 i.e. in relative share 45%...[...]" French airports are so particularly interested to know, understand and appreciate the impact of the EASA rules of this NPA.

The consultation, only in English, does not allow to French airports operators, having no sufficient translation means, to know, understand and correctly appreciate the impact of the rules proposed in this NPA. Consequently, French aerodrome operators are not able to use all their rights, which are recognized by article 6.1 of the "rulemaking procedure", applicable for the redaction and the publication of NPA: "Any person or organisation with an interest in the rule

under development shall be entitled to comment on the basis of the published NPA, without discrimination on the basis of nationality”.

Article 32-2 of the basic regulation (CE N°216/2008) indicates that all the translation works required for the EASA functioning are performed by the translation center of the EU.

It is also in line with ADR.OR.E.005 (i) related to the aerodrome manual. Indeed, it is indicated that the aerodrome manual shall reflect the basis certification and shall be in a language acceptable by the competent authority and understandable by everyone, who has to use it. So, IR-OPS, AMC and CS, elements of the certification basis shall be written in the official language recognized by the Member State.

Besides, this requirement of the use of the official language appears in most of national constitutions.

In consequence, the EASA regulation shall be written in French to be correctly applied on French aerodromes.

It is why, UAF ask EASA to answer to the following questions.

1. How the fact to have no French version of EASA rules could be considered as compliant with article 58-2 of the basic regulation on transparency and communication ? This article indicates that the agency ensure the public and any interested party are rapidly given objective, reliable and easily understandable information with regard to its.

2. How the fact to have no French version of EASA rules could be considered as compliant with the « Rulemaking Procedure » applicable for the redaction and publication of the NPA (§2 Explanatory Note page 5/22) ? This « Rulemaking Procedure » is the subject of the EASA Management Board Decision 08-2007 – Decision amending and replacing the Rulemaking Procedure – MB Meeting 03-2007- in application of article 52 of the basic regulation. In particular, How the fact to have no French version of EASA rules could be considered as compliant with article 6-1 of the EASA Rulemaking Procedure and article 52-1-c) of the basic regulation (“the procedures ensure ensure that the Agency publishes documents and consults widely with interested parties...”).

3. How the fact to have no French version of EASA rules could be considered as compliant with the article 22 of the Charter of fundamental rights of the European Union (2010/C 83/02) which stipulates that the European Union respects the linguistic diversity?

4. How the fact to have no French version of EASA rules could be considered as compliant with the interdiction of discrimination due to the nationality as stipulated in article 18 of the Treaty on the functioning of European Union?

5. How the fact to have no French version of EASA rules could be considered as compliant with article 342 of the Treaty on the functioning of European Union (former article 290) et of the regulation n°1 (modified) governing the languages of the European Union (in particular articles 1, 2 et 4)? These articles give the list of the official languages and the work languages of the EU institutions, including French among others. They also indicate that the r delivered by the EU institutions to a member State or at a citizen of this Member State shall be in the official language of this State and that the general texts are written in official languages.

6.If the answers to the here above questions would not be satisfactory vis-à-vis the applicable rules, how EASA plans to correct the NPA process used and to proceed for the publication of its set of rules ?

response *Noted*

comment	<p>3135 comment by: <i>Tarbes-Lourdes-Pyrénées airport</i></p> <p>Attachment #44</p> <p>See Comment B.I 3545</p> <p>NPA 2011-20 (B.I et III) Com gal 11</p> <p>Références aux Guidance Materials dans les articles de l'Implementing Rules ou les Spécifications de certification</p> <p>Traduction de courtoisie For the consistency of the regulation, references to Guidance Materials (GM) must not be included in Certification Specifications (CS) or Implementing Rules (IR) and have to be developed in specific notes. Otherwise, it implies that GM has the same value as CS or IR. It shall not be the case.</p>
response	<p><i>Accepted</i></p>

comment	<p>3136 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #45</p> <p>See Comment B.I 1901</p> <p>ADBM - NPA 2011-20 (B.I-III) Com gal 2</p> <p>Responsabilité de l'exploitant</p> <p>Traduction de courtoisie The EASA regulation increases significantly the responsibility of the aerodrome operator compared to the existing situation in France. More and more missions have been put under the responsibility of aerodrome operator. The rulemaking rationale should lead to counter balance this increase of responsibilities by conferring the necessary powers to the aerodrome operator in order to assume his new responsibilities. But the EASA regulation cannot confer such powers to the operator. Indeed, the repartition of responsibilities in member States is, in some cases, conducted under constitutional rules, for example when they are affected to public authorities, is largely out of the scope of the EASA. Moreover, some provisions relating to the missions of the aerodrome operator do not take into account the principles of subsidiarity and proportionality. The safety of air transport must be assured without altering the repartition of the missions in member States. Each member States must have the possibility to designate authorities or entities in charge of the missions mentioned in the regulation notably concerning the obligation outside of the airport perimeter. In others cases, the maintaining of competencies of public authorities is fixed by EU requirements. It is for example the case with the Directive (modified) n° 96/67/ CE dated 15 October 1996 related to the ground handling. Article 14 of this directive indicates that if the activity of a ground handler might be dependent on safety conditions of aircraft, equipment and persons, such</p>
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conditions shall be defined and implemented by a public authority independent of the aerodrome operator through an agreement process. Consequently, the aerodrome operator has no power to forbid the access of a ground handler at the airport or to suspend this access for reasons related to safety. The draft of the future regulation to replace this directive does not modify this aspect (article 16 of the draft dated 16/03/2012).

Consequently, ADBM suggests to insert a new article between article 2 and article 3 of the cover regulation :

Article 2 bis: "competent authorities"

Points 1 and 2 of article 3 of the cover regulation (« 1. Member States shall designate [...] No 216/2008. ») must be integrated in this new article 2 bis because they are the first rules about competent authority apart from the scope of monitoring, *stricto sensu*. These paragraphs are completed with the addition of the following paragraph: "When the responsibilities mentioned in the annexes of this regulation are assumed by an entity which is independent from the aerodrome operator, the competent authority shall ensure that all the essential requirements are covered and shall describe the allocation of these responsibilities in the approval terms of the certificate."

response *Noted*

comment 3137 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#46](#)

See Comment B.I 3559

ADBM - NPA 2011-20 (B.I-III) Com gal 3

Nombre de spécifications de certification (CS) et de moyens acceptables de conformité (AMC)

Traduction de courtoisie

Many efforts have been undertaken in the European Union to reduce the administrative burden. But the text of the NPA contains a great volume of very specific rules. These provisions will considerably increase administrative burdens and costs.

Consequently, we strongly suggest on one hand to have Implementing rules (IR) less precise and to rather describe a general framework and on the other hand to transfer many AMC and CS into guidance material (GM). Many texts should be considered as examples to follow instead of being solutions indifferently imposed to anybody, it is even more valid knowing that many of them have no direct effects on safety.

response *Noted*

comment 3138 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#47](#)

See Comment B.I 3560

ADBM - NPA 2011-20 (B.I-III) Com gal 4

Modification de l'annexe 14 de l'OACI

Traduction de courtoisie

ADBM appreciates the spirit of cooperation shown by EASA during the NPA process. EASA has tried to find solutions for flexibility. However, this effort is still not sufficient because the results lead to a loss of flexibility in comparison with the ICAO system. It is notably due to the fact that EASA takes up indistinctly ICAO standards and ICAO recommendations.

ADBM strongly wish that EASA deals with ICAO recommendations and ICAO standards with different manners to keep the flexibility of ICAO system.

So ADBM proposes that EASA takes as principle to consider ICAO recommendations as good practices only and transpose them into GM.

ADBM admits that, after use of this principle, some ICAO recommendations (few) could be CS or AMC, for example the recommendation related to the runway width.

Moreover NPA reflects very partially and incompletely, the annex 14 modifications proposed by ICAO in its State letter n°41. These modifications have already been validated by the ICAO Air Navigation Commission and many ICAO experts. It is planned that these modifications would be applicable before the entry into force of EASA regulation.

ADBM urges EASA to take up the contents of ICAO State Letter 41, also to anticipate the future ICAO annex 14, which will be more based on objectives or performances to reach than prescriptive rules. Such anticipation will prevent Europe from facing an obsolete regulation from its publication.

ADBM reminds that Annex 14 has been thought out in the middle of the last century for airport design when there was still space around. Nowadays, the paradigm has changed because rules should be thought for aerodrome certification in an optimisation of space and resources. Existing annex 14 SARPS reflect very incompletely this new paradigm.

N.B.: in several comments about CS and AMC, ADBM indicates that it is appropriate to transfer the CS or AMC into GM. Such transfer needs to rewrite the text so that the term "should" does not appear anymore. Indeed, this term should be used only for CS and AMC in the present regulation.

response *Noted*

comment 3139 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#48](#)

See Comment B.I 3561

ADBM - NPA 2011-20 (B.I-III) Com gal 5

Forme

	Traduction de courtoisie The structure of the rules and cross references makes the document complex to read and understand.
response	<i>Accepted</i>

comment	<p>3140 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #49</p> <p>See Comment B.I 1904</p> <p>ADBM - NPA 2011-20 (B.I-III) Com gal 6</p> <p>Arrangements</p> <p>Traduction de courtoisie In different member States including France, public authorities have an essential role concerning airport safety and are in charge of specific powers to this end. In France the constitutional framework implies that some missions are assumed by a public authority such as the "préfets" who are in charge and have the power to enforce law and order on the aerodromes and also outside the aerodromes whether it is for the definition or the application of the rules. With the EASA projects, these missions will not be affected to the public authority anymore but to the aerodrome operator by the way of arrangements between itself and others entities providing services at the airport (MET, security, airlines...) In order to facilitate the implementation of the future regulation, ADBM suggests that every rule taken by a public authority, including rules adopted by the "préfets" must be considered as arrangements and this must be written in the EASA project.</p>
response	<i>Noted</i>

comment	<p>3141 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #50</p> <p>See Comment B.I 3562</p> <p>ADBM - NPA 2011-20 (B.I-III) Com gal 7</p> <p>Langue</p> <p>Traduction de courtoisie ADBM draw the attention of EASA on the fact that its futures rules shall be understood by all the actors, who have to use them. Consequently, these rules shall be written in the national language of the State and not only in English.</p>
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§2.2.2 of the « Regulatory Impact Assessment » (page 15/130) giving the number of French airports entering the scope of the future EASA rules indicate that many of them are French: "Looking at the result for individual Member States, France has two peculiarities in this European picture : it has the largest number of aerodromes (159) and it is also the country with the highest number of aerodromes below the BR threshold (72 i.e. in relative share 45%...[...]" French airports are so particularly interested to know, understand and appreciate the impact of the EASA rules of this NPA.

The consultation, only in English, does not allow to French airports operators, having no sufficient translation means, to know, understand and correctly appreciate the impact of the rules proposed in this NPA. Consequently, French aerodrome operators are not able to use all their rights, which are recognized by article 6.1 of the "rulemaking procedure", applicable for the redaction and the publication of NPA: "Any person or organisation with an interest in the rule under development shall be entitled to comment on the basis of the published NPA, without discrimination on the basis of nationality".

Article 32-2 of the basic regulation (CE N°216/2008) indicates that all the translation works required for the EASA functioning are performed by the translation center of the EU.

It is also in line with ADR.OR.E.005 (i) related to the aerodrome manual. Indeed, it is indicated that the aerodrome manual shall reflect the basis certification and shall be in a language acceptable by the competent authority and understandable by everyone, who has to use it. So, IR-OPS, AMC and CS, elements of the certification basis shall be written in the official language recognized by the Member State.

Besides, this requirement of the use of the official language appears in most of national constitutions.

In consequence, the EASA regulation shall be written in French to be correctly applied on French aerodromes.

It is why, ADBM ask EASA to answer to the following questions.

1. How the fact to have no French version of EASA rules could be considered as compliant with article 58-2 of the basic regulation on transparency and communication ? This article indicates that the agency ensure the public and any interested party are rapidly given objective, reliable and easily understandable information with regard to its.

2. How the fact to have no French version of EASA rules could be considered as compliant with the « Rulemaking Procedure » applicable for the redaction and publication of the NPA (§2 Explanatory Note page 5/22) ? This « Rulemaking Procedure » is the subject of the EASA Management Board Decision 08-2007 – Decision amending and replacing the Rulemaking Procedure – MB Meeting 03-2007- in application of article 52 of the basic regulation. In particular, How the fact to have no French version of EASA rules could be considered as compliant with article 6-1 of the EASA Rulemaking Procedure and article 52-1-c) of the basic regulation ("the procedures ensure ensure that the Agency publishes documents and consults widely with interested parties...").

3. How the fact to have no French version of EASA rules could be considered as compliant with the article 22 of the Charter of fundamental rights of the European Union (2010/C 83/02) which stipulates that the European Union respects the linguistic diversity?

4. How the fact to have no French version of EASA rules could be considered as compliant with the interdiction of discrimination due to the nationality as stipulated in article 18 of the Treaty on the functioning of European Union?

5. How the fact to have no French version of EASA rules could be considered as compliant with article 342 of the Treaty on the functioning of European Union (former article 290) et of the regulation n°1 (modified) governing the languages of the European Union (in particular articles 1, 2 et 4)? These articles

give the list of the official languages and the work languages of the EU institutions, including French among others. They also indicate that the r delivered by the EU institutions to a member State or at a citizen of this Member State shall be in the official language of this State and that the general texts are written in official languages.

6.If the answers to the here above questions would not be satisfactory vis-à-vis the applicable rules, how EASA plans to correct the NPA process used and to proceed for the publication of its set of rules ?

response *Noted*

comment 3142 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#51](#)

ADBM - NPA 2011-20 (B.III) Com gal 10

Formulation "move to GM"

Traduction de courtoisie

We understand that the provisions where it is indicated that the text is transferred to GM ("move to GM") will not be incorporated in IR, CS or AMC. ADBM will not contest the transfer of these provisions to GM.

response *Accepted*

comment 3149 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#52](#)

See Comment B.I 3579

UAF NPA 2011-20 (B.I-III) Com gal 2

Responsabilité de l'exploitant

Traduction de courtoisie

The EASA regulation increases significantly the responsibility of the aerodrome operator compared to the existing situation in France. More and more missions have been put under the responsibility of aerodrome operator.

The rulemaking rationale should lead to counter balance this increase of responsibilities by conferring the necessary powers to the aerodrome operator in order to assume his new responsibilities. But the EASA regulation cannot confer such powers to the operator. Indeed, the repartition of responsibilities in member States is, in some cases, conducted under constitutional rules, for example when they are affected to public authorities, is largely out of the scope of the EASA.

Moreover, some provisions relating to the missions of the aerodrome operator do not take into account the principles of subsidiarity and proportionality.

The safety of air transport must be assured without altering the repartition of the missions in member States. Each member States must have the possibility to designate authorities or entities in charge of the missions mentioned in the regulation notably concerning the obligation outside of the airport perimeter. In others cases, the maintaining of competencies of public authorities is fixed by EU requirements. It is for example the case with the Directive (modified) n° 96/67/ CE dated 15 October 1996 related to the ground handling. Article 14 of this directive indicates that if the activity of a ground handler might be dependent on safety conditions of aircraft, equipment and persons, such conditions shall be defined and implemented by a public authority independent of the aerodrome operator through an agreement process. Consequently, the aerodrome operator has no power to forbid the access of a ground handler at the airport or to suspend this access for reasons related to safety. The draft of the future regulation to replace this directive does not modify this aspect (article 16 of the draft dated 16/03/2012).

Consequently, UAF suggests to insert a new article between article 2 and article 3 of the cover regulation :

Article 2 bis: "competent authorities"

Points 1 and 2 of article 3 of the cover regulation (« 1. Member States shall designate [...] No 216/2008. ») must be integrated in this new article 2 bis because they are the first rules about competent authority apart from the scope of monitoring, *stricto sensu*. These paragraphs are completed with the addition of the following paragraph: "When the responsibilities mentioned in the annexes of this regulation are assumed by an entity which is independent from the aerodrome operator, the competent authority shall ensure that all the essential requirements are covered and shall describe the allocation of these responsibilities in the approval terms of the certificate."

response *Noted*

comment

3150

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#53](#)

See Comment B.I 3580

UAF NPA 2011-20 (B.I-III) Com gal 3

Nombre de spécifications de certification (CS) et de moyens acceptables de conformité (AMC)

Traduction de courtoisie

Many efforts have been undertaken in the European Union to reduce the administrative burden. But the text of the NPA contains a great volume of very specific rules. These provisions will considerably increase administrative burdens and costs.

Consequently, we strongly suggest on one hand to have Implementing rules (IR) less precise and to rather describe a general framework and on the on the hand to transfer many AMC and CS into guidance material (GM). Many texts should be considered as examples to follow instead of being solutions indifferently imposed to anybody, it is even more valid knowing that many of them have no direct effects on safety.

response *Noted*

The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS and SC will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.

The comments not related to CS/GM will be answered by the appropriate Agency responder.

comment

3151

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#54](#)

See comment B.I 3581

UAF NPA 2011-20 (B.I-III) Com gal 4

Modification de l'annexe 14 de l'OACI

Traduction de courtoisie

UAF appreciates the spirit of cooperation shown by EASA during the NPA process. EASA has tried to find solutions for flexibility. However, this effort is still not sufficient because the results lead to a loss of flexibility in comparison with the ICAO system. It is notably due to the fact that EASA takes up indistinctly ICAO standards and ICAO recommendations.

UAF strongly wish that EASA deals with ICAO recommendations and ICAO standards with different manners to keep the flexibility of ICAO system.

So UAF proposes that EASA takes as principle to consider ICAO recommendations as good practices only and transpose them into GM.

UAF admits that, after use of this principle, some ICAO recommendations (few) could be CS or AMC, for example the recommendation related to the runway width.

Moreover NPA reflects very partially and incompletely, the annex 14 modifications proposed by ICAO in its State letter n°41. These modifications have already been validated by the ICAO Air Navigation Commission and many ICAO experts. It is planned that these modifications would be applicable before the entry into force of EASA regulation.

UAF urges EASA to take up the contents of ICAO State Letter 41, also to anticipate the future ICAO annex 14, which will be more based on objectives or performances to reach than prescriptive rules. Such anticipation will prevent Europe from facing an obsolete regulation from its publication.

UAF reminds that Annex 14 has been thought out in the middle of the last century for airport design when there was still space around. Nowadays, the paradigm has changed because rules should be thought for aerodrome certification in an optimisation of space and resources. Existing annex 14 SARPS reflect very incompletely this new paradigm.

N.B.: in several comments about CS and AMC, UAF indicates that it is appropriate to transfer the CS or AMC into GM. Such transfer needs to rewrite

	the text so that the term "should" does not appear anymore. Indeed, this term should be used only for CS and AMC in the present regulation.
response	<i>Noted</i>

comment	<p>3152 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #55</p> <p>See comment B.I 3582</p> <p>UAF NPA 2011-20 (B.I-III) Com gal 5</p> <p>Forme</p> <p>Traduction de courtoisie The structure of the rules and cross references makes the document complex to read and understand.</p>
response	<i>Accepted</i>

comment	<p>3153 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #56</p> <p>See comment B.I 2331</p> <p>UAF NPA 2011-20 (B.I-III) Com gal 6</p> <p>Arrangements</p> <p>Traduction de courtoisie In different member States including France, public authorities have an essential role concerning airport safety and are in charge of specific powers to this end. In France the constitutional framework implies that some missions are assumed by a public authority such as the "préfets" who are in charge and have the power to enforce law and order on the aerodromes and also outside the aerodromes whether it is for the definition or the application of the rules. With the EASA projects, these missions will not be affected to the public authority anymore but to the aerodrome operator by the way of arrangements between itself and others entities providing services at the airport (MET, security, airlines...) In order to facilitate the implementation of the future regulation, UAF suggests that every rule taken by a public authority, including rules adopted by the "préfets" must be considered as arrangements and this must be written in the EASA project.</p>
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response *Noted*

comment 3154 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#57](#)

See comment B.I 3583

UAF NPA 2011-20 (B.I-III) Com gal 7

Langue

Traduction de courtoisie

UAF draw the attention of EASA on the fact that its futures rules shall be understood by all the actors, who have to use them. Consequently, these rules shall be written in the national language of the State and not only in English.

§2.2.2 of the « Regulatory Impact Assessment » (page 15/130) giving the number of French airports entering the scope of the future EASA rules indicate that many of them are French: "Looking at the result for individual Member States, France has two peculiarities in this European picture : it has the largest number of aerodromes (159) and it is also the country with the highest number of aerodromes below the BR threshold (72 i.e. in relative share 45%...[...]" French airports are so particularly interested to know, understand and appreciate the impact of the EASA rules of this NPA.

The consultation, only in English, does not allow to French airports operators, having no sufficient translation means, to know, understand and correctly appreciate the impact of the rules proposed in this NPA. Consequently, French aerodrome operators are not able to use all their rights, which are recognized by article 6.1 of the "rulemaking procedure", applicable for the redaction and the publication of NPA: "Any person or organisation with an interest in the rule under development shall be entitled to comment on the basis of the published NPA, without discrimination on the basis of nationality".

Article 32-2 of the basic regulation (CE N°216/2008) indicates that all the translation works required for the EASA functioning are performed by the translation center of the EU.

It is also in line with ADR.OR.E.005 (i) related to the aerodrome manual. Indeed, it is indicated that the aerodrome manual shall reflect the basis certification and shall be in a language acceptable by the competent authority and understandable by everyone, who has to use it. So, IR-OPS, AMC and CS, elements of the certification basis shall be written in the official language recognized by the Member State.

Besides, this requirement of the use of the official language appears in most of national constitutions.

In consequence, the EASA regulation shall be written in French to be correctly applied on French aerodromes.

It is why, UAF ask EASA to answer to the following questions.

1. How the fact to have no French version of EASA rules could be considered as compliant with article 58-2 of the basic regulation on transparency and communication ? This article indicates that the agency ensure the public and any interested party are rapidly given objective, reliable and easily understandable information with regard to its.

2. How the fact to have no French version of EASA rules could be considered as

compliant with the « Rulemaking Procedure » applicable for the redaction and publication of the NPA (§2 Explanatory Note page 5/22) ? This « Rulemaking Procedure » is the subject of the EASA Management Board Decision 08-2007 – Decision amending and replacing the Rulemaking Procedure – MB Meeting 03-2007- in application of article 52 of the basic regulation. In particular, How the fact to have no French version of EASA rules could be considered as compliant with article 6-1 of the EASA Rulemaking Procedure and article 52-1-c) of the basic regulation (“the procedures ensure ensure that the Agency publishes documents and consults widely with interested parties...”).

3. How the fact to have no French version of EASA rules could be considered as compliant with the article 22 of the Charter of fundamental rights of the European Union (2010/C 83/02) which stipulates that the European Union respects the linguistic diversity?

4. How the fact to have no French version of EASA rules could be considered as compliant with the interdiction of discrimination due to the nationality as stipulated in article 18 of the Treaty on the functioning of European Union?

5. How the fact to have no French version of EASA rules could be considered as compliant with article 342 of the Treaty on the functioning of European Union (former article 290) et of the regulation n°1 (modified) governing the languages of the European Union (in particular articles 1, 2 et 4)? These articles give the list of the official languages and the work languages of the EU institutions, including French among others. They also indicate that the r delivered by the EU institutions to a member State or at a citizen of this Member State shall be in the official language of this State and that the general texts are written in official languages.

6.If the answers to the here above questions would not be satisfactory vis-à-vis the applicable rules, how EASA plans to correct the NPA process used and to proceed for the publication of its set of rules ?

response *Noted*

comment

3155

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#58](#)

See comment B.I 3586

UAF NPA 2011-20 (B.I et III) Com gal 11

Références aux Guidance Materials dans les articles de l'Implementing Rules ou les Spécifications de certification

Traduction de courtoisie

For the consistency of the regulation, references to Guidance Materials (GM) must not be included in Certification Specifications (CS) or Implementing Rules (IR) and have to be developed in specific notes. Otherwise, it implies that GM has the same value as CS or IR. It shall not be the case.

response *Accepted*

TITLE PAGE

p. 1

comment	1031	comment by: <i>MST / STR - Stuttgart Airport</i>
	Attachment #59	
	Please consider our comments on Certification Specifications / ADR-DSN stated in the attachment.	
	see comments on ADR-DSN (B.III) · B.III 3038 - 3072	
response	<i>Noted</i>	
	The ADR-DSN CS and general comments are answered in the appropriate segment for individual comments.	

comment	1676	comment by: <i>CAA CZ</i>
	Comment by Prague airport GENERALLY: There are many titles without any text in NPA. For example: GM-ADR-DSN.M.645 to 680 GM-ADR-DSN.M.720 to 740 GM-ADR-DSN.M.760 to 770 GM-ADR-DSN.N.790 to 800 GM-ADR-DSN.P.805 to 815 GM-ADR-DSN.U.925 to 940 We recommend placing them at the "Intentionally Left Blank"	
response	<i>Accepted</i>	

comment	2212	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>	
response	<i>Noted</i>	

TABLE OF CONTENTS

p. 2-3

comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	Noted	

CS-ADR – Book 1

p. 4

comment	390	comment by: <i>ADV -German Airports Association</i>
	Attachment #60	
	Comments on ADR-DSN See now: B.III 3004 - 3037	
response	Noted	
	The ADR-DSN CS and general comments are answered in the appropriate segment for individual comments.	

comment	413	comment by: <i>SWISS AERODROMES ASSOCIATION</i>
	We refer to the general comment delivered above.	
	The following comments are examples only of the general trend we would like EASA to adopt in setting design criteria for aerodromes.	
	Non commented provisions should therefore not be considered as agreed with.	
response	Noted	
	It is not clear from this comment which other comments are referred to.	

comment	435	comment by: <i>Flughafen Düsseldorf GmbH</i>
	Sämtliche Maßangaben (z.B. CS-ADR-DSN.E.360 - Neigung auf dem Vorfeld, CS-ADR-DSN.E.365 - Sicherheitsabstände auf Luftfahrzeug-Standplätzen etc.) sind aufgrund unterschiedlicher lokaler Zwänge an den verschiedenen Flughäfen nicht in Book 1 (CS-ADR-DSN...), sondern in Book 2 (GM-ADR-DSN...) aufzuführen, analog der Empfehlungen in ICAO.	
response	Not accepted	

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment	<p>1008 comment by: <i>Federal Office of Civil Aviation FOCA</i></p>
	<p>Please change definition to: "Graded Area means that part of the runway strip intended to reduce the risk of damage to an aircraft running off the runway." Cleared and Graded Area (CDA) should only be named Graded Area as not to create confusion with clearway or the runway strip itself, which shall also be obstacle free and cleared.</p> <p>Please change definition to: "Critical Area means an area of defined dimensions extending about a ground equipment within which the presence of vehicles, aircraft or persons will cause unacceptable disturbance of the signals". Critical areas are not limited to ground antennae of a precision instrument approach equipment.</p>
response	<p><i>Partially accepted</i></p>
	<p>The proposed text for the Cleared and Graded Area will be added to the definition. The term 'cleared and graded' is used by ICAO and will remain in the EASA text.</p> <p>The proposed change to the Critical Area definition — antennae to equipment — will be added to the EASA text.</p>
comment	<p>1747 comment by: <i>Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology</i></p>
	<p>Since all European Member States are equally contracting states of ICAO and thus bound to the ICAO convention and its annexes, an European system for aerodromes should respect the worldwide agreed principles of ICAO and refrain from creating special European conditions which jeopardize the competitiveness of the european aviation industry compared to other ICAO members. Therefore, the differentiating between Standards and Recommended Practices is of utmost importance. As this principle is not fully reflected (EASA: "The structure of European rules, however, does not come with a tool exactly mirroring the character of an ICAO recommendation"), we strongly advise that the NPA be changed/amended accordingly, e.g. by shifting all ICAO Recommended Practices to GM (Book 2)!</p>
response	<p><i>Noted</i></p>
	<p>The proposed Agency explanatory note will clarify the rationale for adopting some ICAO recommended practices into the NPA CSs. In any event, the mechanisms of ELOS, SC and DAAD will provide the flexibility and proportionality for individual aerodromes. GM provides guidance. Therefore, any design specifications contained in the recommended practices that are transferred to GM would carry no weight in constructing the aerodrome's Certification Basis.</p>

comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	Noted	

comment	2631	comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
	Attachment #61	
	ADBM - NPA 2011-20 (B.III) CS-ADR-DSN.A.002	
	Référence: CS-ADR-DSN.A.002 Définitions	
	Traduction de courtoisie ADBM propose:	
	<ul style="list-style-type: none"> • either to group together all the definitions in the cover regulation of book I or in the CS of book III • or to create a specific book for definitions. 	
	We noticed an inconsistency between article 2 of the cover regulation (book I) and the article 2 of the CS (book III) related to definitions. Indeed, some terms are at the same time in book I and book III without being defined identically while some terms are defined only once.	
response	Noted	
	The list of the definitions contained in Article 2 of the draft regulation are not the same as those contained in the book of certification specifications, because the terms used in the draft regulation are not the same as those used in the certification specifications. Inconsistencies will be reviewed.	

comment	2634	comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
	Attachment #62	
	ADBM NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « cleared and graded area »	
	Référence: CS-ADR-DSN.A.002 « cleared and graded area » 'Cleared and Graded Area (CGA)' means that part of the Runway Strip cleared of all obstacles except for minor specified items and graded, intended to reduce the risk of damage to an aircraft running off the runway.	
	Traduction de courtoisie There is an inconsistency between this definition and the definition of the runway strip.	

Indeed, the runway strip has two objectives: reducing damages to aircrafts in case of running off the runway and protecting aircrafts flying over the runway strip. Being a part of the runway strip, the CGA should be submitted to the same objectives, which is not the case here because it does not take into account the protection of flying aircrafts.

response *Not accepted*

The CGA definition states that it is part of the runway strip and therefore falls under the overarching definition of runway strip.

comment 2814 comment by: *BMVBS - Federal Ministry of Transport, Building and Urban Development*

Since all European Member States are equally contracting states of ICAO and thus bound to the ICAO convention and its annexes, an European system for aerodromes should respect the worldwide agreed principles of ICAO and refrain from creating special European conditions which jeopardize the competitiveness of the European aviation industry compared to other ICAO members. Therefore, the differentiating between Standards and Recommended Practices is of utmost importance. As this principle is not fully reflected (EASA: "*The structure of European rules, however, does not come with a tool exactly mirroring the character of an ICAO recommendation*"), we strongly advise that the NPA be changed/amended accordingly, e.g. by shifting all ICAO Recommended Practices to GM (Book 2).

response *Not accepted*

Many of the recommended practices contain design specifications.

comment 3143 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#63](#)

ADBM - NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « aerodrome equipment »

Référence: CS-ADR-DSN.A.002 « aerodrome equipment »

"Aerodrome equipment shall mean any equipment, apparatus, appurtenance, software or accessory, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome."

Traduction de courtoisie

Even if this definition is already in the basic regulation, we consider that it is too much detailed and it would be better to describe the equipment as a whole than piece by piece.

We suggest the following writing :

"Aerodrome equipment shall mean any equipment, apparatus or appurtenance, ~~software or accessory~~, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome."

This definition goes too far and we will have a multitude of equipments. It will

	<p>create unnecessary administrative burden and uncertainty about who does what. It would be better to keep only important equipments considering that they include software and accessories.</p>
response	<p><i>Not accepted</i></p> <p>This is the BR definition and cannot be changed.</p>
comment	<p>3144 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #64</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « clearway »</p> <p>Référence: CS-ADR-DSN.A.002 « clearway » 'Clearway' means a defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height.</p> <p>Traduction de courtoisie We wonder who is the "appropriate authority" since it is not defined in the EASA rules. Is it the competent authority or a third authority?</p>
response	<p><i>Noted</i></p> <p>This comment is not related to the CS and will be answered in CR/AR general comments.</p>
comment	<p>3145 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #65</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « runway strip »</p> <p>Référence: CS-ADR-DSN.A.002 « runway strip » "Runway strip means a defined area including the runway and stopway, if provided, intended: (a) to reduce the risk of damage to aircraft running off a runway; and (b) to protect aircraft flying over it during take-off or landing operations."</p> <p>Traduction de courtoisie This definition should be specified to avoid any misunderstanding by well separating the cleared and graded area (CGA) previously defined but whose objectives are incoherent with the runway strip ones. We propose to add a definition for the portion of the runway which is not graded and which could be: « Cleared runway strip means the part of the runway strip intended to protect aircraft flying over it during take-off or landing</p>

operations ».

Indeed, the runway strip has two objectives: reducing damages to aircrafts in case of running off the runway and protecting aircrafts flying over the runway strip. Being a part of the runway strip, the CGA should be submitted to the same objectives, which is not the case here because it does not take into account the protection of flying aircrafts.

To not have two different parts of runway strip with identical objectives, it is appropriate to distinguish the graded portion from the non-graded portion of runway strip with different objectives.

response *Not accepted*

The CGA definition states that it is part of the runway strip and therefore falls under the overarching definition of runway strip.

CS-ADR – Book 1 – CS-ADR-DSN.A.001 – Applicability

p. 4-9

comment

135

comment by: *CAA Norway*

We suggest to delete the definition of Landing direction indicator in CS-ADR-DSN.A.002 on page 7. This is not used at the airports in scope.

response

Not accepted

comment

136

comment by: *CAA Norway*

We suggest to delete the definition of Signal area in CS-ADR-DSN.A.002 on page 9. This is not used at the airports in scope.

response

Not accepted

comment

274

comment by: *Icelandic Civil Aviation Administration*

Definitions - Aircraft Arresting System - This definition is not correct, it is not necessary either. Suggest to delete. (Explanation: It's airplane but not aircraft arresting system (not for helicopters), Series of components does not seem to describe the arresting system accurately, it is used to assist in bringing an airplane to a stop without destroying it, what is the difference in routine and emergency landings, it does not belong in this definition.

response

Noted

The aircraft arresting system definition has been deleted.

comment	275	comment by: <i>Icelandic Civil Aviation Administration</i>
	We suggest to delete the definition of Landing direction indicator in CS-ADR-DSN.A.002 on page 7. This is not used at the airports in scope. Not used at modern airports.	
response	<i>Not accepted</i>	

comment	276	comment by: <i>Icelandic Civil Aviation Administration</i>
	We suggest to delete the definition of Signal area in CS-ADR-DSN.A.002 on page 9. This is not used at the airports in scope. Not used at modern airports.	
response	<i>Not accepted</i>	

comment	414	comment by: <i>SWISS AERODROMES ASSOCIATION</i>
	The definitions should be present in one sole place (NPA Part BI) and we refer to the comments made in this respect when commenting Part BI	
response	<i>Noted</i>	
	The definitions cannot be located in one place only as they reflect the text of the part to which they are attached.	

comment	591	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • Draft Commission Regulation - Article 3 - Oversight capabilities - paragraph 1 (p10) • ANNEX I — Part-AR - ADR.AR.B.005(c) - Management System (p20) • ANNEX I - Part-AR - ADR.AR.C.065 — Obstacles-Objects (p30) • ANNEX I - Part-AR - ADR-AR.C.070 — confusing, misleading and hazardous lights (p30) • ANNEX I - Part-AR - ADR.AR.C.075 — Protection of communication, navigation and surveillance systems (p30-31) • ANNEX I - Part-AR - ADR.AR.C.080 — Other activities (p31) • ANNEX I - Part-AR - ADR.AR.C.065 — Obstacles-Objects (c) (p30) • AMC/GM to ANNEX I — Part-AR — AMC1-ADR.AR.B.005(c) - Management System (p13) • AMC-GM to Annex I - AMC2-ADR-AR.C.065 (b) — Obstacles — Objects — wind turbines (p51) • AMC-GM to Annex I - AMC1-ADR-AR.C.070(a) — confusing, misleading and hazardous lights (p52) • AMC-GM to Annex I - AMC2-ADR-AR.C.070(a) — Confusing, misleading 	

- and hazardous lights (p52)
- AMC-GM to Annex I – AMC1-ADR.AR.C.070(b) — Confusing, misleading and hazardous lights (p53)
- AMC-GM to Annex I - GM1-ADR-AR.C.065 (b);(c) — Obstacles — Objects (p38)
- AMC/GM to ANNEX I — Part-AR - AMC1-ADR.AR.C.060(b) — Wildlife hazard management – MITIGATING MEASURES (page 37)
- CS-ADR - Book 1 - CS-ADR-DSN.A.002 – Definitions – ‘clearway’ (p5)

2. Justification and proposed text / comment

This comment is linked with comment 1008 in book I and 789 in book II.

This comment is **critical** as the rules, as written presently, can not be applied in the French system, linked with the definition of “competent authority” and its related obligations. This comment is linked to the issue on responsibility (see proposal for adding Article 2bis in the Cover regulation).

This comment aims to inform EASA on how the French DGAC understands the notion of “competent authority”, and also to list the rules which can not be applied for such competent authority.

France understands the competent authority is the civil aviation authority in charge of the oversight of the aerodrome operator for the tasks mentioned in its aerodrome certificate.

To explain our comment: In France, there are regions, and representatives from the States in these regions (“préfet” in French). The local representative from the State has some responsibilities, particularly for land planning use. For example, this representative is competent on land use matters to apply the obstacle limitation surfaces and to edict rules on policy on aerodromes (e.g. defining the movement area or stating that people working on the aerodrome have to be trained). The “préfet” is not considered as a competent authority, as if he was, its services would have to respect all the rules which apply the competent authorities, in particular the obligation to have a SMS: this is not possible in the French system and it would be too complex, too expensive and not feasible considering the reduced resources.

This should be taken into account while writing the rules: it is proposed to clarify this point by distinguishing in the rules the “competent authorities” and the “other authorities”. Moreover, security and local land use authorities are considered as “authorities” but shall not be “competent authorities” as requiring them to have a management system would be totally unfeasible.

However, coordination between these entities exists and can be made through several means. DGAC understands that coordination arrangements can be fulfilled by the mean of: protocols, legally defined coordination, or both entities being members of the government or the same State authorities.

DGAC France fully supports the use of the word “appropriate authority” in the definition of “clearway” in CS-ADR-DSN.A.002 (p5), which gives to France the flexibility we need.

It is proposed to clarify these points by:

- **modifying paragraph (c) of ADR.AR.B.005 as follows :**

"The competent authority shall establish procedures for participation in a mutual exchange of all necessary information and assistance of other competent authorities/authorities of the Member State concerned.

- **replacing the 2 first sentences of AMC1-ADR.AR.B.005(c) by:**

« *The coordination between the competent authority(ies) and the other*

authorities of the Member State should be formally documented, and should encompass, as deemed appropriate by the Member State, the following authorities :

~~The competent authority should establish coordination arrangements with other **competent** authorities of the Member State. Such coordination arrangements should in particular include the following **competent** authorities ... »~~

- **modifying the provisions on surroundings: ADR-AR.C.065, ADR-AR.C.070, ADR-AR.C.075, ADR-AR.C.080 and corresponding AMCs and GMs, and AMC1-ADR.AR.C.060(b) as proposed in specific DGAC's comments.**

response *Noted*

These comments are not related to the CS and will be answered in OR/AR general comments.

comment 629 comment by: *Finnish Transport Safety Agency*

We suggest to delete the definition of Landing direction indicator in CS-ADR-DSN.A.002 on page 7. This is not used at the airports in scope. Not used at modern airports.

response *Not accepted*

comment 630 comment by: *Finnish Transport Safety Agency*

We suggest to delete the definition of Signal area in CS-ADR-DSN.A.002 on page 9. This is not used at the airports in scope. Not used at modern airports.

response *Not accepted*

comment 684 comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.A.002	Définitions
Proposition/commentaire	ADP propose : - soit de regrouper l'ensemble des définitions dans la cover regulation du livre I ou dans les spécifications de certification (CS) du livre III ; - soit de créer un livre spécifique aux définitions.
Justification	Nous remarquons une certaine incohérence entre l'article 2 de la cover regulation (livre I)

	<p>et l'article 2 des CS (livre III) relatifs aux définitions.</p> <p>En effet certains termes sont présents à la fois dans le livre I et dans le livre III sans pour autant être définis de manière identique, tandis que d'autres termes ne figurent qu'à un seul endroit.</p>
Traduction de courtoisie	<p>ADP propose:</p> <ul style="list-style-type: none"> - either to group together all the definitions in the cover regulation of book I or in the CS of book III - or to create a specific book for definitions. <p>We noticed an inconsistency between article 2 of the cover regulation (book I) and the article 2 of the CS (book III) related to definitions. Indeed, some terms are at the same time in book I and book III without being defined identically while some terms are defined only once.</p>

response *Noted*

The list of the definitions contained in article 2 of the draft regulation are not the same as those contained in the book of certification specifications, because the terms used in the draft regulation are not the same as those used in the certification specifications. Inconsistencies will be reviewed.

comment 686

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.A.002 « aerodrome equipment »	"Aerodrome equipment shall mean any equipment, apparatus, appurtenance, software or accessory, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome."
Proposition/commentaire	<p>Bien que cette définition soit déjà dans le règlement de base, nous estimons que pour les aérodromes, elle va trop loin dans les détails et qu'il vaut mieux considérer l'équipement dans son ensemble et non pas pièce par pièce.</p> <p>Nous proposons la rédaction suivante :</p> <p>"Aerodrome equipment shall mean any</p>

	equipment, apparatus or appurtenance, software or accessory , that is used or intended to be used to contribute to the operation of aircraft at an aerodrome.”
Justification	Avec une définition allant aussi loin nous allons avoir une multitude d'équipements et même des équipements inclus dans d'autres équipements. Cela va générer non seulement des lourdeurs administratives mais également une confusion dans le « qui fait quoi ». Il est préférable de ne conserver que les équipements d'une certaine importance considérant que les logiciels et les accessoires font partie de ces équipements.
Traduction de courtoisie	<p>Even if this definition is already in the basic regulation, we consider that it is too much detailed and it would be better to describe the equipment as a whole than piece by piece.</p> <p>We suggest the following writing : “Aerodrome equipment shall mean any equipment, apparatus or appurtenance, software or accessory, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome.”</p> <p>This definition goes too far and we will have a multitude of equipments. It will create unnecessary administrative burden and uncertainty about who does what. It would be better to keep only important equipments considering that they include software and accessories.</p>

response *Noted*

This is in the BR and cannot be changed.

comment 687

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.A.002 « cleared and graded area »

'Cleared and Graded Area (CGA)' means that part of the Runway Strip cleared of all obstacles except for minor specified items and graded, intended to reduce the risk of damage to an aircraft running off the

	runway.
Proposition/commentaire	Nous constatons une incohérence dans la définition avec celle de la bande de piste.
Justification	En effet, la bande de piste a deux objectifs: réduire les dommages aux aéronefs en cas de sortie de piste et protéger les avions en survol. La CGA faisant partie intégrante de la bande de piste, elle devrait répondre aux deux mêmes objectifs, ce qui n'est pas tout à fait le cas en l'espèce puisqu'elle ne reprend pas celui de protection des avions en survol.
Traduction de courtoisie	There is an inconsistency between this definition and the definition of the runway strip. Indeed, the runway strip has two objectives: reducing damages to aircrafts in case of running off the runway and protecting aircrafts flying over the runway strip. Being a part of the runway strip, the CGA should be submitted to the same objectives, which is not the case here because it does not take into account the protection of flying aircrafts.

response *Not accepted*

The CGA definition states that it is part of the runway strip and therefore falls under the overarching definition of runway strip.

comment 689

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.A.002 « clearway »	'Clearway' means a defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height.
Proposition/commentaire	La question se pose de savoir qui, ici, est "the appropriate authority" dont le terme n'est pas défini dans la réglementation AESA. S'agit-il de l'autorité compétente ou d'une autorité tierce?

Justification	
Traduction de courtoisie	We wonder who is the "appropriate authority" since it is not defined in the EASA rules. Is it the competent authority or a third authority?

response *Noted*

This comment is not related to the CS and will be answered in CR/AR general comments.

comment

690

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.A.002 « frangible object »	'Frangible object' means an object of low mass designed to break, distort or yield on impact so as to present the minimum hazard to aircraft.
Proposition/commentaire	"Frangible object": de quel type d'impact s'agit-il? Nous proposons la modification suivante: 'Frangible object' means an object of low mass designed to break, distort or yield on impact due to an aircraft so as to present the minimum hazard to aircraft."
Justification	Nous supposons qu'il s'agit d'un impact uniquement causé par un avion dans la mesure où les objets frangibles sont mis dans des endroits où il est nécessaire de réduire le risque de dommage dans le cas d'un aéronef sortant de la piste ou d'une voie de circulation. En ajoutant "due to aircraft", nous sommes aussi plus en corrélation avec la définition de "frangibility".
Traduction de courtoisie	"Frangible object": what kind of impact is it ? We propose the following modification : "Frangible object means an object of low mass designed to break, distort or yield on impact due to an aircraft so as to present the minimum hazard to aircraft." We suppose that this is only an impact caused by aircraft because frangible objects are put in places where it is necessary to

	<p>reduce the risk of damages in the case of an aircraft runway or taxiway excursion.</p> <p>By adding "due to aircraft" we are better in link with the definition of "frangibility".</p>
response	<p><i>Not accepted</i></p> <p>This is the wording from the ICAO definition.</p>

comment	691	comment by: <i>ADP : Aeroports de Paris</i>
	<p>Référence: CS-ADR-DSN.A.002 « non-instrument runway »</p>	<p>'Non-instrument runway' means a runway intended for the operation of aircraft using visual approach procedures.</p>
	<p>Proposition/commentaire</p>	<p>Il est proposé:</p> <ul style="list-style-type: none"> - Soit de reprendre les termes de l'Approach classification task force de l'OACI ; - Soit d'ajouter "only": "Non-instrument runway means a runway intended only for the operation of aircraft using visual approach procedures".
	<p>Justification</p>	<p>Si nous reprenons les définitions telles qu'écrites, nous allons avoir des pistes, considérées comme des infrastructures, qui seront à la fois « instrument runways » et « non-instrument runways ».</p> <p>En effet la grande majorité des pistes aux instruments sont également destinées à être utilisées pour des procédures d'approches à vue.</p> <p>Vu les termes utilisés, « instrument » et « non-instrument », il est compris qu'il s'agit de catégories exclusives. Or, cela ne sera pas le cas avec de telles définitions qui, certes, proviennent de l'OACI.</p>
	<p>Traduction de courtoisie</p>	<p>It is proposed:</p> <ul style="list-style-type: none"> - either to take up the ICAO Approach classification task force terms; - or to add "only": "Non-instrument runway means a runway intended only for the operation of aircraft using visual approach procedures".

	<p>If we keep the definitions as written, we will have runways considered as infrastructure which will be at the same time « instrument runways » and « non-instrument runways ».</p> <p>Indeed, the majority of the « instrument runways » are also used for visual approaches.</p> <p>Regarding to the terms « instrument runways » and « non-instrument runways », it is understand that there are exclusives categories. Now, it will not be the case with such definition even if they come from the ICAO</p>
<p>response <i>Noted</i></p> <p>This is the ICAO definition of non-instrument runway. EASA follows the relevant ICAO work in this area, which, however, has not been finalised.</p>	

comment 692

comment by: ADP : Aeroports de Paris

<p>Référence: CS-ADR-DSN.A.002 « runway end safety area »</p>	<p>'Runway end safety area (RESA)' means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway.</p>
<p>Proposition/commentaire</p>	<p>Cette définition ne tient pas compte des avancées de l'OACI.</p> <p>Il faudrait tenir compte de la lettre aux états n°41 qui précise les objectifs de la RESA et ajouter notamment que la RESA permet aussi "à un avion qui dépasse la piste de décélérer et à un avion qui se présente trop court de poursuivre son atterrissage".</p>
<p>Justification</p>	<p>La définition proposée par l'OACI a le grand avantage de préciser la fonction de la RESA ce qui est un élément incontournable pour pouvoir réaliser une étude de sécurité dans le cas d'ELOS ou de conditions spéciales.</p>
<p>Traduction de courtoisie</p>	<p>This definition does not take into account the works of ICAO. It should be taken into account the letter to the States n°41 that specifies the objectives of RESA as follows:</p>

	<p>“Runway end safety area (RESA)’ means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway, and also to allow an aeroplane overrunning to decelerate and an aeroplane undershooting to continue its approach or landing.”</p> <p>The ICAO definition has the advantage to precise the function of RESA which is very important to carry out a safety study for ELOS or special conditions.</p>
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response *Noted*

This is the ICAO definition of RESA. EASA follows the relevant ICAO work in this area, which, however, has not been finalised.

comment 693

comment by: *ADP : Aeroports de Paris*

<p>Référence: CS-ADR-DSN.A.002 « runway strip »</p>	<p>“Runway strip means a defined area including the runway and stopway, if provided, intended: (a) to reduce the risk of damage to aircraft running off a runway; and (b) to protect aircraft flying over it during take-off or landing operations.”</p>
<p>Proposition/commentaire</p>	<p>Cette définition mérite d'être précisée pour éviter toute erreur d'interprétation en séparant bien la cleared and graded area (CGA) définie avant mais dont les objectifs ne sont pas cohérents avec ceux de la bande de piste. Nous proposons d'ajouter une définition pour la partie de la bande de piste qui n'est pas nivelée qui pourrait être : « Cleared runway strip means the part of the runway strip intended to protect aircraft flying over it during take-off or landing operations ».</p>
<p>Justification</p>	<p>En effet, la bande de piste a deux objectifs: réduire les dommages aux aéronefs en cas de sortie de piste et protéger les avions en</p>

	<p>survol. La CGA faisant partie intégrante de la bande de piste, elle devrait répondre aux deux mêmes objectifs, ce qui n'est pas tout à fait le cas en l'espèce puisqu'elle ne reprend pas celui de protection des avions en survol. Pour ne pas avoir deux parties de bande de piste différentes mais avec des objectifs identiques, il convient de bien différencier la partie nivelée de la partie non nivelée de la bande de piste avec des objectifs différenciés.</p>
<p>Traduction de courtoisie</p>	<p>This definition should be specified to avoid any misunderstanding by well separating the cleared and graded area (CGA) previously defined but whose objectives are incoherent with the runway strip ones.</p> <p>We propose to add a definition for the portion of the runway which is not graded and which could be: « Cleared runway strip means the part of the runway strip intended to protect aircraft flying over it during take-off or landing operations ».</p> <p>Indeed, the runway strip has two objectives: reducing damages to aircrafts in case of running off the runway and protecting aircrafts flying over the runway strip. Being a part of the runway strip, the CGA should be submitted to the same objectives, which is not the case here because it does not take into account the protection of flying aircrafts. To not have two different parts of runway strip with identical objectives, it is appropriate to distinguish the graded portion from the non-graded portion of runway strip with different objectives.</p>

response *Not accepted*

The CGA definition states that it is part of the runway strip and therefore falls under the overarching definition of runway strip.

comment 826

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.002 — Definitions (p4-9)

- CS-ADR - Book 1 - CS-ADR-DSN. H.420 — Inner horizontal surface (p37-38)
- CS-ADR - Book 1 - CS-ADR-DSN.H.430 — Transitional surface (p38-39)
- CS-ADR - Book 1 - CS-ADR-DSN.H.455 — Inner transitional surface (p43-44)
- (B.III) corrigendum - Table J-1 - Dimensions and slopes of obstacle limitation surfaces — Approach runways (p3-4)

2. Justification and proposed text / comment

This comment is linked with comment 10 in (B.III) corrigendum.

These provisions are to be reviewed to take into account the concept of "support line" that has been adopted by the group ADR.003 as an alternative of the contour the runway strip.

For recall, this concept permits to solve the issues raised when the dimensions of the runway strip are much greater than the minimum value required. In these cases, the "support line" of OLS, particularly the support line of the transitional surfaces, is not coincident with the contour of the runway strip. Thus it is essential to be able to establish OLS independently from the contour of the runway strip, which is allowed by this concept.

For instance, the distance of 60m in note (c) of table J-1 corresponds to the minimal length of the runway strip beyond the runway end. It is frequent to have runway strips ending beyond this distance. For technical reasons, the obstacle limitation surfaces related to interrupted take-off surface are related to this distance and not to the end of the runway strip.

Note: the concept of the support line enables to manage both the case where the runway strip is coincident with the support line and the cases where it is not coincident. Thus, the redaction with the strip could be deleted without any consequence.

This concept has already been taken into account in CS on transitional surfaces (for instance CS-ADR-DSN.H.430), which is a good thing, but it is essential to use it also for other OLS when the strip is used in order to harmonize the design.

Thus the following proposed modifications:

"Obstacle free zone (OFZ)" means the airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces or, when the support line is not coincident with the strip, the portion of ground bounded by the support line which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes."

Table J-1 – Dimensions and slopes of obstacle limitation surfaces – Approach runways * Note (c)

"c. Distance to the end of strip or, when the runway strip is not coincident with the inner edge of the approach surface, to 60 m beyond the runway end."

CS-ADR-DSN. H.420 — Inner horizontal surface

"[...] (c) Characteristics: The outer limits of the inner horizontal surface are defined by circular arcs centred on the intersection of the extended RWY centre line with the end of the RWY strip or, when the runway strip is not coincident with the inner edge of the approach surface, with the vertical line passing through the middle of the inner edge of the approach surface, joined tangentially by straight lines. (Figure H-1.)

[...]"

Editorial improvement of CS-ADR-DSN.H.430 – Transitional surface

"[...]

(b) Description:[...]

(2) Where the transitional surface is not coincident with the runway strip: a complex surface along the side of a support line, parallel to and at a specified distance specified in table H-1 from the runway centre line, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface.

(c) Characteristics: The limits of a transitional surface should comprise:

(1) Where the transitional surface is coincident with the runway strip:

(i) a lower edge beginning at the intersection of the side of the approach surface with the inner horizontal surface and extending down the side of the approach surface to the inner edge of the approach surface and from there along the length of the strip parallel to the runway centre line; and

~~(2)~~(ii) An upper edge located in the plane of the inner horizontal surface; or

~~(3)~~ (2) Where the transitional surface is not coincident with the runway strip:

(i) a lower edge beginning at the intersection of the side of the approach surface with the inner horizontal surface and extending down the side of the approach surface to the inner edge of the approach surface and from there along a support line parallel to the runway centre line, whose distance to the runway centre line is according to table H-1 below; and

(ii) An upper edge located in the plane of the inner horizontal surface.

[...]"

CS-ADR-DSN.H.455 – Inner transitional surface

"[...]

(b) Characteristics: The limits of an inner transitional surface should comprise:

(1) Where the transitional surface is coincident with the runway strip:

(i) a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that surface, from there along the strip parallel to the runway centre line to the inner edge of the balked landing surface and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and

~~(2)~~(ii) an upper edge located in the plane of the inner horizontal surface.

(2) Where the transitional surface is not coincident with the runway strip:

(i) a lower edge beginning at the intersection of the side of the approach surface with the inner horizontal surface and extending down the side of the approach surface to the inner edge of the approach surface and from there along the support line parallel to the runway centre line, at a specified distance to the runway centre line indicated in table H-2 below; and

(ii) An upper edge located in the plane of the inner horizontal surface.

(c) The elevation of a point on the lower edge should be:

(1) along the side of the inner approach surface and balked landing surface – equal to the elevation of the particular surface at that point; and

(2) along the strip – equal to the elevation of the nearest point on the centre line of the runway or its extension.

(3) Along the transitional surface support line – equal to the elevation of this line at that point.

[...]"

Table H-2: distance between inner transitional surface support line and runway centre line

	Precision approach Category I	Precision approach Category II or III

Runway code	1,2	3,4	60 m
	45 m	60 m	

response *Not accepted*

The concept of the 'support line' is not appropriate for ICAO design criteria.

comment 832

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.001 — Applicability (p4-9)

2. Justification and proposed text / comment

The applicability is defined by the basic regulation so should not be duplicated in the certification specifications; the first sentence of this CS is self-sufficient. Moreover, the application is a little more complex than what is written in this CS.

DGAC proposes to modify this CS as follows:

"CS-ADR-DSN.A.001 — Applicability

The design specifications in this book are applicable to aerodromes falling within the scope of the Regulation (EC) No 216/2008 (hereafter referred to as the 'Basic Regulation')¹ and its amending regulations, viz.:

~~*Aerodromes, including equipment, located in the territory subject to the provisions of the Treaty, open to public use and which serve commercial air transport and where operations using instrument approach or departure procedures are provided, and:*~~

~~*(a) have a paved runway of 800 metres or above; or*~~

~~*(b) exclusively serve helicopters.*~~

The applicable specifications should be used in constructing the aerodrome's Certification Basis.

Supplementary Guidance Material (GM) is located in Book 2 — EASA Guidance Material for Aerodrome Design. For ease of cross-referencing, the GM numbering format mirrors the CS numbering sequence."

response *Accepted*

comment 833

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.002 – Definitions – ‘marking’ (p4-9)

2. Justification and proposed text / comment

DGAC recognizes that the definition given is the same as in ICAO - Annex 14. But it only takes into account markings on the surface of the movement area whereas markings are also displayed on objects to reduce hazards to aircraft by indicating the presence of the obstacles, as said in the note introducing chapter 6 of ICAO – Annex 14. DGAC proposes to keep the same definition for marking on the surface movement and to add a bullet to define marking on objects. DGAC proposes to change the definition to take into account the marking of objects:

“Marking’ means a symbol or group of symbols displayed:

- (a) on the surface of the movement area in order to convey aeronautical information or
 (b) on objects to reduce hazards to aircraft by indicating the presence of the obstacles.”

response Not accepted

The ICAO definition will be used.

comment

834

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.002 – Definitions – ‘aerodrome’ (p4), ‘aerodrome equipment’ (p4), ‘apron (p5) and ‘operator’ (p8)

2. Justification and proposed text / comment

The definitions of “aerodrome”, “aerodrome equipment”, “apron” and “operator” are already contained in the Basic regulation so it is useless to duplicate them in the CS, and even prejudicial because there is a risk of omission of future updates.

Moreover, CS-ADR-DSN.A.002 already contains the definition of “aerodrome operator” (p5), which details the one for “operator”.

DGAC proposes to **delete the definition of the words ‘aerodrome’, ‘aerodrome equipment’, ‘apron’ and ‘operator’:**

~~“Aerodrome’ means a defined area (including any buildings, installations and equipment) on land or water or on a fixed offshore or floating structure intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.”~~

~~“Aerodrome equipment’ shall mean any equipment, apparatus, appurtenance, software or accessory, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome.”~~

~~“Apron’ means a defined area intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.”~~

response

~~"Operator' means any legal or natural person, operating or proposing to operate one or more aircraft or one or more aerodromes."~~

Noted

The list of the definitions contained in article 2 of the draft regulation are not the same as those contained in the book of certification specifications, because the terms used in the draft regulation are not the same as those used in the certification specifications. Inconsistencies will be reviewed.
This comment is not related to the CS and will be answered in OR/AR general comments.

comment

835

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.002 - Definitions - 'cleared and graded area' (p5)

2. Justification and proposed text / comment

The definition of 'cleared and graded area' in CS-ADR-DSN.A.002 is not consistent with the definition of the runway strip.

Justification: the proposed definition of a 'runway strip' (which is in line with ICAO Annex 14 Volume 1 definition) is:

"Runway strip' means a defined area including the runway and stopway, if provided, intended:

- (a) to reduce the risk of damage to aircraft running off a runway; and*
- (b) to protect aircraft flying over it during take-off or landing operations."*

As the "cleared and graded area (CGA)" is contained in the strip, this area should respect the two objectives of a runway strip. The proposed definition only mentions one objective, which is understood as the main objective in this area.

Consequently, it is proposed to modify the definition of "cleared and graded area (CGA)" in CS-ADR-DSN.A.002 as follows:

*"**Cleared and Graded Area (CGA)**' means that part of the Runway Strip cleared of all obstacles except for minor specified items and graded, **mainly** intended to reduce the risk of damage to an aircraft running off the runway."*

response

Not accepted

The CGA definition states that it is part of the runway strip and therefore falls under the overarching definition of runway strip.

comment

836

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.002 – Definitions – ‘clearway’ (p5)

2. Justification and proposed text / comment

This comment is an informative comment, to support the use of “appropriate authority”.

This comment is **linked to the one on “competent authority”**.

(See comments n° 1008 in Book I, n° 798 in Book II and n° 591 in Book III)

As the land use is, in France, the competency of one representative from the State (the “préfet”) who is not a competent authority as defined by EASA (and should not be, as this is not possible in the French system), this representative from the State is an “authority” but not a “competent authority”.

Consequently, DGAC France fully supports the use of the word “appropriate authority” in this definition, which enables France to have flexibility.

response *Noted*

This comment is not related to the CS and will be answered in OR/AR general comments

comment

837

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.002 – Definitions – ‘road holding position’ (p8)

2. Justification and proposed text / comment

The proposed definition for “road holding position” is the same as the one contained in ICAO Annex 14 Volume 1: “**Road-holding position**’ means a designated position at which vehicles may be required to hold.”

However, this definition could be more precise, as the word “road” is also defined in this CS (same definition as ICAO one: “**Road**’ means an established surface route on the movement area meant for the exclusive use of vehicles.”

It is proposed to improve this definition, by specifying that a ‘Road-holding position’ in a designated position **on a road**.

Proposal:

CS-ADR-DSN.A.002 – Definitions – ‘road holding position’

“**Road-holding position**’ means a designated position **on a road** at which vehicles may be required to hold.”

response *Not accepted*

comment

838

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.002 — Definitions - Runway end safety area (RESA) - (p8)
- CS-ADR - Book 1 - CS-ADR-DSN.A.002 — Definitions - Aircraft arresting system - (p5)
- CS-ADR - Book 1 - CS-ADR-DSN.C.215 - Dimensions of runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.C.220 - Objects on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.C.225 - Clearing and grading of runway end safety areas (p22-23)

2. Proposed text / comment

This comment is **critical**, as these definitions and CS-ADR-DSN.C.215 does not enable to perform an ELOS.

The **definition of RESA** has been revised following strong debates in ICAO, and this new definition has been agreed and is contained in ICAO Proposal for amendment of Annex 14, Volume I (State letter 41 – Ref : AN 4/1.1.52-11/41). This revised definition details the safety objective of a RESA, and enable to perform safety assessments on RESA, ie ELOS with an relevant demonstration.

It is consequently proposed to revise the definition of RESA and take the one from ICAO SL/41 (which is a clarification and an improvement of the proposed definition), to enable to perform ELOS on the CS related to RESA.

The **proposed definition for “arresting system”** states that this system is “used” to stop an aircraft, whereas ICAO states, in State letter 41 – Ref : AN 4/1.1.52-11/41 which introduces this new concept of arresting system, does not give a definition but states that such a system :

- is “intended to enhance safety in the event of an aircraft overrun” (SL11/41 – p16) and
- has “demonstrated performance” (SL11/41 – p16 and para 9.4 p72) and
- is “predictable and effective in arresting aircraft overruns” (SL11/41 – p16 and para 9.3 p72).

The different is that the arresting system is designed so that it is “intended” to stop an aircraft, but it can not stop all aircraft overrunning in all conditions. **It is consequently proposed to revise this definition to clarify and improve it, and consequently enable States to properly assess possible safety assessments (for ELOS) on this subject.**

Moreover, concerning **CS-ADR-DSN.C.215**, it should take into account, in the writing, the fact that ICAO Annex 14 Volume I requires 90m length, and that the recommendation (240m) is done “if practicable”. This clarification is important, because it is necessary to know on which safety objective an ELOS will be based. Moreover, having a RESA of 240 m length would be unapplicable on most aerodromes. Furthermore, the costs of arresting systems will be too high for most aerodrome operators. It is consequently proposed to write paragraph (a) of CS-ADR-DSN.C.215 so that the CS would focus on ICAO standard, and ask to have a longer RESA if practicable. It is also proposed to delete (b), since, in most, if not all cases, it won't be possible to demonstrate the same level of risks if the length is less than the ICAO Annex 14 Volume I recommendation. Finally, paragraphs (c) and (d) should be inverted since the standard for width should also apply to an arresting system.

CS-ADR-DSN.C.220 contains 2 erroneous references to other CS. Moreover, it should detail that an arresting system can be authorized even if it is an object.

CS-ADR-DSN.C.225 is not appropriate in case of an arresting system: it is proposed to add a reference to a possible "arresting system" which would not have to respect this specification.

As a conclusion, French DGAC proposes the following modifications:

CS-ADR-DSN.A.002 – Definitions - Runway end safety area (RESA)

"Runway end safety area (RESA)" means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway, and also to allow an aeroplane overrunning to decelerate and an aeroplane undershooting to continue its approach or landing."

CS-ADR-DSN.A.002 – Definitions – Aircraft Arresting System

"Aircraft Arresting System" means a series of components with demonstrated performance used intended to stop an aircraft by absorbing its momentum in a routine or emergency landing or rejected take-off."

CS-ADR-DSN.C.215 – Dimensions of runway end safety areas

"(a) Length of RESA

A runway end safety area should, as far as practicable, extend from the end of a runway strip to a distance of at least 90 m.

Wherever practicable, a runway end safety area should extend to a distance of :

- (1) 240 m where the code number is 3 or 4; and
- (2) 120 m where the code number is 1 or 2; and
- (3) with a minimum distance of at least 90 m.

~~(b) Where a RESA exceeding the minimum distance, but less than the distance in (a)(1) and (a)(2) is considered necessary, the aerodrome operator should undertake a safety assessment to identify the hazards and appropriate actions to reduce the risk.~~

~~(c) Where an arresting system of demonstrated performance capability is installed, the specifications above may be reduced in accordance with the design specification of the arresting system.~~

(d) Width of RESA

The width of a runway end safety area should, wherever practicable, be equal to that of the graded portion of the associated runway strip."

~~(d) Where an arresting system of demonstrated performance capability is installed, the specifications above may be reduced in accordance with the design specification of the arresting system.~~

CS-ADR-DSN.C.220 - Objects on runway end safety areas

" (a) No fixed object, other than visual aids required for air navigation or for aircraft safety purposes and satisfying the relevant frangibility requirement CS-ADR-DSN.T.9210, should be permitted on a runway end safety area. The detailed requirements for sitting objects on a RESA are in CS-ADR-DSN.T.9215 (Sitting of equipment and installations on operational areas).

(b) Where an arresting system demonstrated performance capability is installed, according to CS-ADR-DSN.C.215(d), the specifications of paragraph (a) above may be adapted in accordance with the design specification of the arresting system."

CS-ADR-DSN.C.225 - Clearing and grading of runway end safety areas

" (a) A runway end safety area should provide a cleared and graded area for aeroplanes which the runway is intended to serve in the event of an aeroplane undershooting or overrunning the runway.

(b) The surface of the runway end safety area should be prepared, but does not need to be prepared to the same quality as the runway strip.

(c) Where an arresting system demonstrated performance capability is installed, according to CS-ADR-DSN.C.215(d), the specifications of paragraph (a) above may be adapted in accordance with the design specification of the arresting system."

response *Noted*

The ICAO definition of RESA is used, in this case modified in anticipation of SL 41 adoption.
The remaining CS comments are addressed individually under the relevant CS number.

comment

1079

comment by: Euroairport Bâle-Mulhouse

Attachment [#66](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.A.002
« aerodrome equipment »

Référence: CS-ADR-DSN.A.002 « aerodrome equipment »

"Aerodrome equipment shall mean any equipment, apparatus, appurtenance, software or accessory, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome."

Traduction de courtoisie

Even if this definition is already in the basic regulation, we consider that it is too much detailed and it would be better to describe the equipment as a whole than piece by piece.

We suggest the following writing :

"Aerodrome equipment shall mean any equipment, apparatus **or** appurtenance, ~~software or accessory~~, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome."

This definition goes too far and we will have a multitude of equipments. It will create unnecessary administrative burden and uncertainty about who does what. It would be better to keep only important equipments considering that they include software and accessories.

response *Not accepted*

This is the definition from the BR and cannot be changed.

comment	<p>1080</p> <p>comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #67</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « cleared and graded area »</p> <p>Référence: CS-ADR-DSN.A.002 « cleared and graded area » 'Cleared and Graded Area (CGA)' means that part of the Runway Strip cleared of all obstacles except for minor specified items and graded, intended to reduce the risk of damage to an aircraft running off the runway.</p> <p>Traduction de courtoisie There is an inconsistency between this definition and the definition of the runway strip. Indeed, the runway strip has two objectives: reducing damages to aircrafts in case of running off the runway and protecting aircrafts flying over the runway strip. Being a part of the runway strip, the CGA should be submitted to the same objectives, which is not the case here because it does not take into account the protection of flying aircrafts.</p>
response	<p><i>Not accepted</i></p> <p>The CGA definition states that it is part of the runway strip and therefore falls under the overarching definition of runway strip.</p>
comment	<p>1082</p> <p>comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #68</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « clearway »</p> <p>Référence: CS-ADR-DSN.A.002 « clearway » 'Clearway' means a defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height.</p> <p>Traduction de courtoisie We wonder who is the "appropriate authority" since it is not defined in the EASA rules. Is it the competent authority or a third authority?</p>
response	<p><i>Noted</i></p> <p>This comment is not related to the CS and will be answered in CR/AR general comments.</p>

comment	<p>1083 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #69</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « frangible object »</p> <p>Référence: CS-ADR-DSN.A.002 « frangible object » 'Frangible object' means an object of low mass designed to break, distort or yield on impact so as to present the minimum hazard to aircraft.</p> <p>Traduction de courtoisie "Frangible object": what kind of impact is it ? We propose the following modification : "Frangible object means an object of low mass designed to break, distort or yield on impact due to an aircraft so as to present the minimum hazard to aircraft." We suppose that this is only an impact caused by aircraft because frangible objects are put in places where it is necessary to reduce the risk of damages in the case of an aircraft runway or taxiway excursion. By adding "due to aircraft" we are better in link with the definition of "frangibility".</p>
response	<p><i>Not accepted</i></p> <p>This is the wording from the ICAO definition.</p>

comment	<p>1084 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #70</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « non-instrument runway »</p> <p>Référence: CS-ADR-DSN.A.002 « non-instrument runway» 'Non-instrument runway' means a runway intended for the operation of aircraft using visual approach procedures.</p> <p>Traduction de courtoisie It is proposed:</p> <ul style="list-style-type: none"> • either to take up the ICAO Approach classification task force terms; • or to add "only": "Non-instrument runway means a runway intended only for the operation of aircraft using visual approach procedures". <p>If we keep the definitions as written, we will have runways considered as infrastructure which will be at the same time « instrument runways » and « non-instrument runways ».</p> <p>Indeed, the majority of the « instrument runways » are also used for visual approaches.</p> <p>Regarding to the terms « instrument runways » and « non-instrument runways », it is understand that there are exclusives categories. Now, it will not</p>
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response	<p>be the case with such definition even if they come from the ICAO</p> <p><i>Noted</i></p> <p>This is the ICAO definition of non-instrument runway. EASA follows the relevant ICAO work in this area, which, however, has not been finalised.</p>
comment	<p>1085 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #71</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « runway end safety area »</p> <p>Référence: CS-ADR-DSN.A.002 « runway end safety area » 'Runway end safety area (RESA)' means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway. Traduction de courtoisie</p> <p>This definition does not take into account the works of ICAO. It should be taken into account the letter to the States n°41 that specifies the objectives of RESA as follows:</p> <p>“Runway end safety area (RESA)' means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway, and also to allow an aeroplane overrunning to decelerate and an aeroplane undershooting to continue its approach or landing.”</p> <p>The ICAO definition has the advantage to precise the function of RESA which is very important to carry out a safety study for ELOS or special conditions.</p>
response	<p><i>Noted</i></p> <p>This is the ICAO definition of RESA. EASA follows the relevant ICAO work in this area, which, however, has not been finalised.</p>
comment	<p>1087 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #72</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « runway strip »</p> <p>Référence: CS-ADR-DSN.A.002 « runway strip »</p> <p>“Runway strip means a defined area including the runway and stopway, if provided, intended:</p> <p>(a) to reduce the risk of damage to aircraft running off a runway; and</p> <p>(b) to protect aircraft flying over it during take-off or landing operations.”</p>

	<p>Traduction de courtoisie</p> <p>This definition should be specified to avoid any misunderstanding by well separating the cleared and graded area (CGA) previously defined but whose objectives are incoherent with the runway strip ones.</p> <p>We propose to add a definition for the portion of the runway which is not graded and which could be: « Cleared runway strip means the part of the runway strip intended to protect aircraft flying over it during take-off or landing operations ».</p> <p>Indeed, the runway strip has two objectives: reducing damages to aircrafts in case of running off the runway and protecting aircrafts flying over the runway strip. Being a part of the runway strip, the CGA should be submitted to the same objectives, which is not the case here because it does not take into account the protection of flying aircrafts.</p> <p>To not have two different parts of runway strip with identical objectives, it is appropriate to distinguish the graded portion from the non-graded portion of runway strip with different objectives.</p>
response	<p><i>Not accepted</i></p> <p>The CGA definition states that it is part of the runway strip and therefore falls under the overarching definition of runway strip.</p>
comment	<p>1088 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #73</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.A.002</p> <p>Référence: CS-ADR-DSN.A.002</p> <p>Définitions</p> <p>Traduction de courtoisie</p> <p>UAF propose:</p> <ul style="list-style-type: none"> • either to group together all the definitions in the cover regulation of book I or in the CS of book III • or to create a specific book for definitions. <p>We noticed an inconsistency between article 2 of the cover regulation (book I) and the article 2 of the CS (book III) related to definitions. Indeed, some terms are at the same time in book I and book III without being defined identically while some terms are defined only once.</p>
response	<p><i>Noted</i></p> <p>The list of the definitions contained in Article 2 of the draft regulation are not the same as those contained in the book of certification specifications, because the terms used in the draft regulation are not the same as those used in the certification specifications. Inconsistencies will be reviewed.</p>

comment 1121

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- BIII - CS-ADR - Book 1 - CS-ADR-DSN.A.002 — Definitions (p4-9)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.320 — Objects on taxiway strips (p29)

2. Justification and proposed text / comment

The first sentence is a duplication of what is detailed in the definition of taxiway strip in CS-ADR-DSN.A.002: "an area including a taxiway intended to protect an aircraft operating on the taxiway and to reduce the risk of damage to an aircraft accidentally running off the taxiway".

The other sentences are already dealt with in CS-ADR-DSN.T.915 - *Siting of equipment and installations on operational areas*.

Such duplications are to be avoided in a regulation as much as possible to avoid any confusion, in particular for the future modifications.

CS-ADR-DSN.D.320 — Objects on taxiway strips

~~"The taxiway strip should provide an area which should be free from objects which might create an unacceptable risk to taxiing aeroplanes. This should not preclude parking equipment required for that area in specifically identified positions or zones. The detailed requirements for siting objects on taxiway strips are in CS-ADR-DSN.T.925 (Siting of equipment and installations on operational areas)."~~

response Partially accepted

The second sentence of the CS text has been deleted.

comment 1265

comment by: UK CAA

Page No: Various (example page 6)

Paragraph No: For example - CS-ADR-DSN.A.002 Definitions Instrument Runway (c)

Comment: Where a height is quoted that relates to an aircraft operation it should be predominately **feet followed by metres**, if metres are required at all.

Justification: EU-OPS does not quote these heights in metres. It avoids confusion with visibility measurements and therefore provides a level of consistency between flight operations and aerodrome operations.

Proposed Text: 200 ft (60m) or just 200ft

response Not accepted

The definition is taken verbatim from Annex 14.

comment 1862

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS ADR DSN – Book 1 – CS-ADR-DSN.T.910 – Equipment frangibility requirements (p167)
- CS ADR DSN – Book 2 – ~~CSGM~~-ADR-DSN.T.910 – Equipment frangibility requirements (p299)
- CS-ADR - Book 1 - CS-ADR-DSN.A.002 – Definitions (p4-9)

2. Justification and proposed text / comment

The first sentence is already in the definition of frangibility in CS-ADR-DSN.A.002 – Definitions: *"the ability of an object to retain its structural integrity and stiffness up to a specified maximum load but when subject to a load greater than specified or struck by an aircraft will break, distort or yield in a manner designed to present minimum hazard to an aircraft."*

The following is more guidance and may not be applicable to all kind of visual aids. Moreover this comes from an ICAO Manual.

It is proposed to move the CS to GM as follows:

CS-ADR-DSN.T.910 – Equipment frangibility requirements

~~"(a) Equipment and supports required to be frangible should be designed and constructed so that they will break, distort or yield in the event that they are accidentally impacted by an aircraft. The design materials selected should preclude any tendency for the components, including the electrical conductors, etc., to 'wrap around' the colliding aircraft or any part of it.~~

~~(b) Frangible structures should be designed to withstand the static and operational wind or jet blast loads with a suitable factor of safety, but should break, distort or yield readily when subjected to the sudden collision forces of a 3 000 kg aircraft airborne and travelling at 140 km/h (75 kt) or moving on the ground at 50 km/h (27 kt)."~~

~~CSGM~~-ADR-DSN.T.910 – Equipment frangibility requirements

~~"(a) The design materials selected may preclude any tendency for the components, including the electrical conductors, etc., to 'wrap around' the colliding aircraft or any part of it.~~

~~(b) Frangible structures may be designed to withstand the static and operational wind or jet blast loads with a suitable factor of safety, but may break, distort or yield readily when subjected to the sudden collision forces of a 3 000 kg aircraft airborne and travelling at 140 km/h (75 kt) or moving on the ground at 50 km/h (27 kt).~~

~~Note – Guidance on design for frangibility is contained in the Aerodrome Design Manual (ICAO, Doc 9157, Part 6)."~~

response Partially accepted

Paragraph (a) of the CS has been moved to GM.

comment 1978

comment by: HIA - Highlands and Islands Airports Limited

A number of items are mentioned in the text but their definitions are missing - the following items should be added -

	Balanced Field, Delethalisation, Equivalent Level of Safety, Helicopter, Lower than Standard Category 1 Runway, Runway Excursion, Runway Incursion, Safety Management Systems, Taxiway Holding Position.
response	<p><i>Partially accepted</i></p> <p>The SMS definition is in the Cover Regulation. The remaining proposed definitions are not appropriate for CS.</p> <p>ELOS will not be a definition, but descriptive guidance material will be included in OR.</p> <p>The term 'delethalisation' is not used in the CS.</p>
comment	<p>2019 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #74</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « aerodrome equipment »</p> <p>Référence: CS-ADR-DSN.A.002 « aerodrome equipment » "Aerodrome equipment shall mean any equipment, apparatus, appurtenance, software or accessory, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome."</p> <p>Traduction de courtoisie Even if this definition is already in the basic regulation, we consider that it is too much detailed and it would be better to describe the equipment as a whole than piece by piece. We suggest the following writing : "Aerodrome equipment shall mean any equipment, apparatus or appurtenance, software or accessory, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome." This definition goes too far and we will have a multitude of equipments. It will create unnecessary administrative burden and uncertainty about who does what. It would be better to keep only important equipments considering that they include software and accessories.</p>
response	<p><i>Noted</i></p> <p>This is in the BR and cannot be changed.</p>
comment	<p>2020 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #75</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002</p>

Référence: CS-ADR-DSN.A.002
Définitions

Traduction de courtoisie
UAF propose:

- either to group together all the definitions in the cover regulation of book I or in the CS of book III
- or to create a specific book for definitions.

We noticed an inconsistency between article 2 of the cover regulation (book I) and the article 2 of the CS (book III) related to definitions. Indeed, some terms are at the same time in book I and book III without being defined identically while some terms are defined only once.

response *Noted*

The list of the definitions contained in article 2 of the draft regulation are not the same as those contained in the book of certification specifications, because the terms used in the draft regulation are not the same as those used in the certification specifications. Inconsistencies will be reviewed.

comment 2151 comment by: *Airport Nuremberg - NUE/EDDN*

It would be very helpful, if the EASA definitions would similar to the ICAO Annex 14 include the definitions for snow, slush, ice etc.

response *Noted*

The proposed definitions are not appropriate for CS.

comment 2441 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

Change definition to: Critical Area means an area of defined dimensions extending about a ground equipment within which the presence of vehicles, aircraft or persons will cause unacceptable disturbance of the signals

response *Not accepted*

comment 2442 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

Change definition to: Graded Area means that part of the runway strip intended to reduce the risk of damage to an aircraft running off the runway

response *Not accepted*

This is defined in 'Cleared and graded area'.

comment 2817

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.A.002	Définitions
Proposition/commentaire	ACA propose : - soit de regrouper l'ensemble des définitions dans la cover regulation du livre I ou dans les spécifications de certification (CS) du livre III ; - soit de créer un livre spécifique aux définitions.
Justification	Nous remarquons une certaine incohérence entre l'article 2 de la cover regulation (livre I) et l'article 2 des CS (livre III) relatifs aux définitions. En effet certains termes sont présents à la fois dans le livre I et dans le livre III sans pour autant être définis de manière identique, tandis que d'autres termes ne figurent qu'à un seul endroit.
Traduction de courtoisie	ACA propose: - either to group together all the definitions in the cover regulation of book I or in the CS of book III - or to create a specific book for definitions. We noticed an inconsistency between article 2 of the cover regulation (book I) and the article 2 of the CS (book III) related to definitions. Indeed, some terms are at the same time in book I and book III without being defined identically while some terms are defined only once.

response *Noted*

The list of the definitions contained in Article 2 of the draft regulation are not the same as those contained in the book of certification specifications, because the terms used in the draft regulation are not the same as those used in the certification specifications. Inconsistencies will be reviewed.

comment

2818

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.A.002 « aerodrome equipment »	"Aerodrome equipment shall mean any equipment, apparatus, appurtenance, software or accessory, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome."
Proposition/commentaire	<p>Bien que cette définition soit déjà dans le règlement de base, nous estimons que pour les aérodromes, elle va trop loin dans les détails et qu'il vaut mieux considérer l'équipement dans son ensemble et non pas pièce par pièce.</p> <p>Nous proposons la rédaction suivante : "Aerodrome equipment shall mean any equipment, apparatus or appurtenance, software or accessory, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome."</p>
Justification	<p>Avec une définition allant aussi loin nous allons avoir une multitude d'équipements et même des équipements inclus dans d'autres équipements. Cela va générer non seulement des lourdeurs administratives mais également une confusion dans le « qui fait quoi ». Il est préférable de ne conserver que les équipements d'une certaine importance considérant que les logiciels et les accessoires font partie de ces équipements.</p>
Traduction de courtoisie	<p>Even if this definition is already in the basic regulation, we consider that it is too much detailed and it would be better to describe the equipment as a whole than piece by piece.</p> <p>We suggest the following writing : "Aerodrome equipment shall mean any equipment, apparatus or appurtenance, software or accessory, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome."</p> <p>This definition goes too far and we will have a multitude of equipments. It will create unnecessary administrative burden and uncertainty about who does what. It would be better to keep only important equipments considering that they include software and accessories.</p>

response

Noted

This is in the BR and cannot be changed.

comment

2819

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.A.002 « cleared and graded area »	'Cleared and Graded Area (CGA)' means that part of the Runway Strip cleared of all obstacles except for minor specified items and graded, intended to reduce the risk of damage to an aircraft running off the runway.
Proposition/commentaire	Nous constatons une incohérence dans la définition avec celle de la bande de piste.
Justification	En effet, la bande de piste a deux objectifs: réduire les dommages aux aéronefs en cas de sortie de piste et protéger les avions en survol. La CGA faisant partie intégrante de la bande de piste, elle devrait répondre aux deux mêmes objectifs, ce qui n'est pas tout à fait le cas en l'espèce puisqu'elle ne reprend pas celui de protection des avions en survol.
Traduction de courtoisie	There is an inconsistency between this definition and the definition of the runway strip. Indeed, the runway strip has two objectives: reducing damages to aircrafts in case of running off the runway and protecting aircrafts flying over the runway strip. Being a part of the runway strip, the CGA should be submitted to the same objectives, which is not the case here because it does not take into account the protection of flying aircrafts.

response

Not accepted

The CGA definition states that it is part of the runway strip and therefore falls under the overarching definition of runway strip.

comment

2820

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR- DSN.A.002 « clearway »	'Clearway' means a defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height.
Proposition/commentaire	La question se pose de savoir qui, ici, est "the appropriate authority" dont le terme n'est pas défini dans la réglementation AESA. S'agit-il de l'autorité compétente ou d'une autorité tierce?
Justification	
Traduction de courtoisie	We wonder who is the "appropriate authority" since it is not defined in the EASA rules. Is it the competent authority or a third authority?

response

Noted

This comment is not related to the CS and will be answered in CR/AR general comments.

comment

2821

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR- DSN.A.002 « frangible object »	'Frangible object' means an object of low mass designed to break, distort or yield on impact so as to present the minimum hazard to aircraft.
Proposition/commentaire	"Frangible object": de quel type d'impact s'agit-il? Nous proposons la modification suivante: 'Frangible object' means an object of low mass designed to break, distort or yield on impact due to an aircraft so as to present the minimum hazard to aircraft."
Justification	Nous supposons qu'il s'agit d'un impact uniquement causé par un avion dans la mesure où les objets frangibles sont mis dans des endroits où il est nécessaire de réduire le risque de dommage dans le cas

	<p>d'un aéronef sortant de la piste ou d'une voie de circulation. En ajoutant "due to aircraft", nous sommes aussi plus en corrélation avec la définition de "frangibility".</p>
Traduction de courtoisie	<p>"Frangible object": what kind of impact is it ? We propose the following modification : "Frangible object means an object of low mass designed to break, distort or yield on impact due to an aircraft so as to present the minimum hazard to aircraft." We suppose that this is only an impact caused by aircraft because frangible objects are put in places where it is necessary to reduce the risk of damages in the case of an aircraft runway or taxiway excursion. By adding "due to aircraft" we are better in link with the definition of "frangibility".</p>

response *Not accepted*

This is the wording from the ICAO definition.

comment 2822

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.A.002 « non-instrument runway »	'Non-instrument runway' means a runway intended for the operation of aircraft using visual approach procedures.
Proposition/commentaire	<p>Il est proposé:</p> <ul style="list-style-type: none"> - Soit de reprendre les termes de l'Approach classification task force de l'OACI ; - Soit d'ajouter "only": "Non-instrument runway means a runway intended only for the operation of aircraft using visual approach procedures".
Justification	<p>Si nous reprenons les définitions telles qu'écrites, nous allons avoir des pistes, considérées comme des infrastructures, qui seront à la fois « instrument runways » et « non-instrument runways ». En effet la grande majorité des pistes aux instruments sont également destinées à</p>

	<p>être utilisées pour des procédures d'approches à vue. Vu les termes utilisés, « instrument » et « non-instrument », il est compris qu'il s'agit de catégories exclusives. Or, cela ne sera pas le cas avec de telles définitions qui, certes, proviennent de l'OACI.</p>
Traduction de courtoisie	<p>It is proposed:</p> <ul style="list-style-type: none"> - either to take up the ICAO Approach classification task force terms; - or to add "only": "Non-instrument runway means a runway intended only for the operation of aircraft using visual approach procedures". <p>If we keep the definitions as written, we will have runways considered as infrastructure which will be at the same time « instrument runways » and « non-instrument runways ». Indeed, the majority of the « instrument runways » are also used for visual approaches. Regarding to the terms « instrument runways » and « non-instrument runways », it is understand that there are exclusives categories. Now, it will not be the case with such definition even if they come from the ICAO</p>

response *Noted*

This is the ICAO definition of non-instrument runway. EASA follows the relevant ICAO work in this area, which, however, has not been finalised.

comment 2823

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.A.002 « runway end safety area »

'Runway end safety area (RESA)' means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway.

Proposition/commentaire

Cette définition ne tient pas compte des avancées de l'OACI.

	Il faudrait tenir compte de la lettre aux états n°41 qui précise les objectifs de la RESA et ajouter notamment que la RESA permet aussi "à un avion qui dépasse la piste de décélérer et à un avion qui se présente trop court de poursuivre son atterrissage".
Justification	La définition proposée par l'OACI a le grand avantage de préciser la fonction de la RESA ce qui est un élément incontournable pour pouvoir réaliser une étude de sécurité dans le cas d'ELOS ou de conditions spéciales.
Traduction de courtoisie	<p>This definition does not take into account the works of ICAO. It should be taken into account the letter to the States n°41 that specifies the objectives of RESA as follows: "Runway end safety area (RESA)' means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway, and also to allow an aeroplane overrunning to decelerate and an aeroplane undershooting to continue its approach or landing."</p> <p>The ICAO definition has the advantage to precise the function of RESA which is very important to carry out a safety study for ELOS or special conditions.</p>

response *Noted*

This is the ICAO definition of RESA. EASA follows the relevant ICAO work in this area, which, however, has not been finalised.

comment 2824

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.A.002
« runway strip »

"Runway strip means a defined area including the runway and stopway, if provided, intended:
(a) to reduce the risk of damage to aircraft running off a runway; and
(b) to protect aircraft flying over it during take-off or landing operations."

Proposition/commentaire	<p>Cette définition mérite d'être précisée pour éviter toute erreur d'interprétation en séparant bien la cleared and graded area (CGA) définie avant mais dont les objectifs ne sont pas cohérents avec ceux de la bande de piste.</p> <p>Nous proposons d'ajouter une définition pour la partie de la bande de piste qui n'est pas nivelée qui pourrait être : « Cleared runway strip means the part of the runway strip intended to protect aircraft flying over it during take-off or landing operations ».</p>
Justification	<p>En effet, la bande de piste a deux objectifs: réduire les dommages aux aéronefs en cas de sortie de piste et protéger les avions en survol. La CGA faisant partie intégrante de la bande de piste, elle devrait répondre aux deux mêmes objectifs, ce qui n'est pas tout à fait le cas en l'espèce puisqu'elle ne reprend pas celui de protection des avions en survol. Pour ne pas avoir deux parties de bande de piste différentes mais avec des objectifs identiques, il convient de bien différencier la partie nivelée de la partie non nivelée de la bande de piste avec des objectifs différenciés.</p>
Traduction de courtoisie	<p>This definition should be specified to avoid any misunderstanding by well separating the cleared and graded area (CGA) previously defined but whose objectives are incoherent with the runway strip ones.</p> <p>We propose to add a definition for the portion of the runway which is not graded and which could be: « Cleared runway strip means the part of the runway strip intended to protect aircraft flying over it during take-off or landing operations ».</p> <p>Indeed, the runway strip has two objectives: reducing damages to aircrafts in case of running off the runway and protecting aircrafts flying over the runway strip. Being a part of the runway strip, the CGA should be submitted to the same objectives, which is not the case here because it does not take into account the protection of flying aircrafts. To not have two different parts of runway strip with identical objectives, it is appropriate to distinguish the graded portion from the non-graded portion of runway strip with different objectives.</p>

response *Not accepted*

The CGA definition states that it is part of the runway strip and therefore falls under the overarching definition of runway strip.

comment 2983

comment by: *Fraport AG*

Attachment [#76](#)

The document NPA 2011-20 (BIII) CS ADR DSN AERODROMES DESIGN includes the term "capacitor discharge light" in the chapters
 CS-ADR-DSN.A.002 — Definitions
 CS-ADR-DSN.M.630 — Precision approach category I lighting system; Paragraph (c) (1) and (c) (2)
 CS-ADR-DSN.M.635 — Precision approach category II and III lighting system; Paragraph (I) and (I) (1).

This term is leading to one particular technology which is going to be replaced by other light sources. Forexample a LED light source is able to produces a equal but more conspicuous light signal w/o the disadvantages of a dangerous high voltage discharging gas tubes with a very short life time.

To follow the general spirit of the paper the requirement for a technical solution should be replaced by a specification of the operational characteristics of the lights.

Proposed Change

The term "**capacitor discharge light**" shall be replaced in general by the term "**short pulse flash light**". Change of the relevant paragraph in the chapter **CS-ADR-DSN.A.002 — Definitions** to:

„Short pulse flash light" means a flashing light producing a high intensity peak with a very short duration to provide a conspicuous dynamic light signal suitable for the required function and discernible different to steady or blinking lights."

response *Noted*

Development and use of alternative lights will be monitored and any technological specification changes will be incorporated. Until such changes are agreed, ICAO wording will be used.

comment 3156

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#77](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « cleared and graded area »

Référence: CS-ADR-DSN.A.002 « cleared and graded area »

'Cleared and Graded Area (CGA)' means that part of the Runway Strip cleared of all obstacles except for minor specified items and graded, intended to reduce the risk of damage to an aircraft running off the runway.

Traduction de courtoisie

There is an inconsistency between this definition and the definition of the runway strip.

Indeed, the runway strip has two objectives: reducing damages to aircrafts in case of running off the runway and protecting aircrafts flying over the runway strip. Being a part of the runway strip, the CGA should be submitted to the same objectives, which is not the case here because it does not take into account the protection of flying aircrafts.

response *Not accepted*

The CGA definition states that it is part of the runway strip and therefore falls under the overarching definition of runway strip.

comment 3157

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#78](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « clearway »

Référence: CS-ADR-DSN.A.002 « clearway »

'Clearway' means a defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height.

Traduction de courtoisie

We wonder who is the "appropriate authority" since it is not defined in the EASA rules.

Is it the competent authority or a third authority?

response *Noted*

This comment is not related to the CS and will be answered in CR/AR general comments.

comment 3158

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#79](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « frangible object »

Référence: CS-ADR-DSN.A.002 « frangible object »

'Frangible object' means an object of low mass designed to break, distort or yield on impact so as to present the minimum hazard to aircraft.

Traduction de courtoisie

"Frangible object": what kind of impact is it ?

We propose the following modification : "Frangible object means an object of low mass designed to break, distort or yield on impact **due to an aircraft** so as to present the minimum hazard to aircraft."

We suppose that this is only an impact caused by aircraft because frangible objects are put in places where it is necessary to reduce the risk of damages in the case of an aircraft runway or taxiway excursion.

By adding "due to aircraft" we are better in link with the definition of "frangibility".

response *Not accepted*

This is the wording from the ICAO definition.

comment

3159

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#80](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « non-instrument runway »

Référence: CS-ADR-DSN.A.002 « non-instrument runway»

'Non-instrument runway' means a runway intended for the operation of aircraft using visual approach procedures.

Traduction de courtoisie

It is proposed:

- either to take up the ICAO Approach classification task force terms;
- or to add "only": "Non-instrument runway means a runway intended only for the operation of aircraft using visual approach procedures".

If we keep the definitions as written, we will have runways considered as infrastructure which will be at the same time « instrument runways » and « non-instrument runways ».

Indeed, the majority of the « instrument runways » are also used for visual approaches.

Regarding to the terms « instrument runways » and « non-instrument runways », it is understand that there are exclusives categories. Now, it will not be the case with such definition even if they come from the ICAO

response *Noted*

This is the ICAO definition of non-instrument runway. EASA follows the relevant ICAO work in this area, which, however, has not been finalised.

comment	3160 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	<p>Attachment #81</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « runway end safety area »</p> <p>Référence: CS-ADR-DSN.A.002 « runway end safety area » 'Runway end safety area (RESA)' means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway.</p> <p>Traduction de courtoisie This definition does not take into account the works of ICAO. It should be taken into account the letter to the States n°41 that specifies the objectives of RESA as follows: "'Runway end safety area (RESA)' means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway, and also to allow an aeroplane overrunning to decelerate and an aeroplane undershooting to continue its approach or landing."</p> <p>The ICAO definition has the advantage to precise the function of RESA which is very important to carry out a safety study for ELOS or special conditions.</p>
response	<p><i>Noted</i></p> <p>This is the ICAO definition of RESA. EASA follows the relevant ICAO work in this area, which, however, has not been finalised.</p>

comment	3161 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	<p>Attachment #82</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.A.002 « runway strip »</p> <p>Référence: CS-ADR-DSN.A.002 « runway strip » "Runway strip means a defined area including the runway and stopway, if provided, intended: (a) to reduce the risk of damage to aircraft running off a runway; and (b) to protect aircraft flying over it during take-off or landing operations."</p> <p>Traduction de courtoisie This definition should be specified to avoid any misunderstanding by well separating the cleared and graded area (CGA) previously defined but whose objectives are incoherent with the runway strip ones. We propose to add a definition for the portion of the runway which is not graded and which could be: « Cleared runway strip means the part of the runway strip intended to protect aircraft flying over it during take-off or landing operations ».</p> <p>Indeed, the runway strip has two objectives: reducing damages to aircrafts in case of running off the runway and protecting aircrafts flying over the runway</p>

strip. Being a part of the runway strip, the CGA should be submitted to the same objectives, which is not the case here because it does not take into account the protection of flying aircrafts.
To not have two different parts of runway strip with identical objectives, it is appropriate to distinguish the graded portion from the non-graded portion of runway strip with different objectives.

response *Not accepted*

The CGA definition states that it is part of the runway strip and therefore falls under the overarching definition of runway strip.

CS-ADR – Book 1 – CS-ADR-DSN.A.005 – Aerodrome reference code

p. 10

comment 224

comment by: *CAA Austria - Ministry of Transport*

to c) and Table A1

We think, that point c) and Table A1 are a combination from ICAO and CAA UK CAp 168.

ICAO Table 1-1 describes the aerodrome reference field length, which is within the Austrian definition since 1972 : The length of the runway on sea level at standard atmosphere.

If now, code element one is the greater of TODA or ASDA which are not including corrective factors, we had a shift of aerodromes at code numbers.

Please clarify the switch from ICAO (reference field length to the CAA UK System with TODA und ASDA) !!!

response *Partially accepted*

Table A-1 will be amended to read 'Aeroplane reference field length'.

comment 839

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.005 — Aerodrome reference code (p10)

2. Justification and proposed text / comment

The element one of the code is based on the aeroplane reference field length, as also specified by the chapter 1 of ICAO – Annex 14. This change is important because the aeroplane reference field length, which is a characteristic of the most demanding plane coming on the aerodrome, doesn't necessarily correspond to the greater of TODA or ASDA, which is a characteristic of the infrastructure. Consequently, **the title of the second column of Table A-1 is erroneous.**

Moreover, the reference code is not only for the aerodrome, but can be used

for one specific part of the infrastructure. Consequently, **it would be more appropriate to use, as a title of this CS, "Reference Code" (as in ICAO Annex 14 Volume 1) than "aerodrome reference code"**.

It is consequently proposed to revise CS-ADR-DSN.A.005 as follows :

"CS-ADR-DSN.A.005 – Aerodrome Reference Code

[...]

CODE ELEMENT ONE			CODE ELEMENT TWO	
Code Number	The greater of TODA or ASDA Aeroplane reference field length	Code Letter	Wing Span	Outer Main Gear Wheel Span ^a
1	Less than 800 m	A	Up to but not including 15 m	Up to but not including 4.5 m
2	800 m up to but not including 1200 m	B	15 m up to but not including 24 m	4.5 m up to but not including 6 m
3	1200 m up to but not including 1800 m	C	24 m up to but not including 36 m	6 m up to but not including 9 m
4	1800 m and over	D	36 m up to but not including 52 m	9 m up to but not including 14 m
		E	52 m up to but not including 65 m	9 m up to but not including 14 m
		F	65 m up to but not including 80m	14 m up to but not including 16 m

^a Distance between the outside edges of the main gear wheels

Table A-1 Aerodrome reference code

response *Partially accepted*

Element 1 title will revert to ICAO wording 'aeroplane reference field length'.

comment 1009

comment by: Federal Office of Civil Aviation FOCA

Please change CODE ELEMENT ONE to: "Reference field length". Table A-1 uses for the CODE ELEMENT ONE the greater of TODA or ASDA instead of the reference field length (even though it is referred to the reference field length in (c) as well as in GM-ADR-DSN.A.005 (b)

response *Partially accepted*

Table A-1 will be amended to read 'Aeroplane reference field length'.

comment 1230 comment by: *ECA - European Cockpit Association*

Add paragraph before as new paragraph (a) (and renumber consequently):
 (a) The intent of the reference code is to provide a simple method for interrelating the numerous specifications concerning the characteristics of aerodromes so as to provide a series of aerodrome facilities that are suitable for the aeroplanes that are intended to operate at the aerodrome.

Justification:
 As per ICAO Aerodrome design manual part 1, paragraph 1.3.1.A brief introduction is helpful before jumping into definitions.

response *Noted*

comment 1266 comment by: *UK CAA*

Page No: 10

Paragraph No: CS.ADR.DSN.A.005 (c) (Table A-1)

Comment: The UK supports the use of the greater of TODA or ASDA when selecting the aerodrome reference code.

Justification: Current aircraft performance calculations for all aircraft except the early-post-war 'unclassified' types, use ASDR (accelerate-stop distance required) and TODR (take-off distance required) in a similar context to this. At maximum weight, either the most limiting of these is compared to its ASDA/TODA counterpart (for Class A & B aircraft) or, the TODR is reduced artificially to ASDA (for Class C aircraft). Coding runways using the longer of an aerodrome's ASDA/TODA will produce the more limiting OLS etc and thus offer the better protection.

response *Not accepted*

The consensus is to use ICAO wording 'Aeroplane reference field length' to cater for MS that have 'hot and high' aerodromes. ELOS is available if UK wish to retain the greater of TODA/ASDA as the reference code.

comment 1267 comment by: *UK CAA*

Page No: 10

Paragraph No: CS.ADR.DSN.A.005

Comment: The aerodrome reference code as published does not provide the necessary flexibility for those parts of an aerodrome which do not comply with the design aircraft.

Justification: Not all areas of the aerodrome correspond to the critical aircraft that determines the aerodrome reference code, and those areas also need to be categorised in a manner consistent with the aerodrome reference code. The text suggested below provides the additional flexibility.

Proposed Text: Add new text: CS.ADR.DSN.A.005 **“(e) It is recognised that not all areas of the aerodrome will need to correspond to the critical aircraft that determines the aerodrome reference code. Elements of the aerodrome infrastructure that do not meet the requirements of the aerodrome reference code for the design aircraft should be designated with an appropriate code letter for its dimensions. Limitations shall be identified in terms of aircraft size permitted or operating restrictions.”**

response *Noted*

This is an operational consideration, and any areas of an aerodrome that have design criteria not meeting the published code can be subject to limitations on use via a SC.

comment

1677

comment by: CAA CZ

Comment by CAA CZ
CS-ADR-DSN.A.005 – Aerodrome reference code
We propose to modify header of second column of the Table A -1 from „The greater of TODA or ASDA“ to original Annex wording „Aeroplane reference field length“

response *Partially accepted*

Table A-1 will be amended to read 'Aeroplane reference field length'.

comment

2035

comment by: HIA - Highlands and Islands Airports Limited

A005 (c) Inconsistency - Text refers to Aeroplane Reference Field Lengths but Table A-1 refers to TODA/ASDA. For consistency this should read TODA/ASDA for both, as the reference is to the physical characteristics of the aerodrome.

response *Partially accepted*

Table A-1 will be amended to read 'Aeroplane reference field length'.

comment	2062	comment by: AIRBUS								
	In Table A-1, the Code Number is based on "The greater of TODA and ASDA". However, in (c) above, the Code Number is based on the Reference field length. For consistency reasons, only one reference should be used.									
response	<i>Accepted</i>									
	The ICAO 'Aeroplane reference field length' will be reinstated in the table to replace 'greater of TODA/ASDA'.									
comment	2153	comment by: Airport Nuremberg - NUE/EDDN								
	This should be adapted according the ICAO Annex 14 to "aeroplane reference field length" instead of "the greater of TODA or ASDA" to internationally have the same wording and prevent misunderstandings and misinterpretation.									
response	<i>Partially accepted</i>									
	Table A-1 will be amended to read 'Aeroplane reference field length'.									
comment	2440	comment by: Airport St. Gallen-Altenrhein - ACH/LSZR								
	Change CODE ELEMENT ONE to: Reference field length									
response	<i>Partially accepted</i>									
	Table A-1 will be amended to read 'Aeroplane reference field length'.									
comment	2902	comment by: ADP : Aeroports de Paris								
	<table border="1"> <tr> <td>Référence: CS-ADR- DSN.A.005</td> <td>Aerodrome reference code</td> </tr> <tr> <td>Proposition/commentaire</td> <td>ADP propose d'ajouter le § suivant : "(e) Conformément à l'ADR.OR.C.010, une étude de compatibilité soumise à l'approbation des autorités compétentes peut permettre l'exploitation régulière d'avions avec un code supérieur à celui de l'aéroport."</td> </tr> <tr> <td>Justification</td> <td>Dans le cadre de l'application de la circulaire n°305 de l'OACI, des études de compatibilité déjà réalisées applicables sur plusieurs aéroports (AACG pour l'A380 et BACG pour leB747-800) permettent une telle exploitation.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>It is proposed to add the following § : " (e) In compliance with ADR.OR.C.010, a</td> </tr> </table>		Référence: CS-ADR- DSN.A.005	Aerodrome reference code	Proposition/commentaire	ADP propose d'ajouter le § suivant : "(e) Conformément à l'ADR.OR.C.010, une étude de compatibilité soumise à l'approbation des autorités compétentes peut permettre l'exploitation régulière d'avions avec un code supérieur à celui de l'aéroport."	Justification	Dans le cadre de l'application de la circulaire n°305 de l'OACI, des études de compatibilité déjà réalisées applicables sur plusieurs aéroports (AACG pour l'A380 et BACG pour leB747-800) permettent une telle exploitation.	Traduction de courtoisie	It is proposed to add the following § : " (e) In compliance with ADR.OR.C.010, a
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Traduction de courtoisie	It is proposed to add the following § : " (e) In compliance with ADR.OR.C.010, a									

	<p>compatibility study submitted to the approval by the competent authority, may permit the use of the aerodrome by aircraft with a higher code letter than the aerodrome reference code."</p> <p>In compliance with ICAO circular 305, compatibility studies already realised and applied on many aerodromes (AACG for the A380 and BACG for the B747-800) permit such operations.</p>
response	<p><i>Noted</i></p> <p><i>Note:</i> This is an operational consideration. <i>Accepted:</i> The initialisation will be deleted and replaced with the full title.</p>

CS-ADR — Book 1 — CS-ADR-DSN.B.015 — Number, siting and orientation of runways

p. 11

comment	<p>980 comment by: <i>Salzburger Flughafen GmbH</i></p> <p>CS-ADR-DSN.B.030</p> <p>Delete (d) and (f)</p> <p>(d) The runway threshold should be measured at the start of pavement is not correct as the pavement does normally start before the operational beginning of the runway</p> <p>(f) the width of the runway has nothing to do with the runway threshold, further it is not correct since not all runways are equipped with runway edge markings</p>
response	<p><i>Accepted</i></p>

comment	<p>1232 comment by: <i>ECA - European Cockpit Association</i></p> <p>Delete paragraph and replace with the following:</p>
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(a) The number and orientation of runways at an aerodrome should where possible be at least two runways giving four landing directions, except that, at aerodromes where there is high traffic density and prevailing cross wind conditions do not exceed a maximum speed of 13kts, then two parallel runways may be provided.

(b) The main instrument runway should be orientated to provide maximum safety consistent with maximum utilisation. This should be achieved by orientating the runway in the direction associated with the prevailing wind in conditions of low visibility and/or cloud base. Any secondary runways should be orientated so as to be fully usable when the main instrument runway becomes inoperative with the need to ensure maximum safety taken into account.

(c) The selection of data to be used for the calculation of the usability factor should be based on reliable wind distribution statistics that extend over as long a period as possible, preferably of not less than five years. The observations used should be made at least twelve times daily during the planned hours of operation and spaced at equal intervals of time. In addition, the data used should include usability affected by low visibility conditions, snow or ice, radio aid failures, approach light failures and disabled aircraft which close the runway or runways."

(d) Once the requirements stated in (a), (b) and (c) have been satisfied, the siting and orientation of a runway or runways at an aerodrome should, where possible, be such that the arrival and departure tracks minimize interference with areas approved for residential use and other noise-sensitive areas close to the aerodrome in order to avoid future noise problems.

Justification:

This recommendation is important, especially for newly built runways or airports.

Reference: IFALPA Annex 14, paragraphs 3.1.1; 3.1.2; 3.1.3; and 3.1.4.

response *Not accepted*

comment

1481

comment by: *Flughafen Linz-Hörsching - LNZ/LOWL*

CS-ADR-DSN.B.030

Delete (d) and (f)

(d) The runway threshold should be measured at the start of pavement is not correct as the pavement does normally start before the operational beginning of the runway

(f) The width of the runway has nothing to do with the runway threshold, further it is not correct since not all runways are equipped with runway edge markings

response *Accepted*

comment	2042	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Accept	
response	<i>Noted</i>	

comment	2710	comment by: <i>Flughafen Klagenfurt</i>
	CS-ADR-DSN.B.030	
	Delete (d) and (f)	
	(d) The runway threshold should be measured at the start of pavement is not correct as the pavement does normally start before the operational beginning of the runway	
	(f) The width of the runway has nothing to do with the runway threshold, further it is not correct since not all runways are equipped with runway edge markings	
response	<i>Accepted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.B.015 – Number, siting and orientation of runways

p. 11

comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>	
response	<i>Noted</i>	

comment	2996	comment by: <i>IFATCA</i>
	CS-ADR-DSN.B.020 – Choice of maximum permissible crosswind components <i>MOVE to GM</i>	
	<i>Determining maximum crosswind components can be crucial for the prevention of runway excursions. And it is against IFATCA Policy when environmental constraints have priority over safety (i.e. due to local constraints, noise preferential runways are operated although the acceptable crosswind component is higher than ICAO advices).IFATCA therefore proposes that the choice for maximum permissible crosswind components should be more restrictive.</i>	

response *Noted*

The reference to GM has been replaced by 'intentionally blank'.

CS-ADR — Book 1 — CS-ADR-DSN.B.015 — Number, siting and orientation of runways

p. 11

comment

2212 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response

Noted

CS-ADR — Book 1 — CS-ADR-DSN.B.015 — Number, siting and orientation of runways

p. 11

comment

61

comment by: *Flughafen Düsseldorf GmbH*

The TEST

competent authority shall establish a system [g1] to consistently evaluate that the alternative means of compliance used by itself or by aerodrome operators or providers of apron management services under its oversight provide for compliance with Regulation (EC) No 216/2008 and its Implementing Rules.

[g1]Konkretisierung, zumindest Rahmenbedingungen, wären wünschenswert.

TEST

response

Noted

comment

137

comment by: *CAA Norway*

We suggest to delete whole CS-ADR-DSN.B.030 (f) on page 11. Width is already in art CS-ADR-DSN.B.045 and in a proper place there.

response

Accepted

comment	138	comment by: CAA Norway
	We suggest to replace the wording "the painted band across the runway" in CS-ADR-DSN.B.030 (g) on page 11 by the correct ICAO wording " transverse stripe ".	
response	Accepted	
comment	277	comment by: Icelandic Civil Aviation Administration
	We suggest to delete whole CS-ADR-DSN.B.030 (f) on page 11. Width is already in art CS-ADR-DSN.B.045 and in a proper place there.	
response	Accepted	
comment	278	comment by: Icelandic Civil Aviation Administration
	We suggest to replace the wording "the painted band across the runway" in CS-ADR-DSN.B.030 (g) on page 11 by the correct ICAO wording "transverse stripe".	
response	Accepted	
comment	339	comment by: Vienna International Airport
	CS-ADR-DSN.B.030	
	Delete (d) and (f)	
	(d) The runway threshold should be measured at the start of pavement is not correct as the pavement does normally start before the operational beginning of the runway	
	(f) The width of the runway has nothing to do with the runway threshold, further it is not correct since not all runways are equipped with runway edge markings	
response	Accepted	
comment	351	comment by: Estonian CAA
	We suggest to delete CS-ADR-DSN.B.030 (d) on page 11. It is not correct that the runway threshold should be measured at the start of pavement. The pavement does normally start before the operational beginning of the runway.	

response *Accepted*

comment 352 comment by: *Estonian CAA*

We suggest to delete whole CS-ADR-DSN.B.030 (f) on page 11. Width is already in art CS-ADR-DSN.B.045 and in a proper place there.

response *Accepted*

comment 353 comment by: *Estonian CAA*

We suggest to replace the wording "the painted band across the runway" in CS-ADR-DSN.B.030 (g) on page 11 by the correct ICAO wording "transverse stripe".

response *Accepted*

comment 631 comment by: *Finnish Transport Safety Agency*

We suggest to delete CS-ADR-DSN.B.030 (d) on page 11. It is not correct that the runway threshold should be measured at the start of pavement. The pavement does normally start before the operational beginning of the runway.

response *Accepted*

comment 632 comment by: *Finnish Transport Safety Agency*

We suggest to delete whole CS-ADR-DSN.B.030 (f) on page 11. Width is already in art CS-ADR-DSN.B.045 and in a proper place there.

response *Accepted*

comment 633 comment by: *Finnish Transport Safety Agency*

We suggest to replace the wording "the painted band across the runway" in CS-ADR-DSN.B.030 (g) on page 11 by the correct ICAO wording "transverse stripe".

response *Accepted*

comment 765 comment by: *CAA Austria - Ministry of Transport*

CS-ADR-DSN.B.030

Delete (d) and (f)

(d) The runway threshold should be measured at the start of pavement is not correct as the pavement does normally start before the operational beginning of the runway

(f) The width of the runway has nothing to do with the runway threshold, further it is not correct since not all runways are equipped with runway edge markings

response *Accepted*

comment 1030 comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.030 — Runway threshold (p11)
- GM-ADR - Book 2 - GM-ADR-DSN.B.030 — Runway threshold (p208)

2. Justification and proposed text / comment

In CS-ADR-DSN.B.030 :

- paragraph (d): the start of pavement is not always defined with precision. Moreover, this is not coming from ICAO Annex 14 Volume 1. However, it is recognized that this paragraph is useful. Paragraphe (b) should consequently be deleted from the CS, and should be in GM.
- paragraph (f): This paragraph duplicates paragraph (c) of GM-ADR-DSN.B.045 — Width of runways, which deals with runway width and not runway threshold : This paragraph should be deleted from the CS.

Consequently, it is proposed to:

- **move paragraph (d) of CS-ADR-DSN.B.030 in GM.**
- **modify paragraph (f), as follows :**

"CS-ADR-DSN.B.030 – Runway threshold

[...]

(d) The runway threshold should be measured at the start of the pavement

[...]

(f) The width of the runway should be measured at the outside edge of the runway edge marking.

[...]"

"GM-ADR-DSN.B.030 – Runway threshold

[...]

(d) [...]

(3) The runway threshold should be measured at the start of the pavement.

[...]"

response	<i>Partially accepted</i>	
	Paragraphs (d) and (f) will be deleted.	
comment	1094	comment by: <i>Flughafen Graz Betriebs GmbH</i>
	CS-ADR-DSN.B.030	
	Delete (d) and (f)	
	(d) The runway threshold should be measured at the start of pavement is not correct as the pavement does normally start before the operational beginning of the runway	
	(f) The width of the runway has nothing to do with the runway threshold, further it is not correct since not all runways are equipped with runway edge markings	
response	<i>Accepted</i>	
comment	1144	comment by: <i>Swedish Transport Agency</i>
	We suggest to delete CS-ADR-DSN.B.030 (d) on page 11. It is not correct that the runway threshold should be measured at the start of pavement. The pavement does normally start before the operational beginning of the runway.	
response	<i>Accepted</i>	
comment	1145	comment by: <i>Swedish Transport Agency</i>
	We suggest to delete whole CS-ADR-DSN.B.030 (f) on page 11. Width is already in art CS-ADR-DSN.B.045 and in a proper place there.	
response	<i>Accepted</i>	
comment	1146	comment by: <i>Swedish Transport Agency</i>
	We suggest to replace the wording "the painted band across the runway" in CS-ADR-DSN.B.030 (g) on page 11 by the correct ICAO wording "transverse stripe".	
response	<i>Accepted</i>	

comment	<p>1156 comment by: <i>Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH</i></p> <p>CS-ADR-DSN.B.030</p> <p>Delete (d) and (f)</p> <p>(d) The runway threshold should be measured at the start of pavement is not correct as the pavement does normally start before the operational beginning of the runway</p> <p>(f) The width of the runway has nothing to do with the runway threshold, further it is not correct since not all runways are equipped with runway edge markings</p>
response	<p><i>Accepted</i></p>

comment	<p>1248 comment by: <i>CAA Norway</i></p> <p>We suggest to delete (d). It is not correct that the runway threshold should be measured at the start of pavement. The pavement does normally start before the operational beginning of the runway.</p>
response	<p><i>Accepted</i></p>

comment	<p>1268 comment by: <i>UK CAA</i></p> <p>Page No: 11</p> <p>Paragraph No: CS.ADR.DSN B.030 (f)</p> <p>Comment: This is repeated in B.045b (runway width).</p> <p>Justification: We suggest that it is deleted here as this paragraph refers to threshold not runway width.</p> <p>Proposed Text: Delete B.030 (f)</p>
response	<p><i>Accepted</i></p>

comment	<p>1269 comment by: <i>UK CAA</i></p> <p>Page No: 11</p> <p>Paragraph No: CS.ADR.DSN B.030 (g)</p> <p>Comment: The UK supports this location.</p>
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	Justification: The UK has confirmed this with ICAO and it will promote accuracy in surveys management and declared distances.
response	<i>Noted</i>
	Because of other changes to this CS, paragraph (g) is now paragraph (e), and 'painted band' has been replaced by 'transverse stripe'.
comment	2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>
response	<i>Noted</i>
comment	2438 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	ammend (d): The runway threshold should be measured at the start of pavement is not correct as the pavement does normally start before the operational beginning of the runway
response	<i>Accepted</i>
comment	2439 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	Delete (f): The width of the runway has nothing to do with the runway threshold, further it is not correct since not all runways are equipped with runway edge markings
response	<i>Accepted</i>
comment	2581 comment by: <i>Danish Transport Authority</i>
	EDITORIAL (f) We suggest to delete paragraph (f). The paragraph is described under "width of runways" CS-ADR-DSN.B.045.
response	<i>Accepted</i>
comment	2582 comment by: <i>Danish Transport Authority</i>
	EDITORIAL: (g) We suggest to revise the text in brackets to "the transverse

	stripe across the runway”.
response	<i>Accepted</i>

comment	2616 comment by: <i>Swedavia AB - Swedish airports (currently 11 airports)</i>
	We suggest to delete CS-ADR-DSN.B.030 (d) on page 11. It is not correct that the runway threshold should be measured at the start of pavement. The pavement does normally start before the operational beginning of the runway.
response	<i>Accepted</i>

comment	2941 comment by: <i>Isavia</i>
	We suggest deleting CS-ADR-DSN.B.030 (d) on page 11. It is not correct that the runway threshold should be measured at the start of pavement. The pavement does normally start before the operational beginning of the runway.
response	<i>Accepted</i>

CS-ADR — Book 1 — CS-ADR-DSN.B.015 — Number, siting and orientation of runways

p. 11

comment	876 comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> CS-ADR - Book 1 - CS-ADR-DSN.B.035 — Actual length of runway and declared distances (p11) <p><u>2. Justification and proposed text / comment</u></p> <p>Making such a reference to a Guidance Material in this Certification Specification is strongly confusing. Indeed, from a legal perspective, such a reference may make the content of the GM become binding, through the introduction of the CS in the certification Basis, which is absolutely not the intent of a guidance material.</p> <p>Consequently, DGAC proposes to delete paragraph (c) of this CS.</p> <p>"CS-ADR-DSN.B.035 - Actual length of runway and declared [...] (c) A detailed description of declared distances is set out in GM ADR-DSN.B.035."</p>

response

Accepted

Reference to GM will be deleted.

comment

1011

comment by: *Federal Office of Civil Aviation FOCA*

CS-ADR-DSN.B.030: Please delete (d) and (f). Para. d) is not correct as the pavement does normally start before the operational beginning of the runway. Para. (f) is not correct since not all runways are equipped with runway edge markings.

response

Accepted

comment

1271

comment by: *UK CAA***Page No:** 11**Paragraph No:** CS.ADR.DSN B.035

Comment: Requirements should indicate the points from which to calculate declared distances from runway intersections. Guidance is provided in UK CAP 168, Chapter 3, paragraph 13.5.

Justification: The UK has confirmed this with ICAO and it will promote accuracy on surveys management and declared distances.

Proposed Text: Take text and diagrams from UK CAP 168, Chapter 3, paragraph 13.5.

response

Noted

This is an operational consideration and will be addressed to by GM.OPS.

comment

2212 ❖

comment by: *HIA - Highlands and Islands Airports Limited**Noted*

response

Noted

comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR — Book 1 — CS-ADR-DSN.B.045 — Width of runways

p. 12

comment	241	comment by: <i>BAA Airside operations</i>
	Add a note "Aircraft may operate from narrower runways if certificated to do so"	
	If the aircraft type is so certificated there needs to be the flexibility to accommodate this situation, which is not currently reflected in the proposed wording.	
response	<i>Noted</i>	
	This is an operational consideration.	

comment	340	comment by: <i>Vienna International Airport</i>
	Delete (b)	
response	<i>Not accepted</i>	

comment	415	comment by: <i>SWISS AERODROMES ASSOCIATION</i>
	This is typically an ICAO recommendation. The cross reference table should have mentioned this.	
	Standardisation of runway width is not necessary.	
	This CS as all other CSs containing recommendations should be moved to GM.	
response	<i>Not accepted</i>	

comment	766	comment by: <i>CAA Austria - Ministry of Transport</i>
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	Delete (b)
response	<i>Not accepted</i>

comment	<p>840 comment by: <i>DGAC Direction Générale de l'aviation civile</i></p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN.B.045 — Width of runways - - Paragraph (b) - (p12) • GM-ADR - Book 2 - GM-ADR-DSN.B.045 — Width of runways - Paragraph (c) - (p212) <p><u>2. Proposed text / comment</u></p> <p>In this NPA, the expression "runway edge marking" is only used to detail how to measure a runway but is not defined. ICAO Annex 14 Volume 1 does not use nor define this expression. It seems here, the appropriate word would be "Runway side stripe marking" (as used in CS-ADR-DSN.L.550). Moreover, paragraph (b) of CS-ADR-DSN.B.045 and paragraph (c) of GM-ADR-DSN.B.045 duplicate the same provision, with the wording of GM-ADR-DSN.B.045 which is more adequate (ie with "where provided"), as such markings only exist on precision approach runways, or on a paved runway where there is a lack of contrast between the runway edges and the shoulders or the surrounding terrain (see CS-ADR-DSN.L.550). The content of this specification should be in GM (which is what the formal groups decided), with the writing proposed in the GM-ADR-DSN.B.045 and not the one added in CS-ADR-DSN.B.045. Consequently, it is proposed to modify CS-ADR-DSN.B.045 and GM-ADR-DSN.B.045 as follows:</p> <p>"CS-ADR-DSN.B.045 — Width of runways [...] (b) The width of the runway should be measured at the outside edge of the runway edge marking."</p>
response	<p><i>Partially accepted</i></p> <p>'Runway side stripe' will replace 'runway edge'. Paragraph (b) will be amended to read '...outside edge of the runway side stripe marking, where provided, or the edge of the runway'.</p>

comment	<p>859 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).</p> <p>The safe use of a specific width of a runway is an essential question of A/C operation and not of AD design. That's the reason why ICAO abstain from</p>
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setting a standard for rwy-width is not necessary. RWY-width is a usability-factor. In any case the AD-design does not limit or regulate the operation. So the responsibility for safety regarding the rwy-width is with the A/C-operation.

The essential factors for discussing the runway width is given in ICAO ADM (DOC 9157), which is correctly stated within GM.

We suggest to move letter (a) and (b) from CS to GM.

response *Not accepted*

comment 984 comment by: *Salzburger Flughafen GmbH*

(b) delete

response *Not accepted*

comment 1010 comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.B.045	Width of runways
Proposition/commentaire	Ce CS devrait mentionner la possibilité d'accepter les opérations avec des avions code F sur les pistes de 45m moyennant le respect des vérifications et études prescrites dans la circulaire 305 de l'OACI pour chaque type d'avion.
Justification	Le texte OACI est une recommandation, mais dont l'utilisation est sensible en raison des enjeux d'exploitation . L'utilisation de piste de 45m pour les avions de code F peut donc être considérée à condition de s'assurer par une étude appropriée de la compatibilité des aéronefs, comme précisé dans le cadre de la circulaire 305 de l'OACI (datant de 2004). Les dispositions ont été étudiées spécifiquement pour les avions A380 depuis une dizaine d'années et sont utilisées opérationnellement dans plusieurs pays.
Traduction de courtoisie	This CS should mention as additive note that according to ICAO circular n°305, it is possible to accept 45m wide runways for code F aircraft, with provision of adequate checking of compatibility studies for each type of aircraft. ICAO reference is only a recommendation,

	which requires full attention, and for this reason, 45m for cannot be introduced in the table .
response	<p><i>Noted</i></p> <p>This is an operational consideration.</p>
comment	<p>1012 comment by: <i>Federal Office of Civil Aviation FOCA</i></p> <p>Please delete (b) as it is already used in GM-ADR-DSN.B.045 (c) where it properly placed and where a better wording is used ([...] measured at the outside edge of the runway edge marking, where provided.).</p>
response	<p><i>Partially accepted</i></p> <p>'Runway side stripe' will replace 'runway edge'. Paragraph (b) will be amended to read '...outside edge of the runway side stripe marking, where provided, or the edge of the runway'. Paragraph (c) will be deleted from GM B.045.</p>
comment	<p>1096 comment by: <i>Flughafen Graz Betriebs GmbH</i></p> <p>Delete (b)</p>
response	<p><i>Not accepted</i></p>
comment	<p>1158 comment by: <i>Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH</i></p> <p>Delete (b)</p>
response	<p><i>Not accepted</i></p>
comment	<p>1233 comment by: <i>ECA - European Cockpit Association</i></p> <p>Table should be amended as follows: Under columns D and E, "45m" should be replaced by "60m".</p>

Justification:

The safety considerations associated with minimum runway width criteria have been given impetus since the introduction of such aircraft as the A-300/310 and B757/767. IFALPA has expressed its reservations about the inadequate certification of the VMCG performance of these types under conditions of crosswind. In addition, the powerful low-slung engines can ingest surface debris off the sides of the runway and thereby increase the likelihood of engine damage. Operational factors, such as 180° turns on the runway, add potential for runways to be closed due to excursions off the runway edge. This is of particular concern where only one major runway is provided.

Thus, the width of the runways intended to be used by aircraft of codes D and E should be not less than 60 metres. Accordingly, the tabulation presented in the table should be amended by deletion of "45m", where it appears under columns D and E, and substitution by "60m".

See also IFALPA Annex 14, para. 3.2.1 for associated policy related to the provision of runway shoulders.

See also IFALPA Airworthiness Technical Annex, III, Section 2, para. 2.1.2.1 for associated policy related to the determination of minimum runway width based on airworthiness considerations.

Reference: IFALPA Annex 14, paragraph 3.1.9

response *Not accepted*

These are operational considerations.

comment 1482

comment by: Flughafen Linz-Hörsching - LNZ/LOWL

delete (b)

response *Not accepted*

comment 1666

comment by: CAA CZ

Comment by Prague airport

CS-ADR-DSN.B.045 — Width of runways

Permit the operation of aircraft code letter F on a runway with the width of 45 meters, when the total width, including a paved strip, is 75 meters or more.

response *Noted*

This is an operational consideration.

comment 1742

comment by: Aéroports De Lyon

Le texte ne permet pas de flexibilité.

	<u>Proposition</u> : Ajouter la possibilité d'une piste de 45m avec 7,5m de chaque côté pour les codes 4F en accueil occasionnel
response	<i>Not accepted</i>
	The CS allows flexibility by using an SC.

comment	2051 comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Code letter table accepted.
	However add
	(c) - Aircraft may be permitted to operate from narrower runways, if they are certificated to do so.
response	<i>Noted</i>

comment	2437 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	Delete (b): Not all runways have runway edge markings. Already addressed in GM-ADR-DSN.B.045 (c). A better sentence would be([...] measured at the outside edge of the runway edge marking, where provided.)
response	<i>Accepted</i>
	CS wording will be amended to read '...edge marking, where provided'.

comment	2711 comment by: <i>Flughafen Klagenfurt</i>
	Delete (2)
response	<i>Not accepted</i>

comment	463 comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #83

UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.050

Référence: CS-ADR-DSN.B.050

Minimum distance between parallel non-instrument runways

Traduction de courtoisie

This CS should be a GM

It is only a recommendation of the ICAO. It is several decades old and does not take into account the new types of aircrafts.

response *Not accepted*

These distances are based on ICAO design parameters containing numerical specifications.

comment 694

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.B.050	Minimum distance between parallel non-instrument runways
Proposition/commentaire	Ce CS devrait être un GM.
Justification	Ce n'est qu'une recommandation de l'OACI. Elle date de plusieurs dizaines d'années et ne prend pas en compte les nouveaux types d'aéronefs.
Traduction de courtoisie	This CS should be a GM It is only a recommendation of the ICAO. It is several decades old and does not take into account the new types of aircrafts.

response *Not accepted*

These distances are based on ICAO design parameters containing numerical specifications.

comment 882

comment by: *IDRF e.V. (association of regional airports)*

This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).

Letter (a) will be repeated within GM, which should be sufficient. We suggest to delete letter (a) within CS.

response *Not accepted*

These distances are based on ICAO design parameters containing numerical specifications.

comment 1411 comment by: *Euroairport Bâle-Mulhouse*

Attachment [#84](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.050

Référence: CS-ADR-DSN.B.050
Minimum distance between parallel non-instrument runways

Traduction de courtoisie
This CS should be a GM
It is only a recommendation of the ICAO. It is several decades old and does not take into account the new types of aircrafts.

response *Not accepted*

These distances are based on ICAO design parameters containing numerical specifications.

comment 1529 comment by: *Aéroport de Marseille - MRS/LFML*

This CS should be a GM

It is only a recommendation of the ICAO. It is several decades old and does not take into account the new types of aircrafts.

response *Not accepted*

These distances are based on ICAO design parameters containing numerical specifications.

comment 1749 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#85](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.050

Référence: CS-ADR-DSN.B.050
Minimum distance between parallel non-instrument runways

Traduction de courtoisie

	<p>This CS should be a GM It is only a recommendation of the ICAO. It is several decades old and does not take into account the new types of aircrafts.</p>
response	<p><i>Not accepted</i></p> <p>These distances are based on ICAO design parameters containing numerical specifications.</p>

comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2642 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #86</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.050</p> <p>Référence: CS-ADR-DSN.B.050 Minimum distance between parallel non-instrument runways</p> <p>Traduction de courtoisie This CS should be a GM It is only a recommendation of the ICAO. It is several decades old and does not take into account the new types of aircrafts.</p>
response	<p><i>Not accepted</i></p> <p>These distances are based on ICAO design parameters containing numerical specifications.</p>

comment	<p>2825 comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i></p> <table border="1"> <tr> <td>Référence: CS-ADR-DSN.B.050</td> <td>Minimum distance between parallel non-instrument runways</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Ce CS devrait être un GM.</td> </tr> <tr> <td>Justification</td> <td>Ce n'est qu'une recommandation de l'OACI. Elle date de plusieurs dizaines d'années et ne prend pas en compte les nouveaux types d'aéronefs.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>This CS should be a GM</td> </tr> </table>	Référence: CS-ADR-DSN.B.050	Minimum distance between parallel non-instrument runways	Proposition/commentaire	Ce CS devrait être un GM.	Justification	Ce n'est qu'une recommandation de l'OACI. Elle date de plusieurs dizaines d'années et ne prend pas en compte les nouveaux types d'aéronefs.	Traduction de courtoisie	This CS should be a GM
Référence: CS-ADR-DSN.B.050	Minimum distance between parallel non-instrument runways								
Proposition/commentaire	Ce CS devrait être un GM.								
Justification	Ce n'est qu'une recommandation de l'OACI. Elle date de plusieurs dizaines d'années et ne prend pas en compte les nouveaux types d'aéronefs.								
Traduction de courtoisie	This CS should be a GM								

	It is only a recommendation of the ICAO. It is several decades old and does not take into account the new types of aircrafts.
response	<p><i>Not accepted</i></p> <p>These distances are based on ICAO design parameters containing numerical specifications.</p>

CS-ADR – Book 1 – CS-ADR-DSN.B.055 – Minimum distance between parallel instrument runways

p. 12-13

comment	<p>464 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #87</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.055</p> <p>Référence: CS-ADR-DSN.B.055 Minimum distance between parallel instrument runways</p> <p>Traduction de courtoisie This CS should be a GM. It is only a recommendation of the ICAO. It is several decades old and does not take into account the new types of aircrafts.</p>
response	<p><i>Not accepted</i></p> <p>These distances are based on ICAO design parameters containing numerical specifications.</p>

comment	<p>695 comment by: <i>ADP : Aeroports de Paris</i></p> <table border="1"> <tr> <td>Référence: CS-ADR-DSN.B.055</td> <td>Minimum distance between parallel instrument runways</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Ce CS devrait être un GM.</td> </tr> <tr> <td>Justification</td> <td>Ce n'est qu'une recommandation de l'OACI. Elle date de plusieurs dizaines d'années et ne</td> </tr> </table>	Référence: CS-ADR-DSN.B.055	Minimum distance between parallel instrument runways	Proposition/commentaire	Ce CS devrait être un GM.	Justification	Ce n'est qu'une recommandation de l'OACI. Elle date de plusieurs dizaines d'années et ne
Référence: CS-ADR-DSN.B.055	Minimum distance between parallel instrument runways						
Proposition/commentaire	Ce CS devrait être un GM.						
Justification	Ce n'est qu'une recommandation de l'OACI. Elle date de plusieurs dizaines d'années et ne						

	prend pas en compte les nouveaux types d'aéronefs.
Traduction de courtoisie	This CS should be a GM. It is only a recommendation of the ICAO. It is several decades old and does not take into account the new types of aircrafts.

response *Not accepted*

These distances are based on ICAO design parameters containing numerical specifications.

comment 1005 comment by: *IDRF e.V. (association of regional airports)*

This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).

The usual cross-reference within the CS "See GM-ADR-DSN..." may be used.

response *Not accepted*

These distances are based on ICAO design parameters containing numerical specifications.

comment 1412 comment by: *Euroairport Bâle-Mulhouse*

Attachment [#88](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.055

Référence: CS-ADR-DSN.B.055

Minimum distance between parallel instrument runways

Traduction de courtoisie

This CS should be a GM.

It is only a recommendation of the ICAO. It is several decades old and does not take into account the new types of aircrafts.

response *Not accepted*

These distances are based on ICAO design parameters containing numerical specifications.

comment 1530 comment by: *Aéroport de Marseille - MRS/LFML*

This CS should be a GM.

It is only a recommendation of the ICAO. It is several decades old and does not take into account the new types of aircrafts.

response *Not accepted*

These distances are based on ICAO design parameters containing numerical specifications.

comment 1842 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#89](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.055

Référence: CS-ADR-DSN.B.055

Minimum distance between parallel instrument runways

Traduction de courtoisie

This CS should be a GM.

It is only a recommendation of the ICAO. It is several decades old and does not take into account the new types of aircrafts.

response *Not accepted*

These distances are based on ICAO design parameters containing numerical specifications.

comment 2212 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2826 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.B.055

Minimum distance between parallel instrument runways

Proposition/commentaire	Ce CS devrait être un GM.
Justification	Ce n'est qu'une recommandation de l'OACI. Elle date de plusieurs dizaines d'années et ne prend pas en compte les nouveaux types d'aéronefs.
Traduction de courtoisie	This CS should be a GM. It is only a recommendation of the ICAO. It is several decades old and does not take into account the new types of aircrafts.

response *Not accepted*

These distances are based on ICAO design parameters containing numerical specifications.

comment	3146	comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
	Attachment #90	
	ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.055	
	Référence: CS-ADR-DSN.B.055 Minimum distance between parallel instrument runways	
	Traduction de courtoisie This CS should be a GM. It is only a recommendation of the ICAO. It is several decades old and does not take into account the new types of aircrafts.	
response	<i>Not accepted</i>	
	These distances are based on ICAO design parameters containing numerical specifications.	

comment	465	comment by: <i>Union des Aéroports français - UAF</i>
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Attachment [#91](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.060

Référence: CS-ADR-DSN.B.060
 Longitudinal slopes of runways

Traduction de courtoisie

We consider that the rules concerning the slopes fall into the scope of best practices and not certification rules. It is more appropriate to have these rules into GM.

The respect of these rules can interfere with the objective of drainage.

However, for precision approaches it is appropriate to write the following CS: "for precision approach runway category II and III, the longitudinal slope of runway should not exceed 0.8% on the first 900 meters in the landing way to comply with the requirements of ILS equipments of category II and III".

Besides, in order to take into account the constraints of the land, it is appropriate to add the following CS :

«Longitudinal slopes of runway should be in coherency with the runway transversal slope to allow a rapid drainage".

response *Not accepted*

The requirements are design criteria. Longitudinal slopes are not intended for drainage of water.

comment 696

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.B.060	Longitudinal slopes of runways
Proposition/commentaire	<p>Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc plus approprié de retrouver ces règles en GM.</p> <p>En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage de l'eau.</p> <p>Cependant pour des raisons liées à l'atterrissage de certains aéronefs pour des approches de précisions, il conviendrait de reprendre en CS la règle suivante : «pour les approches de précision de catégorie II et III, la pente longitudinale de piste ne devrait pas excéder 0,8% sur les 900 premiers mètres dans le sens de l'atterrissage pour répondre aux exigences d'utilisation des équipements ILS de catégorie II et III."</p> <p>Par ailleurs, pour tenir compte des contraintes liées au terrain et aux techniques de raccordement des voies de circulation à la piste, tout en respectant l'objectif de drainage, il est</p>

	souhaitable de rajouter le CS suivant: "les pentes longitudinales de la piste devraient être en cohérence avec les pentes transversales pour permettre un drainage rapide."
Justification	
Traduction de courtoisie	We consider that the rules concerning the slopes fall into the scope of best practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage. However, for precision approaches it is appropriate to write the following CS: "for precision approach runway category II and III, the longitudinal slope of runway should not exceed 0.8% on the first 900 meters in the landing way to comply with the requirements of ILS equipments of category II and III". Besides, in order to take into account the constraints of the land, it is appropriate to add the following CS : «Longitudinal slopes of runway should be in coherency with the runway transversal slope to allow a rapid drainage".

response *Not accepted*

The requirements are design criteria. Longitudinal slopes are not intended for drainage of water.

comment 843

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 – CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 – CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 – CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 – CS-ADR-DSN.B.100 —Slopes on runway turn pads (p16)
- CS-ADR - Book 1 – CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 – CS-ADR-DSN.B.180 — Longitudinal Slopes on

- runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
 - CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
 - CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.
(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention

of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid

contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

~~(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."~~

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the

runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. ”

GM-ADR-DSN.B.070 — Sight distance

~~“Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 — Transverse slopes

~~“(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage.”~~

GM-ADR-DSN.B.080 — Transverse slopes on runways

~~“The transverse slope may be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.~~

~~The transverse slope should may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage.”~~

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

~~“The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface.”~~

GM-ADR-DSN.B.100 — Slopes on runway turn pads

~~“The slopes are the same as those on the adjacent runway pavement surface.~~

~~Slopes should be are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft.”~~

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 — Slopes on runway shoulders

~~"The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

~~"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward~~

~~slope of 1.25 %, the lower limit of this plane being a horizontal line which:
(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

~~(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:
(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

~~Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"~~

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

~~(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.~~

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

~~(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~

~~(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %~~

~~(c) Where clearway is provided, the slope on the REASA should can be amended accordingly."~~

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

~~The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~" The longitudinal slope of a taxiway may not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B."~~

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

- ~~(1) 1.5 % where the code letter is C, D, E or F; and
(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 — Transverse slopes on taxiways

~~"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:~~

- ~~(1) 1.5 % where the code letter is C, D, E or F; and
(2) 2 % where the code letter is A or B.~~

~~(b) Slopes ~~should~~ ~~may~~ be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 — Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

- ~~(1) 2.5 % for strips where the code letter is C, D, E or F; and
(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 — Slopes on taxiway strips

~~"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:~~

- ~~(1) 2.5 % for strips where the code letter is C, D, E or F; and
(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

~~"(a) The design of slopes ~~should~~ ~~may~~ direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ ~~may~~ be taken to reduce the fire hazard resulting from fuel spillage.~~

~~(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant)~~

on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "

response *Noted*

Comments will be addressed to under their individual CS reference.

comment

1013

comment by: IDRF e.V. (association of regional airports)

This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).

The usual cross-reference within the CS "See GM-ADR-DSN..." may be used.

Longitudinal slopes on movement areas are typical A/C-(operator-) and A/C-operation-limited issues. A/C-operators and pilots are obliged to decide either to use or not to use or under which conditions to use an infrastructure. It is already within the interest of aerodrome-operators to provide infrastructures with an optimized usability. Therefore the limits are useful and will help the aerodrome to take care for ideal slopes. But if they cannot meet the herewith stated limitation, safety is the primary question of the A/C-operator and pilot rather than it is a question to be solved from the aerodrome.

response *Not accepted*

These distances are based on ICAO design parameters containing numerical specifications. Cross-references to GM have been deleted. The remaining comments are operational considerations.

comment

1414

comment by: Euroairport Bâle-Mulhouse

Attachment [#92](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.060

Référence: CS-ADR-DSN.B.060
Longitudinal slopes of runways

	<p>Traduction de courtoisie</p> <p>We consider that the rules concerning the slopes fall into the scope of best practices and not certification rules. It is more appropriate to have these rules into GM.</p> <p>The respect of these rules can interfere with the objective of drainage.</p> <p>However, for precision approaches it is appropriate to write the following CS: "for precision approach runway category II and III, the longitudinal slope of runway should not exceed 0.8% on the first 900 meters in the landing way to comply with the requirements of ILS equipments of category II and III".</p> <p>Besides, in order to take into account the constraints of the land, it is appropriate to add the following CS : «Longitudinal slopes of runway should be in coherency with the runway transversal slope to allow a rapid drainage".</p>
response	<p><i>Not accepted</i></p> <p>The requirements are design criteria. Longitudinal slopes are not intended for drainage of water.</p>
comment	<p>1531 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p>
	<p>We consider that the rules concerning the slopes fall into the scope of best practices and not certification rules. It is more appropriate to have these rules into GM.</p> <p>The respect of these rules can interfere with the objective of drainage.</p> <p>However, for precision approaches it is appropriate to write the following CS: "for precision approach runway category II and III, the longitudinal slope of runway should not exceed 0.8% on the first 900 meters in the landing way to comply with the requirements of ILS equipments of category II and III".</p> <p>Besides, in order to take into account the constraints of the land, it is appropriate to add the following CS : «Longitudinal slopes of runway should be in coherency with the runway transversal slope to allow a rapid drainage".</p>
response	<p><i>Not accepted</i></p> <p>The requirements are design criteria. Longitudinal slopes are not intended for drainage of water.</p>
comment	<p>1746 comment by: <i>Aéroports De Lyon</i></p>
	<p>Il s'agit d'une recommandation OACI, il est impossible de respecter ces limites. Elle peuvent même aller à l'encontre de l'objectif des pentes: le drainage de l'eau</p> <p>L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. I</p> <p><u>Proposition</u>: Préciser la donnée en GM + supprimer la contrainte de 0.8%</p>
response	<p><i>Not accepted</i></p>

The requirements are design criteria. Longitudinal slopes are not intended for drainage of water.

comment 1847 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#93](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.060

Référence: CS-ADR-DSN.B.060

Longitudinal slopes of runways

Traduction de courtoisie

We consider that the rules concerning the slopes fall into the scope of best practices and not certification rules. It is more appropriate to have these rules into GM.

The respect of these rules can interfere with the objective of drainage.

However, for precision approaches it is appropriate to write the following CS: "for precision approach runway category II and III, the longitudinal slope of runway should not exceed 0.8% on the first 900 meters in the landing way to comply with the requirements of ILS equipments of category II and III".

Besides, in order to take into account the constraints of the land, it is appropriate to add the following CS :

«Longitudinal slopes of runway should be in coherency with the runway transversal slope to allow a rapid drainage".

response *Not accepted*

The requirements are design criteria. Longitudinal slopes are not intended for drainage of water.

comment 2212 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2416 comment by: *SWISS AERODROMES ASSOCIATION*

Longitudinal slopes, as other physical characteristics, are published. Safe use of an aerodrome is in the responsibility of the aircraft operator. Aerodrome operators will have to meet BRs and ERs. There is therefore no reason to set requirements on longitudinal slope in a CS.

response *Not accepted*

The CS quantifies the ER with numerical values. The aerodrome *operator* is

responsible for the safe use of the aerodrome.

comment 2446 comment by: *Airport Nuremberg - NUE/EDDN*

This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!

If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.

response *Not accepted*

This is from ICAO Annex 14, which is widely used outside the European Union. The slope parameters are based on ICAO design criteria containing numerical specifications.

comment 2495 comment by: *AENA - Aeropuertos Españoles y Navegación Aérea*

This comment is critical.

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value.

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

(i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.

(ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed because less confusing and more clear, and

consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, the proposal on the specifications listed above is the following:

Longitudinal slopes on runways

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

response

Not accepted

The requirements are design criteria for maximum allowable slope gradients. Longitudinal slopes are not intended for drainage of water.

comment

2643

comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#94](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.060

Référence: CS-ADR-DSN.B.060

Longitudinal slopes of runways

Traduction de courtoisie

We consider that the rules concerning the slopes fall into the scope of best practices and not certification rules. It is more appropriate to have these rules into GM.

The respect of these rules can interfere with the objective of drainage. However, for precision approaches it is appropriate to write the following CS: "for precision approach runway category II and III, the longitudinal slope of runway should not exceed 0.8% on the first 900 meters in the landing way to comply with the requirements of ILS equipments of category II and III". Besides, in order to take into account the constraints of the land, it is appropriate to add the following CS : «Longitudinal slopes of runway should be in coherency with the runway transversal slope to allow a rapid drainage".

response *Not accepted*

The requirements are design criteria. Longitudinal slopes are not intended for drainage of water.

comment 2827

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.B.060	Longitudinal slopes of runways
Proposition/commentaire	<p>Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc plus approprié de retrouver ces règles en GM.</p> <p>En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage de l'eau.</p> <p>Cependant pour des raisons liées à l'atterrissage de certains avions pour des approches de précision, il conviendrait de reprendre en CS la règle suivante : «pour les approches de précision de catégorie II et III, la pente longitudinale de piste ne devrait pas excéder 0,8% sur les 900 premiers mètres dans le sens de l'atterrissage pour répondre aux exigences d'utilisation des équipements ILS de catégorie II et III."</p> <p>Par ailleurs, pour tenir compte des contraintes liées au terrain et aux techniques de raccordement des voies de circulation à la piste, tout en respectant l'objectif de drainage, il est souhaitable de rajouter le CS suivant: "les pentes longitudinales de la piste devraient être en cohérence avec les pentes transversales pour permettre un drainage rapide."</p>
Justification	
Traduction de courtoisie	<p>We consider that the rules concerning the slopes fall into the scope of best practices and not certification rules. It is more appropriate to have these rules into GM.</p> <p>The respect of these rules can interfere with the objective of drainage.</p>

	<p>However, for precision approaches it is appropriate to write the following CS: "for precision approach runway category II and III, the longitudinal slope of runway should not exceed 0.8% on the first 900 meters in the landing way to comply with the requirements of ILS equipments of category II and III". Besides, in order to take into account the constraints of the land, it is appropriate to add the following CS : «Longitudinal slopes of runway should be in coherency with the runway transversal slope to allow a rapid drainage".</p>
<p>response</p>	<p><i>Not accepted</i></p> <p>The requirements are design criteria. Longitudinal slopes are not intended for drainage of water.</p>

CS-ADR – Book 1 – CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

p. 13

<p>comment</p>	<p>466 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #95</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.065</p> <p>Référence: CS-ADR-DSN.B.065 Longitudinal slope changes on runways</p> <p>Traduction de courtoisie This CS should be a GM. We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p>
<p>response</p>	<p><i>Not accepted</i></p> <p>The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.</p>

comment 697

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.B.065	Longitudinal slope changes on runways
Proposition/commentaire	Ce CS devrait être du GM.
Justification	Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM. En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage de l'eau.
Traduction de courtoisie	This CS should be a GM. We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.

response *Not accepted*

The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.

comment 843 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)

- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in

some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the

surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 — Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 — Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

~~(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."~~

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 — Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the

pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. ”

GM-ADR-DSN.B.070 — Sight distance

“Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 — Transverse slopes

“(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.

(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage.”

GM-ADR-DSN.B.080 — Transverse slopes on runways

“The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope should may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage.”

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

“The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface.”

GM-ADR-DSN.B.100 — Slopes on runway turn pads

“The slopes are the same as those on the adjacent runway pavement surface.

Slopes should be are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft.”

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips**

"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:

- (1) 1.5 % where the code number is 4;*
- (2) 1.75 % where the code number is 3; and*
- (3) 2 % where the code number is 1 or 2.*

(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;*
- (2) 1.75 % where the code number is 3; and*
- (3) 2 % where the code number is 1 or 2."*

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.185 – Transverse Slopes on runway strips**

"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:

- (1) 2.5 % where the code number is 3 or 4; and*
- (2) 3 % where the code number is 1 or 2;*

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and*
- (2) 3 % where the code number is 1 or 2;*

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~
~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

~~(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~
~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

~~Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"~~

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

~~(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.~~

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

~~(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~

~~(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %~~

~~(c) Where clearway is provided, the slope on the REASA should ~~can~~ be amended accordingly."~~

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

~~The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways****CS-ADR-DSN.D.275 – Sight distance of taxiways**

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways****CS-ADR-DSN.D.280 – Transverse slopes on taxiways**

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the~~

accumulation of water on the surface of the taxiway, but should not exceed:
 (1) 1.5 % where the code letter is C, D, E or F; and
 (2) 2 % where the code letter is A or B."

GM-ADR-DSN.D.280 — Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:
 (1) 1.5 % where the code letter is C, D, E or F; and
 (2) 2 % where the code letter is A or B.
 (b) Slopes should may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 — Slopes on taxiway strips

"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:
 (1) 2.5 % for strips where the code letter is C, D, E or F; and
 (2) 3 % for strips of taxiways where the code letter is A or B;
 the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

GM-ADR-DSN.D.330 — Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:
 (1) 2.5 % for strips where the code letter is C, D, E or F; and
 (2) 3 % for strips of taxiways where the code letter is A or B;
 the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.
 (b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

"(a) The design of slopes should may direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures should may be taken to reduce the fire hazard resulting from fuel spillage.
 (b) Slopes on apron have the same purpose as other pavement slopes,

meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "

response *Noted*

Comments will be addressed to under their individual CS reference.

comment

1022

comment by: IDRF e.V. (association of regional airports)

This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).

We suggest to change CS and GM, because the essential safety issue by limiting the slope changes is to reduce dynamic loads, which is described within actual GM. The figures are at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden.

response *Not accepted*

comment

1415

comment by: Euroairport Bâle-Mulhouse

Attachment [#96](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.065

Référence: CS-ADR-DSN.B.065

Longitudinal slope changes on runways

Traduction de courtoisie

This CS should be a GM.

We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.

The respect of these rules can interfere with the objective of drainage.

response *Not accepted*

The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.

comment 1532 comment by: *Aéroport de Marseille - MRS/LFML*

This CS should be a GM.

We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.

The respect of these rules can interfere with the objective of drainage.

response *Not accepted*

The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.

comment 1850 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#97](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.065

Référence: CS-ADR-DSN.B.065

Longitudinal slope changes on runways

Traduction de courtoisie

This CS should be a GM.

We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.

The respect of these rules can interfere with the objective of drainage.

response *Not accepted*

The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.

comment 2212 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment	<p>2418 comment by: <i>SWISS AERODROMES ASSOCIATION</i></p> <p>Longitudinal slopes changes, as other physical characteristics, are published. Safe use of an aerodrome is in the responsibility of the aircraft operator. Aerodrome operators will have to meet BRs and ERs. There is therefore no reason to set requirements on longitudinal slope changes in a CS</p>
response	<p><i>Not accepted</i></p> <p>The CS quantifies the ER with numerical values. The aerodrome <i>operator</i> is responsible for the safe use of the aerodrome.</p>
comment	<p>2447 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p> <p>This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!</p> <p>If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.</p>
response	<p><i>Not accepted</i></p> <p>This is from ICAO Annex 14, which is widely used outside the European Union. These parameters are based on ICAO design criteria containing numerical specifications.</p>
comment	<p>2496 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p> <p>CS-ADR-DSN.B.065 – Longitudinal slope changes on runways</p> <p>"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:</p> <p>(1) 1.5 % where the code number is 3 or 4; and</p> <p>(2) 2 % where the code number is 1 or 2.</p> <p>(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:</p> <p>(1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;</p> <p>(2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and</p> <p>(3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.</p> <p>(c) Slope changes are so designed as to reduce dynamic loads on the</p>

undercarriage system of the aeroplane.”

response *Not accepted*

Proposed paragraph (c) is in GM B.065.

comment 2828

comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.B.065	Longitudinal slope changes on runways
Proposition/commentaire	Ce CS devrait être du GM.
Justification	Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM. En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage de l'eau.
Traduction de courtoisie	This CS should be a GM. We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.

response *Not accepted*

The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.

comment 3147

comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#98](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.065

Référence: CS-ADR-DSN.B.065
Longitudinal slope changes on runways

Traduction de courtoisie

This CS should be a GM.

We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.

The respect of these rules can interfere with the objective of drainage.

response *Not accepted*

The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.

CS-ADR – Book 1 – CS-ADR-DSN.B.070 – Sight distance for slopes on runways

p. 14

comment

467

comment by: *Union des Aéroports français - UAF*

Attachment [#99](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.070

Référence: CS-ADR-DSN.B.070
Sight distance for slopes on runways

Traduction de courtoisie

This CS should be a GM.

All the rules concerning the slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.

We must note that this provision takes arbitrary height which should correspond to the height of the pilot's eye but this height does not depend directly on the code letter of the aerodrome.

response

Not accepted

The requirements are design criteria.

comment

698

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.B.070

Sight distance for slopes on runways

Proposition/commentaire

Ce CS devrait être du GM.

Justification	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc approprié de retrouver ces règles en GM. Il est à remarquer que cette disposition prend de manière arbitraire des hauteurs qui devraient correspondre à la hauteur de l'œil du pilote or cette hauteur ne dépend pas directement du code lettre de l'aérodrome.
Traduction de courtoisie	This CS should be a GM. All the rules concerning the slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM. We must note that this provision takes arbitrary height which should correspond to the height of the pilot's eye but this height does not depend directly on the code letter of the aerodrome.

response *Not accepted*

The requirements are design criteria.

comment 843 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)

- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observed at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid

contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. ~~Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft.~~ For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, ~~are should be~~ designed so that they will correspond to the characteristics needed for such type of approach."

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action."

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the~~

~~runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

~~“(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage.”~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

~~“The transverse slope may be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.~~

~~The transverse slope should may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage.”~~

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

~~“The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface.”~~

GM-ADR-DSN.B.100 – Slopes on runway turn pads

~~“The slopes are the same as those on the adjacent runway pavement surface.~~

~~Slopes should be are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft.”~~

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

~~“The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %.”~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

~~“The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %.”~~

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips**

~~"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.185 – Transverse Slopes on runway strips**

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

- ~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
- ~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

~~[...]"~~

GM-ADR-DSN.B.195 Clearways

"[...]

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:
 (1) is perpendicular to the vertical plane containing the runway centre line; and
 (2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas****CS-ADR-DSN.C.230 - Slopes on runway end safety areas**

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

~~CS-GM-ADR-DSN.C.230~~ – Slopes on runway end safety areas

~~"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~

~~(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %~~

~~(c) Where clearway is provided, the slope on the REASA ~~should~~ can be amended accordingly."~~

*** Longitudinal slopes on taxiways****CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways**

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways****CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways**

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code~~

letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B."

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of

surface water (or possible fluid contaminant) but may not exceed:

- (1) 1.5 % where the code letter is C, D, E or F; and
- (2) 2 % where the code letter is A or B.

(b) Slopes ~~should~~ **may** be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

- ~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~
- ~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

- (1) 2.5 % for strips where the code letter is C, D, E or F; and
- (2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 – Slopes on aprons —and GM

"(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service

road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ *may* be kept as shallow as possible and ~~should~~ *may* be such that the operation of the aircraft and vehicles is not compromised. "

response *Noted*

Comments will be addressed to under their individual CS reference.

comment 1114 comment by: IDRF e.V. (association of regional airports)

equivalent to our comment concerning CS-ADR-DSN.B.065

response *Not accepted*

The requirements are ICAO design criteria.

comment 1234 comment by: ECA - European Cockpit Association

Amend paragraphs as follows:

(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

(1) Any point 3m **(10 ft)** above a runway to all other points 3m **(10 ft)** above the runway within a distance of ~~at least half the full length~~ of the runway where the Code letter is C, D, ~~E~~ or **E F**

(2) Any point ~~2 m~~ **1.5m (5 ft)** above a runway to all other points ~~2m 1.5m~~ **(5ft)** above the runway within a distance of ~~at least half the full length~~ of the runway where the Code letter is A or B.

~~(3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.~~

Justification:

Pilots must be assured that the full length of the runway is clear. One method of achieving this, at least under conditions of good visibility, is to establish runway sight distance criteria to provide a direct line-of-sight down the entire length of the runway unobstructed by undulations in the runway profile. The numerical values chosen are considered to be more representative of the pilots' eye-height for aeroplanes associated with the different runway categories.

Reference: IFALPA Annex 14, paragraph 3.1.17

response *Not accepted*

The requirements are ICAO design criteria.

comment 1418 comment by: Euroairport Bâle-Mulhouse

Attachment [#100](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.070

Référence: CS-ADR-DSN.B.070
Sight distance for slopes on runways

Traduction de courtoisie

This CS should be a GM.

All the rules concerning the slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.

We must note that this provision takes arbitrary height which should correspond to the height of the pilot's eye but this height does not depend directly on the code letter of the aerodrome.

response *Not accepted*

The requirements are design criteria.

comment 1533 comment by: Aéroport de Marseille - MRS/LFML

This CS should be a GM.

All the rules concerning the slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.

We must note that this provision takes arbitrary height which should correspond to the height of the pilot's eye but this height does not depend directly on the code letter of the aerodrome.

response *Not accepted*

The requirements are design criteria.

comment 1750 comment by: Aéroports De Lyon

L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc approprié de retrouver ces règles en GM.

Il est à remarquer que cette disposition prend de manière arbitraire des hauteurs qui devraient correspondre à la hauteur de l'œil du pilote or cette hauteur ne dépend pas directement du code lettre de l'aérodrome.

Proposition: Préciser la donnée en GM (Guidance)

response *Not accepted*

The requirements are design criteria.

comment 1855 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#101](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.070

Référence: CS-ADR-DSN.B.070
Sight distance for slopes on runways

Traduction de courtoisie

This CS should be a GM.

All the rules concerning the slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.

We must note that this provision takes arbitrary height which should correspond to the height of the pilot's eye but this height does not depend directly on the code letter of the aerodrome.

response *Not accepted*

The requirements are design criteria.

comment 2212 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2419 comment by: *SWISS AERODROMES ASSOCIATION*

Physical characteristics are published. Safe use of an aerodrome is in the responsibility of the aircraft operator. Aerodrome operators will have to meet BRs and ERs. There is therefore no reason to set requirements on slopes in a CS

response *Not accepted*

The CS quantifies the ER with numerical values. The aerodrome *operator* is responsible for the safe use of the aerodrome.

comment 2448 comment by: *Airport Nuremberg - NUE/EDDN*

This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By

transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!

If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.

response *Not accepted*

This is from ICAO Annex 14, which is widely used outside the European Union. The requirements are ICAO design criteria.

comment 2497 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

(1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;

(2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and

(3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action."

response *Not accepted*

Proposed paragraph (b) is in GM B.070.

comment 2644 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#102](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.070

Référence: CS-ADR-DSN.B.070

Sight distance for slopes on runways

Traduction de courtoisie

This CS should be a GM.

All the rules concerning the slopes fall into the scope of good practices and not

certification. It is more appropriate to have these rules into GM.
We must note that this provision takes arbitrary height which should correspond to the height of the pilot's eye but this height does not depend directly on the code letter of the aerodrome.

response *Not accepted*

The requirements are design criteria.

comment

2829

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.B.070	Sight distance for slopes on runways
Proposition/commentaire	Ce CS devrait être du GM.
Justification	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc approprié de retrouver ces règles en GM. Il est à remarquer que cette disposition prend de manière arbitraire des hauteurs qui devraient correspondre à la hauteur de l'œil du pilote or cette hauteur ne dépend pas directement du code lettre de l'aérodrome.
Traduction de courtoisie	This CS should be a GM. All the rules concerning the slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM. We must note that this provision takes arbitrary height which should correspond to the height of the pilot's eye but this height does not depend directly on the code letter of the aerodrome.

response *Not accepted*

The requirements are design criteria.

comment	18	comment by: <i>ACI EUROPE - Airports Council International</i>
	mention that it is restricted to runways	
response	<i>Accepted</i>	
	Text will be amended to include the applicability to runways only.	
comment	223	comment by: <i>CAA Austria - Ministry of Transport</i>
	ad "runway" to title	
response	<i>Accepted</i>	
	Text will be amended to include the applicability to runways only.	
comment	407	comment by: <i>Cologne/Bonn Airport</i>
	mention that it is restricted to runways and move to GM	
response	<i>Partially accepted</i>	
	Text will be amended to include the applicability to runways only. The CS contains numerical values and will be retained in Book 1.	
comment	468	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #103	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.075	
	Référéncé: CS-ADR-DSN.B.075 Distance between slope changes	
	Traduction de courtoisie	
	We propose to conserve into CS by modifying only the following part: "Undulations or appreciable changes in slopes located close together along a runway should be avoided to avoid damage to the aeroplane undercarriage due to confining dynamic load of the undercarriage system the aeroplane when it moves at high speed".	
	The rest of the provision has to be transferred into « guidance material » GM	
	We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.	
	The respect of these rules can interfere with the objective of drainage. Besides, the objective of this provision has to be clarified.	
	The respect of these rules can interfere with the objective of drainage.	

response *Not accepted*

The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.

comment 596

comment by: *Avinor*

CS.ADR.DSN.B.075. Mention that it is restricted to runways.

response *Accepted*

Text will be amended to include the applicability to runways only.

comment 699

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.B.075	Distance between slope changes
Proposition/commentaire	Nous proposons de conserver en CS en la modifiant uniquement la partie suivante: "Undulations or appreciable changes in slopes located close together along a runway should be avoided to avoid damage to the aeroplane undercarriage due to confining dynamic load of the undercarriage system the aeroplane when it moves at high speed". Le reste de la disposition est à déplacer en « guidance material » (GM).
Justification	Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM. En revanche l'objectif de cette disposition est à expliciter comme nous le proposons. En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage.
Traduction de courtoisie	We propose to conserve into CS by modifying only the following part: "Undulations or appreciable changes in slopes located close together along a runway should be avoided to avoid damage to the aeroplane undercarriage due to confining dynamic load of the undercarriage system the aeroplane when it moves at high speed". The rest of the provision has to be transferred into « guidance material » GM

	<p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p> <p>Besides, the objective of this provision has to be clarified. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.</p>
comment	<p>791 comment by: <i>Munich Airport International</i></p> <p>mention that it is restricted to runways and move to GM</p>
response	<p><i>Partially accepted</i></p> <p>Text will be amended to include the applicability to runways only. The CS contains numerical values and will be retained in Book 1.</p>
comment	<p>1115 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>equivalent to our comment concerning CS-ADR-DSN.B.065</p>
response	<p><i>Noted</i></p>
comment	<p>1381 comment by: <i>Geneva International Airport (ROMIG)</i></p> <p>Add the words "for runways" in the title This is specific to slope changes on RWYs</p>
response	<p><i>Accepted</i></p> <p>Text will be amended to include the applicability to runways only.</p>

comment	<p>1419</p> <p>comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #104</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.075</p> <p>Référence: CS-ADR-DSN.B.075 Distance between slope changes</p> <p>Traduction de courtoisie</p> <p>We propose to conserve into CS by modifying only the following part: “Undulations or appreciable changes in slopes located close together along a runway should be avoided to avoid damage to the aeroplane undercarriage due to confining dynamic load of the undercarriage system the aeroplane when it moves at high speed”.</p> <p>The rest of the provision has to be transferred into « guidance material » GM</p> <p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.</p> <p>The respect of these rules can interfere with the objective of drainage.</p> <p>Besides, the objective of this provision has to be clarified. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.</p>
comment	<p>1534</p> <p>comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>We propose to conserve into CS by modifying only the following part: “Undulations or appreciable changes in slopes located close together along a runway should be avoided to avoid damage to the aeroplane undercarriage due to confining dynamic load of the undercarriage system the aeroplane when it moves at high speed”.</p> <p>The rest of the provision has to be transferred into « guidance material » GM</p> <p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.</p> <p>The respect of these rules can interfere with the objective of drainage.</p> <p>Besides, the objective of this provision has to be clarified.</p> <p>The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.</p>

comment	<p>1856 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #105</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.075</p> <p>Référence: CS-ADR-DSN.B.075 Distance between slope changes</p> <p>Traduction de courtoisie We propose to conserve into CS by modifying only the following part: "Undulations or appreciable changes in slopes located close together along a runway should be avoided to avoid damage to the aeroplane undercarriage due to confining dynamic load of the undercarriage system the aeroplane when it moves at high speed". The rest of the provision has to be transferred into « guidance material » GM We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage. Besides, the objective of this provision has to be clarified. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.</p>
comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2420 comment by: <i>SWISS AERODROMES ASSOCIATION</i></p> <p>Physical characteristics are published. Safe use of an aerodrome is in the responsibility of the aircraft operator. Aerodrome operators will have to meet BRs and ERs. There is therefore no reason to set requirements on slopes in a CS</p>
response	<p><i>Noted</i></p> <p>The requirements are ICAO design criteria.</p>

comment	2449 comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	<p>This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!</p> <p>If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.</p>
response	<p><i>Not accepted</i></p> <p>This is from ICAO Annex 14 design criteria, which are widely used outside the European Union. The structure of future EASA requirements on aerodrome design allows a degree of possible flexibility.</p>

comment	2645 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
	<p>Attachment #106</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.075</p> <p>Référence: CS-ADR-DSN.B.075 Distance between slope changes</p> <p>Traduction de courtoisie We propose to conserve into CS by modifying only the following part: "Undulations or appreciable changes in slopes located close together along a runway should be avoided to avoid damage to the aeroplane undercarriage due to confining dynamic load of the undercarriage system the aeroplane when it moves at high speed". The rest of the provision has to be transferred into « guidance material » GM We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage. Besides, the objective of this provision has to be clarified. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.</p>

comment	2830 comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i>
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Référence: CS-ADR-DSN.B.075	Distance between slope changes
Proposition/commentaire	<p>Nous proposons de conserver en CS en la modifiant uniquement la partie suivante: "Undulations or appreciable changes in slopes located close together along a runway should be avoided to avoid damage to the aeroplane undercarriage due to confining dynamic load of the undercarriage system the aeroplane when it moves at high speed". Le reste de la disposition est à déplacer en « guidance material » (GM).</p>
Justification	<p>Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM. En revanche l'objectif de cette disposition est à expliciter comme nous le proposons. En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage.</p>
Traduction de courtoisie	<p>We propose to conserve into CS by modifying only the following part: "Undulations or appreciable changes in slopes located close together along a runway should be avoided to avoid damage to the aeroplane undercarriage due to confining dynamic load of the undercarriage system the aeroplane when it moves at high speed".</p> <p>The rest of the provision has to be transferred into « guidance material » GM</p> <p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p> <p>Besides, the objective of this provision has to be clarified. The respect of these rules can interfere with the objective of drainage.</p>

response *Not accepted*

The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.

comment 3012 comment by: *ADV -German Airports Association*

GM-ADR-DSN.B.140
Add definiton of inner and outer shoulder according to AACG

response *Noted*

Comment is not relevant for the CS.B.075 and will be addressed in GM B.140.

comment 3048 comment by: *MST / STR - Stuttgart Airport*

CS.ADR.DSN.B.075
mention that it is restricted to runways and move to GM

response *Partially accepted*

Text will be amended to include the applicability to runways only. The CS contains numerical values and will be retained in Book 1.

comment 3081 comment by: *Fraport AG*

CS-ADR-DSN.B.075 — Distance between slope changes

Editorial

Complete paragraph

Fraport
mention that it is restricted to runways

AG

response *Accepted*

The text has been amended to include the applicability to runways only.

comment	17	comment by: <i>ACI EUROPE - Airports Council International</i>			
	(a) (1) & (2) move to GM & mention that this is restricted to runways Justification: only objectives are important				
response	<i>Partially accepted</i>				
	Text will be amended to include the applicability to runways only. The CS contains numerical values and will be retained in Book 1.				
comment	222	comment by: <i>CAA Austria - Ministry of Transport</i>			
	add "runway" to title				
response	<i>Accepted</i>				
	Text will be amended to include the applicability to runways only.				
comment	263	comment by: <i>Belgian CAA</i>			
	The text was changed compared to ICAO Annex 14, but the motivation to do so wasn't indicated in the cross references.				
response	<i>Noted</i>				
	'substantially' has been reinstated to mirror ICAO.				
comment	408	comment by: <i>Cologne/Bonn Airport</i>			
	<table border="1"> <tr> <td>CS.ADR.DSN.B.080 (a) (1) (2)</td> <td>move to GM & mention that this is restricted to runways</td> <td>Only objectives are important</td> </tr> </table>		CS.ADR.DSN.B.080 (a) (1) (2)	move to GM & mention that this is restricted to runways	Only objectives are important
CS.ADR.DSN.B.080 (a) (1) (2)	move to GM & mention that this is restricted to runways	Only objectives are important			
response	<i>Partially accepted</i>				
	Text will be amended to include the applicability to runways only. The CS contains numerical values and will be retained in Book 1.				

comment	<p>469 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #107</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.080</p> <p>Référence: CS-ADR-DSN.B.080 Transverse slopes</p> <p>Traduction de courtoisie We propose to keep into CS the following parts : - (a) "To promote the most rapid drainage of water [...] rapid drainage." The rest of the provision has to be moved to « guidance material » GM. We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The CS contains numerical values and will be retained in Book 1.</p>

comment	<p>598 comment by: <i>Avinor</i></p> <p>CS.ADR.DSN.B.080 (a) (1) (2). Move to GM & mention that this is restricted to runways.</p>
response	<p><i>Partially accepted</i></p> <p>Text will be amended to include the applicability to runways only. The CS contains numerical values and will be retained in Book 1.</p>

comment	<p>700 comment by: <i>ADP : Aeroports de Paris</i></p> <table border="1" style="width: 100%;"> <tr> <td style="width: 30%;">Référence: CS-ADR-DSN.B.080</td> <td>Transverse slopes</td> </tr> <tr> <td>Proposition/commentaire</td> <td> <p><u>Nous proposons de conserver en CS les parties suivantes:</u></p> <p>- (a) "To promote the most rapid drainage of water [...] rapid drainage."</p> <p>Le reste de la disposition est à transférer en « guidance material » (GM).</p> </td> </tr> <tr> <td>Justification</td> <td>Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces</td> </tr> </table>	Référence: CS-ADR-DSN.B.080	Transverse slopes	Proposition/commentaire	<p><u>Nous proposons de conserver en CS les parties suivantes:</u></p> <p>- (a) "To promote the most rapid drainage of water [...] rapid drainage."</p> <p>Le reste de la disposition est à transférer en « guidance material » (GM).</p>	Justification	Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces
Référence: CS-ADR-DSN.B.080	Transverse slopes						
Proposition/commentaire	<p><u>Nous proposons de conserver en CS les parties suivantes:</u></p> <p>- (a) "To promote the most rapid drainage of water [...] rapid drainage."</p> <p>Le reste de la disposition est à transférer en « guidance material » (GM).</p>						
Justification	Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces						

	<p>règles en GM. En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage. En revanche, il est intéressant de garder en CS l'objectif de ces pentes.</p>
Traduction de courtoisie	<p>We propose to keep into CS the following parts :</p> <p>- (a) "To promote the most rapid drainage of water [...] rapid drainage."</p> <p>The rest of the provision has to be moved to « guidance material » GM.</p> <p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p>

response *Not accepted*

The CS contains numerical values and will be retained in Book 1.

comment 792

comment by: *Munich Airport International*

(a)

(1)(2): move to GM & mention that this is restricted to runways

Justification: Only objectives are important

response *Partially accepted*

Text will be amended to include the applicability to runways only. The CS contains numerical values and will be retained in Book 1.

comment 843 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway

- (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
 - CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
 - CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM

(p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways****CS-ADR-DSN.B.060 – Longitudinal slopes of runway**

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

(1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;

(2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and

(3) 2 % where the code number is 1 or 2.

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

(1) 1.5 % where the code number is 3 or 4; and

(2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

(1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;

(2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and

(3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be

sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface."~~

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"~~The slopes are the same as those on the adjacent runway pavement surface. Slopes should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."~~

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~A longitudinal slope along that portion of a strip to be graded may not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2."~~

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

"~~(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"~~(a) Transverse slopes on that portion of a strip to be graded may not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the~~

direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

~~(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA should ~~can~~ be amended accordingly."

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

(a) The longitudinal slope of a taxiway should not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and
(2) 3 % where the code letter is A or B.

The slopes on a taxiway are intended to prevent the accumulation of water (or

possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

"The longitudinal slope of a taxiway may not exceed:

- (1) 1.5 % where the code letter is C, D, E or F; and
- (2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes ~~should~~ may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and

(2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest~~

building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~“(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction.”~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

“(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~“(c) On an aircraft stand the maximum slope should not exceed 1 % in any direction.”~~

~~“(d) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. ”~~

response *Noted*

Comments will be addressed to under their individual CS reference.

comment *1116*

comment by: *IDRF e.V. (association of regional airports)*

This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).

The original ICAO-recommendation-text reads **The transverse slope should ideally be:** and indicate with the word "ideally" clearly, that the figures are at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden.

We suggest to move the figures to GM.

response *Not accepted*

The CS contains ICAO design criteria based on numerical values and will be retained in Book 1.

comment *1387*

comment by: *Geneva International Airport (ROMIG)*

Keep the first sentence of the paragraph and move to GM the second sentence as well as the articles (1) and (2). Add the words "for runways" in

	<p>the title The principle should be kept through the first sentence. This is specific to slopes on RWYs.</p>
response	<p><i>Partially accepted</i></p> <p>Text will be amended to include the applicability to runways only. The CS contains numerical values and will be retained in Book 1.</p>
comment	<p>1420 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #108</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.080</p> <p>Référence: CS-ADR-DSN.B.080 Transverse slopes</p> <p>Traduction de courtoisie We propose to keep into CS the following parts : - (a) "To promote the most rapid drainage of water [...] rapid drainage." The rest of the provision has to be moved to « guidance material » GM. We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The CS contains numerical values and will be retained in Book 1.</p>
comment	<p>1535 comment by: Aéroport de Marseille - MRS/LFML</p> <p>We propose to keep into CS the following parts : - (a) "To promote the most rapid drainage of water [...] rapid drainage." The rest of the provision has to be moved to « guidance material » GM. We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The CS contains numerical values and will be retained in Book 1.</p>

comment	1776	comment by: <i>Aéroports De Lyon</i>
	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Elle peuvent même aller à l'encontre de l'objectif des pentes: le drainage de l'eau.	
	<u>Proposition</u> : Préciser la donnée en GM	
response	<i>Not accepted</i>	
	The CS contains numerical values and will be retained in Book 1.	

comment	1857	comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	Attachment #109	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.080	
	Référence: CS-ADR-DSN.B.080 Transverse slopes	
	Traduction de courtoisie We propose to keep into CS the following parts : - (a) "To promote the most rapid drainage of water [...] rapid drainage." The rest of the provision has to be moved to « guidance material » GM. We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.	
response	<i>Not accepted</i>	
	The CS contains numerical values and will be retained in Book 1.	

comment	2058	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Rerword – 'The transverse slope should be substantially the same'	
response	<i>Accepted</i>	
	Text will be amended. This follows Annex 14 wording.	

comment	2421	comment by: <i>SWISS AERODROMES ASSOCIATION</i>
	Trasverse slopes, as other physical characteristics, are published. Safe use of an aerodrome is in the responsibility of the aircraft operator. Aerodrome operators will have to meet BRs and ERs. There is therefore no reason to set	

	<p>requirements on longitudinal slope in a CS. The wording of the ICAO recommendation contains the word "ideally" which moreover underlines that such a provision should not be more than GM.</p>
response	<p><i>Not accepted</i></p> <p>The CS contains ICAO design criteria based on numerical values and will be retained in Book 1.</p>
comment	<p>2436 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p>
	<p>Keep the first sentence. Move the second sentence as well as the articles (1) and (2) to GM. Change the title to "Transverse Slopes for runways".</p>
response	<p><i>Partially accepted</i></p>
	<p>Text will be amended to include the applicability to runways only. The CS contains numerical values and will be retained in Book 1.</p>
comment	<p>2450 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p>
	<p>This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!</p> <p>If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.</p>
response	<p><i>Not accepted</i></p>
	<p>This is from ICAO Annex 14, which is widely used outside the European Union. The CS contains numerical values and will be retained in Book 1.</p>
comment	<p>2498 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p>
	<p>CS-ADR-DSN.B.080 – Transverse slopes "(a)–To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be: (1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and</p>

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.
 (b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.
 (c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

response *Not accepted*

The CS contains numerical values and will be retained in Book 1.

comment 2646 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#110](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.080

Référence: CS-ADR-DSN.B.080
 ransverse slopes

Traduction de courtoisie

We propose to keep into CS the following parts :

- (a) "To promote the most rapid drainage of water [...] rapid drainage."

The rest of the provision has to be moved to « guidance material » GM.

We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.

The respect of these rules can interfere with the objective of drainage.

response *Not accepted*

The CS contains numerical values and will be retained in Book 1.

comment 2831 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.B.080

Transverse slopes

Proposition/commentaire

Nous proposons de conserver en CS les parties suivantes:

- (a) "To promote the most rapid drainage of water [...] rapid drainage."

Le reste de la disposition est à transférer en « guidance material » (GM).

Justification

Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles

	<p>de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM.</p> <p>En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage.</p> <p>En revanche, il est intéressant de garder en CS l'objectif de ces pentes.</p>
Traduction de courtoisie	<p>We propose to keep into CS the following parts :</p> <p>- (a) "To promote the most rapid drainage of water [...] rapid drainage."</p> <p>The rest of the provision has to be moved to « guidance material » GM.</p> <p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.</p> <p>The respect of these rules can interfere with the objective of drainage.</p>

response *Not accepted*

The CS contains numerical values and will be retained in Book 1.

comment **3014** comment by: *ADV -German Airports Association*

CS.ADR.DSN.B.080 (a) (1) (2)
move to GM & mention that this is restricted to runways

Justification
Only objectives are important

response *Partially accepted*

Text will be amended to include the applicability to runways only. The CS contains numerical values and will be retained in Book 1.

comment **3049** comment by: *MST / STR - Stuttgart Airport*

CS.ADR.DSN.B.080 (a) (1) (2)

	<p>move to GM & mention that this is restricted to runways</p> <p>Justification Only objectives are important</p>
response	<p><i>Partially accepted</i></p> <p>Text will be amended to include the applicability to runways only. The CS contains numerical values and will be retained in Book 1.</p>
comment	<p>3082 comment by: <i>Fraport AG</i></p> <p>CS-ADR-DSN.B.080 — Transverse slopes</p> <p>Editorial</p> <p>Complete paragraph</p> <p>Subparagraphs (a) (1) and (a) (2) should be moved to GM</p> <p>Fraport AG mention that it is restricted to runways only objectives are important for CS</p>
response	<p><i>Partially accepted</i></p> <p>Text will be amended to include the applicability to runways only. The CS contains numerical values and will be retained in Book 1.</p>

CS-ADR — Book 1 — CS-ADR-DSN.B.085 — Runway strength	p. 14
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comment	<p>470 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #111</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.085</p> <p>Référence: CS-ADR-DSN.B.085 Runway strength</p> <p>Traduction de courtoisie It is appropriate to delete: "Conditions for overload operations and ACN/PCN are in Book 2 — Guidance Material for Aerodrome Design". The reference to « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.</p>
response	<p><i>Accepted</i></p>

comment

701

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.B.085	Runway strength
Proposition/commentaire	Il convient de supprimer: " Conditions for overload operations and ACN/PCN are in Book 2—Guidance Material for Aerodrome Design ".
Justification	La référence aux Guidance Materials (GM) dans une spécification de certification donne une valeur réglementaire supérieure au GM visé, ce qui n'est pas souhaité.
Traduction de courtoisie	It is appropriate to delete: " Conditions for overload operations and ACN/PCN are in Book 2—Guidance Material for Aerodrome Design ". The reference to « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.

response

Accepted

comment

845

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.B.085 — Runway Strength (p14)

2. Justification and proposed text / comment

NPA 2011-20 uses "most demanding aeroplane" and not "critical aeroplane" (except in some GM, which have not been developed within the formal groups): it is proposed to **use "most demanding aeroplane"**

Moreover, it is not appropriate to refer to a GM in a CS (see comment on CS-ADR-DSN.B.035): having such a reference to a Guidance Material in this Certification Specification is strongly confusing. Indeed, **from a legal perspective**, such a reference may make the content of the GM become binding, through the introduction of the CS in the certification Basis, which is absolutely not the intent of a guidance material. Consequently, DGAC proposes **to delete the last sentence of this CS-ADR-DSN.B.085.**

Proposal:

"CS-ADR-DSN.B.085— Runway Strength

The runway should be of sufficient strength to support normal operations of the most ~~critical~~-demanding aeroplane without risk of damage either to the aeroplane or the runway. ~~Conditions for overload operations and ACN/PCN are in Book 2—Guidance Material for Aerodrome Design.~~"

response *Partially accepted*

'Critical' is the term used by ICAO. The reference to GM has been deleted.

comment 1136 comment by: *IDRF e.V. (association of regional airports)*

This new Non-ICAO-text is helpful to describe the purpose of this design-element and a good example for our requested CS-structure (see our general comment).

In this case the matters of engineering and figures are correctly moved to GM.

response *Noted*

comment 1273 comment by: *UK CAA*

Page No: 14

Paragraph No: CS-ADR-DSN.B.085

Comment: The prevention of damage to the runway is outside the scope of EASA.

Justification: Runway maintenance processes and procedures measure and mitigate any damage to the runway, which is unpreventable during normal operations.

Proposed Text: "The runway should be of sufficient strength to support normal operations of the most critical aeroplane without risk of damage to the aeroplane".

response *Partially accepted*

The proposed text is accepted with the addition of the words '...to the aeroplane or the runway'.

comment 1421 comment by: *Euroairport Bâle-Mulhouse*

Attachment [#112](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.085

Référence: CS-ADR-DSN.B.085
Runway strength

Traduction de courtoisie
It is appropriate to delete: "~~Conditions for overload operations and ACN/PCN~~"

are in Book 2—Guidance Material for Aerodrome Design".
The reference to « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.

response *Accepted*

comment 1536 comment by: *Aéroport de Marseille - MRS/LFML*

It is appropriate to delete: "~~Conditions for overload operations and ACN/PCN are in Book 2—Guidance Material for Aerodrome Design~~".

The reference to « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.

response *Accepted*

comment 1684 comment by: *Salzburger Flughafen GmbH*

response *Noted*

No comment has been made.

comment 1860 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#113](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.085

Référence: CS-ADR-DSN.B.085

Runway strength

Traduction de courtoisie

It is appropriate to delete: "~~Conditions for overload operations and ACN/PCN are in Book 2—Guidance Material for Aerodrome Design~~".

The reference to « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.

response *Accepted*

comment 2212 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2284 comment by: AIRBUS

The runway should be of sufficient strength to support ~~normal~~ **regular** operations of the most critical aeroplane without risk of damage either to the aeroplane or the runway. Conditions for overload operations and ACN/PCN are in Book 2 – Guidance Material for Aerodrome Design.

response *Noted*

The overload operations conditions have been moved to GM.

comment 2647 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#114](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.085

Référence: CS-ADR-DSN.B.085

Runway strength

Traduction de courtoisie

It is appropriate to delete: "~~Conditions for overload operations and ACN/PCN are in Book 2 – Guidance Material for Aerodrome Design~~".

The reference to « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.

response *Accepted*

comment 2832 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.B.085

Runway strength

Proposition/commentaire

Il convient de supprimer: "~~Conditions for overload operations and ACN/PCN are in Book 2 – Guidance Material for Aerodrome Design~~".

Justification

La référence aux Guidance Materials (GM) dans une spécification de certification donne une valeur réglementaire supérieure au GM visé, ce qui n'est pas souhaité.

Traduction de courtoisie

It is appropriate to delete: "~~Conditions for overload operations and ACN/PCN are in Book 2 – Guidance Material for Aerodrome Design~~".

	The reference to « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.
response	<i>Accepted</i>

CS-ADR – Book 1 – CS-ADR-DSN.B.090 – Surface of runways

p. 15

comment	<p>471 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #115</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.090</p> <p>Référence: CS-ADR-DSN.B.090 Surface of runways</p> <p>Traduction de courtoisie It is appropriate to move the (c) to GM. This provision is only a recommendation of the ICAO. It concerns only the conception and does not have to enter in the certification basis concerning runways in service. Such provision is particularly hard to respect and to monitor.</p>
response	<p><i>Not accepted</i></p> <p>This will remain in CS and the duplication will be deleted from GM.</p>

comment	<p>702 comment by: <i>ADP : Aeroports de Paris</i></p> <table border="1"> <tr> <td>Référence: CS-ADR-DSN.B.090</td> <td>Surface of runways</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de déplacer le (c) en GM.</td> </tr> <tr> <td>Justification</td> <td> <p>Cette disposition n'est qu'une recommandation de l'OACI. C'est une disposition qui ne concerne que la conception et n'a pas à entrer dans la base de certification qui concerne des pistes en service.</p> <p>Par ailleurs, une telle disposition est particulièrement difficile à respecter et à vérifier.</p> </td> </tr> </table>	Référence: CS-ADR-DSN.B.090	Surface of runways	Proposition/commentaire	Il convient de déplacer le (c) en GM.	Justification	<p>Cette disposition n'est qu'une recommandation de l'OACI. C'est une disposition qui ne concerne que la conception et n'a pas à entrer dans la base de certification qui concerne des pistes en service.</p> <p>Par ailleurs, une telle disposition est particulièrement difficile à respecter et à vérifier.</p>
Référence: CS-ADR-DSN.B.090	Surface of runways						
Proposition/commentaire	Il convient de déplacer le (c) en GM.						
Justification	<p>Cette disposition n'est qu'une recommandation de l'OACI. C'est une disposition qui ne concerne que la conception et n'a pas à entrer dans la base de certification qui concerne des pistes en service.</p> <p>Par ailleurs, une telle disposition est particulièrement difficile à respecter et à vérifier.</p>						

	La normalisation européenne EN 13036 définit par ailleurs une valeur de 0,6mm et des méthodes de mesures.
Traduction de courtoisie	<p>It is appropriate to move the (c) to GM.</p> <p>This provision is only a recommendation of the ICAO. It concerns only the conception and does not have to enter in the certification basis concerning runways in service. Such provision is particularly hard to respect and to monitor.</p> <p>A European standardisation EN13036 deals with that matter, but the level is based on a 0,6mm value.</p>

response *Not accepted*

This will remain in CS and the duplication will be deleted from GM.

comment 850 comment by: *SWISS AERODROMES ASSOCIATION*

There is no demonstrated need nor justification for exceeding ICAO

response *Not accepted*

The text and design criteria are taken from ICAO.

comment 1235 comment by: *ECA - European Cockpit Association*

Amend paragraph (b) as follows:

(b) The surface of a paved runway, **including any markings thereon**, should be so constructed as to provide **good** friction characteristics **approaching that of a dry runway** when the runway is wet

Add following paragraphs:

(e) (i) Except across the crown of a camber or across drainage channels, the finished surface of the wearing course is to be of such regularity that when tested with a 3m (10 ft) straight-edge placed anywhere in any direction on the surface there is no deviation greater than 3mm (1/8 in.) between the bottom of the straight-edge and the surface of the pavement anywhere along the straight-edge.

(e) (ii) Isolated irregularities of the order of 2½cm to 3 cm (1 in. to 1¼ in.) over a 45m (150 ft) distance are tolerable.
 (f) Care should be exercised when inserting runway lights or drainage grilles in runway surfaces to ensure that the tolerances given in (e) are not exceeded.

Justification:

Apart from the obvious direct effect on performance by physical retardation, there are other considerations resulting directly from runways not constructed according to the above requirements, which should be examined. These include the influence of inadvertent premature lift-off due to runway profile, the inability of the pilot to read the instrumentation accurately and the possible degradation in braking efficiency.

ECA is becoming increasingly concerned over current runway re-surfacing methods and regrets the absence of legislation covering the size and setting times of the ramps created between sections of the surface during these operations.

Reference: IFALPA Annex 14, paragraphs 3.1.22 and 3.1.23

response *Noted*

comment

1423

comment by: *Euroairport Bâle-Mulhouse*

Attachment [#116](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.090

Référence: CS-ADR-DSN.B.090Surface of runways

Traduction de courtoisie

It is appropriate to move the (c) to GM.

This provision is only a recommendation of the ICAO. It concerns only the conception and does not have to enter in the certification basis concerning runways in service.

Such provision is particularly hard to respect and to monitor.

response *Not accepted*

This will remain in CS and the duplication will be deleted from GM.

comment

1487

comment by: *Flughafen Linz-Hörsching - LNZ/LOWL*

Add:

if a runway has a high friction antiskid surface the average texture depth can be more than 1.0 mm

response *Not accepted*

The ICAO specification is for *not less* than 1.0 mm — allowing for more if desired.

comment 1505 comment by: *IDRF e.V. (association of regional airports)*

letter (a) and (b) are OK.

letter (c) and (d) of this DSN-element are based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).

The figures and the direction of grooves are at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden. It is more a typical engineering-matter to follow the intended purpose, than to use simplified figures, which are not based on scientific findings. There is no need to limit these items in a specific way. We suggest to move them into GM.

response *Not accepted*

These design criteria are from ICAO.

comment 1537 comment by: *Aéroport de Marseille - MRS/LFML*

It is appropriate to move the (c) to GM.

This provision is only a recommendation of the ICAO. It concerns only the conception and does not have to enter in the certification basis concerning runways in service.

Such provision is particularly hard to respect and to monitor

response *Not accepted*

This will remain in CS and the duplication will be deleted from GM.

comment 1748 comment by: *Aéroports De Lyon*

"The average surface texture depth of a new surface should be not less than 1.0 mm." Donnée difficilement mesurable et surtout non respectée à ce jour, il serait préférable de l'inscrire à titre indicatif

Proposition: Préciser la donnée en GM (Guidance)

response *Not accepted*

The CS contains numerical values and will be retained in Book 1 as design criteria.

comment	<p>1864 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #117</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.090</p> <p>Référence: CS-ADR-DSN.B.090 Surface of runways</p> <p>Traduction de courtoisie It is appropriate to move the (c) to GM. This provision is only a recommendation of the ICAO. It concerns only the conception and does not have to enter in the certification basis concerning runways in service. Such provision is particularly hard to respect and to monitor.</p>
response	<p><i>Not accepted</i></p> <p>This will remain in CS and the duplication will be deleted from GM.</p>

comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2321 comment by: <i>DGAC Direction Générale de l'aviation civile</i></p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS ADR DSN – Book 1 — CS-ADR-DSN.B.090 — Surface of runways (p15) <p><u>2. Justification and proposed text / comment</u></p> <p>* Paragraph (b): “<i>Good friction characteristics when the runway is wet</i>” is unclear. What is essential for safety is that the surface friction characteristic is greater than the minimum level required. Moreover, this is consistent with State Letter 11/41, to which the NPA should comply with.</p> <p>* Paragraph (c): the average surface texture depth necessary to ensure rapid drainage of runways depends on local conditions at the aerodrome (e.g.: climate, runway slopes). It is absolutely not necessary to demand a minimum average surface texture depth of 1.0 mm. Instead, the CS should detail the objective of macro-texture, as proposed below.</p> <p>* Paragraph (d): the wording is not clear at all. From a general point of view, an efficient drainage of water on infrastructures is done by lateral grooves, in the line of the deepest slope. The wording “<i>shortest drainage path</i>” is used in</p>
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now section of attachment A of Annex 14 volume 1, proposed in State Letter 11/41. DGAC proposes to use this wording to add clarity. Thus the proposed modifications:

CS-ADR-DSN.B.090 — Surface of runways

"(a) The surface of a runway should be constructed without irregularities that would result in loss in friction characteristics or otherwise adversely affect the take-off or landing of an aeroplane.

(b) The surface of a paved runway should be so constructed or resurfaced as to provide good surface friction characteristics at or above the minimum friction level set by the State when the runway is wet.

(c) The average surface texture depth of a new surface should be appropriate to provide rapid drainage, taking into account the runway and adjacent areas slopes, other drainage facilities, and aerodrome climatic and traffic conditions. Where practicable, it should be not less than 1.0 mm.

(d) If the surface is grooved or scored, the grooves or scorings should be either perpendicular to the runway centre line or ~~parallel to non-perpendicular transverse joints, where applicable~~ in the direction of the deepest slope in order to provide the shortest drainage path."

response Not accepted

This is ICAO text and design criteria.

comment

2339

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS ADR DSN - Book 1 — CS-ADR-DSN.B.090 — Surface of runways (p15)
- CS ADR DSN - Book 2 - GM-ADR-DSN.T.905 — Fire stations (p299)

2. Justification and proposed text / comment

It is appropriate to move these provisions to GM, except for the operational objective (i.e. achieving the response time) that shall remain in the CS.

Indeed, there are several possibilities to comply with the response time: it can be by the providing of fire stations, by the pre positioning of vehicles or by the construction of emergency roads.

The installation of several fire stations is thus only a possible solution to comply with the objective and thus it is essential to move it to GM.

CS-ADR-DSN.T.905 — Fire stations

"Fire stations, including satellite fire stations where necessary, should be so located on the aerodrome as to achieve the response time.

(a) ~~All rescue and fire-fighting vehicles should normally be housed in a fire station. Satellite fire stations should be provided whenever the response time cannot be achieved from a single fire station.~~

(b) ~~The fire station should be located so that the access for rescue and fire-fighting vehicles into the runway area is direct and clear, requiring a minimum number of turns.~~

(c) ~~The fire station, and any satellite fire stations, should be located outside taxiway and runway strips and not infringe obstacle limitation surfaces."~~

GM-ADR-DSN.T.905 — Fire stations

"(a) All rescue and fire-fighting vehicles should normally be housed in a fire station. Satellite fire stations should be provided whenever the response time cannot be achieved from a single fire station.

(b) The fire station should be located so that the access for rescue and fire-fighting vehicles into the runway area is direct and clear, requiring a minimum number of turns.

(c) The fire station, and any satellite fire stations, should be located outside taxiway and runway strips and not infringe obstacle limitation surfaces."

response *Not accepted*

The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature; so is not included in the CS.

comment

2451

comment by: *Airport Nuremberg - NUE/EDDN*

The wording in subpoint (d) should be adapted to: If **the** surface is grooved or scored [...]

response

Accepted

Typo to be corrected from 'he' to 'the'.

comment

2572

comment by: *AENA - Aeropuertos Españoles y Navegación Aérea*

* Paragraph (b): "Good friction characteristics when the runway is wet" is unclear. What is essential for safety is that the surface friction characteristic is greater than the minimum level required.

Moreover, this is consistent with State Letter 11/41, to which the NPA should comply with.

* Paragraph (c): the average surface texture depth necessary to ensure rapid drainage of runways depends on local conditions at the aerodrome (e.g.: climate, runway slopes). It is absolutely not necessary to demand a minimum average surface texture depth of 1.0 mm. Instead, the CS should detail the objective of macro-texture, as proposed below.

* Paragraph (d): the wording is not clear at all. From a general point of view, an efficient drainage of water on infrastructures is done by lateral grooves, in the line of the deepest slope. The wording "shortest drainage path" is used in now section of attachment A of Annex 14 volume 1, proposed in State Letter 11/41. DGAC proposes to use this wording to add clarity.

Thus the proposed modifications:

CS-ADR-DSN.B.090 — Surface of runways

"(a) The surface of a runway should be constructed without irregularities that would result in loss in friction characteristics or otherwise adversely affect the take-off or landing of an aeroplane.

(b) The surface of a paved runway should be so constructed or resurfaced as to provide good surface friction characteristics at or above the minimum friction level set by the State when the runway is wet.

(c) The average surface texture depth of a new surface should be appropriate to provide rapid drainage, taking into account the runway and adjacent areas slopes, other drainage facilities, and aerodrome climatic and traffic conditions. Where practicable, it should be not less than 1.0 mm.

(d) If the surface is grooved or scored, the grooves or scorings should be either perpendicular to the runway centre line or ~~parallel to non-perpendicular transverse joints, where applicable in the direction of the deepest slope in order to provide the shortest drainage path.~~

response Not accepted

The text and design criteria are taken from ICAO.

comment 2648 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#118](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.090

Référence: CS-ADR-DSN.B.090
Surface of runways

Traduction de courtoisie

It is appropriate to move the (c) to GM.

This provision is only a recommendation of the ICAO. It concerns only the conception and does not have to enter in the certification basis concerning runways in service.

Such provision is particularly hard to respect and to monitor.

response Not accepted

This will remain in CS and the duplication will be deleted from GM.

comment 2833 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.B.090

Surface of runways

Proposition/commentaire

Il convient de déplacer le (c) en GM.

Justification

Cette disposition n'est qu'une recommandation de l'OACI. C'est une disposition qui ne concerne que la conception et n'a pas à entrer dans la base de certification qui concerne des pistes en service.

Par ailleurs, une telle disposition est particulièrement difficile à respecter et à vérifier.

Traduction de courtoisie	<p>It is appropriate to move the (c) to GM.</p> <p>This provision is only a recommendation of the ICAO. It concerns only the conception and does not have to enter in the certification basis concerning runways in service.</p> <p>Such provision is particularly hard to respect and to monitor.</p>
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response *Not accepted*

This will remain in CS and the duplication will be deleted from GM.

CS-ADR – Book 1 – CS-ADR-DSN.B.095 – Runway turn pads

p. 15-16

comment 19 comment by: *ACI EUROPE - Airports Council International*

Figure B-1 should be in GM

response *Accepted*

Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.

comment 409 comment by: *Cologne/Bonn Airport*

Figure B-1 should be in GM

response *Accepted*

Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.

comment 590 comment by: *DGAC Direction Générale de l'aviation civile*

Attachments [#119](#) [#120](#)

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.B.095 – Runway Turn Pads (p15-16)
- CS-ADR - Book 1 – CS-ADR-DSN.L.565 – Runway Turn Pad Marking (p65)
- CS-ADR - Book 2 – GM-ADR-DSN.B.095 – Runway turn pads (p217)
- CS-ADR - Book 2 – GM-ADR-DSN.L.565 – Runway turn pad marking (p252)

2. Proposed text / comment

Providing a turn pad on a runway facilitates operations, but is not necessarily mandatory: it is proposed to revise paragraph (b) of CS-ADR-DSN.B.095 accordingly.

Moreover, it is proposed to include in this CS an “alternative turn pad”. Indeed:

- France has some provisions, detailed and different from Annex 14 Volume 1, which have been notified to ICAO, but are not included in NPA 2011-20 as an alternative design feature within the CS;
- Some alternative design features within a CS already exist in this NPA, which are not coming from Annex 14 volume 1 (ex: alternate aiming points in CS-ADR-DSN.L.540: (c) (2) page 58 and 59: EASA indicated it comes from UK).

Consequently, it is proposed to include the specifications of French turn pads in CS-ADR-DSN.B.095 (page 16), which are already included in the project for ICAO PANS Aerodromes agreed within the group (several States from all the world) and ICAO secretariat, written in cooperation with CAA UK, Germany, ACI, Boeing and Airbus.

It is proposed:

- to add a paragraph (h) in CS-ADR-DSN.B.095 to include this alternative shape for a turn pad,
- to move paragraph (a) and figure B-1 of CS-ADR-DSN.B.095 to GM,
- to add details on the alternative turn pad in GM (the content is taken from the draft PANS Aerodromes); and
- to add a paragraph on the marking of such turn pads.

Proposal for CS-ADR-DSN.B.095 – page 16 on Turn pads , and corresponding GM:

• **Add to CS-ADR-DSN.B.095:**

*At the beginning of (b): “*When provided*”, and

*Paragraph (h):

“(h) *An alternative turn pad than the one described above can be designed. In this case, the following criteria should be considered:*

the specific ground maneuvering capability of the considered aeroplane (notably the maximum effective steering angle of the nose landing gear);

the provision for adequate clearances

the provision for appropriate marking and lighting;

the provision of shoulders;

the protection from jet blast;

if relevant, the protection of ILS.”

• **Move paragraph (a) of CS-ADR-DSN.B.095 and Figure B-1 from CS-ADR-DSN.B.095 to guidance material GM-ADR-DSN.B.095, and add the following**

content in GM-ADR-DSN.B.095:

"(a) Turn pads are generally provided when an exit taxiway is not available at the runway end. A turn pad allows an aeroplane to turn back after landing and before take-off and to position itself correctly on the runway. (See Figure GM-B-1).

Note - In the event that a turn pad is either not available or does not allow an aeroplane to perform a turn-around, a tow vehicle may be used to maneuver the aeroplane via a series of short back and forth movements to bring the aeroplane into alignment with the runway centerline. If the shoulders of a turn pad are paved or are otherwise suitable to support the occasional pass of an aeroplane landing gear, a turn-around maneuver may be used. The maneuver guidance is generally provided by a marshaller.

(b) The ground maneuvering capabilities available from manufacturers (in aircraft characteristic for airport planning manuals) are one of the key factors to be considered in order to determine if an existing turn pad is suitable for a particular aeroplane. The speed of the maneuvering aeroplane is also a factor.

Note - Taxi cameras can assist the flight crew in preventing the wheels of the aeroplane from leaving the full-strength pavement during normal ground maneuvering. The taxi camera system or marshaller guidance should be required on an aeroplane dispatched to an aerodrome with turn pads having a width less than that the required one.

(c) In case an alternative turn pad is provided, it can have a different shape. For instance, the turn pad can be a half circle, as shown on Figure GM-B-2:

(see figure GM-B-2 given in the attached file, and the other attached file to show the whole comment including the figure GM-B-2)

Note: The following values are generally used:

$\gamma = 30$ degrees,

e being the same separation as for taxiways to objects, and

e' being a specific margin for the rotation, to take into account possible oversteering, and which can be chosen as follows:

	Code letter					
	A	B	C	D	E	F
e'	1.5m	2.25 m	5.7 m (a) or 8.8m (b)	8.8m	8.8m	8.8m

(a) if the turn pad is intended to be used by aeroplanes with a wheel base less than 18 m.

(b) if the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m.

In order to assist a pilot in knowing where the aeroplane should be positioned when the pilot initiates the turn around manoeuvre, some form of visual guidance can be provided. Alignment poles can be installed far enough away from the runway so that they are not obstructions, but within the range of vision of the pilot. Such poles can be set in a way that when the two poles align with one another, the pilot's position is essentially at the location where the turn around maneuver should be initiated. The poles can be painted a bright orange color to aid in their visibility and the two poles can be set on the order of 20 to 30 meters apart from one another, so that it is easy to detect when the two poles are in alignment with the pilot's eye. By careful setting of the two poles, any aeroplane up to the size of the most demanding (or critical)

aeroplane will be able to easily perform the manoeuvre without placing the nose gear of the aeroplane off of a pavement edge as the aeroplane carries out the manoeuvre."

· And add a paragraph on markings in CS-ADR-DSN-L.565 page 65:

"CS-ADR-DSN-L.565 – Runway turn pad marking

(a) *Applicability: Where a runway turn pad is provided, [...]*

(b) *Characteristics:*

(1) *The runway turn pad marking should be curved from the runway centre line into [...]*

~~(6) *The design of the turn pad marking should be such that, when the cockpit of the aeroplane remains over the runway turn pad marking, the clearance distance between any wheel of the aeroplane landing gear and the edge of the runway turn pad should be not less than those specified in the following tabulation:*~~

<i>Code letter</i>	<i>Clearance</i>
--------------------	------------------

<i>A</i>	<i>1.5 m</i>
----------	--------------

<i>B</i>	<i>2.25 m</i>
----------	---------------

<i>C</i>	<i>3 m if the turn pad is intended to be used by aeroplanes with a wheel base less than 18 m</i>
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	<i>4.5 m if the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m</i>
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<i>D</i>	<i>4.5 m</i>
----------	--------------

<i>E</i>	<i>4.5 m</i>
----------	--------------

<i>F</i>	<i>4.5 m</i>
----------	--------------

[...]

(c) Where alternative turn pads are provided, as specified in CS-ADR-DSN.B.095 paragraph (h), adequate marking should be provided, showing the trajectory the aeroplane should follow."

"GM-ADR-DSN.L.565 – Runway turn pad marking

In case of a turn pad with the alternative shape proposed in GM-ADR-DSN.B.095, the marking should follow the trajectory of the aircraft which was used to dimension the turn pad (see Figure GM-B-2 of GM-ADR-DSN.B.095)."

response *Noted*

The ICAO design criteria will be used in the CS. There is flexibility for alternate designs by ELOS or SC.

comment *600*

comment by: *Avinor*

CS.ADR.DSN.B.095 (g). Figure B-1 should be in the GM. Only objectives are important.

response *Partially accepted*

Figure B-1 will be moved to GM. The CS contains numerical values and will be retained in Book 1.

comment	793	comment by: <i>Munich Airport International</i>
	(g)	
	Figure B-1 should be in GM	
response	<i>Accepted</i>	
	Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.	

comment	1014	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	Please change para. (a) to: [...] a runway turn pad should normally be provided to facilitate a 180-degree turn of aeroplanes (see Figure B-1). (a) Not all runway need a turn pad at the end (even without a taxiway serving it) since some runways are for take-off only and in the rare event of an aborted take-off reaching the end of the runway a pushback or towing procedures can be established. On a wide runway most aeroplanes can perform a 180-degree turn without the need of a turn pad.	
	Para (b): Typo at the end of the sentence. Please change para - please change to: [...] to the most demanding aircraft.	
	Please delete para. (g) since it is not clear when severe weather conditions apply.	
response	<i>Noted</i>	
	<i>Note:</i> If a turn pad is not required, then it need not be provided. — This is an operational decision. <i>Agreed:</i> Colon will be replaced by a full stop.	

comment	1236	comment by: <i>ECA - European Cockpit Association</i>
	Add the following note under (c): Note 1:- Wheel base means the distance from the nose gear to the geometric centre of the main gear.	
	Justification: For clarification, as the definition is not in the Article 2 of the Cover Regulation (NPA 2011-20 (B.I))	
response	<i>Accepted</i>	

An explanation of 'wheelbase' will be added to the text.

comment 1237 comment by: ECA - European Cockpit Association

Delete paragraph (d) and replace with:
The runway turn pad may be located on either side of the runway and it should be located adjoining the end of the runway, thus allowing the maximum possible length of the runway to be used. Additional turn pads may be located along the runway to reduce taxiing time and distance for some aeroplanes.

Justification:
Self-explanatory.

response Noted

The CS contains the provision for left or right side turn pads. Additional turn pads are an operational decision for the aerodrome operator.

comment 1238 comment by: ECA - European Cockpit Association

Attachment [#121](#)

Delete (e) and replace with (include also picture attached):

(i) The downwind side of the turn pad should have a diagonal side parallel to the runway turn pad guidance line to ensure that sufficient clearance is provided for the main wheels. The angle that this diagonal side makes with the runway side (intersection angle, α) should be compatible with the radius of turn of the most critical aeroplane using the runway and should not exceed 30° .
(ii) The intersection point of the diagonal side with the runway should have fillets in order to achieve the required wheel clearance. Guidance on suitable dimensions is given in the ICAO Doc. 9157 Aerodrome Design Manual, Part 2 (Taxiways, Aprons and Holding Bays).
(iii) The radius of the fillet curve shall be sufficient to provide an area widening into the runway turn pad in order to facilitate early recognition of the turn-off into the runway turn pad.

Justification:
Self-explanatory - the proposed description is more detailed and therefore more appropriate.
Reference: IFALPA Annex 14, paragraphs 3.x.5, 3.x.7 & 3.x.8.

response Noted

Provided that the minimum CS clearance distances are maintained, the actual turn pad design is an operational consideration. ICAO Annex 14, Volume I, is the prime reference document for the NPA.

comment	<p>1239 comment by: <i>ECA - European Cockpit Association</i></p>
	<p>Attachment #122</p> <p>Add new paragraph (h) on runway turn pads width (including the picture attached): (h) The width of the runway turn pad (W), should be not less than that given by the following tabulation.</p> <p>Justification: Self-explanatory - ECA considers the margin to be too narrow. With the text proposal, we consider it to be more appropriate. Reference: IFALPA Annex 14, paragraph 3.x.4</p>
response	<p><i>Noted</i></p> <p>Provided that the minimum CS clearance distances are maintained, the actual turn pad design is an operational consideration. ICAO Annex 14, Volume I, is the prime reference document for the NPA.</p>
comment	<p>1240 comment by: <i>ECA - European Cockpit Association</i></p>
	<p>Attachment #123</p> <p>Add the following note and attached graphic under new point (h) on runway turn pads width: Note:- The turn pad dimensions are given for a runway width of 45 m for both Code E and Code F to cater for the exceptional circumstances whereby limited operation of the respective Code letter aircraft is envisaged such as at alternate aerodromes.</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 3.x.4</p>
response	<p><i>Noted</i></p> <p>Provided that the minimum CS clearance distances are maintained, the actual turn pad design is an operational consideration. ICAO Annex 14, Volume I, is the prime reference document for the NPA.</p>
comment	<p>1246 comment by: <i>ECA - European Cockpit Association</i></p>
	<p>Attachment #124</p> <p>Include the following text and figure under new point (i) on Runway turn pads length: The length of the runway turn pad should be divided into two components, the straight or rectangular portion (a) and the diagonal or triangular portion (b), as</p>

	<p>illustrated by figure in CS-ADR-DSN.B.095(h). The length of the straight or rectangular portion (a) should not be less than the values given in the attached tabulation:</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 3.x.6</p>
response	<p><i>Noted</i></p> <p>Provided that the minimum CS clearance distances are maintained, the actual turn pad design is an operational consideration. ICAO Annex 14, Volume I, is the prime reference document for the NPA.</p>
comment	<p>1247 comment by: <i>SWISS AERODROMES ASSOCIATION</i></p> <p>This CS is an example of combined standard and recommendation material. We approve the "should" mentioned in letter a) and c) to allow deviation. Turn pads, as other physical characteristics, are published. Safe use of an aerodrome is in the responsibility of the aircraft operator. Aerodrome operators will have to meet BRs and ERs. There is therefore no reason to set requirements on turn pads in a CS</p>
response	<p><i>Noted</i></p> <p>Provided that the minimum CS clearance distances are maintained, the actual turn pad design is an operational consideration. ICAO Annex 14, Volume I, is the prime reference document for the NPA.</p>
comment	<p>1254 comment by: <i>ECA - European Cockpit Association</i></p> <p>Attachment #125</p> <p>Add the following text and attached table under new point (i) on runway turn pads length: The diagonal or triangular portion (b) should not be less than the values as given in the following tabulation:</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 3.x.6</p>
response	<p><i>Noted</i></p> <p>Provided that the minimum CS clearance distances are maintained, the actual turn pad design is an operational consideration. ICAO Annex 14, Volume I, is the prime reference document for the NPA aerodrome design criteria.</p>

comment	1277	comment by: UK CAA
	<p>Page No: 15</p> <p>Paragraph No: CS-ADR-DSN.B.095</p> <p>Comment: The statements in paragraph (b) and (c) should be merged to reflect the ICAO text.</p> <p>Justification: ICAO text is clear and simple to understand; reference to the most demanding aircraft has already been made using "...the aeroplane for which the turn pad is intended...".</p> <p>Proposed Text: "The design of a runway turn pad shall be such that, when the cockpit of the aeroplane for which the turn pad is intended remains over the turn pad marking, the clearance distance between any wheel of the aeroplane landing gear and the edge of the turn pad shall be not less than that given by the following tabulation:"</p> <p>And DELETE (c)</p>	
response	Accepted	

comment	1407	comment by: Geneva International Airport (ROMIG)
	Figure B-1 should be in GM	
response	Accepted	
	Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.	

comment	1425	comment by: Euroairport Bâle-Mulhouse
	Attachment #126	
	Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.095	
	Référence: CS-ADR-DSN.B.095 Runway turn pads	
	Traduction de courtoisie It is appropriate to transfer the figure B-1: "Typical turn pad layout » in « guidance material » (GM). It is only one example. Other shapes may be used as it is in France.	
response	Accepted	
	Figure B-1 will be moved to GM. The CS text relating to turn pads will be	

retained.

comment 1513 comment by: *IDRF e.V. (association of regional airports)*

In principle the CSs under section 1 for RWY turn pads are written in an adequate and constructive way. It is acceptable to keep the ICAO-recommendations within the CSs, except ...B.095 (e)-(g). These 3 DSN-sub-elements are based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III). They are at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden. It is a typical engineering-matter to follow the intended purpose, there is no need to limit these items in a specific way.

Letter (C) is only acceptable as they are ICAO-standards. Unfortunately the figures are indiscriminately and not based on scientific findings. We expect that it is possible to find risk based figures based on relating studies. We hope EASA in able to initiate such studies for Europe.

response *Noted*

Provided that the minimum CS clearance distances are maintained, the actual turn pad design is an operational consideration. ICAO Annex 14, Volume I, is the prime reference document for the NPA aerodrome design criteria.

comment 1538 comment by: *Aéroport de Marseille - MRS/LFML*

It is appropriate to transfer the figure B-1: "Typical turn pad layout » in « guidance material » (GM).

It is only one example. Other shapes may be used as it is in France.

response *Accepted*

Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.

comment 1867 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#127](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.095

Référence: CS-ADR-DSN.B.095
unway turn pads

Traduction de courtoisie

It is appropriate to transfer the figure B-1: "Typical turn pad layout » in « guidance material » (GM).

response	<p>It is only one example. Other shapes may be used as it is in France.</p> <p><i>Accepted</i></p> <p>Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.</p>
comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2433 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>delete (g): Since it is not clear when severe weather conditions apply, the article should be deleted</p>
response	<p><i>Not accepted</i></p> <p>This is based on ICAO text and will be retained in the CS.</p>
comment	<p>2434 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>amend article (a) to: [...] a runway turn pad should normally be provided to facilitate a 180-degree turn of aeroplanes (see Figure B-1). Not all RWY ends need a runway turn pad.</p>
response	<p><i>Noted</i></p> <p>If a turn pad is not needed, then it need not be provided.</p>
comment	<p>2435 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>move fig B1 to GM</p>
response	<p><i>Partially accepted</i></p> <p>Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.</p>
comment	<p>2649 comment by: <i>ECA - European Cockpit Association</i></p>

	<p>Delete (g) and replace with the following: On pavements at locations affected by rain, snow or slush, the slippery conditions would reduce wheel traction and therefore require a greater wheel-to-pavement edge clearance in consideration of aircraft controllability. In such situations the wheel-to pavement edge clearance should be 7 m (23 ft) for Code E and F aircrafts.</p> <p>Justification: The proposed text is more detailed and stringent and therefore more appropriate. Reference: IFALPA Annex 14, paragraph 3.x.3, note 2.</p>
response	<p><i>Noted</i></p> <p>Provided that the minimum CS clearance distances are maintained, the actual turn pad design is an operational consideration. ICAO Annex 14, Volume I, is the prime reference document for the NPA.</p>
comment	<p>2650 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #128</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.095</p> <p>Référence: CS-ADR-DSN.B.095 Runway turn pads</p> <p>Traduction de courtoisie It is appropriate to transfer the figure B-1: "Typical turn pad layout » in « guidance material » (GM). It is only one example. Other shapes may be used as it is in France.</p>
response	<p><i>Accepted</i></p> <p>Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.</p>
comment	<p>2790 comment by: <i>Swedavia AB - Swedish airports (currently 11 airports)</i></p> <p>CS.ADR.DSN.B.095 (g). Figure B-1 should be in GM. Only objectives are important.</p>
response	<p><i>Accepted</i></p> <p>Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.</p>

comment

2834

comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.B.095	Runway turn pads
Proposition/commentaire	Il convient de transférer la figure B-1 « Typical turn pad layout » en « guidance material » (GM).
Justification	La figure B-1 ne représente qu'un exemple. D'autres formes peuvent être utilisées comme c'est le cas en France.
Traduction de courtoisie	It is appropriate to transfer the figure B-1: "Typical turn pad layout » in « guidance material » (GM). It is only one example. Other shapes may be used as it is in France.

response

Accepted

Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.

comment

3050

comment by: *MST / STR - Stuttgart Airport*

CS.ADR.DSN.B.095 (g)
Figure B-1 should be in GM

response

Accepted

Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.

comment

3083

comment by: *Fraport AG*

CS-ADR-DSN.B.095 — Runway turn pads (g) Figure B-1

Editorial

Figure B-1

Figure B-1 move to GM

Fraport

AG

response	only objectives are important for CS
	<i>Accepted</i>
	Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.

CS-ADR – Book 1 – Figure B-1 Typical turn pad layout

p. 16

comment	472	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #129	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.095	
	Référence: CS-ADR-DSN.B.095 Runway turn pads	
	Traduction de courtoisie It is appropriate to transfer the figure B-1: "Typical turn pad layout » in « guidance material » (GM). It is only one example. Other shapes may be used as it is in France.	
response	<i>Accepted</i>	
	Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.	

comment	703	comment by: <i>ADP : Aeroports de Paris</i>
	Référence: CS-ADR-DSN.B.095	Runway turn pads
	Proposition/commentaire	Il convient de transférer la figure B-1 « Typical turn pad layout » en « guidance material » (GM).
	Justification	La figure B-1 ne représente qu'un exemple. D'autres formes peuvent être utilisées comme c'est le cas en France.
	Traduction de courtoisie	It is appropriate to transfer the figure B-1: "Typical turn pad layout » in « guidance material » (GM). It is only one example. Other shapes may be used as it is in France.

response *Accepted*

Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.

comment *1514* comment by: *IDRF e.V. (association of regional airports)*

As it is a "typical" Layout it should be moved to GM. The figure is only for orientation and could be verified in a lot of ways. To set it into a CS tends to result in unnecessary burden.

response *Accepted*

Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.

comment *2212* ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment *3015* comment by: *ADV -German Airports Association*

CS.ADR.DSN.B.095 (g)
Figure B-1 should be in GM

response *Accepted*

Figure B-1 will be moved to GM. The CS text relating to turn pads will be retained.

comment *419* comment by: *SWISS AERODROMES ASSOCIATION*

This is another example of a recommendation which, all the more since it contains no figures, must be moved to GM

response *Not accepted*

The text is based on ICA and will be retained in the CS.

comment 843 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)

- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve

the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS). Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and
- (3) 2 % where the code number is 1 or 2.

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways

"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 — Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

(1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;

(2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and

(3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 — Sight distance

"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 — Transverse slopes

"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.

(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

GM-ADR-DSN.B.080 — Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface.~~"

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface. Slopes ~~should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %.~~"

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"(a) ~~A longitudinal slope along that portion of a strip to be graded should not exceed:~~

(1) 1.5 % where the code number is 4;

(2) 1.75 % where the code number is 3; and

(3) 2 % where the code number is 1 or 2.

(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded **may not exceed:**

(1) 1.5 % where the code number is 4;

(2) 1.75 % where the code number is 3; and

(3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) ~~Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

~~(1) 2.5 % where the code number is 3 or 4; and
 (2) 3 % where the code number is 1 or 2;
 except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.
 (b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:
 (1) 2.5 % where the code number is 3 or 4; and
 (2) 3 % where the code number is 1 or 2;
 except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.
 (b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

"[...] (e) Slopes on clearways:
 Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.
 The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:
 (1) is perpendicular to the vertical plane containing the runway centre line; and
 (2) passes through a point located on the runway centre line at the end of the take-off run available.
 [...]"

GM-ADR-DSN.B.195 Clearways

"[...]
 (b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:
 (1) is perpendicular to the vertical plane containing the runway centre line; and
 (2) passes through a point located on the runway centre line at the end of the take-off run available.
 Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes
 (1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.
 (2) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~ Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.
 (b) Transverse slopes
 (1) ~~The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %.~~ Transitions between differing slopes should be as gradual as practicable."

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA should ~~can~~ be amended accordingly."

*** Longitudinal slopes on taxiways****CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways**

(a) The longitudinal slope of a taxiway should not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B.

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways****CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways**

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways****CS-ADR-DSN.D.275 – Sight distance of taxiways**

"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the

~~taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B.~~

~~(b) Slopes should may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:~~

(1) 2.5 % for strips where the code letter is C, D, E or F; and
 (2) 3 % for strips of taxiways where the code letter is A or B;
 the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~(a)~~ Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

~~(a)~~ The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~(c)~~ On an aircraft stand the maximum slope may not exceed 1 % in any direction.

~~(ed)~~ Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "

response Noted

Comments will be addressed to under their individual CS reference.

comment

1258

comment by: ECA - European Cockpit Association

Modify the paragraph as follows:

The longitudinal and transverse slopes on a runway turn pad **and its adjoining shoulders** should be sufficient to prevent the accumulation of water on the surfaces ~~and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface but should not exceed 1.0 percent.~~

	Justification: Reference: IFALPA Annex 14, paragraph 3.x.9
response	<i>Not accepted</i>
	The text is based on ICAO and will be retained in the CS.

comment	1515 comment by: <i>IDRF e.V. (association of regional airports)</i>
	The CSs for RWY turn pad are written in an adequate and constructive way for which reason it is acceptable to keep the ICAO-recommendations within the CSs.
response	<i>Accepted</i>

comment	2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>

comment	2499 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	CS-ADR-DSN.B.100 Slopes on runway turn pads <i>"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface."</i>
response	<i>Not accepted</i>
	The text is based on ICAO and will be retained in the CS.

comment	1259 comment by: <i>ECA - European Cockpit Association</i>
	Amend as follows: The strength of a runway turn pad should <u>be at least equal to that of be compatible with</u> the adjoining runway which it serves, due consideration being given to the fact that the turn pad will be subjected to slowmoving traffic making hard turns and consequent higher stresses on the pavement.

	<p>Justification: As explained in the note in ICAO Annex 14 3.3.9, the forces exerted during the manoeuvres in the runway turn pad require it to be more resistant than the runway itself, not "compatible", which implies a downgrading de facto from ICAO recommendation.</p>
response	<p><i>Accepted</i></p> <p>Conforms to ICAO wording.</p>

comment	<p>1516 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>The CSs for RWY turn pad are written in an adequate and constructive way for which reason it is acceptable to keep the ICAO-recommendations within the CSs.</p>
response	<p><i>Accepted</i></p>

comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>

CS-ADR – Book 1 – CS-ADR-DSN.B.110 – Surface of runway turn pads

p. 16

comment	<p>1517 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>The CSs for RWY turn pad are written in an adequate and constructive way for which reason it is acceptable to keep the ICAO-recommendations within the CSs.</p>
response	<p><i>Noted</i></p>

comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2659 comment by: ECA - European Cockpit Association</p> <p>Modify paragraphs (a) & (b) as follows: (a) The surface of a runway the turn pad should not have surface irregularities that may cause damage to an aeroplane using the turn pad structures. (b) The surface of a runway paved turn pad should be constructed or resurfaced so as to provide good friction characteristics compatible with the runway friction characteristics for aeroplanes making hard turns even when the surface is wet.</p> <p>Justification: The text in the NPA is de facto a downgrading of the recommendation from ICAO Annex 14. Furthermore, the proposed text is clearer and more specific, therefore more appropriate. References: ICAO Annex 14, paragraph 3.3.11; and IFALPA Annex 14, paragraph 3.x.12 on runway turn pads.</p>
response	<p><i>Not accepted</i></p> <p>Paragraph (a) is the same as ICAO. Paragraph (b) text has been modified, but retains the appropriate ICAO meaning.</p>

CS-ADR – Book 1 – CS-ADR-DSN.B.115 – Width of shoulders for runway turn pads

p. 16

comment	<p>1262 comment by: ECA - European Cockpit Association</p> <p>Delete the paragraph and replace with the two following paragraphs: (a) When the runway is intended to be used by turbined engined aeroplanes, the surface of the runway turn pad shoulder should be prepared so as to resist erosion and the ingestion of the surface material by aeroplanes. (b) The width of the runway turn pad shoulder should be at least half the total wing span of the most critical aeroplane using the runway.</p> <p>Justification: The addition of (b) is aimed at including the note in ICAO Annex 14, paragraph 3.3.12, modified by IFALPA Annex 14, paragraph 3.y.2. Reference: IFALPA Annex 14, paragraphs 3.y.3 and 3.y.2.</p>
response	<p><i>Not accepted</i></p> <p>The CS text is from ICAO; the note accompanying the ICAO Annex 14 paragraph No. 3.3.12 covers the proposed new paragraph (b) and will be inserted in GM B.115.</p>

comment	1518	comment by: <i>IDRF e.V. (association of regional airports)</i>
	The CSs for RWY turn pad are written in an adequate and constructive way for which reason it is acceptable to keep the ICAO-recommendations within the CSs.	
response	<i>Accepted</i>	

comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.B.120 – Strength of shoulders for runway turn pads

p. 17

comment	1264	comment by: <i>ECA - European Cockpit Association</i>
	Delete the paragraph and replace with: A runway turn pad shoulder should be prepared or constructed so as to be capable, in the event of an aeroplane inadvertently entering it, of supporting the aeroplane without causing structural damage. It should also be capable of allowing ground vehicles to operate in the area.	
	Justification: Self-explanatory. Reference: IFALPA Annex 14, paragraph 3.y.1	
response	<i>Not accepted</i>	
	The ICAO text will be retained.	

comment	1519	comment by: <i>IDRF e.V. (association of regional airports)</i>
	The CSs for RWY turn pad are written in an adequate and constructive way for which reason it is acceptable to keep the ICAO-recommendations within the CSs.	
response	<i>Accepted</i>	

comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	Noted	

CS-ADR – Book 1 – CS-ADR-DSN.B.125 – Runway shoulders
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p. 17

comment	1272	comment by: <i>ECA - European Cockpit Association</i>
	<p>Amend text in paragraph (a) to read: Runway shoulders should be provided for a runway where the code letter is D or E, and the runway width is less than 60 m and the runway length is 1800 m and more.</p> <p>Justification: We consider that, in all cases, runway shoulders should be provided where the runway width is less than 60 m. Reference: IFALPA Annex 14, paragraph 3.2.1</p>	
response	<p><i>Not accepted</i></p> <p>Deviates from ICAO wording.</p>	

comment	1520	comment by: <i>IDRF e.V. (association of regional airports)</i>
	<p>This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).</p> <p>The figures are at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden. It is a typical engineering-matter to follow the intended purpose, there is no need to limit these items in a specific way. In fact it is so that the function, objectives and purposes of the RWY-shoulder may vary.</p> <p>Unfortunately the figures of ICAO Annex 14 recommendations are indiscriminately and not based on scientific findings. We expect that it is possible to find risk based figures based on relating studies. We hope EASA in able to initiate such studies for Europe.</p> <p>Anyway we suggest to move them to GM.</p>	
response	<p><i>Not accepted</i></p>	

comment	2068	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	(a) Add - and should normally be paved.	
response	<i>Not accepted</i>	
	Not required by ICAO.	

CS-ADR – Book 1 – CS-ADR-DSN.B.130 – Slopes on runway shoulders

p. 17

comment	20	comment by: <i>ACI EUROPE - Airports Council International</i>
	move to GM	
	Justification: only objectives are important	
response	<i>Not accepted</i>	
	The CS contains numerical values and will be retained in Book 1.	

comment	410	comment by: <i>Cologne/Bonn Airport</i>
	move to GM Only objectives are important	
response	<i>Not accepted</i>	
	The CS contains numerical values and will be retained in Book 1.	

comment	473	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #130	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.130	
	Référence: CS-ADR-DSN.B.130 Slopes on runway shoulders	

	<p>Traduction de courtoisie</p> <p>We propose to keep into CS the following part: « The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway. »</p> <p>The rest of the provision has to be moved to « guidance material » GM : « and its transverse slope should not exceed 2.5% »</p> <p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.</p> <p>The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The numerical specification forms the design criteria.</p>

comment	<p>601 comment by: <i>Avinor</i></p> <p>CS.ADR.DSN.B.130. Move to GM.</p>
response	<p><i>Not accepted</i></p> <p>The CS contains numerical values and will be retained in Book 1.</p>

comment	<p>704 comment by: <i>ADP : Aeroports de Paris</i></p> <table border="1" style="width: 100%;"> <tr> <td style="width: 30%;">Référence: CS-ADR-DSN.B.130</td> <td>Slopes on runway shoulders</td> </tr> <tr> <td>Proposition/commentaire</td> <td> <p>Nous proposons de conserver en CS la partie suivante:</p> <p>« The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway. »</p> <p>Le reste de la disposition est à transférer en « guidance material » (GM) : « and its transverse slope should not exceed 2.5% »</p> </td> </tr> <tr> <td>Justification</td> <td> <p>Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM.</p> <p>En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage.</p> </td> </tr> <tr> <td>Traduction de courtoisie</td> <td> <p>We propose to keep into CS the following part:</p> <p>« The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway. »</p> </td> </tr> </table>	Référence: CS-ADR-DSN.B.130	Slopes on runway shoulders	Proposition/commentaire	<p>Nous proposons de conserver en CS la partie suivante:</p> <p>« The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway. »</p> <p>Le reste de la disposition est à transférer en « guidance material » (GM) : « and its transverse slope should not exceed 2.5% »</p>	Justification	<p>Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM.</p> <p>En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage.</p>	Traduction de courtoisie	<p>We propose to keep into CS the following part:</p> <p>« The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway. »</p>
Référence: CS-ADR-DSN.B.130	Slopes on runway shoulders								
Proposition/commentaire	<p>Nous proposons de conserver en CS la partie suivante:</p> <p>« The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway. »</p> <p>Le reste de la disposition est à transférer en « guidance material » (GM) : « and its transverse slope should not exceed 2.5% »</p>								
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Traduction de courtoisie	<p>We propose to keep into CS the following part:</p> <p>« The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway. »</p>								

	<p>The rest of the provision has to be moved to « guidance material » GM : « and its transverse slope should not exceed 2.5% »</p> <p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The numerical specification forms the design criteria.</p>
comment	<p>794 comment by: <i>Munich Airport International</i></p> <p>Move to GM</p> <p>Justification: Only objectives are important</p>
response	<p><i>Not accepted</i></p> <p>The numerical specification forms the design criteria.</p>
comment	<p>843 ❖ comment by: <i>DGAC Direction Générale de l'aviation civile</i></p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13) • CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13) • CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14) • CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14) • CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16) • CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17) • CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19) • CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)

- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are

applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

~~(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."~~

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

~~(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."~~

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 — Sight distance

"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »

*** Transverse slopes on runways****CS-ADR-DSN.B.080 — Transverse slopes**

"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.

(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

GM-ADR-DSN.B.080 — Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope should may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads****CS-ADR-DSN.B.100 Slopes on runway turn pads**

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface."

GM-ADR-DSN.B.100 — Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface. Slopes should be are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders****CS-ADR-DSN.B.130 — Slopes on runway shoulders**

"The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips**

"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:

- (1) 1.5 % where the code number is 4;*
- (2) 1.75 % where the code number is 3; and*
- (3) 2 % where the code number is 1 or 2.*

(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;*
- (2) 1.75 % where the code number is 3; and*
- (3) 2 % where the code number is 1 or 2."*

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.185 – Transverse Slopes on runway strips**

"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:

- (1) 2.5 % where the code number is 3 or 4; and*
- (2) 3 % where the code number is 1 or 2;*

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and*
- (2) 3 % where the code number is 1 or 2;*

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

- (1) is perpendicular to the vertical plane containing the runway centre line; and*
- (2) passes through a point located on the runway centre line at the end of the*

~~take-off run available.
[...]"~~

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) ~~The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~
(1) ~~is perpendicular to the vertical plane containing the runway centre line; and~~
(2) ~~passes through a point located on the runway centre line at the end of the take-off run available.~~

~~Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"~~

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

(1) ~~The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.~~

(2) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

(1) ~~The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~

(b) ~~The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %~~

(c) ~~Where clearway is provided, the slope on the REASA should~~ **can** ~~be amended accordingly."~~

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

~~The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" ~~The longitudinal slope of a taxiway may not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B."~~

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 — Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes ~~should~~ **may** be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips****CS-ADR-DSN.D.330 — Slopes on taxiway strips**

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 — Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and

(2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons****CS-ADR-DSN.E.360 Slopes on aprons**

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

"(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the

slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "

response *Noted*

Comments will be addressed to under their individual CS reference.

comment

1413

comment by: Geneva International Airport (ROMIG)

Move to GM
Too detailed.

response

Not accepted

The CS contains numerical values and will be retained in Book 1.

comment

1426

comment by: Euroairport Bâle-Mulhouse

Attachment [#131](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.130

Référence: CS-ADR-DSN.B.130

Slopes on runway shoulders

Traduction de courtoisie

We propose to keep into CS the following part: « The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway. »

The rest of the provision has to be moved to « guidance material » GM : « and its transverse slope should not exceed 2.5% »

We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.

The respect of these rules can interfere with the objective of drainage.

response

Not accepted

The numerical specification forms the design criteria.

comment	<p>1521 comment by: <i>IDRF e.V. (association of regional airports)</i></p>
	<p>This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III). The figures are at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden. It is a typical engineering-matter to follow the intended purpose, there is no need to limit these items in a specific way. In fact it is so that the function, objectives and purposes of the RWY-shoulder may vary.</p> <p>Unfortunately the figures of ICAO Annex 14 recommendations are indiscriminately and not based on scientific findings. We expect that it is possible to find risk based figures based on relating studies. We hope EASA is able to initiate such studies for Europe.</p> <p>Anyway we suggest to move them to GM.</p>
response	<p><i>Not accepted</i></p> <p>The numerical specification forms the design criteria.</p>
comment	<p>1539 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p>
	<p>We propose to keep into CS the following part: « The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway. » The rest of the provision has to be moved to « guidance material » GM : « and its transverse slope should not exceed 2.5% »</p> <p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The numerical specification forms the design criteria.</p>
comment	<p>1760 comment by: <i>Aéroports De Lyon</i></p>
	<p>L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Elle peuvent même aller à l'encontre de l'objectif des pentes: le drainage de l'eau.</p> <p><u>Proposition</u>: Préciser la donnée en GM</p>
response	<p><i>Not accepted</i></p> <p>The CS contains numerical values and will be retained in Book 1.</p>

comment	<p>1868 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #132</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.130</p> <p>Référence: CS-ADR-DSN.B.130 Slopes on runway shoulders</p> <p>Traduction de courtoisie We propose to keep into CS the following part: « The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway. »</p> <p>The rest of the provision has to be moved to « guidance material » GM : « and its transverse slope should not exceed 2.5% »</p> <p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.</p> <p>The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The numerical specification forms the design criteria.</p>

comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2432 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>Suggest moving the "CS" to "GM"</p>
response	<p><i>Not accepted</i></p> <p>The CS contains numerical values and will be retained in Book 1.</p>

comment	<p>2452 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p> <p>This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU</p>
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	do not have. Therefore it is disadvantaging the aerodromes within the European Union!
	If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.
response	<i>Not accepted</i>
	The CS contains numerical values and will be retained in Book 1.

comment	2500 comment by: AENA - Aeropuertos Españoles y Navegación Aérea
	CS-ADR-DSN.B.130 – Slopes on runway shoulders "The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."
response	<i>Not accepted</i>
	The CS contains numerical values and will be retained in Book 1.

comment	2651 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD
	Attachment #133
	ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.130
	Référence: CS-ADR-DSN.B.130 Slopes on runway shoulders
	Traduction de courtoisie We propose to keep into CS the following part: « The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway. »
	The rest of the provision has to be moved to « guidance material » GM : « and its transverse slope should not exceed 2.5% »
	We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.
	The respect of these rules can interfere with the objective of drainage.
response	<i>Not accepted</i>
	The numerical specification forms the design criteria.

comment	2835 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN
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Référence: CS-ADR-DSN.B.130	Slopes on runway shoulders
Proposition/commentaire	<p>Nous proposons de conserver en CS la partie suivante: « The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway. »</p> <p>Le reste de la disposition est à transférer en « guidance material » (GM) : « and its transverse slope should not exceed 2.5% »</p>
Justification	<p>Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM.</p> <p>En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage.</p>
Traduction de courtoisie	<p>We propose to keep into CS the following part: « The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway. »</p> <p>The rest of the provision has to be moved to « guidance material » GM : « and its transverse slope should not exceed 2.5% »</p> <p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.</p> <p>The respect of these rules can interfere with the objective of drainage.</p>

response *Not accepted*

The numerical specification forms the design criteria.

comment 3016

comment by: *ADV -German Airports Association*

CS.ADR.DSN.B.130
move to GM

	Justification Only objectives are important
response	<i>Not accepted</i>
	The CS contains numerical values and will be retained in Book 1.

comment	3051 comment by: <i>MST / STR - Stuttgart Airport</i>
	CS.ADR.DSN.B.130 move to GM
	Justification Only objectives are important
response	<i>Not accepted</i>
	The CS contains numerical values and will be retained in Book 1.

comment	3084 comment by: <i>Fraport AG</i>
	CS-ADR-DSN.B.130 — Slopes on runway shoulders
	Editorial
	Complete paragraph
	Move complete paragraph to GM
	Fraport AG only objectives are important for CS
response	<i>Not accepted</i>
	The CS contains numerical values and will be retained in Book 1.

CS-ADR — Book 1 — CS-ADR-DSN.B.135 — Width of runway shoulders	p. 17
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comment	21 comment by: <i>ACI EUROPE - Airports Council International</i>
	(2) delete
	Justification: operations in practice have proved to be safe with shoulders less than 75m, i.e. 60m and Aribus as well as Airlines have proved it. This based on ICAO Circular 301 and 305

response *Not accepted*

The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.

comment

341

comment by: *Vienna International Airport*

Delete (2)

response

Not accepted

Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.

comment

411

comment by: *Cologne/Bonn Airport*

delete
(a) (2)

Operations in practice have proved to be safe with shoulders less than 75m, i.e. 60m and Airbus as well as Airlines have proved it. This based on ICAO Circular 301 and 305

response

Not accepted

Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.

comment

474

comment by: *Union des Aéroports français - UAF*

Attachment [#134](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.135

Référence: CS-ADRDSN.B.135

Width of runway shoulder

Traduction de courtoisie

It is appropriate to delete : « ~~(2) 75 m where the code letter is F.~~ »

According to the circular ICAO n°305, it is possible to have runway shoulder so that the overall width of the runway and its shoulders is only of 60 meters even

	for codes F taking into account that there are extra widths that do not answer to all objectives of the shoulder but only to prevent erosion by jet blast, injection of objects and damages to the aircraft.
response	<i>Not accepted</i>
	The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.

comment	602 comment by: <i>Avinor</i>
	CS.ADR.DSN.B.135 (a) (2). Delete. Only objectives are important.
response	<i>Not accepted</i>
	Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.

comment	628 comment by: <i>Dublin Airport Authority</i>
	Based on ICAO Circulars 301/305 – operations have proved to be safe with shoulders less than 75m, suggest deletion.
response	<i>Not accepted</i>
	Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.

comment	705 comment by: <i>ADP : Aeroports de Paris</i>								
	<table border="1"> <tr> <td>Référence: CS-ADR-DSN.B.135</td> <td>Width of runway shoulder</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de supprimer : « (2) 75 m where the code letter is F. »</td> </tr> <tr> <td>Justification</td> <td>En vertu de la circulaire OACI n°305, il est possible d'avoir des accotements de 60 m uniquement même pour les codes F à condition d'ajouter des surlargeurs qui ne répondent pas à la totalité des objectifs de l'accotement mais juste à l'objectif de lutte contre le souffle et l'ingestion des objets.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>It is appropriate to delete : « (2) 75 m where the code letter is F. »</td> </tr> </table>	Référence: CS-ADR-DSN.B.135	Width of runway shoulder	Proposition/commentaire	Il convient de supprimer : « (2) 75 m where the code letter is F. »	Justification	En vertu de la circulaire OACI n°305, il est possible d'avoir des accotements de 60 m uniquement même pour les codes F à condition d'ajouter des surlargeurs qui ne répondent pas à la totalité des objectifs de l'accotement mais juste à l'objectif de lutte contre le souffle et l'ingestion des objets.	Traduction de courtoisie	It is appropriate to delete : « (2) 75 m where the code letter is F. »
Référence: CS-ADR-DSN.B.135	Width of runway shoulder								
Proposition/commentaire	Il convient de supprimer : « (2) 75 m where the code letter is F. »								
Justification	En vertu de la circulaire OACI n°305, il est possible d'avoir des accotements de 60 m uniquement même pour les codes F à condition d'ajouter des surlargeurs qui ne répondent pas à la totalité des objectifs de l'accotement mais juste à l'objectif de lutte contre le souffle et l'ingestion des objets.								
Traduction de courtoisie	It is appropriate to delete : « (2) 75 m where the code letter is F. »								

	<p>According to the circular ICAO n°305, it is possible to have runway shoulder of only 60 meters even for codes F provided that there are extra widths that do not answer to all objectives of the shoulder but only to the objective of the fight against blowing and injection of objects.</p>
response	<p><i>Not accepted</i></p> <p>The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.</p>
comment	<p>767 comment by: CAA Austria - Ministry of Transport</p> <p>(2) check with ICAO</p>
response	<p><i>Not accepted</i></p> <p>Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.</p>
comment	<p>795 comment by: Munich Airport International</p> <p><u>(a)</u></p> <p>(2): delete</p> <p>Justification: Operations in practice have proved to be safe with shoulders less than 75m, i.e. 60m and Airbus as well as Airlines have proved it. This based on ICAO Circular 301 and 305</p>
response	<p><i>Not accepted</i></p> <p>The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.</p>

comment 846

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.B.135 – Width of runway shoulders (p17)
- GM-ADR – Book 2 – GM-ADR-DSN.B.125 –Runway shoulders (p217-218)
- GM-ADR – Book 2 – GM-ADR-DSN.B.135 – Width of runway shoulders (p219)

2. Justification and proposed text / comment

CS-ADR-DSN.B.135 is compliant with ICAO Annex 14 volume 1.

ICAO Circular 305 ("Operation of new larger aeroplanes at existing aerodromes") details specific solutions which can be used for New larger aeroplanes (example: code F aeroplanes). This circular states that for the use of runways narrower than 60 m by large aeroplanes (including code F aeroplanes), shoulders can be composed of two parts:

- inner shoulders, paved and of adequate bearing strength to provide an overall width of the runway and its (inner) shoulders of 60 m;
- outer shoulders: paved/stabilized and with adequate bearing strength to provide an overall width of the runway and its shoulder of 75 m.

with 2 conditions :

- having inset runway edge lights (in lieu of elevated lights),
- additional runway centre line guidance.

This notion has been introduced in paragraph (e) of GM-ADR-DSN.B.125 – Runway shoulders, but some mitigation measures mentioned in ICAO Circular 305 are lacking : it is proposed to add them.

Moreover, GM-ADR-DSN.B.135 – Width of runway shoulders has no content, but some interesting guidance on possible reduced width of runway shoulders is contained in GM-ADR-DSN.B.125 (notably in paragraphs (d), (e) and (f)) as a reduced width is linked to an adapted structure of the runway shoulder). To facilitate the reader, it is suggested to make a reference to GM-ADR-DSN.B.125 in GM-ADR-DSN.B.135.

Consequently, it is proposed to modify GM-ADR-DSN.B.125 and 135 as follows:

GM-ADR-DSN.B.125 – Runway shoulders

"(a) [...]"

(e) *Where a reduced paved width of 60 m is accepted:*

(1) *The outer unpaved 7.5 m of runway shoulder should be stabilised; the ground is prepared so that there is full grass coverage with no loose gravel or other material. This may include additional materials if the bearing strength and surface of the ground are not sufficient.*

(2) *A programme of inspections of the shoulders and runway should be implemented to confirm its continuing serviceability and ensure that there is no deterioration that could create a risk of FOD or otherwise hazard aircraft operations.*

(3) *Possible additional mitigation measures are to provide the runway with inset runway edge lights (in lieu of elevated lights, to protect aeroplane from ingestion) and additional runway centre line guidance.*

(34) *As movements of code letter F aircraft increase, the need for full paved*

*width shoulders should be assessed by local hazard analysis.
[...]"*

GM-ADR-DSN.B.135 – Width of runway shoulders

" Guidance on possible reduced width of runway shoulders in contained in GM-ADR-DSN.B.125 (notably in paragraphs (d), (e) and (f)) as a reduced width of runway shoulder can be accepted if an adapted structure of the runway shoulder and adequate mitigation measures are in place."

response *Not accepted*

GM-ADR-DSN.B.125: The proposed paragraph (e)(3) is not GM. In any case, there is no requirement stated as to whether lights should be elevated or inset. This can be covered by ELOS.

GM-ADR-DSN.B.135: This can be covered by using ELOS.

GM can not propose mitigation measures that would change the CS.

comment 987 comment by: *Salzburger Flughafen GmbH*

Delete (2)

response *Not accepted*

Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.

comment 1097 comment by: *Flughafen Graz Betriebs GmbH*

Delete (2)

response *Not accepted*

Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.

comment 1162 comment by: *Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH*

Delete (2)

response *Not accepted*

Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.

comment	<p>1274 comment by: <i>ECA - European Cockpit Association</i></p>
	<p>Add the following paragraph:</p> <p>In the case of runways intended to be used by aircraft of codes D, E and F, the runway shoulders should extend symmetrically on each side of the runway so that the overall width of the runway and its shoulders is not less than 90 m.</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 3.2.3</p>
response	<p><i>Not accepted</i></p> <p>Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.</p>
comment	<p>1417 comment by: <i>Geneva International Airport (ROMIG)</i></p>
	<p>Delete Operations in practice have proved to be safe with shoulders less than 75m, i.e. 60m and Aribus as well as Airlines have proved it. This based on ICAO Circular 301 and 305</p>
response	<p><i>Not accepted</i></p> <p>The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.</p>
comment	<p>1428 comment by: <i>Euroairport Bâle-Mulhouse</i></p>
	<p>Attachment #135</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.135</p> <p>Référence: CS-ADRDSN.B.135 Width of runway shoulder</p> <p>Traduction de courtoisie It is appropriate to delete : « (2) 75 m where the code letter is F. » According to the circular ICAO n°305, it is possible to have runway shoulder so that the overall width of the runway and its shoulders is only of 60 meters even for codes F taking into account that there are extra widths that do not answer to all objectives of the shoulder but only to prevent erosion by jet blast, injection of objects and damages to the aircraft.</p>
response	<p><i>Not accepted</i></p>

The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.

comment 1483 comment by: *Flughafen Linz-Hörsching - LNZ/LOWL*

delete (2)

response *Not accepted*

Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.

comment 1522 comment by: *IDRF e.V. (association of regional airports)*

This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).

The figures are at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden. It is a typical engineering-matter to follow the intended purpose, there is no need to limit these items in a specific way. In fact it is so that the function, objectives and purposes of the RWY-shoulder may vary.

Unfortunately the figures of ICAO Annex 14 recommendations are indiscriminately and not based on scientific findings. We expect that it is possible to find risk based figures based on relating studies. We hope EASA in able to initiate such studies for Europe.

Anyway we suggest to move them to GM.

response *Not accepted*

The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.

comment 1540 comment by: *Aéroport de Marseille - MRS/LFML*

It is appropriate to delete : « ~~(2) 75 m where the code letter is F.~~ »

According to the circular ICAO n°305, it is possible to have runway shoulder of only 60 meters even for codes F provided that there are extra widths that do not answer to all objectives of the shoulder, but only to the objective of the fight against blowing and injection of objects.

response	<i>Not accepted</i>	
	The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.	
comment	1869	comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	Attachment #136	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.135	
	Référence: CS-ADRDSN.B.135 Width of runway shoulder	
	Traduction de courtoisie It is appropriate to delete : « (2) 75 m where the code letter is F. » According to the circular ICAO n°305, it is possible to have runway shoulder so that the overall width of the runway and its shoulders is only of 60 meters even for codes F taking into account that there are extra widths that do not answer to all objectives of the shoulder but only to prevent erosion by jet blast, injection of objects and damages to the aircraft.	
response	<i>Not accepted</i>	
	The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.	
comment	2187	comment by: <i>Dublin Airport Authority</i>
	Based on ICAO Circulars 301/305 – operations have proved to be safe with shoulders less than 75m, suggest deletion.	
response	<i>Not accepted</i>	
	Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.	
comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	Noted	

comment	2431	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	Delete: Operations in practice have proved to be safe with shoulders less than 75m, i.e. 60m and Aribus as well as Airlines have proved it. This based on ICAO Circular 301 and 305	
response	<i>Not accepted</i>	
	Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.	

comment	2458	comment by: <i>Shannon Airport</i>
	Based on ICAO Circulars 301/305 – operations have proved to be safe with shoulders less than 75m, suggest deletion.	
response	<i>Not accepted</i>	
	The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.	

comment	2712	comment by: <i>Flughafen Klagenfurt</i>
	Delete (2)	
response	<i>Not accepted</i>	
	Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.	

comment	2836	comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i>						
	<table border="1"> <tr> <td>Référence: CS-ADR-DSN.B.135</td> <td>Width of runway shoulder</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de supprimer : « (2) 75 m where the code letter is F. »</td> </tr> <tr> <td>Justification</td> <td>En vertu de la circulaire OACI n°305, il est possible d'avoir des accotements de 60 m uniquement même pour les codes F à condition d'ajouter des surlargeurs qui ne répondent pas à la totalité des objectifs de l'accotement mais juste à l'objectif de lutte contre le souffle et</td> </tr> </table>		Référence: CS-ADR-DSN.B.135	Width of runway shoulder	Proposition/commentaire	Il convient de supprimer : « (2) 75 m where the code letter is F. »	Justification	En vertu de la circulaire OACI n°305, il est possible d'avoir des accotements de 60 m uniquement même pour les codes F à condition d'ajouter des surlargeurs qui ne répondent pas à la totalité des objectifs de l'accotement mais juste à l'objectif de lutte contre le souffle et
Référence: CS-ADR-DSN.B.135	Width of runway shoulder							
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	l'ingestion des objets.
Traduction de courtoisie	It is appropriate to delete : « (2) 75 m where the code letter is F. » According to the circular ICAO n°305, it is possible to have runway shoulder of only 60 meters even for codes F provided that there are extra widths that do not answer to all objectives of the shoulder but only to the objective of the fight against blowing and injection of objects.

response *Not accepted*

The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.

comment 2986

comment by: *DAA Cork Airport*

Based on ICAO Circulars 301/305 – operations have proved to be safe with shoulders less than 75m, suggest deletion.

response *Not accepted*

Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.

comment 3017

comment by: *ADV -German Airports Association*

CS.ADR.DSN.B.135 (a) (2)
delete

Justification

Operations in practice have proved to be safe with shoulders less than 75m, i.e. 60m and Airbus as well as Airlines have proved it. This based on ICAO Circular 301 and 305

response *Not accepted*

The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet

blast erosion and RFFS access.

comment	<p>3052 comment by: <i>MST / STR - Stuttgart Airport</i></p> <p>CS.ADR.DSN.B.135 (a) (2) delete</p> <p>Justification Operations in practice have proved to be safe with shoulders less than 75m, i.e. 60m and Airbus as well as Airlines have proved it. This based on ICAO Circular 301 and 305</p>
response	<p><i>Not accepted</i></p> <p>The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.</p>

comment	<p>3085 comment by: <i>Fraport AG</i></p> <p>CS-ADR-DSN.B.135 — Width of runway shoulders (a) (2)</p> <p>Editorial</p> <p>75 m where the code letter is F.</p> <p>Delete complete paragraph</p> <p>Fraport AG operations in practice have proved to be safe with shoulders less than 75m, i.e. 60m and Airbus as well as Airlines have proved it. This based on ICAO Circular 301 and 305</p>
response	<p><i>Not accepted</i></p> <p>The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.</p>

comment	<p>3127 comment by: <i>ATB Aéroport Toulouse-Blagnac - TLS/LFBO</i></p> <p>Attachment #137</p> <p>ATB NPA 2011-20 (B.III) CS-ADR-DSN.B.135</p> <p>Référence: CS-ADRDSN.B.135Width of runway shoulder</p>
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	<p>Traduction de courtoisie It is appropriate to delete : « (2) 75 m where the code letter is F. » According to the circular ICAO n°305, it is possible to have runway shoulder so that the overall width of the runway and its shoulders is only of 60 meters even for codes F taking into account that there are extra widths that do not answer to all objectives of the shoulder but only to prevent erosion by jet blast, injection of objects and damages to the aircraft.</p>
response	<p><i>Not accepted</i></p> <p>The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.</p>

comment	<p>3148 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #138</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.135</p> <p>Référence: CS-ADRDSN.B.135 Width of runway shoulder</p> <p>Traduction de courtoisie It is appropriate to delete : « (2) 75 m where the code letter is F. » According to the circular ICAO n°305, it is possible to have runway shoulder so that the overall width of the runway and its shoulders is only of 60 meters even for codes F taking into account that there are extra widths that do not answer to all objectives of the shoulder but only to prevent erosion by jet blast, injection of objects and damages to the aircraft.</p>
response	<p><i>Not accepted</i></p> <p>The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.</p>

comment	<p>406 comment by: <i>Cologne/Bonn Airport</i></p> <p>Add definiton of inner and outer shoulder according to AACG</p>
response	<p><i>Noted</i></p>

The text will be reviewed accordingly. The terms 'inner' and 'outer' runway shoulder are mentioned in ICAO Circular 305, but with no definition.

comment	1523	comment by: <i>IDRF e.V. (association of regional airports)</i>
	This CS is written in an adequate and constructive way for which reason it is acceptable to keep the ICAO-recommendations within the CSs.	
response	<i>Accepted</i>	

comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

comment	2675	comment by: <i>ECA - European Cockpit Association</i>
	<p>Add the following paragraph: A runway shoulder should be stabilised, compacted and hard-surfaced and possess a bearing capacity sufficient to withstand the static and dynamic loads of all aircraft they are intended to serve. Where operational factors necessitate a 180° turn on the runway, the shoulder should possess a bearing capacity sufficient to withstand the maximum dynamic load of the largest aircraft likely to be required to perform this manoeuvre.</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 3.2.5</p>	
response	<i>Not accepted</i>	

comment	1524	comment by: <i>IDRF e.V. (association of regional airports)</i>
	I'm not sure, where I can find this element within ICAO as marked in the NPA. Nevertheless this CS, even if it is additional new text, is written in an adequate, helpful and constructive way and therefore acceptable.	
response	<i>Noted</i>	

comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	Noted	

CS-ADR – Book 1 – CS-ADR-DSN.B.150 – Runway strip to be provided

p. 17-18

comment	475	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #139	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.150	
	Référence: CS-ADR-DSN.B.150 Runway strip to be provided	
	Traduction de courtoisie It is appropriate to delete : " The runway strip is a defined area including the runway and stopway, if provided, intended: (4) to reduce the risk of damage to aircraft running off a runway; and to protect aircraft flying over it during take-off or landing operations. " The definition and objectives of runway strip are useless at this part of the text because they are already mentioned elsewhere (CS-ADR-DSN.A002 – Definitions).	
response	Accepted	

comment	706	comment by: <i>ADP : Aeroports de Paris</i>
	Référence: CS-ADR-DSN.B.150	Runway strip to be provided
	Proposition/commentaire	Il convient de supprimer: " The runway strip is a defined area including the runway and stopway, if provided, intended: (1) to reduce the risk of damage to aircraft running off a runway; and (2) to protect aircraft flying over it during take-off or landing operations. " (3)
	Justification	La définition et les objectifs de la bande de piste sont inutiles à cet endroit du texte car ils se trouvent déjà ailleurs (CS-ADR-DSN.A002 –

	Definitions).
Traduction de courtoisie	<p>It is appropriate to delete : "The runway strip is a defined area including the runway and stopway, if provided, intended: (4) to reduce the risk of damage to aircraft running off a runway; and to protect aircraft flying over it during take-off or landing operations."</p> <p>The definition and objectives of runway strip are useless at this part of the text because they are already mentioned elsewhere (CS-ADR-DSN.A002 - Definitions).</p>
response	<i>Accepted</i>

comment	847	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> BIII - CS-ADR - Book 1 - CS-ADR-DSN.B.150 — Runway strip to be provided (p17-18) <p><u>2. Justification and proposed text / comment</u></p> <p>The definition and objectives of runway strips are useless in this CS because they are already stated in CS-ADR-DSN.A.002 - Definitions.</p> <p>CS-ADR-DSN.B.150 — Runway strip to be provided</p> <p><i>"(a) A runway and any associated stopways should be included in a strip. The runway strip is a defined area including the runway and stopway, if provided, intended:</i> (1) to reduce the risk of damage to aircraft running off a runway; and (2) to protect aircraft flying over it during take-off or landing operations."</p>	
response	<i>Accepted</i>	

comment	1429	comment by: <i>Euroairport Bâle-Mulhouse</i>
	<p>Attachment #140</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.150</p> <p>Référence: CS-ADR-DSN.B.150 Runway strip to be provided</p>	

	<p>Traduction de courtoisie It is appropriate to delete : "The runway strip is a defined area including the runway and stopway, if provided, intended: (4) to reduce the risk of damage to aircraft running off a runway; and to protect aircraft flying over it during take-off or landing operations." The definition and objectives of runway strip are useless at this part of the text because they are already mentioned elsewhere (CS-ADR-DSN.A002 - Definitions).</p>
response	<i>Accepted</i>

comment	<p>1525 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>Compared to ICAO Annex 14, the additional text (1) and (2) is written in an adequate, helpful and constructive way and therefore acceptable.</p>
response	<p><i>Noted</i></p> <p>The text is already included in the definition. Therefore it has been deleted to avoid repetition.</p>

comment	<p>1541 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>It is appropriate to delete : "The runway strip is a defined area including the runway and stopway, if provided, intended: (1) to reduce the risk of damage to aircraft running off a runway; and to protect aircraft flying over it during take-off or landing operations." The definition and objectives of runway strip are useless at this part of the text because they are already mentioned elsewhere (CS-ADR-DSN.A002 - Definitions).</p>
response	<i>Accepted</i>

comment	<p>1870 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #141</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.150</p> <p>Référence: CS-ADR-DSN.B.150 Runway strip to be provided</p> <p>Traduction de courtoisie It is appropriate to delete : "The runway strip is a defined area including the runway and stopway, if provided, intended: (4) to reduce the risk of damage to aircraft running off a runway; and to</p>
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protect aircraft flying over it during take-off or landing operations."
 The definition and objectives of runway strip are useless at this part of the text because they are already mentioned elsewhere (CS-ADR-DSN.A002 - Definitions).

response *Accepted*

comment 2212 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2652 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#142](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.150

Référence: CS-ADR-DSN.B.150
 Runway strip to be provided

Traduction de courtoisie
 t is appropriate to delete : "~~The runway strip is a defined area including the runway and stopway, if provided, intended:
 (4) to reduce the risk of damage to aircraft running off a runway; and to protect aircraft flying over it during take-off or landing operations.~~"
 The definition and objectives of runway strip are useless at this part of the text because they are already mentioned elsewhere (CS-ADR-DSN.A002 - Definitions).

response *Accepted*

comment 2837 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.B.150	Runway strip to be provided
Proposition/commentaire	Il convient de supprimer: " The runway strip is a defined area including the runway and stopway, if provided, intended: (1) to reduce the risk of damage to aircraft running off a runway; and (2) to protect aircraft flying over it during take-off or landing operations. " (3)

Justification	La définition et les objectifs de la bande de piste sont inutiles à cet endroit du texte car ils se trouvent déjà ailleurs (CS-ADR-DSN.A002 - Definitions).
Traduction de courtoisie	<p>It is appropriate to delete : "The runway strip is a defined area including the runway and stopway, if provided, intended: (4) to reduce the risk of damage to aircraft running off a runway; and to protect aircraft flying over it during take-off or landing operations."</p> <p>The definition and objectives of runway strip are useless at this part of the text because they are already mentioned elsewhere (CS-ADR-DSN.A002 - Definitions).</p>
response	<i>Accepted</i>

CS-ADR – Book 1 - CS-ADR-DSN.B.155 – Length of runway strip

p. 18

comment	2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
response	<i>Noted</i>

CS-ADR – Book 1 – CS-ADR-DSN.B.160 – Width of runway strip

p. 18

comment	279 comment by: <i>Icelandic Civil Aviation Administration</i>
response	<p>We suggest to combine precision and non-precision paragraphs in CS-ADR-DSN.B.160 (a) and (b) on page 18. The words: "wherever practicable" make precision approach rwy strip less demanding (because shall was changed by should), than the strip for non-precision appr runway. Suggest also to remove the words "where practicable" as this is not necessary in the EASA rules as ELOSs and SCs and DAADs can be used if needed.</p>

Delete 'wherever practicable' from (a) to be consistent with (b) and (c). All other numerical specifications are identical to ICAO and will remain in Book 1.

comment	354	comment by: <i>Estonian CAA</i>
	We suggest to combine precision and non-precision paragraphs in CS-ADR-DSN.B.160 (a) and (b) on page 18. The words: 'wherever practicable' make precision approach rwy strip less demanding (because shall was changed by should), than the strip for non-precision appr runway.	
response	<i>Partially accepted</i>	
	Delete 'wherever practicable' from (a) to be consistent with (b) and (c). All other numerical specifications are identical to ICAO and will remain in Book 1.	

comment	476	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #143	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.160	
	Référence: CS-ADR-DSN.B.160 Width of runway strip	
	Traduction de courtoisie (a) it is appropriate to delete " wherever practicable ". (b) and (c) have to be transferred into GM. This is a typical example of the EASA practice making ICAO recommendations more restricting than ICAO Standards by an automatic copy-paste. Indeed, (b) and (c) do not mention "wherever practicable". Now, these specifications are only taken from recommendations whereas the (a) is taken from a norm and mentions "wherever practicable". There is a lack of coherence. The CS being a provision included in the certification basis, the "wherever practicable" is useless and can even involve juridical confusion. The provisions about widths of runway strip for the runway with precision or non-precision approach are only good practices and not normative references. They should be in GM and not in CS.	
response	<i>Partially accepted</i>	
	Delete 'wherever practicable' from (a) to be consistent with (b) and (c). All other numerical specifications are identical to ICAO and will remain in Book 1.	

comment	707	comment by: <i>ADP : Aeroports de Paris</i>
	Référence: CS-ADR-DSN.B.160	Width of runway strip

Proposition/commentaire	(a) Il convient de supprimer " wherever practicable ". (b) et (c) sont à transférer en GM.
Justification	En effet, le (b) et le (c) ne mentionnent pas "wherever practicable". Or ces spécifications sont issues uniquement de recommandation, alors que le (a) est issu d'une norme et mentionne le "wherever practicable". Il y a ici un manque de cohérence. Le CS étant une disposition entrant dans la base de certification, le "wherever practicable" est inutile et peut même mener à une certaine confusion juridique. Les dispositions relatives aux largeurs de bande de piste pour les pistes avec approche classique et à vue ne sont que des règles de l'art et non des références normatives et ont leur place en GM et non en CS.
Traduction de courtoisie	(a) it is appropriate to delete " wherever practicable ". (b) and (c) have to be transferred into GM. Indeed, (b) and (c) do not mention "wherever practicable". Now, these specifications are only taken from recommendations whereas the (a) is taken from a norm and mentions "wherever practicable". There is a lack of coherence. The CS being a provision included in the certification basis, the "wherever practicable" is useless and can even involve juridical confusion. The provisions about widths of runway strip for the runway with precision or non-precision approach are only good practices and not normative references. They should be in GM and not in CS.

response *Partially accepted*

Delete 'wherever practicable' from (a) to be consistent with (b) and (c). All other numerical specifications are identical to ICAO and will remain in Book 1.

comment 1148

comment by: *Swedish Transport Agency*

response	<p>We suggest to combine precision and non-precision paragraphs in CS-ADR-DSN.B.160 (a) and (b) on page 18. The words: "wherever practicable" make precision approach rwy strip less demanding (because shall was changed by should), than the strip for non-precision appr runway.</p> <p><i>Partially accepted</i></p> <p>Delete 'wherever practicable' from (a) to be consistent with (b) and (c). All other numerical specifications are identical to ICAO and will remain in Book 1.</p>
comment	<p>1279 comment by: ECA - European Cockpit Association</p> <p>Amend paragraph (c) (1) to read: (c)(1) 75 m 150 m where the code number is 3 or 4;</p> <p>Justification: <u>We recommend that the paragraph be changed because the intent of ICAO Annex 14, paras 3.4.3 and 3.4.4 equally apply to para. 3.4.5, namely to protect aircraft over flying the runway during a missed approach and aircraft involved in runway side run-off incidents or accidents.</u> We consider that the recommended figure of 75m for code numbers 3 or 4 is inadequate and that this should be 150m (500 ft.). The equivalent widths in feet should also be shown.</p> <p>Reference: IFALPA Annex 14, paragraph 3.4.5</p>
response	<p><i>Not accepted</i></p> <p>Numerical design specifications are identical to ICAO and will remain in Book 1.</p>
comment	<p>1430 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #144</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.160</p> <p>Référence: CS-ADR-DSN.B.160 Width of runway strip</p> <p>Traduction de courtoisie (a) it is appropriate to delete "wherever practicable". (b) and (c) have to be transferred into GM. This is a typical example of the EASA practice making ICAO recommendations more restricting than ICAO Standards by an automatic copy-paste. Indeed, (b) and (c) do not mention "wherever practicable". Now, these specifications are only taken from recommendations whereas the (a) is taken from a norm and mentions "wherever practicable". There is a lack of coherence. The CS being a provision included in the certification basis, the "wherever practicable" is useless and can even involve juridical confusion. The provisions about widths of runway strip for the runway with precision or</p>

response	<p>non-precision approach are only good practices and not normative references. They should be in GM and not in CS.</p> <p><i>Partially accepted</i></p> <p>Delete 'wherever practicable' from (a) to be consistent with (b) and (c). All other numerical specifications are identical to ICAO and will remain in Book 1.</p>
comment	<p>1526 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>This DSN-element is partially based on an ICAO Annex 14 recommendation and partially based on an ICAO Annex 14 standards.</p> <p>The width of rwy strips were indiscriminately determined by ICAO and not based on scientific findings or on enforceable studies. Furthermore there is an inconsistency within ICAO's several methods of approaches to take care for safety on departing or landing traffic (compare Annex 14 with PANS-ATM/OPS). For illustration we attached cross-section of Annex 14-surfaces, OFZ and OAS.</p> <p>The correct way to determine these important figures should be be on a risk based approach. We hope ICAO will change to this philosophie within a review of chapter 3 of ICAO Annex 14. This could also be done by a good regulator for some basic means. Because this is a general question, we allow us to expect an underlying study arranged by EASA.</p> <p>In the meantime it is acceptable to use ICAO-standards. But to state the ICAO-recommendation figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).</p> <p>In this context the CS could stay with letter (a) on an interim bases. Letter (b) and (c) are items to be moved to GM, if nessecary accompanied by additional explanations.</p>
response	<p><i>Not accepted</i></p> <p>Numerical design specifications are identical to ICAO and will remain in Book 1.</p>
comment	<p>1543 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>(a) it is appropriate to delete "wherever practicable". (b) and (c) have to be transferred into GM.</p> <p>This is a typical example of the EASA practice making ICAO recommendations more restricting than ICAO Standards by an automatic copy-paste. Indeed, (b) and (c) do not mention "wherever practicable". Now, these specifications are only taken from recommendations whereas the (a) is taken from a norm and mentions "wherever practicable". There is a lack of coherence.</p> <p>The CS being a provision included in the certification basis, the "wherever practicable" is useless and can even involve juridical confusion.</p>

	<p>The provisions about widths of runway strip for the runway with precision or non-precision approach are only good practices and not normative references. They should be in GM and not in CS</p>
response	<p><i>Partially accepted</i></p> <p>Delete 'wherever practicable' from (a) to be consistent with (b) and (c). All other numerical specifications are identical to ICAO and will remain in Book 1.</p>
comment	<p>1871 comment by: Zürich Airport</p> <p>There is no risk based justification for the fact that the design criteria for instrument runways are more demanding than the ones for non-instrument runways. On the contrary it has been demonstrated that instrument approaches and most notably precision approaches are safer than visual approaches. From a safety perspective it would therefore be detrimental if non-instrument runways would be limited to visual approaches only, as safety can be increased if an visual approach is replaced or amended by an instrument approach, even if it is not possible to meet the required design criteria for an instrument runway. Under no way it should be concluded that a runway meeting only the less stringent requirements for a non-instrument runway should only be used for visual approaches.</p>
response	<p><i>Noted</i></p>
comment	<p>1872 comment by: Aéroport Nantes Atlantique - NTE/LFRS</p> <p>Attachment #145</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.160</p> <p>Référence: CS-ADR-DSN.B.160 Width of runway strip</p> <p>Traduction de courtoisie (a) it is appropriate to delete "wherever practicable". (b) and (c) have to be transferred into GM. This is a typical example of the EASA practice making ICAO recommendations more restricting than ICAO Standards by an automatic copy-paste. Indeed, (b) and (c) do not mention "wherever practicable". Now, these specifications are only taken from recommendations whereas the (a) is taken from a norm and mentions "wherever practicable". There is a lack of coherence. The CS being a provision included in the certification basis, the "wherever practicable" is useless and can even involve juridical confusion. The provisions about widths of runway strip for the runway with precision or non-precision approach are only good practices and not normative references. They should be in GM and not in CS.</p>
response	<p><i>Partially accepted</i></p>

Delete 'wherever practicable' from (a) to be consistent with (b) and (c). All other numerical specifications are identical to ICAO and will remain in Book 1.

comment 2212 ❖ comment by: HIA - Highlands and Islands Airports Limited

Noted

response Noted

comment 2528 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

The wording of paragraph (c) could be used to clarify paragraphs (a) and (b) as shown below.

Moreover, the provision of paragraph (b)(2) specifying the width of the runway strip for non precision approach runway of code 1 or 2 is only a recommendation in ICAO Annex 14 volume 1. These provisions are only good practices. Such runway strip extends at a distance of 40m on each side of the runway centre line, instead of 75m and there has never been any safety issue noticed on that subject.

It is thus proposed to move it to GM.

CS-ADR-DSN.B.160 – Width of runway strip

"(a) A strip including a precision approach runway should, wherever practicable, extend on each side of the centre line of the runway and its extended centre line throughout the length of the strip, to a distance of at least:

(1) 150 m where the code number is 3 or 4; and

(2) 75 m where the code number is 1 or 2; ~~on each side of the centre line of the runway and its extended centre line throughout the length of the strip.~~

(b) A strip including a non-precision approach runway should extend laterally on each side of the centre line of the runway and its extended centre line throughout the length of the strip, to a distance of at least:

(1) 150 m where the code number is 3 or 4; and

(2) ~~75 m where the code number is 1 or 2; on each side of the centre line of the runway and its extended centre line throughout the length of the strip.~~

(c) A strip including a non-instrument runway should extend on each side of the centre line of the runway and its extended centre line throughout the length of the strip, to a distance of at least:

(1) 75 m where the code number is 3 or 4;

(2) 40 m where the code number is 2; and

(3) 30 m where the code number is 1."

response Not accepted

Numerical design specifications are identical to ICAO and will remain in Book 1.

comment 2653 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#146](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.160

Référence: CS-ADR-DSN.B.160
Width of runway strip

Traduction de courtoisie

(a) it is appropriate to delete "~~wherever practicable~~".

(b) and (c) have to be transferred into GM.

This is a typical example of the EASA practice making ICAO recommendations more restricting than ICAO Standards by an automatic copy-paste.

Indeed, (b) and (c) do not mention "wherever practicable". Now, these specifications are only taken from recommendations whereas the (a) is taken from a norm and mentions "wherever practicable". There is a lack of coherence. The CS being a provision included in the certification basis, the "wherever practicable" is useless and can even involve juridical confusion.

The provisions about widths of runway strip for the runway with precision or non-precision approach are only good practices and not normative references. They should be in GM and not in CS.

response *Partially accepted*

Delete 'wherever practicable' from (a) to be consistent with (b) and (c). All other numerical specifications are identical to ICAO and will remain in Book 1.

comment

2838

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.B.160	Width of runway strip
Proposition/commentaire	(a) Il convient de supprimer " wherever practicable ". (b) et (c) sont à transférer en GM.
Justification	Nous avons ici un exemple typique de la méthode utilisée par l'AESA qui rend des recommandations OACI plus contraignantes que des normes OACI par un copier-coller trop automatique. En effet, le (b) et le (c) ne mentionnent pas "wherever practicable". Or ces spécifications sont issues uniquement de recommandation, alors que le (a) est issu d'une norme et mentionne le "wherever practicable". Il y a ici un manque de cohérence. Le CS étant une disposition entrant dans la base de certification, le "wherever practicable" est inutile et peut même mener à une certaine confusion juridique. Les dispositions relatives aux largeurs de bande de piste pour les pistes avec approche classique et à vue ne sont que des règles de l'art et non des références normatives et ont leur place en

	GM et non en CS.
Traduction de courtoisie	<p>(a) it is appropriate to delete "wherever practicable". (b) and (c) have to be transferred into GM.</p> <p>This is a typical example of the EASA practice making ICAO recommendations more restricting than ICAO Standards by an automatic copy-paste. Indeed, (b) and (c) do not mention "wherever practicable". Now, these specifications are only taken from recommendations whereas the (a) is taken from a norm and mentions "wherever practicable". There is a lack of coherence.</p> <p>The CS being a provision included in the certification basis, the "wherever practicable" is useless and can even involve juridical confusion.</p> <p>The provisions about widths of runway strip for the runway with precision or non-precision approach are only good practices and not normative references. They should be in GM and not in CS.</p>
response	<p><i>Partially accepted</i></p> <p>Delete 'wherever practicable' from (a) to be consistent with (b) and (c). All other numerical specifications are identical to ICAO and will remain in Book 1.</p>

CS-ADR – Book 1 – CS-ADR-DSN.B.165 – Objects on runway strips	p. 18
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comment	<p>139</p> <p>comment by: CAA Norway</p> <p>Editorial: Wrong reference to chapter 5 in CS-ADR-DSN.B.165 (b) on page 21.(which chapter 5?)</p>
response	<p><i>Accepted</i></p> <p>This will be amended with EASA reference.</p>

comment	280	comment by: <i>Icelandic Civil Aviation Administration</i>
	Suggest to take out the words "as far as practicable", not necessary in the EASA rules, ELOSs, SCs and DAADs can be used if needed.	
response	<i>Not accepted</i>	
	The wording is taken from ICAO.	
comment	281	comment by: <i>Icelandic Civil Aviation Administration</i>
	Editorial: Wrong reference to chapter 5 in CS-ADR-DSN.B.165 (b) on page 21.(which chapter 5?)	
response	<i>Accepted</i>	
	This will be amended with EASA reference.	
comment	477	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #147	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.165	
	Référence: CS-ADR-DSN.B.165 Objects on runway strips	
	Traduction de courtoisie It is appropriate to move this provision to OPS	
response	<i>Not accepted</i>	
	This is an ICAO design standard.	
comment	635	comment by: <i>Finnish Transport Safety Agency</i>
	Editorial: Wrong reference to chapter 5 in CS-ADR-DSN.B.165 (b) on page 21.(which chapter 5?)	
response	<i>Accepted</i>	
	This will be amended with EASA reference.	
comment	708	comment by: <i>ADP : Aeroports de Paris</i>

Référence: CS-ADR-DSN.B.165	Objects on runway strips
Proposition/commentaire	Il convient de transférer cette disposition en OPS comme annoté (« Move to OPS »).
Justification	
Traduction de courtoisie	It is appropriate to move this provision to OPS

response *Not accepted*

This is an ICAO design standard.

comment	818	comment by: <i>Finavia</i>
	There is a contradiction between CS-ADR-DSN.B.165 and CS-ADR-DSN.T.915. No fixed object should be permitted on a runway strip within 77.5 m of the runway centerline (B.165) / on a runway strip (T.195).	
response	<i>Noted</i>	
	B.165 relates to objects. T.915 relates to equipment and installations. The wording is taken from the respective ICAO source.	

comment	851	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • BIII- CS-ADR - Book 1 - CS-ADR-DSN.B.165 — Objects on runway strips (p18) • BIII- CS-ADR - Book 1 - CS-ADR-DSN.B.170 — Non-precision approach and non-instrument runway strips (p19) 	
	<p><u>2. Justification and proposed text / comment</u></p> <p>The references are erroneous. Moreover, paragraph (a) of CS-ADR-DSN.B.165 should be deleted because already dealt with in CS-ADR-DSN.T.915 and such duplication in a regulation is to be avoided as much as possible to avoid any confusion, in particular for the future modifications.</p>	
	<p>CS-ADR-DSN.B.165 — Objects on runway strips "(a) An object situated on a runway strip which may endanger aeroplanes should be regarded as an obstacle and should, as far as practicable, be removed.</p>	

(b) No fixed object, other than visual aids required for air navigation or for aircraft safety purposes and satisfying the relevant frangibility requirement in Chapter 5 CS-ADR-DSN.T.910, should be permitted on a runway strip:[...]"

CS-ADR-DSN.B.170 — Non-precision approach and non-instrument runway strips

"(a) No fixed object, other than visual aids required for air navigation or for aircraft safety purposes and satisfying the relevant frangibility requirement in CS-ADR-DSN.T.920910, should be permitted on a runway strip: [...]"

response *Not accepted*

This is an ICAO design standard.

comment *1015* comment by: *Federal Office of Civil Aviation FOCA*

Please correct the reference to the chapter CS-ADR-DSN.T.910 dealing with frangibility requirement. There is a reference to Chapter 5 even though there is no chapter 5 in Book 1.

response *Partially accepted*

Paragraph (b) will be moved to GM.

comment *1149* comment by: *Swedish Transport Agency*

Wrong reference to chapter 5 in CS-ADR-DSN.B.165 (b) on page 21.(which chapter 5?)

response *Accepted*

This will be amended with EASA reference.

comment *1281* comment by: *UK CAA*

Page No: 18

Paragraph No: CS-ADR-DSN.B.165

Comment: The description of the protection of buried objects within the Cleared & Graded should be moved from the GM [GM-ADR-DSN.B.610 (a)] to the CS.

Justification: Protection for an aircraft within the cleared and graded area should extend to buried objects to ensure undercarriage is not unduly damaged. Without the existence of a ramp over buried objects, damage likely to injure persons could result from an runway excursion.

Proposed Text: NEW CS FROM EXISTING GM: “(c) Within the general area of the strip adjacent to the runway, measures should be taken to prevent an aeroplane’s wheel, when sinking into the ground, from striking a hard vertical face. Special problems may arise for runway light fittings or other objects mounted in the strip or at the intersection with a taxiway or another runway. In the case of construction, such as runways or taxiways, where the surface must also be flush with the strip surface, a vertical face can be eliminated by chamfering from the top of the construction to not less than 30 cm below the strip surface level. Other objects, the functions of which do not require them to be at surface level, should be buried to a depth of not less than 30 cm. Where this is not feasible, to eliminate a buried vertical surface, a slope should be provided which extends from the top of the construction to not less than 0.3 m below ground level. The slope should be no greater than 1:10. Newly constructed features which are not required to be at ground level should be buried to a depth of not less than 0.45 m”.

response *Partially accepted*

Text has been added for provision of ramps to eliminate vertical surfaces on buried objects within the Cleared and Graded area.

comment

1283

comment by: UK CAA

Page No: 18

Paragraph No: CS.ADR.DSN.B.165 “Objects on runway strips”

Comment: Essentials navigation aids, such as ILS glidepath aerals, need to be sited in the runway strip, so allowance must be made for them. The text as shown does not include design requirements for permitted equipment.

Justification: Safety – all navigation aids and other equipment should be as light and frangible as their function permits.

Proposed Text: New “(c): Aids to air navigation that need to be sited on the runway strip should be made as light and frangible as design and function will permit, and the height of such objects should be kept to a minimum for the particular site and function of the equipment. Objects which may impact the consequences of a ground swing, should be sited outside the graded area of the runway strip and positioned so that they do not penetrate a limiting surface sloping upward and outward from the runway centreline at a slope of 1:10”.

response *Noted*

This is covered in CS-ADR-DSN.T.915 — Siting of equipment and installations on operational areas. The reference to a 1:10 OLS emanating from the runway centreline does not appear in Annex 14.

comment

1431

comment by: Euroairport Bâle-Mulhouse

	<p>Attachment #148</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.165</p> <p>Référence: CS-ADR-DSN.B.165 Objects on runway strips</p> <p>Traduction de courtoisie It is appropriate to move this provision to OPS</p>
response	<p><i>Not accepted</i></p> <p>This is an ICAO design standard.</p>
comment	<p>1527 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>This DSN-element is based on an ICAO Annex 14 recommendation.</p> <p>Letter (a) is written in an adequate and constructive way for which reason it is acceptable to keep this part of the ICAO-recommendation within the CSs. To state the figures (letter (b)) within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III). To set them into a CS tends to result in unnecessary burden. We suggest to move them to GM.</p>
response	<p><i>Not accepted</i></p> <p>This is an ICAO standard for aerodrome design.</p>
comment	<p>1544 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>It is appropriate to move this provision to OPS</p>
response	<p><i>Not accepted</i></p> <p>This is an ICAO design standard.</p>
comment	<p>1873 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #149</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.165</p> <p>Référence: CS-ADR-DSN.B.165 Objects on runway strips</p> <p>Traduction de courtoisie It is appropriate to move this provision to OPS</p>

response	<p><i>Not accepted</i></p> <p>This is an ICAO design standard.</p>
comment	<p>1876 comment by: <i>ENAC Ente Nazionale per l'Aviazione Civile</i></p> <p>par. (b): In order to avoid strict interpretation, replace " visual aids" with "visual aids or equipment/installation" according to Annex 14 ICAO 9.9.1.</p>
response	<p><i>Noted</i></p> <p>Equipment and installations are covered in CS T.915.</p>
comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p><i>Noted</i></p>
response	<p><i>Noted</i></p>
comment	<p>2334 comment by: <i>AIRBUS</i></p> <p>(a) An fixed object situated on a runway strip which may endanger aeroplanes should be regarded as an obstacle and should, as far as practicable, be removed.</p> <p>Rationale: movable object is an operational issue and has been moved to OPS</p>
response	<p><i>Noted</i></p> <p>The wording is taken from ICAO and will remain.</p>
comment	<p>2529 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p> <p>Paragraph (a) of CS-ADR-DSN.B.165 should be deleted because already dealt with in CS-ADR-DSN.T.915 and such duplication in a regulation is to be avoided as much as possible to avoid any confusion, in particular for the future modifications.</p> <p>CS-ADR-DSN.B.165 – Objects on runway strips</p> <p>"(a) An object situated on a runway strip which may endanger aeroplanes should be regarded as an obstacle and should, as far as practicable, be removed.</p> <p>(b) No fixed object, other than visual aids required for air navigation or for aircraft safety purposes and satisfying the relevant frangibility requirement in</p>

response *Chapter 5 CS-ADR-DSN.T.910, should be permitted on a runway strip:[...]"*
Not accepted

This is an ICAO design standard referring to objects (not equipment and installation as in CS T.915).

comment 2583 comment by: *Danish Transport Authority*

Editorial: Reference to unknown chapter 5.

response *Accepted*

This will be amended with EASA reference.

comment 2654 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#150](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.165

Référence: CS-ADR-DSN.B.165
Objects on runway strips

Traduction de courtoisie
It is appropriate to move this provision to OPS

response *Not accepted*

This is an ICAO design standard.

comment 2839 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.B.165	Objects on runway strips
Proposition/commentaire	Il convient de transférer cette disposition en OPS comme annoté (« Move to OPS »).
Justification	
Traduction de courtoisie	It is appropriate to move this provision to OPS

response *Not accepted*

This is an ICAO design standard.

comment	2945	comment by: <i>Isavia</i>
	Text to remain as is	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.B.170 – Non-precision approach and non-instrument runway strips

p. 19

comment	478	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #151	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.170	
	Référence: CS-ADR-DSN.B.170 Non-precision approach and non-instrument runway strips	
	Traduction de courtoisie It is appropriate to move to OPS and to modify the ADR reference as follows : "CS-ADR-DSN.T.910"	
response	<i>Partially accepted</i>	
	The reference will be amended. The CS will remain.	

comment	709	comment by: <i>ADP : Aeroports de Paris</i>
	Référence: CS-ADR-DSN.B.170	Non-precision approach and non-instrument runway strips
	Proposition/commentaire	Il convient de transférer cette disposition en OPS et de modifier la référence ADR en: "CS-ADR-DSN.T.910"
	Justification	
	Traduction de courtoisie	It is appropriate to move to OPS and to modify the ADR reference as follows : "CS-ADR-DSN.T.910"

response *Partially accepted*

The reference will be amended. The CS will remain.

comment 814

comment by: *Finnish Transport Safety Agency*

Reference CS-ADR-DSN.T.920 should be CS-ADR-DSN.T.910

response *Accepted*

This will be amended with correct reference.

comment 851 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- BIII- CS-ADR - Book 1 - CS-ADR-DSN.B.165 — Objects on runway strips (p18)
- BIII- CS-ADR - Book 1 - CS-ADR-DSN.B.170 — Non-precision approach and non-instrument runway strips (p19)

2. Justification and proposed text / comment

The references are erroneous.

Moreover, paragraph (a) of CS-ADR-DSN.B.165 should be deleted because already dealt with in CS-ADR-DSN.T.915 and such duplication in a regulation is to be avoided as much as possible to avoid any confusion, in particular for the future modifications.

CS-ADR-DSN.B.165 — Objects on runway strips

~~"(a) An object situated on a runway strip which may endanger aeroplanes should be regarded as an obstacle and should, as far as practicable, be removed.~~

~~(b) No fixed object, other than visual aids required for air navigation or for aircraft safety purposes and satisfying the relevant frangibility requirement in Chapter 5 CS-ADR-DSN.T.910, should be permitted on a runway strip:[...]"~~

CS-ADR-DSN.B.170 — Non-precision approach and non-instrument runway strips

~~"(a) No fixed object, other than visual aids required for air navigation or for aircraft safety purposes and satisfying the relevant frangibility requirement in CS-ADR-DSN.T.920910, should be permitted on a runway strip: [...]"~~

response *Accepted*

This will be amended with correct reference.

comment	1016	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	Please correct the reference to the chapter CS-ADR-DSN.T.910 dealing with frangibility requirements. There is a wrong reference to CS-ADR-DSN.T.920.	
response	<i>Accepted</i>	
	This will be amended with correct reference.	

comment	1103	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • BIII - CS-ADR - Book 1 – CS-ADR-DSN.B.170 — Non-precision approach and non-instrument runway strips (p18) • BIII - CS-ADR - Book 2 – GM-ADR-DSN.B.160 — Width of runway strip (p219) <p><u>2. Justification and proposed text / comment</u></p> <p>The wording of paragraph (c) could be used to clarify paragraphs (a) and (b) as shown below, to clearly that the strip extends on each side of the centre line of the runway and its extended centre line throughout the length of the strip. Moreover, DGAC France informs EASA that the provision of paragraph (b)(2) specifying the width of the runway strip for non precision approach runway of code 1 or 2 <u>is not binding in France and is only a recommendation in ICAO Annex 14 volume 1</u>. These provisions are only good practices. In France, <u>such runway strip extends at a distance of 40m on each side of the runway centre line, instead of 75m and there has never been any safety issue noticed on that subject.</u></p> <p>It is proposed to revise this CS-ADR-DSN.B.160 as follows :</p> <p>CS-ADR-DSN.B.160 — Width of runway strip</p> <p>"(a) A strip including a precision approach runway should, wherever practicable, extend on each side of the centre line of the runway and its extended centre line throughout the length of the strip, to a distance of at least:</p> <p>(1) 150 m where the code number is 3 or 4; and</p> <p>(2) 75 m where the code number is 1 or 2; on each side of the centre line of the runway and its extended centre line throughout the length of the strip.</p> <p>(b) A strip including a non-precision approach runway should extend laterally on each side of the centre line of the runway and its extended centre line throughout the length of the strip, to a distance of at least:</p> <p>(1) 150 m where the code number is 3 or 4; and</p> <p>(2) 75 m where the code number is 1 or 2; on each side of the centre line of the runway and its extended centre line throughout the length of the strip.</p> <p>(c) A strip including a non-instrument runway should extend on each side of the centre line of the runway and its extended centre line throughout the length of the strip, to a distance of at least:</p> <p>(1) 75 m where the code number is 3 or 4;</p> <p>(2) 40 m where the code number is 2; and</p>	

response	<p>(3) 30 m where the code number is 1."</p> <p><i>Noted</i></p> <p>Incorrect references seem to have been used.</p>
comment	<p>1311 comment by: Zürich Airport</p> <p>The Non-instrument Runways as a specific Subject are very well regulated with the ICAO SARPs. We are actually looking back in a long and safe practical experience using these runways. Based on our as well as on the experiences of other Airports in Europe, we do strongly recommend the Agency to take over the regulating mechanism from the ICAO Annex 14 unchanged. Trying to regulate this subject in a in a different way, can bring about different restrictions in use of these RWY and in this case this will lead to a big opposition against EASA Regulations in Europe.</p>
response	<p><i>Noted</i></p>
comment	<p>1432 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #152</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.170</p> <p>Référence: CS-ADR-DSN.B.170 Non-precision approach and non-instrument runway strips</p> <p>Traduction de courtoisie It is appropriate to move to OPS and to modify the ADR reference as follows : "CS-ADR-DSN.T.910"</p>
response	<p><i>Partially accepted</i></p> <p>The reference will be amended. The CS will remain.</p>
comment	<p>1545 comment by: Aéroport de Marseille - MRS/LFML</p> <p>It is appropriate to move to OPS and to modify the ADR reference as follows : "CS-ADR-DSN.T.910"</p>
response	<p><i>Partially accepted</i></p> <p>The reference will be amended. The CS will remain.</p>

comment	1774	comment by: <i>IDRF e.V. (association of regional airports)</i>
	This CS and its figures are indiscriminately, without any basis of ICAO Annex 14 or an enforceable study or something equivalent.	
	Suggest to delete this CS	
response	<i>Not accepted</i>	
	Design specifications are identical to ICAO and will remain in Book 1.	
comment	1875	comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	Attachment #153	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.170	
	Référence: CS-ADR-DSN.B.170	
	Non-precision approach and non-instrument runway strips	
	Traduction de courtoisie	
	It is appropriate to move to OPS and to modify the ADR reference as follows : "CS-ADR-DSN.T.910"	
response	<i>Partially accepted</i>	
	The reference will be amended. The CS will remain.	
comment	1893	comment by: <i>ENAC Ente Nazionale per l'Aviazione Civile</i>
	par. (a): In order to avoid strict interpretation, replace " visual aids" with "visual aids or equipment/installation" according to Annex 14 ICAO 9.9.1.	
response	<i>Noted</i>	
	Equipment and installations are covered in CS T.915.	
comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>	
response	<i>Noted</i>	

comment 2655 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#154](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.170

Référence: CS-ADR-DSN.B.170

Non-precision approach and non-instrument runway strips

Traduction de courtoisie

It is appropriate to move to OPS and to modify the ADR reference as follows : "CS-ADR-DSN.T.910"

response *Partially accepted*

The reference will be amended. The CS will remain.

comment 2840 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.B.170

Non-precision approach and non-instrument runway strips

Proposition/commentaire

Il convient de transférer cette disposition en OPS et de modifier la référence ADR en: "CS-ADR-DSN.T.910"

Justification

Traduction de courtoisie

It is appropriate to move to OPS and to modify the ADR reference as follows : "CS-ADR-DSN.T.910"

response *Partially accepted*

The reference will be amended. The CS will remain.

comment 1 comment by: *Manchester Airport plc*

For a Code 3 or 4 instrument runway the width of the graded strip should be

105m. We would not consider 75m sufficient to achieve an acceptable level of safety except for a temporary duration, for example during work in progress.

response *Noted*

ICAO figures are a *minimum* requirement. More can be provided by individual aerodrome operators (if space permits). Additional guidance from Annex 14, Attachment A, will replace paragraphs (a) to (c) in GM B.175.

comment 490 comment by: *East Midlands Airport - EMA/EGNX*

For a Code 3 or 4 instrument runway the width of the graded strip should be 105m. We would not consider 75m sufficient to achieve an acceptable level of safety except for a temporary duration, for example during work in progress.

response *Noted*

ICAO figures are a *minimum* requirement. More can be provided by individual aerodrome operators (if space permits). Additional guidance from Annex 14, Attachment A, will replace paragraphs (a) to (c) in GM B.175.

comment 1298 comment by: *UK CAA*

Page No: 19

Paragraph No: CS.ADR.DSN.B.175 "Grading of runway strips"

Comment: There is a minimum width requirement, but neither the CS nor the associated guidance material reflect fully the material in Annex 14, Attachment A, Section 8.3. This recommends a wider graded area of 105m either side of the runway centreline for a code 3 or 4 precision approach runway.

Justification: Consistency with ICAO and reduction of hazard in the event of a runway excursion, which is one of the work streams for the European Commercial Aviation Safety Team (ECAST).

Proposed Text: New (e): **For a precision approach runway the width of the area to be cleared and graded should be increased to 105m from the centreline.**

response *Not accepted*

The proposed text is contained in GM and is described in Attachment A of Annex 14 (Section 8.3) as being 'desirable'.

comment 1778 comment by: *IDRF e.V. (association of regional airports)*

Except letter (c), this DSN-element is based on an ICAO Annex 14

recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).

The figures are indiscriminately and not based on scientific findings, at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden. In fact the function, objectives and purposes of grading RWY-strips may vary. It is a typical engineering-matter to follow an individual intended purpose, there is no need to limit these items in a specific way.

We suggest to move letter (a), (b) and (d) to GM.

response *Not accepted*

Design specifications are identical to ICAO and will remain in Book 1.

comment 2102 comment by: *HIA - Highlands and Islands Airports Limited*

(a) (1) and (b) (1) There is no reference to widening the CGA to 105m as shown in ICAO documents.

Suggest upgrade to 105m, with reduction to 75m where accepted by risk assessment.

response *Noted*

ICAO figures are a minimum requirement. More can be provided by individual aerodrome operators (if space permits). Additional guidance from Annex 14, Attachment A, will replace paragraphs (a) to (c) in GM B.175.

CS-ADR — Book 1 — CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips

p. 19

comment 479 comment by: *Union des Aéroports français - UAF*

Attachment [#155](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.180

Référence: CS-ADR-DSN.B.180
Longitudinal slopes on runway strips

Traduction de courtoisie

It is appropriate to transfer the (a) to « guidance material » (GM).

We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.

response	The respect of these rules can interfere with the objective of drainage.
	<i>Not accepted</i>
	These are ICAO design specifications;. Llongitudinal slopes are not intended for the drainage of water.

comment 711 comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.B.180	Longitudinal slopes on runway strips
Proposition/commentaire	Il convient de transférer le (a) en « guidance material » (GM).
Justification	Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM. En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage.
Traduction de courtoisie	It is appropriate to transfer the (a) to « guidance material » (GM). We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM. The respect of these rules can interfere with the objective of drainage.

response	<i>Not accepted</i>
	These are ICAO design specifications. Longitudinal slopes are not intended for the drainage of water.

comment 843 ❖ comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway

- (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
 - CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
 - CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM

(p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.
(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways****CS-ADR-DSN.B.060 – Longitudinal slopes of runway**

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

(1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;

(2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and

(3) 2 % where the code number is 1 or 2.

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

(1) 1.5 % where the code number is 3 or 4; and

(2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

(1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;

(2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and

(3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

~~(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."~~

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be

sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface."~~

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"~~The slopes are the same as those on the adjacent runway pavement surface. Slopes should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."~~

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~A longitudinal slope along that portion of a strip to be graded may not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2."~~

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

"~~(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"~~(a) Transverse slopes on that portion of a strip to be graded may not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the~~

direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

~~(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA should ~~can~~ be amended accordingly."

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

(a) The longitudinal slope of a taxiway should not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and
(2) 3 % where the code letter is A or B.

The slopes on a taxiway are intended to prevent the accumulation of water (or

possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

"The longitudinal slope of a taxiway may not exceed:

- (1) 1.5 % where the code letter is C, D, E or F; and
- (2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes ~~should~~ may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and

(2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest~~

building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~*-(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."*~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

*“(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.*

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~*(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.*~~

*(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. ”*

response *Noted*

Comments will be addressed to under their individual CS reference.

comment *1280*

comment by: *ECA - European Cockpit Association*

Add following subparagraph to (b):

(1) In order to accommodate aeroplanes making auto-coupled approaches and automatic landings (irrespective of weather conditions), slope changes should be avoided or kept to a minimum on an area that is symmetrical about the extended runway centre-line at least 60m (200 ft) wide and 300m (1000 ft) long before the threshold of a precision approach runway Category I, II or III. Where slope changes cannot be avoided, the rate of change between two consecutive slopes should not exceed 0.8 per cent per 30m.

Justification:

A new sub-paragraph needs to be added, the intent of which is to protect aeroplanes making auto-coupled approaches and automatic landings by restricting the permissible slope changes in the stipulated area immediately prior to the threshold. This is necessary because these aeroplanes are fitted with a radio altimeter for final height and flare guidance and when the aeroplane is over the terrain in this area the radio altimeter will begin to provide information to the automatic pilot for auto-flare.

Reference: IFALPA Annex 14, paragraph 3.4.13.x

response	<p><i>Not accepted</i></p> <p>This is an operational consideration.</p>
comment	<p>1422 comment by: <i>Geneva International Airport (ROMIG)</i></p> <p>Move to GM Keep article (b) that provides the general principle, move the article (a) to GM.</p>
response	<p><i>Not accepted</i></p> <p>These are ICAO design specifications.</p>
comment	<p>1434 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #156</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.180</p> <p>Référence: CS-ADR-DSN.B.180 Longitudinal slopes on runway strips</p> <p>Traduction de courtoisie It is appropriate to transfer the (a) to « guidance material » (GM). We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>These are ICAO design specifications. Longitudinal slopes are not intended for the drainage of water.</p>
comment	<p>1546 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>It is appropriate to transfer the (a) to « guidance material » (GM).</p> <p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM. The respect of these rules can interfere with the objective of drainage</p>
response	<p><i>Not accepted</i></p> <p>These are ICAO design specifications. Longitudinal slopes are not intended for the drainage of water.</p>

comment	1756 comment by: <i>Aéroports De Lyon</i>
	<p>L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Elle peuvent même aller à l'encontre de l'objectif des pentes: le drainage de l'eau.</p> <p><u>Proposition</u>: Préciser la donnée en GM</p>
response	<p><i>Not accepted</i></p> <p>The requirements are design criteria. Longitudinal slopes are not intended for drainage of water.</p>
comment	1779 comment by: <i>IDRF e.V. (association of regional airports)</i>
	<p>This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).</p> <p>The figures are indiscriminately and not based on scientific findings, at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden.</p> <p>We suggest moving this DSN-element to GM.</p>
response	<p><i>Not accepted</i></p> <p>These are ICAO design specifications.</p>
comment	1878 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	<p>Attachment #157</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.180</p> <p>Référence: CS-ADR-DSN.B.180 Longitudinal slopes on runway strips</p> <p>Traduction de courtoisie It is appropriate to transfer the (a) to « guidance material » (GM). We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p>

These are ICAO design specifications. Longitudinal slopes are not intended for the drainage of water.

comment 2212 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2453 comment by: *Airport Nuremberg - NUE/EDDN*

This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!

If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.

response *Not accepted*

These are ICAO Annex 14 design specifications, which are widely used outside the European Union. The CS contains numerical values and will be retained in Book 1.

comment 2501 comment by: *AENA - Aeropuertos Españoles y Navegación Aérea*

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

~~"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

~~(1) 1.5 % where the code number is 4;~~

~~(2) 1.75 % where the code number is 3; and~~

~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

response *Not accepted*

These are ICAO design specifications.

comment	<p>2656 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #158</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.180</p> <p>Référence: CS-ADR-DSN.B.180 Longitudinal slopes on runway strips</p> <p>Traduction de courtoisie It is appropriate to transfer the (a) to « guidance material » (GM). We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>These are ICAO design specifications. Longitudinal slopes are not intended for the drainage of water.</p>

comment	<p>2841 comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i></p> <table border="1"> <tr> <td>Référence: CS-ADR-DSN.B.180</td> <td>Longitudinal slopes on runway strips</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de transférer le (a) en « guidance material » (GM).</td> </tr> <tr> <td>Justification</td> <td>Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM. En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>It is appropriate to transfer the (a) to « guidance material » (GM). We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM. The respect of these rules can interfere with the objective of drainage.</td> </tr> </table>	Référence: CS-ADR-DSN.B.180	Longitudinal slopes on runway strips	Proposition/commentaire	Il convient de transférer le (a) en « guidance material » (GM).	Justification	Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM. En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage.	Traduction de courtoisie	It is appropriate to transfer the (a) to « guidance material » (GM). We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM. The respect of these rules can interfere with the objective of drainage.
Référence: CS-ADR-DSN.B.180	Longitudinal slopes on runway strips								
Proposition/commentaire	Il convient de transférer le (a) en « guidance material » (GM).								
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response	<p><i>Not accepted</i></p>								

These are ICAO design specifications. Longitudinal slopes are not intended for the drainage of water.

CS-ADR — Book 1 — CS-ADR-DSN.B.185 — Transverse Slopes on runway strips p. 19-20

comment

480

comment by: *Union des Aéroports français - UAF*Attachment [#159](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.185

Référence: CS-ADR-DSN.B.185

Transverse slopes on runway strips

We propose to keep in CS the following part :

(a) "Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface."
The rest has to be transferred to GM.

We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.

The respect of these rules can interfere with the objective of drainage. The first part of the (a) has to be kept because it shows the objective.

response

Not accepted

These are ICAO design specifications. Transverse slope drainage requirements follow paragraph (a)(2).

comment

712

comment by: *ADP : Aeroports de Paris***Référence: CS-ADR-DSN.B.185**

Transverse slopes on runway strips

Proposition/commentaire

Nous proposons de conserver en CS la partie suivante:
- (a) "Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface."
Le reste de la disposition est à transférer en « guidance material » (GM).

Justification

Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles

	<p>de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM.</p> <p>En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage.</p> <p>La première partie du (a) est à conserver car elle marque bien l'objectif qui doit être suivi.</p>
Traduction de courtoisie	<p>We propose to keep in CS the following part : (a) "Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface." The rest has to be transferred to GM.</p> <p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.</p> <p>The respect of these rules can interfere with the objective of drainage.</p> <p>The first part of the (a) has to be kept because it shows the objective.</p>

response *Not accepted*

These are ICAO design specifications. Transverse slope drainage requirements follow paragraph (a)(2).

comment 843 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)

- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of

operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 — Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways****CS-ADR-DSN.B.065 — Longitudinal slope changes on runways**

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

~~(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."~~

*** Sight distance for slopes on runways****CS-ADR-DSN.B.070 — Sight distance for slopes on runways**

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the

runway, and to be able to manoeuvre and take avoiding action. ”

GM-ADR-DSN.B.070 — Sight distance

~~“Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 — Transverse slopes

~~“(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage.”~~

GM-ADR-DSN.B.080 — Transverse slopes on runways

~~“The transverse slope may be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.~~

~~The transverse slope should may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage.”~~

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

~~“The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface.”~~

GM-ADR-DSN.B.100 — Slopes on runway turn pads

~~“The slopes are the same as those on the adjacent runway pavement surface.~~

~~Slopes should be are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft.”~~

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 — Slopes on runway shoulders

~~“The surface of the paved shoulder that abuts the runway should be flush with~~

~~the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

~~"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."~~

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

~~"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

~~"A longitudinal slope along that portion of a strip to be graded may not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2."~~

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

~~"(a) Transverse slopes on that portion of a strip to be graded may not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

~~"[...] (e) Slopes on clearways:~~

~~Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.~~

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

~~(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

~~(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

~~(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

~~Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"~~

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

~~(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.~~

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

~~(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~

~~(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %~~

~~(c) Where clearway is provided, the slope on the REASA should can be amended accordingly."~~

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

~~The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from~~

~~one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 — Transverse slopes on taxiways

~~"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B.~~

~~(b) Slopes ~~should~~ may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 — Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 — Slopes on taxiway strips

~~"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~-(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

~~"(a) The design of slopes ~~should~~ may direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ may be taken to reduce the fire hazard resulting from fuel spillage.~~

~~(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid~~

contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "

response *Noted*

Comments will be addressed to under their individual CS reference.

comment

1435

comment by: Euroairport Bâle-Mulhouse

Attachment [#160](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.185

Référence: CS-ADR-DSN.B.185

Transverse slopes on runway strips

We propose to keep in CS the following part :

(a) "Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface."
The rest has to be transferred to GM.

We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.

The respect of these rules can interfere with the objective of drainage. The first part of the (a) has to be kept because it shows the objective.

response *Not accepted*

These are ICAO design specifications. Transverse slope drainage requirements follow paragraph (a)(2).

comment

1547

comment by: Aéroport de Marseille - MRS/LFML

We propose to keep in CS the following part :

(a) "Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface."
The rest has to be transferred to GM.

We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules

	<p>in GM. The respect of these rules can interfere with the objective of drainage. The first part of the (a) has to be kept because it shows the objective.</p>
response	<p><i>Not accepted</i></p> <p>These are ICAO design specifications. Transverse slope drainage requirements follow paragraph (a)(2).</p>
comment	<p>1758 comment by: <i>Aéroports De Lyon</i></p> <p>L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Elle peuvent même aller à l'encontre de l'objectif des pentes: le drainage de l'eau.</p> <p><u>Proposition</u>: Préciser la donnée en GM</p>
response	<p><i>Not accepted</i></p> <p>These are ICAO design specifications. Transverse slope drainage requirements follow paragraph (a)(2).</p>
comment	<p>1781 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).</p> <p>The figures are indiscriminately and not based on scientific findings, at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden.</p> <p>We suggest moving this DSN-element to GM.</p>
response	<p><i>Not accepted</i></p> <p>These are ICAO design specifications.</p>
comment	<p>1879 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #161</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.185</p> <p>Référence: CS-ADR-DSN.B.185 Transverse slopes on runway strips</p>

	<p>We propose to keep in CS the following part :</p> <p>(a) "Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface." The rest has to be transferred to GM.</p> <p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.</p> <p>The respect of these rules can interfere with the objective of drainage. The first part of the (a) has to be kept because it shows the objective.</p>
response	<p><i>Not accepted</i></p> <p>These are ICAO design specifications. Transverse slope drainage requirements follow paragraph (a)(2).</p>

comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2454 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p> <p>This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!</p> <p>If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.</p>
response	<p><i>Not accepted</i></p> <p>This is from ICAO Annex 14, which is widely used outside the European Union. . The CS contains numerical values and will be retained in Book 1.</p>

comment	<p>2502 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p> <p>CS-ADR-DSN.B.185 – Transverse Slopes on runway strips "(a)–Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed: (1) 2.5 % where the code number is 3 or 4; and</p>
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~~(2) 3 % where the code number is 1 or 2; except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~
~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

response

Not accepted

These are ICAO design specifications. Transverse slope drainage requirements follow paragraph (a)(2).

comment

2657

comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#162](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.185

Référence: CS-ADR-DSN.B.185

Transverse slopes on runway strips

We propose to keep in CS the following part :

(a) "Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface."

The rest has to be transferred to GM.

We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.

The respect of these rules can interfere with the objective of drainage. The first part of the (a) has to be kept because it shows the objective.

response

Not accepted

These are ICAO design specifications. Transverse slope drainage requirements follow paragraph (a)(2).

comment

2842

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.B.185

Transverse slopes on runway strips

Proposition/commentaire

Nous proposons de conserver en CS la partie suivante:
 - (a) "Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface."
 Le reste de la disposition est à transférer en « guidance material » (GM).

Justification	<p>Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM.</p> <p>En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage.</p> <p>La première partie du (a) est à conserver car elle marque bien l'objectif qui doit être suivi.</p>
Traduction de courtoisie	<p>We propose to keep in CS the following part : (a) "Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface." The rest has to be transferred to GM.</p> <p>We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.</p> <p>The respect of these rules can interfere with the objective of drainage.</p> <p>The first part of the (a) has to be kept because it shows the objective.</p>
response	<p><i>Not accepted</i></p> <p>These are ICAO design specifications. Transverse slope drainage requirements follow paragraph (a)(2).</p>

comment 1017

comment by: Federal Office of Civil Aviation FOCA

Please add para. with new (c) as follows: "That portion of a strip of an code number 4 precision approach runway within a distance of at least 90 m from the centre line of a runway and its extended centre line should be so prepared or constructed as to minimise hazards arising from differences in load-bearing capacity to aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway. "

Para. (c) does not specify if the 90 m are meant only from the end of a runway

	<p>or also within the strip from the centre line of a runway. A figure similar to figure A-4 of ICAO Annex 14, Vol. I would improve the understanding of "90 m" and with such a figure a differentiation would be possible.</p>
response	<p><i>Noted</i></p> <p>The CS gives flexibility for increased width of the strip/graded area as the specification is for a 'distance of at least'.</p>
comment	<p>1282 comment by: <i>ECA - European Cockpit Association</i></p> <p>Add following text at the end of both (a) and (b): Open drainage ditches should not be located within the graded portion of the aerodrome runway strip. Where drainage ditches are located at the edge of the graded area, they should be covered in order to preclude structural damage in the event an aeroplane overruns the ditch.</p> <p>Justification: Self-explanatory. Reference: IFALPA Annex 14, paragraph 3.4.16.x</p>
response	<p><i>Noted</i></p> <p>This is addressed in the requirements for the runway strip, including the graded area.</p>
comment	<p>1782 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).</p> <p>The figures are indiscriminately and not based on scientific findings, at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden.</p> <p>We suggest moving this DSN-element to GM.</p>
response	<p><i>Not accepted</i></p> <p>These are ICAO design specifications.</p>
comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p><i>Noted</i></p>

response	<i>Noted</i>
comment	<p>2455 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p> <p>This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!</p> <p>If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.</p>
response	<p><i>Not accepted</i></p> <p>These are ICAO Annex 14 design specifications, which are widely used outside the European Union. The CS contains numerical values and will be retained in Book 1.</p>

CS-ADR – Book 1 – CS-ADR-DSN.B.195 – Clearways

p. 20-21

comment	<p>481 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #163</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.195</p> <p>Référence: CS-ADR-DSN.B.195 Clearways</p> <p>Traduction de courtoisie</p> <p>(a) It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrome design provides information on the use of clearways."</p> <p>(b) It is appropriate to modify as follows: "The origin of a possible clearway".</p> <p>(c) It is appropriate to move the (c) to IR-OPS with the following change: "The length of a possible clearway".</p> <p>(d) (1) It is appropriate to move the the (d) (1) to IR-OPS with the following change: "The width of a possible clearway".</p> <p>(d) (2) It is appropriate to move the GM.</p> <p>(e) It is appropriate to move to GM.</p> <p>(f) is to be deleted.</p> <p>Referring to a GM in a CS involve to have referenced element at the same level as CS which is not the aim.</p>
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It is appropriate to add the word "**possible**" to "clearway" in order to point out that such clearway is not an obligation.
 c) and d) 1) are actions under the responsibility of the aerodrome operator and so should be placed into IR OPS.
 For the d) 2 and the e) we are confronted to good practices and not normative references.
 The f) has to be deleted because it is already written in another provision.

response *Noted*

Accepted: (a) The reference to GM will be deleted.
Not Accepted: Inclusion of the word 'possible' is addressed in paragraph (a).
Partially Accepted: (c) Existing text will be deleted and replaced with the ICAO length requirement.
Partially Accepted: (d)(1) will be deleted.
Not accepted: (e) contains the design specifications from ICAO.
Accepted: (f) will be deleted.

comment 713

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.B.195	Clearways
Proposition/commentaire	<p>(a) Il convient de supprimer la référence: "Book 2 - Guidance Material for Aerodrome design provides information on the use of clearways."</p> <p>(b) Il convient de modifier de la manière suivante: "The origin of a possible clearway".</p> <p>(c) Il convient de déplacer le (c) dans les IR-OPS avec la modification suivante: "The length of a possible clearway".</p> <p>(d) (1) Il convient de déplacer le (d) (1) dans les IR-OPS avec la modification suivante: "The width of a possible clearway".</p> <p>(d) (2) Il convient de le déplacer en GM.</p> <p>(e) Il convient de le déplacer en GM.</p> <p>(f) est à supprimer.</p>
Justification	<p>Indiquer la référence à un GM dans un CS équivaut à avoir les éléments référencés du même niveau que la CS; ce qui n'est pas le but. Il convient de rajouter l'expression "éventuel" à "prolongement dégagé" pour insister sur le fait qu'un tel prolongement n'est pas obligatoire. Les dispositions du c) et du d) 1) sont des actions qui incombent à l'exploitant d'aérodrome et qui ont donc leur place en IR OPS.</p>

	<p>Pour le d) 2) et le e), nous avons affaire à des règles de l'art et non à des références normatives.</p> <p>Le f) est à supprimer car il est déjà pris en compte par une autre disposition et il convient d'éviter les doublons, sources d'erreur et de confusion, notamment pour les évolutions futures de la réglementation.</p>
<p>Traduction de courtoisie</p>	<p>(a) It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrome design provides information on the use of clearways."</p> <p>(b) It is appropriate to modify as follows: "The origin of a possible clearway".</p> <p>(c) It is appropriate to move the (c) to IR-OPS with the following change: "The length of a possible clearway".</p> <p>(d) (1) It is appropriate to move the the (d) (1) to IR-OPS with the following change: "The width of a possible clearway".</p> <p>(d) (2) It is appropriate to move the GM.</p> <p>(e) It is appropriate to move to GM.</p> <p>(f) is to be deleted.</p> <p>Referring to a GM in a CS involve to have referenced element at the same level as CS which is not the aim.</p> <p>It is appropriate to add the word "possible" to "clearway" in order to point out that such clearway is not an obligation.</p> <p>c) and d) 1) are actions under the responsibility of the aerodrome operator and so should be placed into IR OPS.</p> <p>For the d) 2 and the e) we are confronted to good practices and not normative references. The f) has to be deleted because it is already written in another provision.</p>
<p>response</p>	<p><i>Noted</i></p> <p><i>Accepted:</i> (a) The reference to GM will be deleted. <i>Not Accepted:</i> Inclusion of the word 'possible' is addressed in paragraph (a). <i>Partially Accepted:</i> (c) Existing text will be deleted and replaced with the ICAO</p>

length requirement.

Partially Accepted: (d)(1) will be deleted.

Not Accepted: (e) contains the design specifications from ICAO.

Accepted: (f) will be deleted.

comment 843 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on

- runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system)

intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS). Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and
- (3) 2 % where the code number is 1 or 2.

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

(1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;

(2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and

(3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.

(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface.~~"

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface. Slopes ~~should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %.~~"

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

(1) 1.5 % where the code number is 4;

(2) 1.75 % where the code number is 3; and

(3) 2 % where the code number is 1 or 2.

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~"

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded **may not exceed:**

(1) 1.5 % where the code number is 4;

(2) 1.75 % where the code number is 3; and

(3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

"~~(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not~~

exceed:

(1) 2.5 % where the code number is 3 or 4; and

(2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

(1) 2.5 % where the code number is 3 or 4; and

(2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

(1) is perpendicular to the vertical plane containing the runway centre line; and

(2) passes through a point located on the runway centre line at the end of the take-off run available.

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

(1) is perpendicular to the vertical plane containing the runway centre line; and

(2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.

(b) Transverse slopes

(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should

be as gradual as practicable."

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA should ~~can~~ be amended accordingly."

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes should may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward

transverse slope exceeding:

- (1) 2.5 % for strips where the code letter is C, D, E or F; and
 (2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~"(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

"(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "

response Noted

Comments will be addressed to under their individual CS reference.

comment

852

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.B.195 — Clearways (p20-21)

2. Justification and proposed text / comment

In paragraph (a), making such a reference to a Guidance Material in this

Certification Specification is confusing and not particularly useful in a regulation. Indeed, **from a legal perspective**, such a reference may make the content of the GM become binding, through the introduction of the CS in the certification Basis, which is absolutely not the intent of a guidance material. Consequently, DGAC proposes to delete the reference.

Note: if it is decided to keep such reference, DGAC proposes to make it as a note in the CS, as it is done in IACO Annex 14.

Provisions of paragraph (f) of this CS are already dealt with in CS-ADR-DSN.T.915 and such duplication in a regulation is to be avoided as much as possible to avoid any confusion, in particular for the future modifications.

CS-ADR-DSN.B.195 – Clearways

"(a) The inclusion of detailed specifications for clearways in this section is not intended to imply that a clearway has to be provided; ~~Book 2—Guidance Material for Aerodrome Design provides information on the use of clearways.~~

(b) Location of clearways:

The origin of a clearway should be at the end of the take-off run available.

(c) Length of clearways

The length of a clearway should be defined and published.

(d) Width of clearways:

(1) The width of a clearway should be defined and published.

(2) A clearway should extend laterally to a distance of at least 75 m on each side of the extended centre line of the runway, or, in the case of a non-instrument runway, the width of the runway strip.

[...]

~~(f) Objects on clearways:~~

~~The detailed requirements for siting objects on clearways are in CS-ADR-DSN.T.915 (Siting of equipment and installations on operational areas)."~~

response Noted

Agreed: (a) The reference to GM will be deleted.

Not Agreed: Inclusion of the word 'possible' is addressed in paragraph (a).

Partially Agreed: (c) Existing text will be deleted and replaced with the ICAO length requirement.

Partially Agreed: (d)(1) will be deleted.

Not Agreed: (e) contains the design specifications from ICAO.

Agreed: (f) will be deleted.

comment 1018

comment by: Federal Office of Civil Aviation FOCA

It is unclear why the width of a clearway should be linked to the type of runway "non-instrument" and therefore reduced in most of the cases. Please either change formulation or remove criteria. Clearways are not linked to with the approach phase. The type "non-instrument runway" is linked to visual approach only.

CS-ADR-DSN.B.195 (c): The title should be in line with CS-ADR-DSN.B.195 (b), (d), (e) and (f) - typo.

response Accepted

The non-instrument width will be deleted.

comment	<p>1284 comment by: ECA - European Cockpit Association</p> <p>Delete the following text in subparagraph (a): "The inclusion of detailed specifications for clearways in this section is not intended to imply that a clearway has to be provided"</p> <p>Replace with the following text: The inclusion of detailed specifications for clearways in this section is not intended to imply that a clearway should be provided for the purpose of increasing the take-off weight. Clearways should be provided wherever possible solely for safety purposes.</p> <p>Justification: This text requires amendment to make it clear that, whilst the implication is not intended that a clearway should be provided for the purpose of increasing the take-off weight, clearways should be provided wherever possible solely for safety purposes.</p> <p>Reference: IFALPA Annex 14, paragraph 3.6</p>
response	<p><i>Not accepted</i></p> <p>This is an operational consideration.</p>

comment	<p>1285 comment by: ECA - European Cockpit Association</p> <p>Add following subparagraph: (e) (3) The slope of a clearway should be measured and the data made available so that the effect of this slope can be taken into account for aeroplane performance purposes.</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 3.6.5.1</p>
response	<p><i>Not accepted</i></p> <p>This is an operational consideration. The information on slopes and obstacles is published in the obstacle Type A Chart.</p>

comment	<p>1300 comment by: UK CAA</p> <p>Page No: 20</p> <p>Paragraph No: CS.ADR.DSN B.195 (c)</p> <p>Comment: The length of a clearway should not exceed half the length of the</p>
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	<p>take-off run available (TORA).</p> <p>Justification: Consistency with Annex 14, (paragraph 3.6.2, which includes this limitation).</p> <p>Proposed Text: The length of a clearway should be defined and published, and should not exceed half the length of the take-off run available.</p>
response	<p><i>Partially accepted</i></p>
	<p>The following text has been added: ` (c) Length of clearways The length of a clearway should not exceed half the length of the take-off run available.`</p>
comment	<p>1436 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #164</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.195</p> <p>Référence: CS-ADR-DSN.B.195 Clearways</p> <p>Traduction de courtoisie</p> <p>(a) It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrome design provides information on the use of clearways." (b)It is appropriate to modify as follows: "The origin of a possible clearway". (c) It is appropriate to move the (c) to IR-OPS with the following change: "The length of a possible clearway". (d) (1) It is appropriate to move the the (d) (1) to IR-OPS with the following change: "The width of a possible clearway". (d) (2) It is appropriate to move the GM. (e) It is appropriate to move to GM. (f) is to be deleted.</p> <p>Referring to a GM in a CS involve to have referenced element at the same level as CS which is not the aim. It is appropriate to add the word "possible" to "clearway" in order to point out that such clearway is not an obligation. c) and d) 1) are actions under the responsibility of the aerodrome operator and so should be placed into IR OPS. For the d) 2 and the e) we are confronted to good practices and not normative references. The f) has to be deleted because it is already written in another provision.</p>
response	<p><i>Noted</i></p> <p><i>Agreed:</i> (a) The reference to GM will be deleted. <i>Not Agreed:</i> Inclusion of the word 'possible' is addressed in paragraph (a). <i>Partially Agreed:</i> (c) Existing text will be deleted and replaced with the ICAO length requirement. <i>Partially Agreed:</i> (d)(1) will be deleted.</p>

Not Agreed: (e) contains the design specifications from ICAO.
Agreed: (f) will be deleted.

comment	<p>1548 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p>
	<p>a) It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrome design provides information on the use of clearways." (b) It is appropriate to modify as follows: "The origin of a possible clearway". (c) It is appropriate to move the (c) to IR-OPS with the following change: "The length of a possible clearway". (d) (1) It is appropriate to move the the (d) (1) to IR-OPS with the following change: "The width of a possible clearway".</p>
response	<p><i>Noted</i></p> <p><i>Agreed:</i> (a) The reference to GM will be deleted. <i>Not Agreed:</i> Inclusion of the word 'possible' is addressed in paragraph (a). <i>Partially Agreed:</i> (c) Existing text will be deleted and replaced with the ICAO length requirement. <i>Partially Agreed:</i> (d)(1) will be deleted. <i>Not Agreed:</i> (e) contains the design specifications from ICAO. <i>Agreed:</i> (f) will be deleted.</p>

comment	<p>1880 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p>
	<p>Attachment #165</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.195</p> <p>Référence: CS-ADR-DSN.B.195 Clearways</p> <p>Traduction de courtoisie</p> <p>(a) It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrome design provides information on the use of clearways." (b) It is appropriate to modify as follows: "The origin of a possible clearway". (c) It is appropriate to move the (c) to IR-OPS with the following change: "The length of a possible clearway". (d) (1) It is appropriate to move the the (d) (1) to IR-OPS with the following change: "The width of a possible clearway". (d) (2) It is appropriate to move the GM. (e) It is appropriate to move to GM. (f) is to be deleted. Referring to a GM in a CS involve to have referenced element at the same level as CS which is not the aim. It is appropriate to add the word "possible" to "clearway" in order to point out that such clearway is not an obligation.</p>

	<p>c) and d) 1) are actions under the responsibility of the aerodrome operator and so should be placed into IR OPS. For the d) 2 and the e) we are confronted to good practices and not normative references. The f) has to be deleted because it is already written in another provision.</p>
response	<p><i>Noted</i></p> <p><i>Agreed:</i> (a) The reference to GM will be deleted. <i>Not Agreed:</i> Inclusion of the word 'possible' is addressed in paragraph (a). <i>Partially Agreed:</i> (c) Existing text will be deleted and replaced with the ICAO length requirement. <i>Partially Agreed:</i> (d)(1) will be deleted. <i>Not Agreed:</i> (e) contains the design specifications from ICAO. <i>Agreed:</i> (f) will be deleted.</p>
comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p>
	<p><i>Noted</i></p>
response	<p><i>Noted</i></p>
comment	<p>2430 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p>
	<p>It is unclear why the width of a clearway should be linked to the type of runway "non-instrument" and therefore reduced in most of the cases. EASA should either change the formulation or remove this criteria.</p>
response	<p><i>Accepted</i></p> <p>The requirement for non-instrument clearway width will be deleted.</p>
comment	<p>2503 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p>
	<p>CS-ADR-DSN.C.195 - Slopes on clearways "[...](e) <i>Slopes on clearways:</i> <i>Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.</i> The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which: (1) is perpendicular to the vertical plane containing the runway centre line; and (2) passes through a point located on the runway centre line at the end of the take-off run available. [...]"</p>
response	<p><i>Not accepted</i></p>

This is an ICAO design requirement.

comment 2658 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#166](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.195

Référence: CS-ADR-DSN.B.195

Clearways

Traduction de courtoisie

(a) It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrome design provides information on the use of clearways."

(b) It is appropriate to modify as follows: "The origin of a possible clearway".

(c) It is appropriate to move the (c) to IR-OPS with the following change: "The length of a possible clearway".

(d) (1) It is appropriate to move the the (d) (1) to IR-OPS with the following change: "The width of a possible clearway".

(d) (2) It is appropriate to move the GM.

(e) It is appropriate to move to GM.

(f) is to be deleted.

Referring to a GM in a CS involve to have referenced element at the same level as CS which is not the aim.

It is appropriate to add the word "possible" to "clearway" in order to point out that such clearway is not an obligation.

c) and d) 1) are actions under the responsibility of the aerodrome operator and so should be placed into IR OPS.

For the d) 2 and the e) we are confronted to good practices and not normative references.

The f) has to be deleted because it is already written in another provision.

response *Noted*

Agreed: (a) The reference to GM will be deleted.

Not Agreed: Inclusion of the word 'possible' is addressed in paragraph (a).

Partially Agreed: (c) Existing text will be deleted and replaced with the ICAO length requirement.

Partially Agreed: (d)(1) will be deleted.

Not Agreed: (e) contains the design specifications from ICAO.

Agreed: (f) will be deleted.

comment 2843 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.B.195

Clearways

Proposition/commentaire

(a) Il convient de supprimer la référence: "Book 2 - Guidance Material for Aerodrome design provides information on the use of clearways."

	<p>(b) Il convient de modifier de la manière suivante: "The origin of a possible clearway".</p> <p>(c) Il convient de déplacer le (c) dans les IR-OPS avec la modification suivante: "The length of a possible clearway".</p> <p>(d) (1) Il convient de déplacer le (d) (1) dans les IR-OPS avec la modification suivante: "The width of a possible clearway".</p> <p>(d) (2) Il convient de le déplacer en GM.</p> <p>(e) Il convient de le déplacer en GM.</p> <p>(f) est à supprimer.</p>
Justification	<p>Indiquer la référence à un GM dans un CS équivaut à avoir les éléments référencés du même niveau que la CS; ce qui n'est pas le but. Il convient de rajouter l'expression "éventuel" à "prolongement dégagé" pour insister sur le fait qu'un tel prolongement n'est pas obligatoire. Les dispositions du c) et du d) 1) sont des actions qui incombent à l'exploitant d'aérodrome et qui ont donc leur place en IR OPS.</p> <p>Pour le d) 2) et le e), nous avons affaire à des règles de l'art et non à des références normatives.</p> <p>Le f) est à supprimer car il est déjà pris en compte par une autre disposition et il convient d'éviter les doublons, sources d'erreur et de confusion, notamment pour les évolutions futures de la réglementation.</p>
Traduction de courtoisie	<p>(a) It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrome design provides information on the use of clearways."</p> <p>(b) It is appropriate to modify as follows: "The origin of a possible clearway".</p> <p>(c) It is appropriate to move the (c) to IR-OPS with the following change: "The length of a possible clearway".</p> <p>(d) (1) It is appropriate to move the the (d) (1) to IR-OPS with the following change: "The width of a possible clearway".</p> <p>(d) (2) It is appropriate to move the GM.</p> <p>(e) It is appropriate to move to GM.</p>

	<p>(f) is to be deleted.</p> <p>Referring to a GM in a CS involve to have referenced element at the same level as CS which is not the aim. It is appropriate to add the word "possible" to "clearway" in order to point out that such clearway is not an obligation. c) and d) 1) are actions under the responsibility of the aerodrome operator and so should be placed into IR OPS. For the d) 2 and the e) we are confronted to good practices and not normative references. The f) has to be deleted because it is already written in another provision.</p>
response	<p><i>Noted</i></p> <p><i>Agreed:</i> (a) The reference to GM will be deleted. <i>Not Agreed:</i> Inclusion of the word 'possible' is addressed in paragraph (a). <i>Partially Agreed:</i> (c) Existing text will be deleted and replaced with the ICAO length requirement. <i>Partially Agreed:</i> (d)(1) will be deleted. <i>Not Agreed:</i> (e) contains the design specifications from ICAO. <i>Agreed:</i> (f) will be deleted.</p>

comment

2890	<p>comment by: <i>SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard</i></p> <p>Attachment #167</p> <p>SEARD NPA 2011-20 (B.III) CS-ADR-DSN.B.195</p> <p>Référence: CS-ADR-DSN.B.195 Clearways</p> <p>Traduction de courtoisie</p> <p>(a) It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrome design provides information on the use of clearways." (b)It is appropriate to modify as follows: "The origin of a possible clearway". (c) It is appropriate to move the (c) to IR-OPS with the following change: "The length of a possible clearway". (d) (1) It is appropriate to move the the (d) (1) to IR-OPS with the following change: "The width of a possible clearway". (d) (2) It is appropriate to move the GM. (e) It is appropriate to move to GM.</p>
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	<p>(f) is to be deleted. Referring to a GM in a CS involve to have referenced element at the same level as CS which is not the aim. It is appropriate to add the word "possible" to "clearway" in order to point out that such clearway is not an obligation. c) and d) 1) are actions under the responsibility of the aerodrome operator and so should be placed into IR OPS. For the d) 2 and the e) we are confronted to good practices and not normative references. The f) has to be deleted because it is already written in another provision.</p>
response	<p><i>Noted</i></p> <p><i>Agreed:</i> (a) The reference to GM will be deleted. <i>Not Agreed:</i> Inclusion of the word 'possible' is addressed in paragraph (a). <i>Partially Agreed:</i> (c) Existing text will be deleted and replaced with the ICAO length requirement. <i>Partially Agreed:</i> (d)(1) will be deleted. <i>Not Agreed:</i> (e) contains the design specifications from ICAO. <i>Agreed:</i> (f) will be deleted.</p>

comment	<p>3126 comment by: ATB Aéroport Toulouse-Blagnac - TLS/LFBO</p> <p>Attachment #168</p> <p>ATB NPA 2011-20 (B.III) CS-ADR-DSN.B.195</p> <p>Référence: CS-ADR-DSN.B.195 Clearways</p> <p>Traduction de courtoisie (a) It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrome design provides information on the use of clearways." (b) It is appropriate to modify as follows: "The origin of a possible clearway". (c) It is appropriate to move the (c) to IR-OPS with the following change: "The length of a possible clearway". (d) (1) It is appropriate to move the the (d) (1) to IR-OPS with the following change: "The width of a possible clearway". (d) (2) It is appropriate to move the GM. (e) It is appropriate to move to GM. (f) is to be deleted. Referring to a GM in a CS involve to have referenced element at the same level as CS which is not the aim. It is appropriate to add the word "possible" to "clearway" in order to point out that such clearway is not an obligation. c) and d) 1) are actions under the responsibility of the aerodrome operator and so should be placed into IR OPS. For the d) 2 and the e) we are confronted to good practices and not normative references. The f) has to be deleted because it is already written in another provision.</p>
response	<p><i>Noted</i></p>

Agreed: (a) The reference to GM will be deleted.
Not Agreed: Inclusion of the word 'possible' is addressed in paragraph (a).
Partially Agreed: (c) Existing text will be deleted and replaced with the ICAO length requirement.
Partially Agreed: (d)(1) will be deleted.
Not Agreed: (e) contains the design specifications from ICAO.
Agreed: (f) will be deleted.

CS-ADR – Book 1 – CS-ADR-DSN.B.200 – Stopways

p. 21

comment 23 comment by: *ACI EUROPE - Airports Council International*

(d) (2) delete

Justification: impossible to measure

response *Partially accepted*

Paragraph (d)(2) will be moved to GM.

comment 62 comment by: *Amsterdam Airport Schiphol - AMS/EHAM (and D.A.A)*

What are the characteristics of an unpaved stopway and how are they to be measured?

response *Partially accepted*

Paragraph (d)(2) will be moved to GM.

comment 221 comment by: *CAA Austria - Ministry of Transport*

(d)(2) has to be clarified - in which way the friction on an unpaved area should be measured

response *Partially accepted*

Paragraph (d)(2) will be moved to GM.

comment 342 comment by: *Vienna International Airport*

(d)(2) delete or clarify - its impossible to measure

response *Partially accepted*

Paragraph (d)(2) will be moved to GM.

comment 401

comment by: *Cologne/Bonn Airport*

add

(a) The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided; Book 2 – Guidance Material for Aerodrome Design provides information on the use of stopways.

According to the provisions for clearways

change

(a) to (b)

(b) to (c)

(c) to (d)

response *Accepted*

comment 482

comment by: *Union des Aéroports français - UAF*

Attachment [#169](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.200

Référence: CS-ADRDSN.B.200 (2)

"(2) The friction characteristics of an unpaved stopway should not be substantially less than that of the runway with which the stopway is associated."

Traduction de courtoisie

As done in the CS-ADR-DSN.B.195 (a), it is appropriate to add:

"The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided".

It is appropriate to delete the (b) which is not enough clear and can conduct to discussions between the operator and the certifier.

It is appropriate to delete the reference to "Book 2 - Guidance Material for Aerodrome Design presents guidance relative to the support capability of a stopway", pour ne pas avoir ce GM avec une même valeur réglementaire que le CS.

It is appropriate to replace the (1) and (2) of the (d) by the new provision introduced in the States letter n° 41 from the works of the Friction task Force of the ICAO : "the surface of a stopway shall be so constructed or resurfaced as to provide surface friction characteristics at or above those of the associated runway".

response *Partially accepted*

Partially Agreed: The following text will be added to the CS: *The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided.*

The slope requirements from CS-ADR-DSN.060 to CS-ADR-DSN.080 will be added to paragraph (b).

Agreed: The reference to GM will be deleted from paragraph (c).

Not Agreed: ICAO wording will be used in paragraph (d)(1). Reference to unpaved stopway friction characteristics in (d)(2) has been moved to GM.

comment 606

comment by: *Avinor*

CS.ADR.DSN.B.200 (d) (2). Delete. Operations in practice have proved to be safe with shoulders less than 75m, i.e. 60m and Aribus as well as Airlines have proved it. This based on ICAO Circular 301 and 305.

response *Noted*

Partially Agreed: CS B.200 paragraph (d)(2) will be moved to GM.

Not Agreed: Distances (60 m for Code D and E and 75 m for Code F) are derived from ICAO Annex 14. The relevant distances are reflected in ICAO Circular 305.

comment 710

comment by: *Munich Airport International*

add

(a) The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided; Book 2 – Guidance Material for Aerodrome Design provides information on the use of stopways

change

(a) to (b)
(b) to (c)
(c) to (d)

Justification: According to the provisions for clearways

response *Accepted*

comment 714

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-	Stopways
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DSN.B.200	
Proposition/commentaire	<p>Il convient d'ajouter comme cela a été fait au CS-ADR-DSN.B.195 (a): "The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided".</p> <p>(b) Il convient de supprimer le (b) qui n'est pas suffisamment clair et source de discussions interminables entre l'exploitant et le certificateur.</p> <p>(c) Il convient de supprimer la référence "Book 2 - Guidance Material for Aerodrome Design presents guidance relative to the support capability of a stopway", pour ne pas avoir ce GM avec une même valeur réglementaire que le CS.</p> <p>(d) Il convient de remplacer les (1) et (2) du (d) par la nouvelle disposition introduite par la lettre aux Etats n°41, issue des travaux de la Friction Task Force de l'OACI: "the surface of a stopway shall be so constructed or resurfaced as to provide surface friction characteristics at or above those of the associated runway".</p>
Justification	
Traduction de courtoisie	<p>As done in the CS-ADR-DSN.B.195 (a), it is appropriate to add: "The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided".</p> <p>It is appropriate to delete the (b) which is not enough clear and can conduct to discussions between the operator and the certifier.</p> <p>It is appropriate to delete the reference to "Book 2 - Guidance Material for Aerodrome Design presents guidance relative to the support capability of a stopway", pour ne pas avoir ce GM avec une même valeur réglementaire que le CS.</p> <p>It is appropriate to replace the (1) and (2) of the (d) by the new provision introduced in the States letter n° 41 from the works of the Friction task Fprce of the ICAO : "the surface of a stopway shall be so constructed or resurfaced as to provide surface friction characteristics at or above those of the associated runway".</p>

response *Partially accepted*

Partially Agreed: The following text will be added to the CS: *The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided.*

The slope requirements from CS-ADR-DSN.060 to CS-ADR-DSN.080 will be added to paragraph (b).

Agreed: The reference to GM will be deleted from paragraph (c).

Not Agreed: ICAO wording will be used in paragraph (d)(1). Reference to unpaved stopway friction characteristics in (d)(2) has been moved to GM.

comment 796

comment by: *Munich Airport International*

(d)

(2): delete

Justification: impossible to measure

response *Partially accepted*

Paragraph (d)(2) will be moved to GM.

comment 888

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.B.200 — Stopways (p21)

2. Justification and proposed text / comment

* As done for clearways in paragraph (a) of CS-ADR-DSN.B.195, there is a need to indicate also for stopways that "*The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided*".

* As written paragraph (b) is not enough clear and ambiguous since the objective of the stopway is already clearly defined in the definition provided in CS-ADR-DSN.A.002. It is proposed to indicate that the slope is appropriate to meet the objective detailed in the definition of the stopway.

* In paragraph (c), making such a reference to a Guidance Material in this Certification Specification is confusing and not particularly useful in a regulation. Indeed, **from a legal perspective**, such a reference may make the content of the GM become binding, through the introduction of the CS in the

certification Basis, which is absolutely not the intent of a guidance material. Consequently, DGAC proposes to delete the reference.

Note: if it is decided to keep such reference, DGAC proposes to make it as a note in the CS, as it is done in IACO Annex 14.

* Finally, it is appropriate in paragraph (d) to use the new provisions introduced in ICAO State Letter 11/41 which was the result of the work of the ICAO friction task force.

CS-ADR-DSN.B.200 – Stopways

"The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided.

(a) Width of stopways:

A stopway should have the same width as the runway with which it is associated.

(b) Slopes on stopways:

Slopes on stopways should be ~~defined and optimised~~ appropriate to meet the objective of a stopway as detailed in its definition.

(c) Strength of stopways:

A stopway should be prepared or constructed so as to be capable, in the event of an abandoned take-off, of supporting the aeroplane which the stopway is intended to serve without inducing structural damage to the aeroplane. ~~Book 2 – Guidance Material for Aerodrome Design presents guidance relative to the support capability of a stopway.~~

(d) Surface of stopways:

The surface of a stopway should be so constructed or resurfaced as to provide surface friction characteristics at or above those of the associated runway.

(1) The surface of a paved stopway should be so constructed as to provide a good coefficient of friction to be compatible with that of the associated runway when the stopway is wet.

(2) The friction characteristics of an unpaved stopway should not be substantially less than that of the runway with which the stopway is associated."

response *Partially accepted*

Partially Agreed: The following text will be added to the CS: *The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided.*

The slope requirements from CS-ADR-DSN.060 to CS-ADR-DSN.080 will be added to paragraph (b).

Agreed: The reference to GM will be deleted from paragraph (c).

Not Agreed: ICAO wording will be used in paragraph (d)(1). Reference to unpaved stopway friction characteristics in (d)(2) has been moved to GM.

comment 991

comment by: *Salzburger Flughafen GmbH*

(d) (2) delete or clarify - it's impossible to measure

response *Partially accepted*

Paragraph (d)(2) will be moved to GM.

comment	1019	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	CS.ADR.DSN.B.200 (b): "should be optimised" needs to be more precise or otherwise deleted.	
response	<i>Accepted</i>	
	ICAO Annex 14 text will be moved from GM to CS to clarify specifications.	
comment	1098	comment by: <i>Flughafen Graz Betriebs GmbH</i>
	(d)(2) delete or clarify - its impossible to measure	
response	<i>Partially accepted</i>	
	Paragraph (d)(2) will be moved to GM.	
comment	1142	comment by: <i>Flughafen Düsseldorf GmbH</i>
	d)2) Wie sollen die Reibungscharakteristika einer unbefestigten Stoppbahn gemessen werden? Dies ist nicht möglich; daher ist der Punkt zu streichen.	
response	<i>Partially accepted</i>	
	Paragraph (d)(2) will be moved to GM.	
comment	1165	comment by: <i>Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH</i>
	(d)(2) delete or clarify - its impossible to measure	
response	<i>Partially accepted</i>	
	Paragraph (d)(2) will be moved to GM.	
comment	1286	comment by: <i>ECA - European Cockpit Association</i>
	Add the following new paragraph (a): The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway should be provided for the purpose of increasing the take-off or landing weight. Where provided, it should be for the purpose of offering added aid for emergency use	
	Renumber the existing paragraphs	

	<p>Justification: Contrary to the practice of some States, we believe that stopways should not be taken into account for performance purposes. The reasons for this are: i) The braking coefficient cannot be satisfactorily measured; hence the accelerate-stop distance and the landing distance may not be conservative if they include stopway credit. ii) The surface cannot be depended on (e.g. in the tropics it is common for the stopways to be of Laterite, which becomes unserviceable immediately after heavy rain). Accordingly, the text requires amendment to make it clear that, whilst the implication is not intended that a stopway should be provided for the purpose of increasing the take-off or landing weight, where a stopway is provided it should be for the purpose of offering added aid for emergency use.</p> <p>Reference: IFALPA Annex 14, paragraph 3.7</p>
response	<p><i>Noted</i></p> <p><i>Partially Agreed:</i> The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided. <i>Note:</i> The remaining comments relate to operational considerations.</p>
comment	<p>1433 comment by: <i>Geneva International Airport (ROMIG)</i></p> <p>Delete Impossible to measure</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (d)(2) will be moved to GM.</p>
comment	<p>1437 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #170</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.200</p> <p>Référence: CS-ADRDSN.B.200 (2) "(2) The friction characteristics of an unpaved stopway should not be substantially less than that of the runway with which the stopway is associated."</p> <p>Traduction de courtoisie As done in the CS-ADR-DSN.B.195 (a), it is appropriate to add: "The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided". It is appropriate to delete the (b) which is not enough clear and can conduct to discussions between the operator and the certifier. It is appropriate to delete the reference to "Book 2 - Guidance Material for Aerodrome Design presents guidance relative to the support capability of a</p>

stopway", pour ne pas avoir ce GM avec une même valeur règlementaire que le CS.

It is appropriate to replace the (1) and (2) of the (d) by the new provision introduced in the States letter n° 41 from the works of the Friction task Force of the ICAO : "the surface of a stopway shall be so constructed or resurfaced as to provide surface friction characteristics at or above those of the associated runway".

response *Partially accepted*

Partially Agreed: The following text will be added to the CS: *The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided.*

The slope requirements from CS-ADR-DSN.060 to CS-ADR-DSN.080 will be added to paragraph (b).

Agreed: The reference to GM will be deleted from paragraph (c).

Not Agreed: ICAO wording will be used in paragraph (d)(1). Reference to unpaved stopway friction characteristics in (d)(2) has been moved to GM.

comment 1497 comment by: *Flughafen Linz-Hörsching - LNZ/LOWL*

(d)(2) delete or clarify - it's impossible to measure

response *Partially accepted*

Paragraph (d)(2) will be moved to GM.

comment 1549 comment by: *Aéroport de Marseille - MRS/LFML*

As done in the CS-ADR-DSN.B.195 (a), it is appropriate to add: "The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided".

It is appropriate to delete the (b) which is not enough clear and can conduct to discussions between the operator and the certifier.

It is appropriate to delete the reference to "Book 2 - Guidance Material for Aerodrome Design presents guidance relative to the support capability of a stopway", pour ne pas avoir ce GM avec une même valeur règlementaire que le CS.

It is appropriate to replace the (1) and (2) of the (d) by the new provision introduced in the States letter n° 41 from the works of the Friction task Force of the ICAO : "the surface of a stopway shall be so constructed or resurfaced as to provide surface friction characteristics at or above those of the associated runway".

response	<p><i>Partially accepted</i></p> <p><i>Partially Agreed:</i> The following text will be added to the CS: <i>The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided.</i> The slope requirements from CS-ADR-DSN.060 to CS-ADR-DSN.080 will be added to paragraph (b).</p> <p><i>Agreed:</i> The reference to GM will be deleted from paragraph (c).</p> <p><i>Not Agreed:</i> ICAO wording will be used in paragraph (d)(1). Reference to unpaved stopway friction characteristics in (d)(2) has been moved to GM.</p>
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comment	<p>1798 comment by: <i>MWEBWV Ministerium für Wirtschaft, Energie, Bauen, Wohnen und Verkehr des Landes Nordrhein-Westfalen</i></p> <p>d) (2) should be deleted, because this requirement is not measurable.</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (d)(2) will be moved to GM.</p>

comment	<p>1881 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #171</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.200 Référence: CS-ADRDSN.B.200 (2) “(2) The friction characteristics of an unpaved stopway should not be substantially less than that of the runway with which the stopway is associated.”</p> <p>Traduction de courtoisie As done in the CS-ADR-DSN.B.195 (a), it is appropriate to add: "The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided". It is appropriate to delete the (b) which is not enough clear and can conduct to discussions between the operator and the certifier. It is appropriate to delete the reference to "Book 2 - Guidance Material for Aerodrome Design presents guidance relative to the support capability of a stopway", pour ne pas avoir ce GM avec une même valeur réglementaire que le CS. It is appropriate to replace the (1) and (2) of the (d) by the new provision introduced in the States letter n° 41 from the works of the Friction task Force of the ICAO : "the surface of a stopway shall be so constructed or resurfaced as to provide surface friction characteristics at or above those of the associated runway".</p>
response	<p><i>Partially accepted</i></p>

Partially Agreed: The following text will be added to the CS: *The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided.*

The slope requirements from CS-ADR-DSN.060 to CS-ADR-DSN.080 will be added to paragraph (b).

Agreed: The reference to GM will be deleted from paragraph (c).

Not Agreed: ICAO wording will be used in paragraph (d)(1). Reference to unpaved stopway friction characteristics in (d)(2) has been moved to GM.

comment 2212 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2428 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

(b) what is "optimised"? - very unclear, delete.

response *Accepted*

ICAO Annex 14 text will be moved from GM to CS.

comment 2429 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

(d) (2) should be deleted, not measurable

response *Partially accepted*

(d)(2) will be moved to GM.

comment 2456 comment by: *Airport Nuremberg - NUE/EDDN*

In line with the regulation on clearways (CS-ADR-DSN.B.195) the introducing note should be added for stopways as well:

The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided. Attachment A, Section 2, provides information on the use of stopways.

response *Accepted*

ICAO Annex 14 text will be moved from GM to CS.

comment	2457	comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	<p>In order to prevent the aerodromes from having to construct existing stopways completely new or having to maintain existing stopways with huge effort, cost and complexity, this ICAO recommendation should be moved to guidance material!</p>	
response	<p><i>Noted</i></p> <p>The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided.</p>	

comment	2530	comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	<p>As done for clearways in paragraph (a) of CS-ADR-DSN.B.195, there is a need to indicate also for stopways that <i>"The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided"</i>.</p> <p>* As written paragraph (b) is not enough clear and ambiguous since the objective of the stopway is already clearly defined in the definition provided in CS-ADR-DSN.A.002. It is proposed to indicate that the slope is appropriate to meet the objective detailed in the definition of the stopway.</p> <p>* In paragraph (c), making such a reference to a Guidance Material in this Certification Specification is confusing and not particularly useful in a regulation. Indeed, from a legal perspective, such a reference may make the content of the GM become binding, through the introduction of the CS in the certification Basis, which is absolutely not the intent of a guidance material. Consequently, It is proposed to delete the reference.</p> <p><i>Note: if it is decided to keep such reference, It is proposed to make it as a note in the CS, as it is done in IACO Annex 14.</i></p> <p>* Finally, it is appropriate in paragraph (d) to use the new provisions introduced in ICAO State Letter 11/41 which was the result of the work of the ICAO friction task force.</p> <p>CS-ADR-DSN.B.200 – Stopways</p> <p><i>"The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided.</i></p> <p><i>(a) Width of stopways:</i> <i>A stopway should have the same width as the runway with which it is associated.</i></p> <p><i>(b) Slopes on stopways:</i> <i>Slopes on stopways should be defined and optimised appropriate to meet the objective of a stopway as detailed in its definition.</i></p> <p><i>(c) Strength of stopways:</i> <i>A stopway should be prepared or constructed so as to be capable, in the event of an abandoned take-off, of supporting the aeroplane which the stopway is intended to serve without inducing structural damage to the aeroplane. Book 2 – Guidance Material for Aerodrome Design presents guidance relative to the support capability of a stopway.</i></p> <p><i>(d) Surface of stopways:</i> <i>The surface of a stopway should be so constructed or resurfaced as to provide</i></p>	

surface friction characteristics at or above those of the associated runway.
~~(1) The surface of a paved stopway should be so constructed as to provide a good coefficient of friction to be compatible with that of the associated runway when the stopway is wet.~~
~~(2) The friction characteristics of an unpaved stopway should not be substantially less than that of the runway with which the stopway is associated."~~

response *Partially accepted*

Partially Agreed: The following text will be added to the CS: *The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided.*

The slope requirements from CS-ADR-DSN.060 to CS-ADR-DSN.080 will be added to paragraph (b).

Agreed: The reference to GM will be deleted from paragraph (c).

Not Agreed: ICAO wording will be used in paragraph (d)(1). Reference to unpaved stopway friction characteristics in (d)(2) has been moved to GM.

comment

2660

comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#172](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.200

Référence: CS-ADRDSN.B.200 (2)

"(2) The friction characteristics of an unpaved stopway should not be substantially less than that of the runway with which the stopway is associated."

Traduction de courtoisie

As done in the CS-ADR-DSN.B.195 (a), it is appropriate to add:

"The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided".

It is appropriate to delete the (b) which is not enough clear and can conduct to discussions between the operator and the certifier.

It is appropriate to delete the reference to "Book 2 - Guidance Material for Aerodrome Design presents guidance relative to the support capability of a stopway", pour ne pas avoir ce GM avec une même valeur réglementaire que le CS.

It is appropriate to replace the (1) and (2) of the (d) by the new provision introduced in the States letter n° 41 from the works of the Friction task Force of the ICAO : "the surface of a stopway shall be so constructed or resurfaced as to provide surface friction characteristics at or above those of the associated runway".

response *Partially accepted*

Partially Agreed: The following text will be added to the CS: *The inclusion of detailed specifications for stopways in this section is not intended to imply that*

a stopway has to be provided.

The slope requirements from CS-ADR-DSN.060 to CS-ADR-DSN.080 will be added to paragraph (b).

Agreed: The reference to GM will be deleted from paragraph (c).

Not Agreed: ICAO wording will be used in paragraph (d)(1). Reference to unpaved stopway friction characteristics in (d)(2) has been moved to GM.

comment	2715	comment by: <i>Flughafen Klagenfurt</i>
	(d)(2) delete or clarify - its impossible to measure	
response	<i>Partially accepted</i>	
	Paragraph (d)(2) will be moved to GM.	

comment	2782	comment by: <i>Brussels Airport</i>
	CS-ADR-DSN.B.200	
	To delete (d)(2)	
	How to measure the friction of a unpaved stopway ?	
response	<i>Partially accepted</i>	
	Paragraph (d)(2) will be moved to GM.	

comment	2844	comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i>
	<u>Référence: CS-ADR-DSN.B.200 (2)</u>	"(2) The friction characteristics of an unpaved stopway should not be substantially less than that of the runway with which the stopway is associated."
	Proposition/commentaire	Il convient d'ajouter comme cela a été fait au CS-ADR-DSN.B.195 (a): "The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided". (b) Il convient de supprimer le (b) qui n'est pas suffisamment clair et source de discussions interminables entre l'exploitant et le certificateur. (c) Il convient de supprimer la référence "Book

	<p>2 - Guidance Material for Aerodrome Design presents guidance relative to the support capability of a stopway", pour ne pas avoir ce GM avec une même valeur réglementaire que le CS.</p> <p>(d) Il convient de remplacer les (1) et (2) du (d) par la nouvelle disposition introduite par la lettre aux Etats n°41, issue des travaux de la Friction Task Force de l'OACI: "the surface of a stopway shall be so constructed or resurfaced as to provide or above those of the associated runway".</p>
Justification	
Traduction de courtoisie	<p>As done in the CS-ADR-DSN.B.195 (a), it is appropriate to add: "The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided".</p> <p>It is appropriate to delete the (b) which is not enough clear and can conduct to discussions between the operator and the certifier.</p> <p>It is appropriate to delete the reference to "Book 2 - Guidance Material for Aerodrome Design presents guidance relative to the support capability of a stopway", pour ne pas avoir ce GM avec une même valeur réglementaire que le CS.</p> <p>It is appropriate to replace the (1) and (2) of the (d) by the new provision introduced in the States letter n° 41 from the works of the Friction task Fprce of the ICAO : "the surface of a stopway shall be so constructed or resurfaced as to provide or above those of the associated runway".</p>

response *Partially accepted*

Partially Agreed: The following text will be added to the CS: *The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided.*

The slope requirements from CS-ADR-DSN.060 to CS-ADR-DSN.080 will be added to paragraph (b).

Agreed: The reference to GM will be deleted from paragraph (c).

Not Agreed: ICAO wording will be used in paragraph (d)(1). Reference to unpaved stopway friction characteristics in (d)(2) has been moved to GM.

comment	3007	comment by: <i>ADV -German Airports Association</i>
	<p>CS-ADR-DSN.B.200 – Stopways add (a) The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided; Book 2 – Guidance Material for Aerodrome Design provides information on the use of stopways. change (a) to (b) (b) to (c) (c) to (d)</p> <p>Justification According to the provisions for clearways</p>	
response	<i>Accepted</i>	

comment	3018	comment by: <i>ADV -German Airports Association</i>
	<p>CS.ADR.DSN.B.200 (d) (2) delete</p> <p>Justification impossible to measure</p>	
response	<i>Partially accepted</i>	
	<p>Paragraph (d)(2) will be moved to GM.</p>	

comment	3042	comment by: <i>MST / STR - Stuttgart Airport</i>
	<p>CS-ADR-DSN.B.200 – Stopways add (a) The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided; Book 2 – Guidance Material for Aerodrome Design provides information on the use of stopways. change (a) to (b) (b) to (c) (c) to (d)</p> <p>Justification</p>	

	According to the provisions for clearways
response	<i>Accepted</i>

comment	3053 comment by: <i>MST / STR - Stuttgart Airport</i>
	CS.ADR.DSN.B.200 (d) (2) delete
	Justification impossible to measure
response	<i>Partially accepted</i>
	Paragraph (d)(2) will be moved to GM.

comment	3086 comment by: <i>Fraport AG</i>
	CS-ADR-DSN.B.200 — Stopways (d) (2)
	Editorial
	The friction characteristics of an unpaved stopway should not be substantially less than that of the runway with which the stopway is associated.
	Delete complete paragraph
	Fraport AG impossible to measure
response	<i>Partially accepted</i>
	Paragraph (d)(2) will be moved to GM.

comment	3125 comment by: <i>ATB Aéroport Toulouse-Blagnac - TLS/LFBO</i>
	Attachment #173
	ATB NPA 2011-20 (B.III) CS-ADR-DSN.B.200
	Référence: CS-ADRDSN.B.200 (2) “(2) The friction characteristics of an unpaved stopway should not be substantially less than that of the runway with which the stopway is associated.”
	Traduction de courtoisie As done in the CS-ADR-DSN.B.195 (a), it is appropriate to add:

"The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided".
 It is appropriate to delete the (b) which is not enough clear and can conduct to discussions between the operator and the certifier.
 It is appropriate to delete the reference to "Book 2 - Guidance Material for Aerodrome Design presents guidance relative to the support capability of a stopway", pour ne pas avoir ce GM avec une même valeur réglementaire que le CS.
 It is appropriate to replace the (1) and (2) of the (d) by the new provision introduced in the States letter n° 41 from the works of the Friction task Force of the ICAO : "the surface of a stopway shall be so constructed or resurfaced as to provide surface friction characteristics at or above those of the associated runway".

response *Partially accepted*

Partially Agreed: The following text will be added to the CS: *The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided.*
 The slope requirements from CS-ADR-DSN.060 to CS-ADR-DSN.080 will be added to paragraph (b).
Agreed: The reference to GM will be deleted from paragraph (c).
Not Agreed: ICAO wording will be used in paragraph (d)(1). Reference to unpaved stopway friction characteristics in (d)(2) has been moved to GM.

CS-ADR – Book 1 – CS-ADR-DSN.B.205 – Radio altimeter operating area

p. 21

comment 49 comment by: *Belfast International Airport - BFS/EGAA*

We note the dimensions but what are the other requirements eg slopes, gradients etc for the radio altimeter operating area?

response *Noted*

No hard specification; therefore, slope guidance is in GM B.205.

comment 140 comment by: *CAA Norway*

A radio altimeter operating area is only needed in CAT II/III ops. We suggest to add the same as is in Annex 14 3.8.1: "**A radio altimeter operating area should be established in the pre-threshold area of an precision approach runway.**" (This should be (a) and (a) to become (b) etc.)

response *Accepted*

Reference to precision approach runway will be added to paragraph (a).

comment	<p>282 comment by: <i>Icelandic Civil Aviation Administration</i></p> <p>The application is missing here. CS-ADR-DSN.B.205 on page 21: A radio altimeter operating area is only needed in CAT II/III ops. We suggest to add the same as is in Annex 14 3.8.1: "A radio altimeter operating area should be established in the pre-threshold area of a precision approach runway." (This should then be (a) and (a) to become (b) etc.)</p>
response	<p><i>Accepted</i></p> <p>Reference to precision approach runway will be added to paragraph (a).</p>
comment	<p>355 comment by: <i>Estonian CAA</i></p> <p>CS-ADR-DSN.B.205 on page 21: A radio altimeter operating area is only needed in CAT II/III ops. We suggest to add the same as is in Annex 14 3.8.1: "A radio altimeter operating area should be established in the pre-threshold area of a precision approach runway." (This should then be (a) and (a) to become (b) etc.)</p>
response	<p><i>Accepted</i></p> <p>Reference to precision approach runway will be added to paragraph (a).</p>
comment	<p>483 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #174</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.205</p> <p>Référence: CS-ADR-DSN.B.205 Radio altimeter operating area</p> <p>Traduction de courtoisie It is appropriate to transfer this provision to GM as annotated.</p>
response	<p><i>Partially accepted</i></p> <p>Reference to the requirement of the radio altimeter operating area for precision approach runways is inserted (as new paragraph (a)). The ICAO text relating to longitudinal slope changes is incorporated in GM B.205(a).</p>
comment	<p>636 comment by: <i>Finnish Transport Safety Agency</i></p> <p>CS-ADR-DSN.B.205 on page 21: A radio altimeter operating area is only needed in CAT II/III ops. We suggest to add the same as is in Annex 14 3.8.1:</p>

"A radio altimeter operating area should be established in the pre-threshold area of an precision approach runway." (This should then be (a) and (a) to become (b) etc.)

response *Accepted*

Reference to precision approach runway will be added to paragraph (a).

comment

715

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.B.205	Radio altimeter operating area
Proposition/commentaire	Il convient de transférer cette disposition en GM comme annoté (« Move to GM »).
Justification	
Traduction de courtoisie	It is appropriate to transfer this provision to GM as annotated.

response *Partially accepted*

Reference to the requirement of the radio altimeter operating area for precision approach runways is inserted (as new paragraph (a)). The ICAO text relating to longitudinal slope changes is incorporated in GM B.205(a).

comment

1150

comment by: *Swedish Transport Agency*

CS-ADR-DSN.B.205 on page 21: A radio altimeter operating area is only needed in CAT II/III ops. We suggest to add the same as is in Annex 14 3.8.1: "A radio altimeter operating area should be established in the pre-threshold area of an precision approach runway." (This should then be (a) and (a) to become (b) etc.)

response *Accepted*

Reference to precision approach runway will be added to paragraph (a).

comment

1302

comment by: *UK CAA*

Page No: 21

Paragraph No: CS-ADR-DSN.B.205

Comment: The CS should include when a radio altimeter operating area should be established.

Justification: As the area is only needed on a precision approach runway, this should be identified in the CS rather than GM. This would be consistent with runway turn pads, runway shoulders etc.

Proposed Text: New (c): **A radio altimeter operating area should be established in the pre-threshold area of a precision approach runway.**

response *Accepted*

The text has been inserted as paragraph (a).

comment

1438

comment by: *Euroairport Bâle-Mulhouse*

Attachment [#175](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.B.205

Référence: CS-ADR-DSN.B.205
Radio altimeter operating area

Traduction de courtoisie
It is appropriate to transfer this provision to GM as annotated.

response *Partially accepted*

Reference to the requirement of the radio altimeter operating area for precision approach runways is inserted (as new paragraph (a)). The ICAO text relating to longitudinal slope changes is incorporated in GM B.205(a).

comment

1550

comment by: *Aéroport de Marseille - MRS/LFML*

It is appropriate to transfer this provision to GM as annotated.

response *Partially accepted*

Reference to the requirement of the radio altimeter operating area for precision approach runways is inserted (as new paragraph (a)). The ICAO text relating to longitudinal slope changes is incorporated in GM B.205(a).

comment

1814

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS ADR DSN – Book 1 — CS-ADR-DSN.B.205 — Radio altimeter operating area (p21)
- GM ADR DSN – Book 2 — GM-ADR-DSN.B.205 — Radio altimeter operating area (p222-223)

2. Justification and proposed text / comment

CS-ADR-DSN.B.205 is applicable on precision approach runways according to Annex 14, Volume 1, Recommendation 3.8.1 and may be considered suitable at other runways but in no case at every runway. Therefore the specification contained in CS-ADR-DSN.B.205 should explicitly apply only "where a radio altimeter operating area is required".

In France the recommended length and width of a radio altimeter operating area for a Cat II precision approach are respectively 700m and 60m.

In addition when a radio altimeter operating area is required, a specific implementation study should be performed taking into account, inter alia, the ground profile of the aerodrome, the type of operations intended and the type of equipment used. This study may conclude that an artificial plane in the pre-threshold area is needed, the dimension of which may widely differ from the ones stipulated in CS-ADR-DSN.B.205.

Therefore DGAC proposes:

- CS-ADR-DSN.B.205 — Radio altimeter operating area

"Where a radio altimeter operating area is required:

(a) Length of the area:

~~A radio altimeter operating area~~ It should extend before the threshold for a distance of at least 300 m.

(b) Width of the area:

~~A radio altimeter operating area~~ It should extend laterally, on each side of the extended

centre line of the runway, to a distance of 60 m, except that, when special circumstances

so warrant, the distance may be reduced to no less than 30 m if an aeronautical study

indicates that such reduction would not affect the safety of operations of aircraft.

- GM-ADR-DSN.B.205 — Radio altimeter operating area

[...]

(c) With a radio altimeter operating area in the pre-threshold area of a precision approach

*runway the margin to calculate the decision altitude ~~should~~ **may** be smaller and the usability*

of the adjacent runway may be enhanced.

*(d) **An implementation study may be performed to establish the required distances at the runway which may conclude that an artificial plane is required, the dimension of which may widely differ from the ones stipulated in CS-ADR-DSN.M.205 and may be lower.***

(e) Further guidance on radio altimeter operating area is given in Manual of All-Weather

Operations, (ICAO, Doc 9365, Section 5.2). Guidance on the use of radio altimeter is

given in the ICAO, PANS-OPS, Volume II, Part II, Section 1.

response	<i>Partially accepted</i>	
	Reference to the requirement of the radio altimeter operating area for precision approach runways is inserted (as new paragraph (a)). The ICAO text relating to longitudinal slope changes is incorporated in GM B.205(a).	
comment	1882	comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	Attachment #176	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.B.205	
	Référence: CS-ADR-DSN.B.205 Radio altimeter operating area	
	Traduction de courtoisie It is appropriate to transfer this provision to GM as annotated.	
response	<i>Partially accepted</i>	
	Reference to the requirement of the radio altimeter operating area for precision approach runways is inserted (as new paragraph (a)). The ICAO text relating to longitudinal slope changes is incorporated in GM B.205(a).	
comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	
comment	2584	comment by: <i>Danish Transport Authority</i>
	A radio altimeter operating area is only needed in CAT II/III ops. We suggest to add the same as is in Annex 14 3.8.1: "A radio altimeter operating area should be established in the pre-threshold area of a precision approach runway."	
response	<i>Accepted</i>	
	Reference to precision approach runway will be added to paragraph (a).	
comment	2661	comment by: <i>ADBM - Aéroport de Bordeaux Merignac - BOD/LFBD</i>
	Attachment #177	

	<p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.B.205</p> <p>Référence: CS-ADR-DSN.B.205 Radio altimeter operating area</p> <p>Traduction de courtoisie It is appropriate to transfer this provision to GM as annotated.</p>
response	<p><i>Partially accepted</i></p> <p>Reference to the requirement of the radio altimeter operating area for precision approach runways is inserted (as new paragraph (a)). The ICAO text relating to longitudinal slope changes is incorporated in GM B.205(a).</p>

comment	<p>2845 comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i></p> <table border="1"> <tr> <td>Référence: CS-ADR-DSN.B.205</td> <td>Radio altimeter operating area</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de transférer cette disposition en GM comme annoté (« Move to GM »).</td> </tr> <tr> <td>Justification</td> <td></td> </tr> <tr> <td>Traduction de courtoisie</td> <td>It is appropriate to transfer this provision to GM as annotated.</td> </tr> </table>	Référence: CS-ADR-DSN.B.205	Radio altimeter operating area	Proposition/commentaire	Il convient de transférer cette disposition en GM comme annoté (« Move to GM »).	Justification		Traduction de courtoisie	It is appropriate to transfer this provision to GM as annotated.
Référence: CS-ADR-DSN.B.205	Radio altimeter operating area								
Proposition/commentaire	Il convient de transférer cette disposition en GM comme annoté (« Move to GM »).								
Justification									
Traduction de courtoisie	It is appropriate to transfer this provision to GM as annotated.								
response	<p><i>Partially accepted</i></p> <p>Reference to the requirement of the radio altimeter operating area for precision approach runways is inserted (as new paragraph (a)). The ICAO text relating to longitudinal slope changes is incorporated in GM B.205(a).</p>								

comment	<p>2946 comment by: <i>Isavia</i></p> <p>The application is missing here. CS-ADR-DSN.B.205 on page 21: A radio altimeter operating area is only needed in CAT II/III ops. We suggest adding the same as is in Annex 14 3.8.1: "A radio altimeter operating area should be established in the pre-threshold area of a precision approach runway." (This should then be (a) and (a) to become (b) etc.)</p>
response	<p><i>Accepted</i></p> <p>Reference to precision approach runway will be added to paragraph (a).</p>

comment 608

comment by: Avinor

CS-ADR-DSN.C.210. In the certification specifications regarding RESA (CS-ADR-DSN.C.210/215), it is stated that a RESA should be provided at each end of a runway strip where the code number is 1 or 2 and the runway is an instrument runway. The length of the REAS shall extend from the end of a runway strip to a distance of at least minimum 90 m. The purpose of providing RESA is meant to handle both overruns and undershoots.

In the present Norwegian regulations, there is no requirements regarding RESA for undershoots in addition to the 60 m long strip area in front of a threshold. It should be pointed out that the Norwegian design regulations have no separate and special requirements for aerodromes categorized or defined as “non-precision runways” according to ICAO. Some of the smallest airports in Norway, code number 1 or 2, is not able to comply with the CS-ADR-DSN.C.210/215) unless the actual LDA is reduced. The consequences of such reductions will have significantly influence on the present DHC-8-103 operations at these airports.

From our point of view, it should be considered to regard this type of deviation as a “special condition case” or a deviation which could be qualified as an equivalent level of safety (“ELOS”) case as described in the Cover regulation, Article 7.

The corresponding GM (GM-ADR-DSN.C.210) discusses possible solutions or different methodology for establishing alternative means of complying with the CS-ADR-DSN.C.210/215. In Norway, we have established a special working tool (methodology) for analyzing deviations regarding the size of the OLS and the size of strip-RESA areas in regard to risk and safety. The methodology is based upon calculating the level of risk due to such deviations. The risk/safety assessments carried out at some of the airports mentioned above which does not comply with the RESA requirements in the NPA (not having more than 60 m strip in front of the thresholds), indicate that the major aircraft operations at these airports are within the acceptable risk levels (target level of safety as stated by ICAO). Due to this, the demand for a special RESA in each end of the strip area at these airports should not need to be established as stated in the CS.

response *Noted*

ICAO requirements will be used by EASA.

comment 1307

comment by: UK CAA

Page No: 22

Paragraph No: CS.ADR.DSN.C.210 “Runway End Safety Area”

Comment: The UK supports the requirements introduced for runway end safety areas.

	Justification: Their inclusion is consistent and compliant with the requirements in ICAO Annex 14, and supports the prevention and mitigation of runway excursions, which is part of the European Aviation Safety Plan.
response	<i>Noted</i>

comment	1309 comment by: UK CAA
	<p>Page No: 22</p> <p>Paragraph No: CS.ADR.DSN.C.210 (a) (2)</p> <p>Comment: RESA needs to be considered for non-instrument Code 1 and 2 runways when jets or higher weight aircraft involved.</p> <p>Justification: Agreed by ICAO ADWG and already implemented in the UK so as to reduce the potential risks from a runway excursion at smaller aerodromes.</p> <p>Proposed Text: New (b): A runway end safety area should be considered for non-instrument runways where the code number is 1 or 2, particularly where there are movements by jet aircraft not using public transport performance factors, or a high proportion of runway-limited movements at the higher weights.</p>
response	<p><i>Noted</i></p> <p>Provision of RESA that exceeds ICAO requirements is an operational consideration. EASA monitors developments in this area and will implement any published changes by ICAO.</p>

comment	1804 comment by: Aéroports De Lyon
	<p>A ce jour, nos aérodromes ne disposent pas de RESA (comme la plupart en France). Il est même impossible d'en mettre une à LYN dans l'emprise de l'aérodrome et sans raccourcir les distances déclarées.</p> <p><u>Proposition:</u> adopter la règle du grand-père en n'exigeant une RESA uniquement sur les nouvelles pistes ou en cas de modification de piste (accompagné d'une Etude d'impacts ou d'un DAAD)</p>
response	<p><i>Not accepted</i></p> <p>ICAO requirements will be used by EASA. The Lyon RIA response indicates that a compliant RESA is possible.</p>

comment	2212 ❖ comment by: HIA - Highlands and Islands Airports Limited
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	Noted
response	<i>Noted</i>

comment	<p>2807 comment by: CAA Norway</p> <p>The provision of RESA in CS-ADR-DSN.C.210 is meant to handle both overruns and undershoots.</p> <p>In 2001 the Norwegian CAA commissioned UK consultants AEA Technology to carry out a risk analysis in order to define requirements for physical design of aerodromes, including requirements for RESA. A main finding regarding undershoot protection was that the likelihood of an undershoot is approximately four times less than for a landing overrun.</p> <p>In order to reach a target level of safety of 10^{-7} per movement, AEA suggested a 24 meter long area before the threshold to be required for a precision approach runway and 330 meters for non-precision approach runway. However, the Norwegian CAA decided to require the 60 m long strip area as required in Annex 14, for a precision approach runway. (The main reasoning for this was to reduce the risk for turbulence.) This approach is supported in GM-ADR-DSN.C.210, paragraph (3).</p> <p>Some of the smaller airports in Norway, code number 2, are not able to comply with the CS-ADR-DSN.C.210/215) unless the actual LDA is reduced, i.a. due to the topography surrounding the aerodrome. The consequences of such reductions would mean a significant impact on the present DHC-8-103 operations at these airports.</p> <p>This CS represents one of the major differences between requirements in EASA NPA 2011-20 and the existing Norwegian regulation. It is the opinion of CAA Norway that this deviation can be considered a "Special Condition", "ELOS" or DAAD.</p>
response	<p><i>Noted</i></p> <p>ICAO requirements will be used by EASA.</p>

comment	<p>2942 comment by: Isavia</p> <p>CS-ADR-DSN.C.210. In the certification specifications regarding RESA (CS-ADR-DSN.C.210/215), it is stated that a RESA should be provided at each end of a runway strip where the code number is 1 or 2 and the runway is an instrument runway. The length of the RESAS shall extend from the end of a runway strip to a distance of at least minimum 90 m. It is understood from this requirement text that the purpose of providing RESA is meant to handle both overruns and undershoots.</p> <p>Isavia maintains that there should not be a requirement to provide RESA for undershoots in addition to the 60 m long strip area in front of a threshold.</p>
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Some of the smallest airports in Iceland, code number 1 or 2, are not able to comply with the CS-ADR-DSN.C.210/215) unless the actual LDA is reduced. The consequences of such reductions will have significant influence on the present aircraft operations at these airports. It is therefore suggested that the text should reflect that RESA is only required in consideration to overruns.

From our point of view, it should be considered to regard this type of deviation as a "special condition case" or a deviation which could be qualified as an equivalent level of safety ("ELOS") case as described in the Cover regulation, Article 7

response *Noted*

ICAO requirements will be used by EASA. As observed in the last paragraph, the SC and ELOS mechanisms could be used to mitigate deviations from the requirement.

CS-ADR – Book 1 – CS-ADR-DSN.C.215 – Dimensions of runway end safety areas

p. 22

comment 22

comment by: *ACI EUROPE - Airports Council International*

Use exact wording from ICAO standard and move the exact wording on ICAO recommendation to GM.

Justification: More than 50% of the European Airports will not be able to meet these requirements. Mainly due to surrounding limitations and the cost implication can not be estimated. In the worst case this might lead into the closure of runways or reduction in runway length which will affect operations of certain aircraft types.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment 111

comment by: *Swedavia AB - Swedish airports (currently 11 airports)*

Use exact wording from ICAO standard and move the exact wording on ICAO recommendation to GM. More than 50% of the European Airports will not be able to meet these requirements. Mainly due to surrounding limitations and the cost implication can not be estimated. In the worst case this might lead into the closure of runways or reduction in runway length which will affect operations of certain aircraft types.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment 125

comment by: *Flughafen Düsseldorf GmbH*

a) Eine Modifizierung der RESA ist in Abhängigkeit der örtlichen Gegebenheiten (Topographie und Flughafengrenzen) zu betrachten. Es ist davon auszugehen, dass die EASA in diesem Punkt daher nur für zukünftige Maßnahmen gilt und genehmigte vorhandene Anlagen diesbezüglich Bestandsschutz besitzen.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres. The grandfather clause is not available.

comment 220

comment by: *CAA Austria - Ministry of Transport*

Use exact wording from ICAO standard and move the exact wording on ICAO recommendation to GM

Minimum distance of 90m must be acceptable without a safety assessment!!!!

4 of 6 Austrian international aerodromes will not be able to built more than 90m RESA. Mainly due to surrounding limitations and the cost implication can not be estimated. In the worst case this might lead into the closure of runways or reduction in runway length which will affect operations of certain aircraft types.

It can not be the target to built on more than 50% of european aerodromes EMAS Systems!

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The safety assessment requirement has been deleted.

Provision of EMAS is not a target, but an option if circumstances require it.

comment 264

comment by: *Belgian CAA*

	<p>The phrasing of this provision is unclear: a distance of at least 240/120m with a minimum distance of at least 90m. A CS should not be ambiguous.</p>
response	<p><i>Accepted</i></p> <p>The term 'at least' will be deleted from the first sentence of paragraph (a) to remove ambiguity.</p>
comment	<p>283 comment by: <i>Icelandic Civil Aviation Administration</i></p> <p>CS-ADR-DSN.C.215 — Dimensions of runway end safety areas (a) - Suggest to remove "as far as practicable" as (b) and (c) cater for this with a safety assessment.</p>
response	<p><i>Partially accepted</i></p> <p>This is the current ICAO wording. SL 41 deletes 'as far as practicable'. This will be reviewed.</p>
comment	<p>412 comment by: <i>Cologne/Bonn Airport</i></p> <p>Use exact wording from ICAO standard and move the exact wording on ICAO recommendation to GM</p> <p>Justification: Proposed wording is misleading and might lead into the closure of runways or reduction in runway length which will affect operations of certain aircraft types.</p>
response	<p><i>Partially accepted</i></p> <p>The term 'at least' in the first sentence of paragraph (a) will be deleted.</p>
comment	<p>430 comment by: <i>SWISS AERODROMES ASSOCIATION</i></p> <p>A provision could make sense only if a RESA exists. And as for other CSs, it should be moved to GM and not deviate from ICAO.</p>
response	<p><i>Not accepted</i></p> <p>The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.</p>
comment	<p>494 comment by: <i>Union des Aéroports français - UAF</i></p>

Attachment [#178](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.C.215

Référence: CS-ADR-DSN.C.215 (a)
Dimensions of runway end safety areas
(a) Length of RESA

Traduction de courtoisie

UAF particularly insists for the replacement of point (3) by the ICAO Standard of Annex 14: "a runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m" and to move points (1) and (2) to guidance material (GM).

Specifications of the runway end safety area are being reviewed by the ICAO on the founding of clear objectives. These specifications will concern other points than the length. Considering the costs involved and technical difficulties, it seems very early to impose the ICAO recommendation. In France, as mentioned in the RIA, the 90m RESA are only imposed for new runways or lengthening of runway taking into account the "grand father right" and to avoid a shortening of declared distances which would be contrary to the safety.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment 589

comment by: *Finavia*

(d) Width of RESA: to be formulated: "The width of a runway end safety area should be at least twice that of the associated runway."

response *Partially accepted*

The CS will be amended to add 'with a minimum width at least twice that of the associated runway'.

comment 607

comment by: *Avinor*

CS.ADR.DSN.B.215. Use exact wording from ICAO standard and move the exact wording on ICAO recommendation to GM. Impossible to measure.

response *Not accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

comment 716

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.C.215 (a)	Dimensions of runway end safety areas (a) Length of RESA
Proposition/commentaire	ADP insiste particulièrement pour remplacer le point (3) par le standard OACI de l'Annexe 14: "a runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m" et pour transférer les points (1) et (2) en guidance material (GM).
Justification	Les spécifications de l'aire de sécurité d'extrémité de piste sont en train d'être revues par l'OACI en se fondant sur des objectifs clairs. Ces spécifications concerneront d'autres points que la longueur. Vu les coûts mis en jeu, les difficultés techniques extrêmes sur certaines plates-formes, il semble très prématuré d'imposer la recommandation de l'OACI. En France, comme indiqué dans la RIA, les RESA de 90 m ne sont obligatoires que pour les nouvelles pistes ou les allongements de piste tenant compte de la loi du « grand-père » et pour éviter des raccourcissements des distances déclarées ce qui irait à l'encontre de la sécurité dans beaucoup de cas.
Traduction de courtoisie	ADP particularly insists for the replacement of point (3) by the ICAO Standard of Annex 14: "a runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m" and to move points (1) and (2) to guidance material (GM). Specifications of the runway end safety area are being reviewed by the ICAO on the founding of clear objectives. These specifications will concern other points than the length. Considering the costs involved and technical difficulties, it seems very early to impose the ICAO recommendation. In France, as mentioned in the RIA, the 90m RESA are only imposed for new runways or lengthening of runway taking into account the "grand father right" and to avoid a shortening of declared distances which would be contrary to the safety.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment 797

comment by: *Munich Airport International*

Use exact wording from ICAO standard and move the exact wording on ICAO recommendation to GM

Justification: Proposed wording is misleading and might lead into the closure of runways or reduction in runway length which will affect operations of certain aircraft types.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment 838 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.002 — Definitions - Runway end safety area (RESA) - (p8)
- CS-ADR - Book 1 - CS-ADR-DSN.A.002 — Definitions - Aircraft arresting system - (p5)
- CS-ADR - Book 1 - CS-ADR-DSN.C.215 - Dimensions of runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.C.220 - Objects on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.C.225 - Clearing and grading of runway end safety areas (p22-23)

2. Proposed text / comment

This comment is **critical**, as these definitions and CS-ADR-DSN.C.215 does not enable to perform an ELOS.

The **definition of RESA** has been revised following strong debates in ICAO, and this new definition has been agreed and is contained in ICAO Proposal for amendment of Annex 14, Volume I (State letter 41 – Ref : AN 4/1.1.52-11/41).

This revised definition details the safety objective of a RESA, and enable to perform safety assessments on RESA, ie ELOS with an relevant demonstration. **It is consequently proposed to revise the definition of RESA and take the one from ICAO SL/41 (which is a clarification and an improvement of the proposed definition), to enable to perform ELOS on the CS related to RESA.**

The **proposed definition for "arresting system"** states that this system is "used" to stop an aircraft, whereas ICAO states, in State letter 41 – Ref : AN 4/1.1.52-11/41 which introduces this new concept of arresting system, does not give a definition but states that such a system :

- is "intended to enhance safety in the event of an aircraft overrun" (SL11/41 – p16) and
- has "demonstrated performance" (SL11/41 – p16 and para 9.4 p72) and
- is "predictable and effective in arresting aircraft overruns" (SL11/41 – p16 and para 9.3 p72).

The different is that the arresting system is designed so that it is "intended" to stop an aircraft, but it can not stop all aircraft overrunning in all conditions. **It is consequently proposed to revise this definition to clarify and improve it, and consequently enable States to properly assess possible safety assessments (for ELOS) on this subject.**

Moreover, concerning **CS-ADR-DSN.C.215**, it should take into account, in the writing, the fact that ICAO Annex 14 Volume I requires 90m length, and that the recommendation (240m) is done "if practicable". This clarification is important, because it is necessary to know on which safety objective an ELOS will be based. Moreover, having a RESA of 240 m length would be unapplicable on most aerodromes. Furthermore, the costs of arresting systems will be too high for most aerodrome operators. It is consequently proposed to write paragraph (a) of CS-ADR-DSN.C.215 so that the CS would focus on ICAO standard, and ask to have a longer RESA if practicable. It is also proposed to delete (b), since, in most, if not all cases, it won't be possible to demonstrate the same level of risks if the length is less than the ICAO Annex 14 Volume I recommendation. Finally, paragraphs (c) and (d) should be inverted since the standard for width should also apply to an arresting system.

CS-ADR-DSN.C.220 contains 2 erroneous references to other CS. Moreover, it should detail that an arresting system can be authorized even if it is an object.

CS-ADR-DSN.C.225 is not appropriate in case of an arresting system: it is proposed to add a reference to a possible "arresting system" which would not have to respect this specification.

As a conclusion, French DGAC proposes the following modifications:

CS-ADR-DSN.A.002 – Definitions - Runway end safety area (RESA)

"Runway end safety area (RESA)" means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway, and also to allow an aeroplane overrunning to decelerate and an aeroplane undershooting to continue its approach or landing."

CS-ADR-DSN.A.002 – Definitions – Aircraft Arresting System

"**Aircraft Arresting System**' means a series of components with demonstrated performance used-intended to stop an aircraft by absorbing its momentum in a routine or emergency landing or rejected take-off."

CS-ADR-DSN.C.215 – Dimensions of runway end safety areas

(a) Length of RESA

A runway end safety area should, as far as practicable, extend from the end of a runway strip to a distance of at least 90 m.

Wherever practicable, a runway end safety area should extend to a distance of .

- (1) 240 m where the code number is 3 or 4; and
- (2) 120 m where the code number is 1 or 2; and
- (3) with a minimum distance of at least 90 m.

~~(b) Where a RESA exceeding the minimum distance, but less than the distance in (a)(1) and (a)(2) is considered necessary, the aerodrome operator should undertake a safety assessment to identify the hazards and appropriate actions to reduce the risk.~~

~~(c) Where an arresting system of demonstrated performance capability is installed, the specifications above may be reduced in accordance with the design specification of the arresting system.~~

(e) Width of RESA

The width of a runway end safety area should, wherever practicable, be equal to that of the graded portion of the associated runway strip."

(d) Where an arresting system of demonstrated performance capability is installed, the specifications above may be reduced in accordance with the design specification of the arresting system.

CS-ADR-DSN.C.220 - Objects on runway end safety areas

" (a) No fixed object, other than visual aids required for air navigation or for aircraft safety purposes and satisfying the relevant frangibility requirement CS-ADR-DSN.T.9210, should be permitted on a runway end safety area. The detailed requirements for sitting objects on a RESA are in CS-ADR-DSN.T.9215 (Sitting of equipment and installations on operational areas).

(b) Where an arresting system demonstrated performance capability is installed, according to CS-ADR-DSN.C.215(d), the specifications of paragraph (a) above may be adapted in accordance with the design specification of the arresting system."

CS-ADR-DSN.C.225 - Clearing and grading of runway end safety areas

" (a) A runway end safety area should provide a cleared and graded area for aeroplanes which the runway is intended to serve in the event of an aeroplane undershooting or overrunning the runway.

(b) The surface of the runway end safety area should be prepared, but does not need to be prepared to the same quality as the runway strip.

(c) Where an arresting system demonstrated performance capability is installed, according to CS-ADR-DSN.C.215(d), the specifications of paragraph (a) above may be adapted in accordance with the design specification of the arresting system."

response Noted

This has been addressed in CS-ADR-DSN.C.210 comments

comment	<p>1021 comment by: <i>Federal Office of Civil Aviation FOCA</i></p>
	<p>EASA should keep an eye of the amendment process undergoing at the ICAO. There is a risk to have quite different values/data between ICAO and EASA.</p> <p>CS-ADR-DSN.C.215 (d): Change para. to: "The width of a runway end safety area should, wherever practicable, be at least equal to that of the graded portion of the associated runway strip." "at least" shall be added as otherwise existing RESAs with a greater width would be non-compliant.</p>
response	<p><i>Noted</i></p>
	<p><i>Partially Agreed:</i> The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.</p> <p><i>Not Agreed:</i> The CS will be amended to add 'with a minimum width at least twice that of the associated runway'.</p>

comment	<p>1119 comment by: <i>Salzburger Flughafen GmbH</i></p>
	<p>Use exact wording from ICAO standard and move the exact wording on ICAO recommendation to GM</p> <p>Proposed wording ist misleading and might lead into the closure of runways or reduction in runway length which swill affect operations of certain aircraft types</p>
response	<p><i>Partially accepted</i></p>
	<p>The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.</p> <p>The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).</p>

comment	<p>1287 comment by: <i>ECA - European Cockpit Association</i></p>
	<p>Replace existing paragraphs (a), (b) and (c) with the following text:</p> <p>(a) A runway end safety area should extend from the end of a runway strip to a distance of at least:</p> <ol style="list-style-type: none"> (1) 240 m where the code number is 3 or 4; and (2) 120 m where the code number is 1 or 2. <p>(b) A runway end safety area should <i>as far as practicable</i> extend from the end of a runway strip to a distance of at least:</p>

	<p>(1) 240 m where the code number is 1 or 2</p> <p>(c) At some current airports it is not physically possible to provide a 300m long overrun area (critical for rescue and fire fighting). Where this is the case an acceptable level of safety may be provided by a combination of conventional overrun area and an Engineered Materials Arresting System (EMAS).</p> <p>(d) When a runway overrun is constructed in compliance with paragraph (a) the combined overrun area should cater for the largest aircraft which is planned to use that runway.</p> <p>Renumber existing (d) to (e)</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 3.5.3</p>
response	<p><i>Partially accepted</i></p> <p>The term 'at least' in the first sentence of paragraph (a) will be deleted.</p>

comment	<p>1313 comment by: UK CAA</p> <p>Page No: 22</p> <p>Paragraph No: CS.ADR.DSN.C.215 "Dimensions of runway end safety areas"</p> <p>Comment: There is no minimum width requirement.</p> <p>Justification: Minimum width is included in Annex 14 (paragraph 3.5.4).</p> <p>Proposed Text: "The width of a runway end safety area should, wherever practicable, be equal to that of the graded portion of the runway strip, and should be at least twice that of the associated runway".</p>
response	<p><i>Partially accepted</i></p> <p>The CS has been amended to include the minimum width requirement: (a)Width of RESA The width of a runway end safety area should be at least twice that of the associated runway and, wherever practicable, be equal to that of the graded portion of the associated runway strip.</p>

comment	<p>1375 comment by: Zürich Airport</p> <p>The 90m length of RESA specified as a ICAO Standard shall be declared as a CS and the ICAO Recommendation (240m) shall become a GM.</p>
response	<p><i>Not accepted</i></p> <p>The current and proposed (SL 41) figures are recognised globally. 90 metres is</p>

an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

comment 1440 comment by: Euroairport Bâle-Mulhouse

Attachment [#179](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.C.215

Référence: CS-ADR-DSN.C.215 (a)
Dimensions of runway end safety areas
(a) Length of RESA

Traduction de courtoisie

UAF particularly insists for the replacement of point (3) by the ICAO Standard of Annex 14: "a runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m" and to move points (1) and (2) to guidance material (GM).

Specifications of the runway end safety area are being reviewed by the ICAO on the founding of clear objectives. These specifications will concern other points than the length. Considering the costs involved and technical difficulties, it seems very early to impose the ICAO recommendation. In France, as mentioned in the RIA, the 90m RESA are only imposed for new runways or lengthening of runway taking into account the "grand father right" and to avoid a shortening of declared distances which would be contrary to the safety.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

comment 1484 comment by: Geneva International Airport (ROMIG)

Use exact wording from ICAO standard and move the exact wording on ICAO recommendation to GM

More than 50% of the European Airports will not be able to meet these requirements. Mainly due to surrounding limitations and the cost implication can not be estimated. In the worst case this might lead into the closure of runways or reduction in runway length which will affect operations of certain aircraft types.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment	<p>1499</p> <p>comment by: <i>Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH</i></p> <p>replace (a), (b), (c) by ICAO Standard 3.5.2: A runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m.</p> <p>Specifications of the runway end safety area are being reviewed by the ICAO on the founding of clear objectives. These specifications will concern other points than the length. Innsbruck Airport particularly insists for the adoption of ICAO Annex 14 standard 3.5.2. Innsbruck airport has already displaced a big river (width of 50 meters) to gain sufficient terrain for providing RESA length of 90 meters (costs about € 10 Millions). Additional provision of terrain is impossible; therefore any increase of required RESA length will directly affect the declared distances which will affect operation of most aircraft types.</p>
response	<p><i>Partially accepted</i></p> <p>The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres. The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).</p>
comment	<p>1512</p> <p>comment by: <i>Flughafen Linz-Hörsching - LNZ/LOWL</i></p> <p>(a)(3) add: ...if the given infrastructure of existing airports doesn't allow more.</p> <p>(b) delete</p> <p>Explanation: Due to our (LNZ) infrastructural condition, it would not be possible to expand the length of our RESA to 240 m. In addition to it we haven't had any accidents or incidences regarding the RESA since opening our airport. Therefore we would classify our 90 m RESA as safe. Also international studies state, that nearly all accidents caused by overshoots are within the 90 m zone. So we are against extensions of RESAs to 240 m.</p>
response	<p><i>Not accepted</i></p> <p>The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.</p>
comment	<p>1551</p> <p>comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>UAF particularly insists for the replacement of point (3) by the ICAO Standard of Annex 14: "a runway end safety area shall extend from the end of a runway</p>

strip to a distance of at least 90 m" and to move points (1) and (2) to guidance material (GM).

Specifications of the runway end safety area are being reviewed by the ICAO on the founding of clear objectives. These specifications will concern other points than the length. Considering the costs involved and technical difficulties, it seems very early to impose the ICAO recommendation. In France, as mentioned in the RIA, the 90m RESA are only imposed for new runways or lengthening of runway taking into account the "grand father right" and to avoid a shortening of declared distances which would be contrary to the safety.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

comment

1790

comment by: *IDRF e.V. (association of regional airports)*

This DSN-element, except (a) (3), is based on ICAO Annex 14 recommendations. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).

The figures are indiscriminately and not based on scientific findings, at most an orientation and could be verified in a lot of ways. Obviously therefore EASA developed helpful GM, which is essential for engineering.

We suggest to restrict the figures of this DSN-element to the ICAO-standard of 90 m within the CS and move the figures of ICAO-recommendations to GM.

The additional text is helpful, written in an adequate and constructive way and therefore appreciated.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment

1844

comment by: *Aéroports De Lyon*

Les dimensions exigées sont importantes et beaucoup plus élevées qu'actuellement.

Proposition: Il serait raisonnable, dans un premier temps de n'exiger que le point (a) (3) (90m) et de transférer les points (a) (1) et (2) en GM.

response	<p><i>Partially accepted</i></p> <p>The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.</p>
comment	<p>1883 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #180</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.C.215</p> <p>Référence: CS-ADR-DSN.C.215 (a) Dimensions of runway end safety areas (a) Length of RESA</p> <p>Traduction de courtoisie UAF particularly insists for the replacement of point (3) by the ICAO Standard of Annex 14: "a runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m" and to move points (1) and (2) to guidance material (GM). Specifications of the runway end safety area are being reviewed by the ICAO on the founding of clear objectives. These specifications will concern other points than the length. Considering the costs involved and technical difficulties, it seems very early to impose the ICAO recommendation. In France, as mentioned in the RIA, the 90m RESA are only imposed for new runways or lengthening of runway taking into account the "grand father right" and to avoid a shortening of declared distances which would be contrary to the safety.</p>
response	<p><i>Partially accepted</i></p> <p>The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.</p>
comment	<p>2113 comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>(b) Consider including a list of acceptable mitigation measures</p> <p>(c) If installing arrester systems consider the risks to aircraft and possible increase in RFFS provision</p>
response	<p><i>Noted</i></p>
comment	<p>2140 comment by: <i>Aéroport Paris Vatry - XCR/LFOK</i></p>

Attachment [#181](#)

NPA 2011-20 (B.III) CS-ADR-DSN.C.215

Référence: CS-ADR-DSN.C.215 (a)
Dimensions of runway end safety areas
(a) Length of RESA

Traduction de courtoisie

UAF particularly insists for the replacement of point (3) by the ICAO Standard of Annex 14: "a runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m" and to move points (1) and (2) to guidance material (GM).

Specifications of the runway end safety area are being reviewed by the ICAO on the founding of clear objectives. These specifications will concern other points than the length. Considering the costs involved and technical difficulties, it seems very early to impose the ICAO recommendation. In France, as mentioned in the RIA, the 90m RESA are only imposed for new runways or lengthening of runway taking into account the "grand father right" and to avoid a shortening of declared distances which would be contrary to the safety.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment 2148

comment by: *Tarbes-Lourdes-Pyrénées airport*

Attachment [#182](#)

NPA 2011-20 (B.III) CS-ADR-DSN.C.215

Référence: CS-ADR-DSN.C.215 (a)
Dimensions of runway end safety areas
(a) Length of RESA

Traduction de courtoisie

UAF particularly insists for the replacement of point (3) by the ICAO Standard of Annex 14: "a runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m" and to move points (1) and (2) to guidance material (GM).

Specifications of the runway end safety area are being reviewed by the ICAO on the founding of clear objectives. These specifications will concern other points than the length. Considering the costs involved and technical difficulties, it seems very early to impose the ICAO recommendation. In France, as mentioned in the RIA, the 90m RESA are only imposed for new runways or lengthening of runway taking into account the "grand father right" and to avoid a shortening of declared distances which would be contrary to the safety.

response	<i>Partially accepted</i>
	<p>The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.</p> <p>The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).</p>
comment	<p>2426 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>Change article d: wherever practicable, be at least equal to that of ...</p>
response	<i>Partially accepted</i>
	<p>The reference to runway strip ('wherever practicable') remains. An addition will be made: 'with a minimum width of at least twice that of the associated runway'.</p>
comment	<p>2427 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>EASA should follow the ICAO standard and move ICAO recommendations to GM. EASA should also take into account ICAO ammendments. This article could have massive financial and operational affects on a great many airports, something that was not seriously looked at in the RIA.</p>
response	<i>Not accepted</i>
	<p>The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.</p>
comment	<p>2459 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p> <p>Since this is only a Recommendation in the ICAO Annex 14, this should be moved to the guidance material. Especially on already operating aerodromes a subsequet change of the RESA could lead to disproportional higher costs and issues with the aerodrome environment and surrounding, given that an adaptation to fulfill this CS is even possible at all (geographical specifications). This CS disadvantages all aerodromes in the European Union having to constrict their operation without significantly increasing the level of safety! Adding the ICAO recommendation in (a) (1) and (2) with the current standard (3) advances the risk of misinterpretation by local authorities or stakeholders or during supranational inspections conducted at the aerodrome.</p>
response	<i>Not accepted</i>

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

comment

2494

comment by: AENA - Aeropuertos Españoles y Navegación Aérea

This comment is **critical**, as these definitions and CS-ADR-DSN.C.215 does not enable to perform an ELOS.

The **definition of RESA** has been revised following strong debates in ICAO, and this new definition has been agreed and is contained in ICAO Proposal for amendment of Annex 14, Volume I (State letter 41 – Ref : AN 4/1.1.52-11/41). This revised definition details the safety objective of a RESA, and enable to perform safety assessments on RESA, ie ELOS with an relevant demonstration. **It is consequently proposed to revise the definition of RESA and take the one from ICAO SL/41 (which is a clarification and an improvement of the proposed definition), to enable to perform ELOS on the CS related to RESA.**

The **proposed definition for “arresting system”** states that this system is “used” to stop an aircraft, whereas ICAO states, in State letter 41 – Ref : AN 4/1.1.52-11/41 which introduces this new concept of arresting system, does not give a definition but states that such a system :

- is “intended to enhance safety in the event of an aircraft overrun” (SL11/41 – p16) and
- has “demonstrated performance” (SL11/41 – p16 and para 9.4 p72) and
- is “predictable and effective in arresting aircraft overruns” (SL11/41 – p16 and para 9.3 p72).

The different is that the arresting system is designed so that it is “intended” to stop an aircraft, but it can not stop all aircraft overrunning in all conditions. **It is consequently proposed to revise this definition to clarify and improve it, and consequently enable States to properly assess possible safety assessments (for ELOS) on this subject.**

Moreover, concerning **CS-ADR-DSN.C.215**, it should take into account, in the writing, the fact that ICAO Annex 14 Volume I requires 90m length, and that the recommendation (240m) is done “if practicable”. This clarification is important, because it is necessary to know on which safety objective an ELOS will be based. Moreover, having a RESA of 240 m length would be unapplicable on most aerodromes. Furthermore, the costs of arresting systems will be too high for most aerodrome operators. It is consequently proposed to write paragraph (a) of CS-ADR-DSN.C.215 so that the CS would focus on ICAO standard, and ask to have a longer RESA if practicable. It is also proposed to delete (b), since, in most, if not all cases, it won't be possible to demonstrate the same level of risks if the length is less than the ICAO Annex 14 Volume I recommendation. Finally, paragraphs (c) and (d) should be inverted since the standard for width should also apply to an arresting system.

“(a) Length of RESA

A runway end safety area should, ~~as far as practicable,~~ extend from the end of a runway strip to a distance of at least 90 m.

~~Wherever practicable, a runway end safety area should extend to a distance of~~

·
(1) 240 m where the code number is 3 or 4; ~~and~~

~~(2) 120 m where the code number is 1 or 2,; and
(3) with a minimum distance of at least 90 m.~~

~~(b) Where a RESA exceeding the minimum distance, but less than the distance in (a)(1) and (a)(2) is considered necessary, the aerodrome operator should undertake a safety assessment to identify the hazards and appropriate actions to reduce the risk.~~

~~(c) Where an arresting system of demonstrated performance capability is installed, the specifications above may be reduced in accordance with the design specification of the arresting system.~~

~~(d) Width of RESA~~

~~The width of a runway end safety area should, wherever practicable, be equal to that of the graded portion of the associated runway strip."~~

~~(d) Where an arresting system of demonstrated performance capability is installed, the specifications above may be reduced in accordance with the design specification of the arresting system.~~

response Partially accepted

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment

2662

comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#183](#)

ADBM - NPA 2011-20 (B.III) CS-ADR-DSN.C.215

Référence: CS-ADR-DSN.C.215 (a)
Dimensions of runway end safety areas
(a) Length of RESA

Traduction de courtoisie

ADBM particularly insists for the replacement of point (3) by the ICAO Standard of Annex 14: "a runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m" and to move points (1) and (2) to guidance material (GM).

Specifications of the runway end safety area are being reviewed by the ICAO on the founding of clear objectives. These specifications will concern other points than the length. Considering the costs involved and technical difficulties, it seems very early to impose the ICAO recommendation. In France, as mentioned in the RIA, the 90m RESA are only imposed for new runways or lengthening of runway taking into account the "grand father right" and to avoid a shortening of declared distances which would be contrary to the safety.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment 2778

comment by: *Brussels Airport*

CS-ADR-DSN.C.215 (a)

Following text to be rewritten to become more clear : (1) and (2) are inconsistent with (3). It makes this CS too stringent and should be similar to the ICAO Ann 14 Standard which is in line with (3) :

Length of RESA

A runway end safety area should, as far as practicable, extend from the end of a runway

strip to a distance of at least:

- (1) 240 m where the code number is 3 or 4;
- (2) 120 m where the code number is 1 or 2; and
- (3) with a minimum distance of at least 90 m

response *Noted*

The term 'at least' will be deleted from the first sentence of paragraph (a) to remove ambiguity. The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

comment 2780

comment by: *Brussels Airport*

CS-ADR-DSN.C.215(d)

This CS is too stringent and should be similar to the ICAO Ann 14 Standard which is a width of 2x the runway width

Width of RESA

The width of a runway end safety area should, wherever practicable, be equal to that of the graded portion of the associated runway strip.

response *Partially accepted*

The reference to runway strip ('wherever practicable') remains; an addition will be made: 'with a minimum width of at least twice that of the associated runway'.

comment 2846

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.C.215 (a)	Dimensions of runway end safety areas (a) Length of RESA
Proposition/commentaire	ACA insiste particulièrement pour remplacer le point (3) par le standard OACI de l'Annexe 14: "a runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m" et pour transférer les points (1) et (2) en guidance material (GM).
Justification	Les spécifications de l'aire de sécurité d'extrémité de piste sont en train d'être revues par l'OACI en se fondant sur des objectifs clairs. Ces spécifications concerneront d'autres points que la longueur. Vu les coûts mis en jeu, les difficultés techniques extrêmes sur certaines plates-formes, il semble très prématuré d'imposer la recommandation de l'OACI. En France, comme indiqué dans la RIA, les RESA de 90 m ne sont obligatoires que pour les nouvelles pistes ou les allongements de piste tenant compte de la loi du « grand-père » et pour éviter des raccourcissements des distances déclarées ce qui irait à l'encontre de la sécurité dans beaucoup de cas.
Traduction de courtoisie	ACA particularly insists for the replacement of point (3) by the ICAO Standard of Annex 14: "a runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m" and to move points (1) and (2) to guidance material (GM). Specifications of the runway end safety area are being reviewed by the ICAO on the founding of clear objectives. These specifications will concern other points than the length. Considering the costs involved and technical difficulties, it seems very early to impose the ICAO recommendation. In France, as mentioned in the RIA, the 90m RESA are only imposed for new runways or lengthening of runway taking into account the "grand father right" and to avoid a shortening of declared distances which would be contrary to the safety.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment

2891 comment by: *SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard*

Attachment [#184](#)

SEARD NPA 2011-20 (B.III) CS-ADR-DSN.C.215

Référence: CS-ADR-DSN.C.215 (a)
Dimensions of runway end safety areas
(a) Length of RESA

Traduction de courtoisie

SEARD particularly insists for the replacement of point (3) by the ICAO Standard of Annex 14: "a runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m" and to move points (1) and (2) to guidance material (GM).

Specifications of the runway end safety area are being reviewed by the ICAO on the founding of clear objectives. These specifications will concern other points than the length. Considering the costs involved and technical difficulties, it seems very early to impose the ICAO recommendation. In France, as mentioned in the RIA, the 90m RESA are only imposed for new runways or lengthening of runway taking into account the "grand father right" and to avoid a shortening of declared distances which would be contrary to the safety.

response

Partially accepted

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment

2943

comment by: *Isavia*

The words " as practicable" to remain in the text.

response

Noted

The words 'as far as practicable' have been retained in the text, but placed in a

different part of the sentence.

comment 3019 comment by: *ADV -German Airports Association*

CS.ADR.DSN.C.215

Use exact wording from ICAO standard and move the exact wording on ICAO recommendation to GM

Justification

Proposed wording is misleading and might lead into the closure of runways or reduction in runway length which will affect operations of certain aircraft types.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment 3054 comment by: *MST / STR - Stuttgart Airport*

CS.ADR.DSN.C.215

Use exact wording from ICAO standard and move the exact wording on ICAO recommendation to GM

Justification

Proposed wording is misleading and might lead into the closure of runways or reduction in runway length which will affect operations of certain aircraft types.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment 3087 comment by: *Fraport AG*

CS-ADR-DSN.C.215 — Dimensions of runway end safety areas

Editorial

Complete paragraph

Use exact wording from ICAO standard and move the exact wording on ICAO recommendation to GM.

Fraport AG

More than 50% of the European Airports will not be able to meet these requirements. Mainly due to surrounding limitations and the cost implication cannot be estimated. In the worst case this might lead into the closure of runways or reduction in runway length which will affect operations of certain aircraft types.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

comment

3124

comment by: ATB Aéroport Toulouse-Blagnac - TLS/LFBO

Attachment [#185](#)

ATB NPA 2011-20 (B.III) CS-ADR-DSN.C.215

Référence: CS-ADR-DSN.C.215 (a)
Dimensions of runway end safety areas
(a) Length of RESA

Traduction de courtoisie

UAF particularly insists for the replacement of point (3) by the ICAO Standard of Annex 14: "a runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m" and to move points (1) and (2) to guidance material (GM).

Specifications of the runway end safety area are being reviewed by the ICAO on the founding of clear objectives. These specifications will concern other points than the length. Considering the costs involved and technical difficulties, it seems very early to impose the ICAO recommendation. In France, as mentioned in the RIA, the 90m RESA are only imposed for new runways or lengthening of runway taking into account the "grand father right" and to avoid a shortening of declared distances which would be contrary to the safety.

response *Partially accepted*

The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres.

The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).

CS-ADR — Book 1 — CS-ADR-DSN.C.220 — Objects on runway end safety areas

p. 22

comment	141	comment by: CAA Norway
	We suggest to replace the words "visual aids" in CS-ADR-DSN.C.220 on page 22 with "... equipment and installations ...". It can be other equipment or installation than visual aids. Annex 14 para 9.9.2 mentions equipment and installations.	
response	<i>Accepted</i>	
comment	142	comment by: CAA Norway
	Editorial: Check reference given in CS-ADR-DSN.C.220 on page 22. CS-ADR-DSN.T.925 is not there. Should this be CS-ADR-DSN.T.915?	
response	<i>Accepted</i>	
comment	225	comment by: Danish Transport Authority
	The standard from ICAO Annex 14, Volume I item 3.5.4 "The width of a runway end safety area shall be at least twice that of the associated runway" is missing in the CS. The proposed text should be like the wording under (a) regarding length. Suggestion: "The width of the runway end safety area should, as far as practicable, extend to the graded portion of the associated runway strip of at least (1) 75 meter from the centerline where the code number is 3 or 4; (2) 40 meter from the centerline where the code number is 1 or 2 (30 meter for non-precision code 1 runways); and (3) with a minimum distance from center line of at least the width of the associated runway.	
response	<i>Partially accepted</i>	
	The CS will be amended to add 'with a minimum width at least twice that of the associated runway' — dimensions are covered by 'associated' reference.	
comment	284	comment by: Icelandic Civil Aviation Administration
	We suggest to replace the words "visual aids" in CS-ADR-DSN.C.220 on page 22 with "...equipment and installations...". It can be other equipment or installation than visual aids. Annex 14 para 9.9.2 mentions equipment and installations.	

response *Accepted*

comment 286 comment by: *Icelandic Civil Aviation Administration*

Editorial: Check reference given in CS-ADR-DSN.C.220 on page 22. CS-ADR-DSN.T.925 is not there. Should this be CS-ADR-DSN.T.915?

response *Accepted*

comment 356 comment by: *Estonian CAA*

We suggest to replace the words "visual aids" in CS-ADR-DSN.C.220 on page 22 with "...equipment and installations...". It can be other equipment or installation than visual aids. Annex 14 para 9.9.2 mentions equipment and installations.

response *Accepted*

comment 496 comment by: *Union des Aéroports français - UAF*

Attachment [#186](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.C.220

Référence: CS-ADR-DSN.C.220
Objects on runway end safety areas

Traduction de courtoisie

It is appropriate to transfer this provision into IR-OPS

It is an operational rule (notably for equipments) concerning the aerodrome operator.

response *Not accepted*

This CS is design-related.

comment 637 comment by: *Finnish Transport Safety Agency*

We suggest to replace the words "visual aids" in CS-ADR-DSN.C.220 on page 22 with "...equipment and installations...". It can be other equipment or installation than visual aids. Annex 14 para 9.9.2 mentions equipment and installations.

response *Accepted*

comment 638 comment by: *Finnish Transport Safety Agency*

Editorial: Check reference given in CS-ADR-DSN.C.220 on page 22. CS-ADR-DSN.T.925 is not there. Should this be CS-ADR-DSN.T.915?

Also reference CS-ADR-DSN.T.920 should be CS-ADR-DSN.T.910.

response *Accepted*

comment 717 comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.C.220	Objects on runway end safety areas
Proposition/commentaire	Il convient de transférer cette disposition en IR-OPS.
Justification	Il s'agit ici d'une règle d'exploitation (notamment installation d'équipements) concernant l'exploitant d'aérodrome.
Traduction de courtoisie	It is appropriate to transfer this provision into IR-OPS It is an operational rule (notably for equipments) concerning the aerodrome operator.

response *Not accepted*

This CS is design-related.

comment 838 ❖ comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.002 — Definitions - Runway end safety area (RESA) - (p8)
- CS-ADR - Book 1 - CS-ADR-DSN.A.002 — Definitions - Aircraft arresting system - (p5)

- CS-ADR - Book 1 - CS-ADR-DSN.C.215 – Dimensions of runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.C.220 – Objects on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.C.225 – Clearing and grading of runway end safety areas (p22-23)

2. Proposed text / comment

This comment is **critical**, as these definitions and CS-ADR-DSN.C.215 does not enable to perform an ELOS.

The **definition of RESA** has been revised following strong debates in ICAO, and this new definition has been agreed and is contained in ICAO Proposal for amendment of Annex 14, Volume I (State letter 41 – Ref : AN 4/1.1.52-11/41). This revised definition details the safety objective of a RESA, and enable to perform safety assessments on RESA, ie ELOS with an relevant demonstration. **It is consequently proposed to revise the definition of RESA and take the one from ICAO SL/41 (which is a clarification and an improvement of the proposed definition), to enable to perform ELOS on the CS related to RESA.**

The **proposed definition for “arresting system”** states that this system is “used” to stop an aircraft, whereas ICAO states, in State letter 41 – Ref : AN 4/1.1.52-11/41 which introduces this new concept of arresting system, does not give a definition but states that such a system :

- is “intended to enhance safety in the event of an aircraft overrun” (SL11/41 – p16) and
- has “demonstrated performance” (SL11/41 – p16 and para 9.4 p72) and
- is “predictable and effective in arresting aircraft overruns” (SL11/41 – p16 and para 9.3 p72).

The different is that the arresting system is designed so that it is “intended” to stop an aircraft, but it can not stop all aircraft overrunning in all conditions. **It is consequently proposed to revise this definition to clarify and improve it, and consequently enable States to properly assess possible safety assessments (for ELOS) on this subject.**

Moreover, concerning **CS-ADR-DSN.C.215**, it should take into account, in the writing, the fact that ICAO Annex 14 Volume I requires 90m length, and that the recommendation (240m) is done “if practicable”. This clarification is important, because it is necessary to know on which safety objective an ELOS will be based. Moreover, having a RESA of 240 m length would be unapplicable on most aerodromes. Furthermore, the costs of arresting systems will be too high for most aerodrome operators. It is consequently proposed to write paragraph (a) of CS-ADR-DSN.C.215 so that the CS would focus on ICAO standard, and ask to have a longer RESA if practicable. It is also proposed to delete (b), since, in most, if not all cases, it won't be possible to demonstrate the same level of risks if the length is less than the ICAO Annex 14 Volume I recommendation. Finally, paragraphs (c) and (d) should be inverted since the standard for width should also apply to an arresting system.

CS-ADR-DSN.C.220 contains 2 erroneous references to other CS. Moreover, it should detail that an arresting system can be authorized even if it is an object.

CS-ADR-DSN.C.225 is not appropriate in case of an arresting system: it is proposed to add a reference to a possible “arresting system” which would not

have to respect this specification.

As a conclusion, French DGAC proposes the following modifications:

CS-ADR-DSN.A.002 – Definitions - Runway end safety area (RESA)

"Runway end safety area (RESA)" means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway, and also to allow an aeroplane overrunning to decelerate and an aeroplane undershooting to continue its approach or landing."

CS-ADR-DSN.A.002 – Definitions – Aircraft Arresting System

"Aircraft Arresting System" means a series of components with demonstrated performance used intended to stop an aircraft by absorbing its momentum in a routine or emergency landing or rejected take-off."

CS-ADR-DSN.C.215 – Dimensions of runway end safety areas

"(a) Length of RESA

A runway end safety area should, as far as practicable, extend from the end of a runway strip to a distance of at least 90 m.

Wherever practicable, a runway end safety area should extend to a distance of :

- (1) 240 m where the code number is 3 or 4; and
- (2) 120 m where the code number is 1 or 2; and
- (3) with a minimum distance of at least 90 m.

~~(b) Where a RESA exceeding the minimum distance, but less than the distance in (a)(1) and (a)(2) is considered necessary, the aerodrome operator should undertake a safety assessment to identify the hazards and appropriate actions to reduce the risk.~~

~~(c) Where an arresting system of demonstrated performance capability is installed, the specifications above may be reduced in accordance with the design specification of the arresting system.~~

(e) Width of RESA

The width of a runway end safety area should, wherever practicable, be equal to that of the graded portion of the associated runway strip."

~~(d) Where an arresting system of demonstrated performance capability is installed, the specifications above may be reduced in accordance with the design specification of the arresting system.~~

CS-ADR-DSN.C.220 - Objects on runway end safety areas

" (a) No fixed object, other than visual aids required for air navigation or for aircraft safety purposes and satisfying the relevant frangibility requirement CS-ADR-DSN.T.9210, should be permitted on a runway end safety area. The detailed requirements for siting objects on a RESA are in CS-ADR-DSN.T.9215 (Siting of equipment and installations on operational areas).

(b) Where an arresting system demonstrated performance capability is installed, according to CS-ADR-DSN.C.215(d), the specifications of paragraph (a) above may be adapted in accordance with the design specification of the arresting system."

CS-ADR-DSN.C.225 - Clearing and grading of runway end safety areas

" (a) A runway end safety area should provide a cleared and graded area for aeroplanes which the runway is intended to serve in the event of an aeroplane undershooting or overrunning the runway.
 (b) The surface of the runway end safety area should be prepared, but does not need to be prepared to the same quality as the runway strip.
 (c) Where an arresting system demonstrated performance capability is installed, according to CS-ADR-DSN.C.215(d), the specifications of paragraph (a) above may be adapted in accordance with the design specification of the arresting system."

response *Noted*

The specifications for RESA have been amended to include the ICAO SL 41 specifications.

CS-ADR-DSN.C.215: SL 41 paragraph 3.5.5 covers the proposal in paragraph (b).

CS-ADR-DSN.C.220: Erroneous references have been amended. Paragraph (b) is already covered in paragraph (a)...*for aircraft safety purposes and satisfying the relevant frangibility requirement...*

CS-ADR-DSN.C.225: The conditions in C.220 above can be applied to the proposed paragraph (c) of this CS with ELOS or SC.

CS-ADR-DSN.A.002: These definitions will be used until ICAO publish a definition.

comment 1024

comment by: *Federal Office of Civil Aviation FOCA*

References for CS-ADR-DSN.T.920 and T.925 should be corrected

response *Accepted*

comment 1151

comment by: *Swedish Transport Agency*

We suggest to replace the words "visual aids" in CS-ADR-DSN.C.220 on page 22 with "...equipment and installations...". It can be other equipment or installation than visual aids. Annex 14 para 9.9.2 mentions equipment and installations.

response *Accepted*

comment 1152

comment by: *Swedish Transport Agency*

Check reference given in CS-ADR-DSN.C.220 on page 22. CS-ADR-DSN.T.925 is not there. Should this be CS-ADR-DSN.T.915?

response	<i>Accepted</i>
comment	<p>1441 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #187</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.C.220</p> <p>Référence: CS-ADR-DSN.C.220 Objects on runway end safety areas</p> <p>Traduction de courtoisie It is appropriate to transfer this provision into IR-OPS It is an operational rule (notably for equipments) concerning the aerodrome operator.</p>
response	<p><i>Not accepted</i></p> <p>This CS is design-related.</p>
comment	<p>1552 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>It is appropriate to transfer this provision into IR-OPS</p> <p>It is an operational rule (notably for equipments) concerning the aerodrome operator.</p>
response	<p><i>Not accepted</i></p> <p>This CS is design-related.</p>
comment	<p>1884 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #188</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.C.220</p> <p>Référence: CS-ADR-DSN.C.220 Objects on runway end safety areas</p> <p>Traduction de courtoisie It is appropriate to transfer this provision into IR-OPS It is an operational rule (notably for equipments) concerning the aerodrome operator.</p>

response	<i>Not accepted</i>	
	This CS is design-related.	
comment	2141	comment by: <i>Aéroport Paris Vatry - XCR/LFOK</i>
	Attachment #189	
	NPA 2011-20 (B.III) CS-ADR-DSN.C.220	
	Référence: CS-ADR-DSN.C.220	
	Objects on runway end safety areas	
	Traduction de courtoisie	
	It is appropriate to transfer this provision into IR-OPS	
	It is an operational rule (notably for equipments) concerning the aerodrome operator.	
response	<i>Not accepted</i>	
	This CS is design-related.	
comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	
comment	2425	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	References for CS-ADR-DSN.T.920 and T.925 should be corrected.	
response	<i>Accepted</i>	
comment	2492	comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	" (a) No fixed object, other than visual aids required for air navigation or for aircraft safety purposes and satisfying the relevant frangibility requirement CS-ADR-DSN.T.9210, should be permitted on a runway end safety area. The detailed requirements for sitting objects on a RESA are in CS-ADR-DSN.T.9215 (Sitting of equipment and installations on operational areas).	
	(b) Where an arresting system demonstrated performance capability is installed, according to CS-ADR-DSN.C.215(d), the specifications of paragraph (a) above may be adapted in accordance with the design specification of the	

response	<p><i>arresting system.</i>"</p> <p><i>Noted</i></p> <p><i>Partially Agreed:</i> (a) Incorrect references will be amended. <i>Not Agreed:</i> (b)</p>
comment	<p>2585 comment by: <i>Danish Transport Authority</i></p> <p>We suggest to replace the words "visual aids" with "...equipment and installations...". It can be other equipment or installation than visual aids. ICAO Annex 14 para 9.9.2 mentions equipment and installations.</p>
response	<p><i>Accepted</i></p>
comment	<p>2586 comment by: <i>Danish Transport Authority</i></p> <p>EDITORIAL: Reference to CS-ADR-DSN.T.920 should be CS-ADR-DSN.T.910 and reference CS-ADR-DSN.T.925 should be CS-ADR-DSN.T.915.</p>
response	<p><i>Accepted</i></p>
comment	<p>2663 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #190</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.C.220</p> <p>Référence: CS-ADR-DSN.C.220 Objects on runway end safety areas</p> <p>Traduction de courtoisie It is appropriate to transfer this provision into IR-OPS It is an operational rule (notably for equipments) concerning the aerodrome operator.</p>
response	<p><i>Not accepted</i></p> <p>This CS is design-related.</p>
comment	<p>2847 comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i></p>

Référence: CS-ADR-DSN.C.220	Objects on runway end safety areas
Proposition/commentaire	Il convient de transférer cette disposition en IR-OPS.
Justification	Il s'agit ici d'une règle d'exploitation (notamment installation d'équipements) concernant l'exploitant d'aérodrome.
Traduction de courtoisie	It is appropriate to transfer this provision into IR-OPS It is an operational rule (notably for equipments) concerning the aerodrome operator.
response	<i>Not accepted</i> This CS is design-related.

CS-ADR — Book 1 — CS-ADR-DSN.C.225 — Clearing and grading of runway end safety areas

p. 22

comment

498

comment by: *Union des Aéroports français - UAF*

Attachment [#191](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.C.225

Référence: CS-ADR-DSN.C.225
Clearing and grading of runway end safety areas

Traduction de courtoisie

This CS has to be deleted.

Respecting this CS will exclude any establishment of EMAS which is contrary to the safety.

Besides, the (b) is useless because it is necessary to comply with the objectives of the RESA definition.

response

Partially accepted

EMAS will not have an adverse effect on RESA objectives.
Paragraph (b) will be moved to GM.

comment 718

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.C.225	Clearing and grading of runway end safety areas
Proposition/commentaire	Ce CS est à supprimer.
Justification	Le respect d'un tel CS empêcherait toute installation d'EMAS ce qui est contraire à la sécurité. Par ailleurs, le (b) est totalement inutile sachant qu'il faut répondre aux objectifs de la définition de la RESA.
Traduction de courtoisie	This CS has to be deleted. Respecting this CS will exclude any establishment of EMAS which is contrary to the safety. Besides, the (b) is useless because it is necessary to comply with the objectives of the RESA definition.

response *Partially accepted*

EMAS will not have an adverse effect on RESA objectives.
Paragraph (b) will be moved to GM.

comment 838 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.002 — Definitions - Runway end safety area (RESA) - (p8)
- CS-ADR - Book 1 - CS-ADR-DSN.A.002 — Definitions - Aircraft arresting system - (p5)
- CS-ADR - Book 1 - CS-ADR-DSN.C.215 - Dimensions of runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.C.220 - Objects on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.C.225 - Clearing and grading of runway end safety areas (p22-23)

2. Proposed text / comment

This comment is **critical**, as these definitions and CS-ADR-DSN.C.215 does not enable to perform an ELOS.

The **definition of RESA** has been revised following strong debates in ICAO, and this new definition has been agreed and is contained in ICAO Proposal for amendment of Annex 14, Volume I (State letter 41 – Ref : AN 4/1.1.52-11/41). This revised definition details the safety objective of a RESA, and enable to perform safety assessments on RESA, ie ELOS with an relevant demonstration. **It is consequently proposed to revise the definition of RESA and take the one from ICAO SL/41 (which is a clarification and an improvement of the proposed definition), to enable to perform ELOS on the CS related to RESA.**

The **proposed definition for "arresting system"** states that this system is "used" to stop an aircraft, whereas ICAO states, in State letter 41 – Ref : AN 4/1.1.52-11/41 which introduces this new concept of arresting system, does not give a definition but states that such a system :

- is "intended to enhance safety in the event of an aircraft overrun" (SL11/41 – p16) and
- has "demonstrated performance" (SL11/41 – p16 and para 9.4 p72) and
- is "predictable and effective in arresting aircraft overruns" (SL11/41 – p16 and para 9.3 p72).

The different is that the arresting system is designed so that it is "intended" to stop an aircraft, but it can not stop all aircraft overrunning in all conditions. **It is consequently proposed to revise this definition to clarify and improve it, and consequently enable States to properly assess possible safety assessments (for ELOS) on this subject.**

Moreover, concerning **CS-ADR-DSN.C.215**, it should take into account, in the writing, the fact that ICAO Annex 14 Volume I requires 90m length, and that the recommendation (240m) is done "if practicable". This clarification is important, because it is necessary to know on which safety objective an ELOS will be based. Moreover, having a RESA of 240 m length would be unapplicable on most aerodromes. Furthermore, the costs of arresting systems will be too high for most aerodrome operators. It is consequently proposed to write paragraph (a) of CS-ADR-DSN.C.215 so that the CS would focus on ICAO standard, and ask to have a longer RESA if practicable. It is also proposed to delete (b), since, in most, if not all cases, it won't be possible to demonstrate the same level of risks if the length is less than the ICAO Annex 14 Volume I recommendation. Finally, paragraphs (c) and (d) should be inverted since the standard for width should also apply to an arresting system.

CS-ADR-DSN.C.220 contains 2 erroneous references to other CS. Moreover, it should detail that an arresting system can be authorized even if it is an object.

CS-ADR-DSN.C.225 is not appropriate in case of an arresting system: it is proposed to add a reference to a possible "arresting system" which would not have to respect this specification.

As a conclusion, French DGAC proposes the following modifications:

CS-ADR-DSN.A.002 – Definitions - Runway end safety area (RESA)

"Runway end safety area (RESA)" means an area symmetrical about the

extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway, and also to allow an aeroplane overrunning to decelerate and an aeroplane undershooting to continue its approach or landing."

CS-ADR-DSN.A.002 – Definitions – Aircraft Arresting System

"**'Aircraft Arresting System'** means a series of components with demonstrated performance used-intended to stop an aircraft by absorbing its momentum in a routine or emergency landing or rejected take-off."

CS-ADR-DSN.C.215 – Dimensions of runway end safety areas

"(a) Length of RESA

A runway end safety area should, as far as practicable, extend from the end of a runway strip to a distance of at least 90 m.

Wherever practicable, a runway end safety area should extend to a distance of .

- (1) 240 m where the code number is 3 or 4; and
- (2) 120 m where the code number is 1 or 2; and
- (3) with a minimum distance of at least 90 m.

(b) Where a RESA exceeding the minimum distance, but less than the distance in (a)(1) and (a)(2) is considered necessary, the aerodrome operator should undertake a safety assessment to identify the hazards and appropriate actions to reduce the risk.

(c) Where an arresting system of demonstrated performance capability is installed, the specifications above may be reduced in accordance with the design specification of the arresting system.

(d) Width of RESA

The width of a runway end safety area should, wherever practicable, be equal to that of the graded portion of the associated runway strip."

(d) Where an arresting system of demonstrated performance capability is installed, the specifications above may be reduced in accordance with the design specification of the arresting system.

CS-ADR-DSN.C.220 - Objects on runway end safety areas

" (a) No fixed object, other than visual aids required for air navigation or for aircraft safety purposes and satisfying the relevant frangibility requirement CS-ADR-DSN.T.9210, should be permitted on a runway end safety area. The detailed requirements for sitting objects on a RESA are in CS-ADR-DSN.T.9215 (Sitting of equipment and installations on operational areas).

(b) Where an arresting system demonstrated performance capability is installed, according to CS-ADR-DSN.C.215(d), the specifications of paragraph (a) above may be adapted in accordance with the design specification of the arresting system."

CS-ADR-DSN.C.225 - Clearing and grading of runway end safety areas

" (a) A runway end safety area should provide a cleared and graded area for aeroplanes which the runway is intended to serve in the event of an aeroplane undershooting or overrunning the runway.

(b) The surface of the runway end safety area should be prepared, but does not need to be prepared to the same quality as the runway strip.

(c) Where an arresting system demonstrated performance capability is

installed, according to CS-ADR-DSN.C.215(d), the specifications of paragraph (a) above may be adapted in accordance with the design specification of the arresting system."

response *Noted*

This has been addressed in CS-ADR-DSN.C.210.

comment 1025 comment by: *Federal Office of Civil Aviation FOCA*

CS-ADR-DSN.C.225 (b): Please delete article as the quality of the strength is defined in CS-ADR-DSN.C.235.

response *Partially accepted*

This has been moved to GM.

comment 1442 comment by: *Euroairport Bâle-Mulhouse*

Attachment [#192](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.C.225

Référence: CS-ADR-DSN.C.225

Clearing and grading of runway end safety areas

Traduction de courtoisie

This CS has to be deleted.

Respecting this CS will exclude any establishment of EMAS which is contrary to the safety.

Besides, the (b) is useless because it is necessary to comply with the objectives of the RESA definition.

response *Partially accepted*

EMAS will not have an adverse effect on RESA objectives.
Paragraph (b) will be moved to GM.

comment 1553 comment by: *Aéroport de Marseille - MRS/LFML*

This CS has to be deleted.

Respecting this CS will exclude any establishment of EMAS which is contrary to the safety.

Besides, the (b) is useless because it is necessary to comply with the objectives of the RESA definition

response	<p><i>Partially accepted</i></p> <p>EMAS will not have an adverse effect on RESA objectives. Paragraph (b) will be moved to GM.</p>	
comment	1859	comment by: <i>Aéroports De Lyon</i>
	<p>Si l'on applique une telle exigence, il serait impossible de mettre un EMAS (Engineering Materials Arresting System) qui est un dispositif améliorant considérablement la sécurité! "The surface of the RESA should be prepared but does not need to be prepared to the same quality as the runway strip" = concrètement, quel est le revêtement exigé? Article trop vague...</p> <p><u>Proposition</u>: Supprimer ce CS ou le passer en GM.</p>	
response	<p><i>Partially accepted</i></p> <p>EMAS will not have an adverse effect on RESA objectives. Paragraph (b) will be moved to GM.</p>	
comment	1885	comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	<p>Attachment #193</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.C.225</p> <p>Référence: CS-ADR-DSN.C.225 Clearing and grading of runway end safety areas</p> <p>Traduction de courtoisie This CS has to be deleted. Respecting this CS will exclude any establishment of EMAS which is contrary to the safety. Besides, the (b) is useless because it is necessary to comply with the objectives of the RESA definition.</p>	
response	<p><i>Partially accepted</i></p> <p>EMAS will not have an adverse effect on RESA objectives. Paragraph (b) will be moved to GM.</p>	
comment	2142	comment by: <i>Aéroport Paris Vatry - XCR/LFOK</i>
	<p>Attachment #194</p>	

	<p>NPA 2011-20 (B.III) CS-ADR-DSN.C.225</p> <p>Référence: CS-ADR-DSN.C.225 Clearing and grading of runway end safety areas</p> <p>Traduction de courtoisie This CS has to be deleted. Respecting this CS will exclude any establishment of EMAS which is contrary to the safety. Besides, the (b) is useless because it is necessary to comply with the objectives of the RESA definition.</p>
response	<p><i>Partially accepted</i></p> <p>EMAS will not have an adverse effect on RESA objectives. Paragraph (b) will be moved to GM.</p>

comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2424 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>Delete article b, specifications are giveb in a following CS</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (b) will be moved to GM.</p>

comment	<p>2493 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p> <p>" (a) A runway end safety area should provide a cleared and graded area for aeroplanes which the runway is intended to serve in the event of an aeroplane undershooting or overrunning the runway. (b) The surface of the runway end safety area should be prepared, but does not need to be prepared to the same quality as the runway strip. (c) Where an arresting system demonstrated performance capability is installed, according to CS-ADR-DSN.C.215(d), the specifications of paragraph (a) above may be adapted in accordance with the design specification of the arresting system. "</p>
response	<p><i>Noted</i></p> <p>Paragraph (b) will be moved to GM. It is not necessary to add paragraph (c)</p>

(this is already in CS C.215).

comment 2664 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#195](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.C.225

Référence: CS-ADR-DSN.C.225

Clearing and grading of runway end safety areas

Traduction de courtoisie

This CS has to be deleted.

Respecting this CS will exclude any establishment of EMAS which is contrary to the safety.

Besides, the (b) is useless because it is necessary to comply with the objectives of the RESA definition.

response *Partially accepted*

EMAS will not have an adverse effect on RESA objectives.

Paragraph (b) will be moved to GM.

comment 2848 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.C.225	Clearing and grading of runway end safety areas
Proposition/commentaire	Ce CS est à supprimer.
Justification	Le respect d'un tel CS empêcherait toute installation d'EMAS ce qui est contraire à la sécurité. Par ailleurs, le (b) est totalement inutile sachant qu'il faut répondre aux objectifs de la définition de la RESA.
Traduction de courtoisie	This CS has to be deleted. Respecting this CS will exclude any establishment of EMAS which is contrary to the safety. Besides, the (b) is useless because it is necessary to comply with the objectives of the RESA definition.

response *Partially accepted*

EMAS will not have an adverse effect on RESA objectives.
Paragraph (b) will be moved to GM.

CS-ADR – Book 1 – CS-ADR-DSN.C.230 – Slopes on runway end safety areas p. 22-23

comment 499

comment by: *Union des Aéroports français - UAF*

Attachment [#196](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.C.230

Référence: CS-ADR-DSN.C.230
Slopes on runway end safety areas

Traduction de courtoisie

It is appropriate to keep into CS only the following part :

- (a) (1)

The rest of the provision has to be transferred to « guidance material » GM.

We consider that the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.

The respect of these rules can interfere with the objective of drainage.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 719

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.C.230

Slopes on runway end safety areas

Proposition/commentaire

Il convient de ne conserver en CS que la partie suivante:

- (a) (1)

Le reste de la disposition est à transférer en

	« guidance material » (GM).
Justification	<p>Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM.</p> <p>En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage.</p> <p>Le (a) (1) est à conserver dans la mesure où il donne un objectif spécifique pour la conception de la RESA.</p>
Traduction de courtoisie	<p>It is appropriate to keep into CS only the following part :</p> <p>- (a) (1)</p> <p>The rest of the provision has to be transferred to « guidance material » GM.</p> <p>We consider that the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.</p> <p>The respect of these rules can interfere with the objective of drainage.</p>

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 843 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)

- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to

prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 — Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 — Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

~~(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."~~

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 — Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.

(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope should may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface."

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface. Slopes should be are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders****CS-ADR-DSN.B.130 – Slopes on runway shoulders**

~~"The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips**

~~"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.185 – Transverse Slopes on runway strips**

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway

which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~
~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

~~(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~
~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

~~(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.~~

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

~~(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~

~~(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %~~

~~(c) Where clearway is provided, the slope on the REASA should can be amended accordingly."~~

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways****CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways**

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways****CS-ADR-DSN.D.275 – Sight distance of taxiways**

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways****CS-ADR-DSN.D.280 – Transverse slopes on taxiways**

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~
~~(1) 1.5 % where the code letter is C, D, E or F; and~~
~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:
 (1) 1.5 % where the code letter is C, D, E or F; and
 (2) 2 % where the code letter is A or B.
 (b) Slopes ~~should~~ **may** be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~
~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~
~~(2) 3 % for strips of taxiways where the code letter is A or B;~~
~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~
~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:
 (1) 2.5 % for strips where the code letter is C, D, E or F; and
 (2) 3 % for strips of taxiways where the code letter is A or B;
 the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~
~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 – Slopes on aprons —and GM

"(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "

response Noted

Comments will be addressed to under their individual CS reference.

comment

1288

comment by: ECA - European Cockpit Association

Amend Paragraph (a) (1) as follows:

The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface, **nor such that loads will be imposed which may cause structural failure of an aeroplane penetrating the area.**

Justification:

This text should be extended to require that loads will not be imposed which may cause structural failure of an aeroplane penetrating the area.

Reference: IFALPA Annex 14, paragraph 3.5.8

response

Not accepted

The specification figures are identical to ICAO. Grading and treatment of obstacles on the RESA addresses the concerns about structural damage to aeroplanes.

comment

1443

comment by: Euroairport Bâle-Mulhouse

Attachment [#197](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.C.230

Référence: CS-ADR-DSN.C.230

Slopes on runway end safety areas

	<p>Traduction de courtoisie It is appropriate to keep into CS only the following part : - (a) (1) The rest of the provision has to be transferred to « guidance material » GM. We consider that the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>

comment	<p>1554 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>It is appropriate to keep into CS only the following part : - (a) (1) The rest of the provision has to be transferred to « guidance material » GM. We consider that the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>

comment	<p>1794 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).</p> <p>Parts without figures are written in an adequate and constructive way for which reason it is acceptable to keep the ICAO-recommendations within the CS.</p> <p>The figures are indiscriminately and not based on scientific findings, at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden.</p> <p>We suggest move the figures GM.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>

comment	1877	comment by: <i>Aéroports De Lyon</i>
	<p>L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Elle peuvent même aller à l'encontre de l'objectif des pentes: le drainage de l'eau.</p> <p><u>Proposition</u>: Préciser la donnée en GM</p>	
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>	

comment	1886	comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	<p>Attachment #198</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.C.230</p> <p>Référence: CS-ADR-DSN.C.230 Slopes on runway end safety areas</p> <p>Traduction de courtoisie It is appropriate to keep into CS only the following part : - (a) (1) The rest of the provision has to be transferred to « guidance material » GM. We consider that the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p>	
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>	

comment	2144	comment by: <i>Aéroport Paris Vatry - XCR/LFOK</i>
	<p>Attachment #199</p> <p>NPA 2011-20 (B.III) CS-ADR-DSN.C.230</p> <p>Référence: CS-ADR-DSN.C.230 Slopes on runway end safety areas</p> <p>Traduction de courtoisie It is appropriate to keep into CS only the following part :</p>	

	<p>- (a) (1) The rest of the provision has to be transferred to « guidance material » GM. We consider that the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>

comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p>
	<p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2460 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p>
	<p>This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!</p> <p>If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in CS. The figures are recognised globally.</p>

comment	<p>2504 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p>
	<p>CS-ADR-DSN.C.230 - Slopes on runway end safety areas "(a) Longitudinal slopes (1) <i>The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.</i> (2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. <i>Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.</i></p> <p>"(b) Transverse slopes</p>

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5%. Transitions between differing slopes should be as gradual as practicable."~~

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 2665 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#200](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.C.230

Référence: CS-ADR-DSN.C.230

Slopes on runway end safety areas

Traduction de courtoisie

It is appropriate to keep into CS only the following part :

- (a) (1)

The rest of the provision has to be transferred to « guidance material » GM.

We consider that the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.

The respect of these rules can interfere with the objective of drainage.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 2849 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.C.230	Slopes on runway end safety areas
Proposition/commentaire	Il convient de ne conserver en CS que la partie suivante: - (a) (1) Le reste de la disposition est à transférer en « guidance material » (GM).
Justification	Nous trouvons que l'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc plus opportun de retrouver ces règles en GM. En outre, le respect de ces règles peut même aller à l'encontre de l'objectif des pentes à savoir le drainage.

	Le (a) (1) est à conserver dans la mesure où il donne un objectif spécifique pour la conception de la RESA.
Traduction de courtoisie	<p>It is appropriate to keep into CS only the following part :</p> <p>- (a) (1)</p> <p>The rest of the provision has to be transferred to « guidance material » GM.</p> <p>We consider that the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.</p> <p>The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>

CS-ADR — Book 1 — CS-ADR-DSN.C.235 — Strength of runway end safety areas

p. 23

comment 1292

comment by: ECA - European Cockpit Association

Retain the paragraph as a CS with the following text:

(a) A runway end safety area should be so prepared and constructed as to reduce the risk of injury to persons on board an aeroplane undershooting or overrunning the runway, enhance stopping the movement of the aeroplane, and facilitate the rapid movement of rescue and fire fighting vehicles.

(b) The surface of the paved portion of a runway end safety area should be constructed to provide a good friction coefficient when the surface is wet.

(c) Open drainage ditches should not be located within the runway end safety areas. Where drainage ditches are located at the edge of the runway end safety areas graded area, they should be covered in order to preclude structural damage in the event an aeroplane overruns the ditch.

Justification:

	This is an important safety related issue that should be addressed as a CS. Reference: IFALPA Annex 14, paragraphs 3.5.11; 3.5.11.x and 3.5.11.y
response	<i>Not accepted</i>
	This is addressed in the GM. The words 'intentionally blank' will be inserted in the CS.

comment	2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>

comment	2587 comment by: <i>Danish Transport Authority</i>
	The initial part under GM-ADR-DSN.C.235 should be moved to thsi paragraph. The content is similar to the objective in CS-ADR-DSN.C.225 (a).
response	<i>Not accepted</i>
	It is considered appropriate to move CS C.235 to GM.

CS-ADR – Book 1 – CS-ADR-DSN.D.240 – Taxiways General

p. 24

comment	432 comment by: <i>SWISS AERODROMES ASSOCIATION</i>
	Taxiways, as other physical characteristics, are published. Safe use of an aerodrome is in the responsibility of the aircraft operator. Aerodrome operators will have to meet BRs and ERs. There is therefore no reason to set requirements on taxiways in a CS.
	As for other CSs, the whole chapter should be moved to GM
response	<i>Not accepted</i>
	The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment	1006 comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<u>1. Affected paragraphs</u>

- CS-ADR - Book 1 – CS-ADR-DSN.D.240 – Taxiways General (p24)

2. Proposed text / comment

The reference to “this chapter” is ambiguous. See proposed modification below:

CS-ADR-DSN.D.240 – Taxiways General

“Unless otherwise indicated, the requirements in ~~this~~ Chapter **D- TAXIWAYS** are applicable to all types of taxiways.

[...]”

response *Accepted*

comment 1293

comment by: *ECA - European Cockpit Association*

Amend as follows:

A ~~1.5~~ **2.75 m (9 ft.)**

B ~~2.25~~ **4 m (13 ft.)**

C ~~3~~ **5.5 m (17.5 ft.)** if the taxiway is intended to be used by aeroplanes with a wheel base less than 18 m (**58.5ft.**); or

4.5 8 m (26 ft) if the taxiway is intended to be used by aeroplanes with a wheel

base equal to or greater than 18 m (**58.5 ft.**).

D **4.5 8 m (26 ft)** E **4.5 8 m (26 ft.)**.

F **4.5 6** m

Justification:

The following amendment to the tabulation is to make the clearance distances compatible with the IFALPA requirements for minimum taxiway widths. The revised clearances are based on an outer main gear span of 14 m (largest current dimension is A380 with main gear span of 14.336m) on a code letter E or D taxiway. The clearance for code letters C, B and A taxiways is increased in the same proportion. Reference: IFALPA Annex 14, paragraph 3.9.3

response *Not accepted*

The CS numerical values are identical to ICAO.

comment 1801

comment by: *IDRF e.V. (association of regional airports)*

The DSN-elements of chapter D - taxiways are almost exclusively based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).

The figures are indiscriminately and not based on scientific findings, at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden.

	<p>We suggest to move ICAO-recommendation-figures of this DSN-element to GM. ICAO-standard figures (only D.240) may be acceptable until universally valid studies have been made.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p>
	<p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2461 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p>
	<p>Since at an aerodrome not all taxiways are necessarily be used by the highest category aircraft serving the aerodrome, the dimensions of the taxiways should be dependent of the aircraft using it not the size of the aerodrome. By implementing this ICAO Annex 14 recommendation in an CS, it makes it impossible for the aerodrome operator to adapt the size of a taxiway to aircraft using it (i.e. general aviation), but instead all taxiways on an aerodrome have to fulfill the set dimensions and requirements. Additional to the costs and effort at the expense of the aerodrome operator it takes away much of the flexibility needed to adapt the layout of the aerodrome or parts thereof to according traffic.</p>
response	<p><i>Not accepted</i></p> <p>This is an operational consideration.</p>
comment	<p>2810 comment by: <i>ECA - European Cockpit Association</i></p>
	<p><u>Use of runways as taxiways</u></p> <p>ECA does not approve of the practice of using runways as taxiways. The potential for error with possible disastrous consequences of such a practice is obvious. However, recognising that this practice is relatively common at a number of locations, ECA recommends the following guidelines:</p> <ul style="list-style-type: none"> i) Runways used permanently as taxiways shall be marked and lit in accordance with the standard specification for taxiways; ii) Runways which are used both as taxiways and runways shall be provided with a dual, switchable lighting system; and iii) The aerodrome ground chart shall clearly identify runways, which may be used as taxiways. <p>In addition it must be recognised that particular dangers exist when a runway</p>

	parallel to an active runway is used as a taxiway. This practice should be actively discouraged particularly when operations are taking place in IMC.
response	<i>Not accepted</i>
	This is an operational consideration.

comment	2812 comment by: <i>ECA - European Cockpit Association</i>
	Add paragraphs (b) and (c) as follows: (b) Taxiway runway crossing should be prevented by airport design, a physical barrier or the use of a stop bar. (c) Entrance Taxiways for a runway should be restricted to those required for lining up for take off and should be perpendicular to that runway. Justification: IFALPA Annex 14, paragraphs 3.9.2.x and 3.9.2.y
response	<i>Not accepted</i>
	These are operational considerations.

CS-ADR – Book 1 – CS-ADR-DSN.D.245 – Width of Taxiways

p. 24

comment	500 comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #201 UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.245 Référence: CS-ADR-DSN.D.245 Width of taxiways Traduction de courtoisie It is appropriate to transfer this article into GM This article is a repetition of the previous article (CS-ADR-DSN.D.240). Indeed, the widths of taxiways are directly obtained by the provisions related to the space between the extern wheel of the landing gear and the edge of the taxiway.
response	<i>Not accepted</i>
	The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 720

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.D.245	Width of taxiways
Proposition/commentaire	Il convient de transférer cet article en Guidance Material.
Justification	<p>Cet article est une redite de l'article précédent (CS-ADR-DSN.D.240). En effet, les largeurs de voies de circulation sont obtenues directement par les dispositions relatives aux marges entre la roue extérieure du train d'atterrissage et le bord de la voie de circulation.</p> <p>La France a utilisé dans le passé 22,5m au lieu de 23m pour les codes D et E. Ceci s'explique par une raison historique : la valeur en pieds a été arrondie à 23 m par l'OACI lors de la conversion de pieds en mètres. La France a utilisé la valeur exacte avec une décimale : 22,5 m jusqu'à 2006 et les taxiways existants de 22,5m de largeur sont toujours acceptés. La différence entre 22,5 m et 23 m est marginale et l'écart de 2% de largeur en ligne droite devrait être considéré comme acceptable.</p>
Traduction de courtoisie	<p>It is appropriate to transfer this article into GM</p> <p>This article is a repetition of the previous article (CS-ADR-DSN.D.240). Indeed, the widths of taxiways are directly obtained by the provisions related to the space between the extern wheel of the landing gear and the edge of the taxiway.</p> <p>France has used in the past for codes D and E 22,5m instead of 23m. This is explained by an historical reason: the value in feet has been rounded up to 23m by ICAO when converting feet into meters. France has used the exact value with one decimal: 22.5m until 2006 and the existing taxiways of 22,5m width are still accepted.</p> <p>The difference between 22,5 and 23m is marginal and 2% width variation on straight lines should be considered as acceptable.</p>

response *Not accepted*

The specification figures for width of taxiways are identical to ICAO; therefore,

they will stay in CS. CS-ADR-DSN.D.240 has specifications for the clearance distance between the outer main wheel of the aeroplane and the edge of the taxiway.

comment 1110

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.D.245 — Width of Taxiways (p24)

2. Justification and proposed text / comment

This comment is to inform EASA on taxiways width in France.

The clearances are already in CS-ADR-DSN.D.240 and the calculation to deduct the TWY width based on these clearances is contained in GM.

Moreover, France has used in the past, for codes D and E, 22,5m instead of 23m. This is explained by an historical reason: the value in feet in the previous English version of Annex 14 Volume 1 has been rounded up to 23m by ICAO when converting feet into meters. France has used the value with one decimal: 22.5m until.

Aerodromes are certified with 22,5m width taxiways for codes D and E.

It would be possible to consider such taxiways are compliant as AMC-ADR-OPS.A.010 – Data quality requirements states in Table 7 – Length/Distance/Dimension that Runway width accuracy for data is 1 meter.

response Noted

comment 1301

comment by: ECA - European Cockpit Association

Comment:

Cat A Delete 7.5 m and substitute 10 m (33 ft.)

Cat B Delete 10.5 m and substitute 14 m (46 ft.).

Cat C Delete 15 m and substitute 20 m (66 ft.), inserting (58.5 ft.) after "18 m". Delete 18 m and substitute 30 m (100 ft.), inserting (58.5 ft.) after "18 m"

Cat D Delete 18 m and substitute 25 m (83 ft.), inserting after "9 m" the words "(29.25 ft.) and wheel base less than 18 m 7(58.5 ft)". Delete 23 m and substitute 30 (100 ft.), inserting (58.5 ft.) after "18 m".

Cat E Delete 23 m and substitute 30 m (100 ft.)

Cat F Delete 25 m and substitute 30 m

Justification:

The values in the following amendment to the tabulation have been calculated

by adding twice the minimum clearances in CS-ADR-DSN.D.240 to the highest value of main gear span for each Code letter in the Aerodrome Reference Code. The table has been complicated by the introduction of wheel-base although there does not appear to be a current aircraft type in Code C with a wheel-base in excess of 18m. In order to follow the ICAO table as closely as possible this consideration is included in the proposed table.
Reference: IFALPA Annex 14, paragraph 3.9.5

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will not be amended.

comment

1445

comment by: *Euroairport Bâle-Mulhouse*

Attachment [#202](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.245

Référence: CS-ADR-DSN.D.245

Width of taxiways

Traduction de courtoisie

It is appropriate to transfer this article into GM

This article is a repetition of the previous article (CS-ADR-DSN.D.240). Indeed, the widths of taxiways are directly obtained by the provisions related to the space between the extern wheel of the landing gear and the edge of the taxiway.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment

1555

comment by: *Aéroport de Marseille - MRS/LFML*

It is appropriate to transfer this article into GM

This article is a repetition of the previous article (CS-ADR-DSN.D.240). Indeed, the widths of taxiways are directly obtained by the provisions related to the space between the extern wheel of the landing gear and the edge of the taxiway.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment	1810	comment by: <i>IDRF e.V. (association of regional airports)</i>
	We suggest to move this DSN-element to GM, see our comment relating CS-ADR-DSN.D.240.	
response	<i>Not accepted</i>	
	The specification figures are identical to ICAO; therefore, they will stay in the CS.	
comment	1888	comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	Attachment #203	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.245	
	Référence: CS-ADR-DSN.D.245 Width of taxiways	
	Traduction de courtoisie It is appropriate to transfer this article into GM This article is a repetition of the previous article (CS-ADR-DSN.D.240). Indeed, the widths of taxiways are directly obtained by the provisions related to the space between the extern wheel of the landing gear and the edge of the taxiway.	
response	<i>Not accepted</i>	
	The specification figures are identical to ICAO; therefore, they will stay in the CS.	
comment	1910	comment by: <i>Aéroports De Lyon</i>
	A LYS, les taxiways mesurent 22.5m iso 23m conformément à la réglementation en vigueur au moment de la construction. La reprise de tous les taxiways serait un investissement trop coûteux pour l'exploitant.	
	<u>Proposition</u> : Appliquer la loi du grand-père, c'est à dire n'appliquer cette exigence que sur les nouveaux taxiways (ou sur les modifications de taxiway).	
response	<i>Not accepted</i>	
	The CS allows flexibility for non-compliant dimensions by use of a SC or DAAD. This has been analysed in the LYS RIA case study.	
comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>

	Noted
response	<i>Noted</i>

comment	2462 comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	<p>Since at an aerodrome not all taxiways are necessarily be used by the highest category aircraft serving the aerodrome, the dimensions of the taxiways should be dependent of the aircraft using it not the size of the aerodrome. By implementing this ICAO Annex 14 recommendation in an CS, it makes it impossible for the aerodrome operator to adapt the size of a taxiway to aircraft using it (i.e. general aviation), but instead all taxiways on an aerodrome have to fulfill the set dimensions and requirements. Additional to the costs and effort at the expense of the aerodrome operator it takes away much of the flexibility needed to adapt the layout of the aerodrome or parts thereof to according traffic.</p>
response	<i>Noted</i>
	These are operational considerations.

comment	2548 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	<p>This comment is to inform EASA on taxiways width in some Aena Airports. The clearances are already in CS-ADR-DSN.D.240 and the calculation to deduct the TWY width based on these clearances is contained in GM. Moreover, in some Spanish Airports has used in the past, for codes D and E, 22,5m instead of 23m. This is explained by an historical reason: the value in feet in the previous English version of Annex 14 Volume 1 has been rounded up to 23m by ICAO when converting feet into meters. In some Airports have used the value with one decimal: 22.5m until. Aerodromes will be certified with 22,5m width taxiways for codes D and E. It would be possible to consider such taxiways are compliant as AMC-ADR-OPS.A.010 - Data quality requirements states in Table 7 - Length/Distance/Dimension that Runway width accuracy for data is 1 meter.</p>
response	<i>Noted</i>
	This can be addressed by using the DAAD mechanism.

comment	2666 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
	Attachment #204
	ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.245
	Référence: CS-ADR-DSN.D.245

	<p>Width of taxiways</p> <p>Traduction de courtoisie It is appropriate to transfer this article into GM This article is a repetition of the previous article (CS-ADR-DSN.D.240). Indeed, the widths of taxiways are directly obtained by the provisions related to the space between the extern wheel of the landing gear and the edge of the taxiway.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>

comment	<p>2850 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN</p> <table border="1"> <tr> <td><u>Référence: CS-ADR-DSN.D.245</u></td> <td>Width of taxiways</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de transférer cet article en Guidance Material.</td> </tr> <tr> <td>Justification</td> <td>Cet article est une redite de l'article précédent (CS-ADR-DSN.D.240). En effet, les largeurs de voies de circulation sont obtenues directement par les dispositions relatives aux marges entre la roue extérieure du train d'atterrissage et le bord de la voie de circulation.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td> <p>It is appropriate to transfer this article into GM</p> <p>This article is a repetition of the previous article (CS-ADR-DSN.D.240). Indeed, the widths of taxiways are directly obtained by the provisions related to the space between the extern wheel of the landing gear and the edge of the taxiway.</p> </td> </tr> </table>	<u>Référence: CS-ADR-DSN.D.245</u>	Width of taxiways	Proposition/commentaire	Il convient de transférer cet article en Guidance Material.	Justification	Cet article est une redite de l'article précédent (CS-ADR-DSN.D.240). En effet, les largeurs de voies de circulation sont obtenues directement par les dispositions relatives aux marges entre la roue extérieure du train d'atterrissage et le bord de la voie de circulation.	Traduction de courtoisie	<p>It is appropriate to transfer this article into GM</p> <p>This article is a repetition of the previous article (CS-ADR-DSN.D.240). Indeed, the widths of taxiways are directly obtained by the provisions related to the space between the extern wheel of the landing gear and the edge of the taxiway.</p>
<u>Référence: CS-ADR-DSN.D.245</u>	Width of taxiways								
Proposition/commentaire	Il convient de transférer cet article en Guidance Material.								
Justification	Cet article est une redite de l'article précédent (CS-ADR-DSN.D.240). En effet, les largeurs de voies de circulation sont obtenues directement par les dispositions relatives aux marges entre la roue extérieure du train d'atterrissage et le bord de la voie de circulation.								
Traduction de courtoisie	<p>It is appropriate to transfer this article into GM</p> <p>This article is a repetition of the previous article (CS-ADR-DSN.D.240). Indeed, the widths of taxiways are directly obtained by the provisions related to the space between the extern wheel of the landing gear and the edge of the taxiway.</p>								
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>								

comment	592	comment by: Cologne/Bonn Airport
response	Noted	

comment	921	comment by: DGAC Direction Générale de l'aviation civile
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • BIII - CS-ADR - Book 1 – CS-ADR-DSN.D.250 – Taxiways curves (p25) • BIII - CS-ADR - Book 1 – CS-ADR-DSN.D.255 – Junction and intersection of taxiways (p25) • BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.250 – Taxiways curves (p229-230) • BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.255 – Junction and intersection of taxiways (p230) <p><u>2. Proposed text / comment</u></p> <p>The duplication of the last sentence of both CS in the corresponding GM is very confusing as it is not known whether it should be regarded as a certification specification or only a guide. As written, they seem to be more guidance since they are already dealt with by CS-ADR-DSN.D.240. Moreover, the use of “should” in a guidance material is confusing. Thus the proposed modification:</p> <p>CS-ADR-DSN.D.250 – Taxiways curves “Changes in direction of taxiways should be as few and small as possible. The radii of the curves should be compatible with the manoeuvring capability and normal taxiing speeds of the aeroplanes for which the taxiway is intended. The design of the curve should be such that, when the cockpit of the aeroplane for which the taxiway is intended remains over the taxiway centre line markings, the clearance distance between the outer main wheels of the aeroplane and the edge of the taxiway should be not less than those specified in CS-ADR-DSN.D.240.”</p> <p>GM-ADR-DSN.D.250 – Taxiways curves “(a) The design of the curve should needs to be such that, when the cockpit of the aeroplane remains over the taxiway centre line markings, the clearance distance between the outer main wheels of the aeroplane and the edge of the taxiway should may not be less than those specified in CS-ADR-DSN.D.250240. [...]”</p> <p>CS-ADR-DSN.D.255 – Junction and intersection of taxiways ICAO “To facilitate the movement of aeroplanes, fillets should be provided at junctions and intersections of taxiways with runways, aprons and other taxiways. The design of the fillets should ensure that the minimum wheel clearances specified in CS-ADR-DSN.D.240 are maintained when aeroplanes are manoeuvring through the junctions or intersections.”</p> <p>GM-ADR-DSN.D.255 – Junction and intersection of taxiways “(a) The design of the fillets should needs to ensure that the minimum wheel</p>	

clearances specified in CS-ADR-DSN.D.240 are maintained when aeroplanes are manoeuvring through the junctions or intersections.
 (b) Consideration ~~should~~ **needs to** be given to the aeroplane datum length when designing fillets. Guidance on the design of fillets and the definition of the term aeroplane datum length are given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).
 (c) Guidance on factors which may be considered in the aeronautical study is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).
 [...]”

response *Not accepted*

The proposed deletion of CS text. The text remains, but the duplicate text in paragraph (a) of GM D.250 will be deleted.

comment **1486** comment by: *Geneva International Airport (ROMIG)*

The last sentence is found in the GM related to this article. Propose to delete from the CS.
 Inconsistent

response *Partially accepted*

The duplicate GM text will be deleted.

comment **1912** comment by: *Aéroports De Lyon*

Les congés de raccordement mesurent 2 m (iso 4.5m) pour certains taxiways. Cependant, des actions correctives (convoyage, contrôle des accotements, publication aéronautique à jour préconisant de l'over steering) sont en place afin d'assurer un niveau de sécurité équivalent.

Proposition: Appliquer la loi du grand-père, c'est à dire n'appliquer cette exigence que sur les nouveaux taxiways (ou sur les modifications de taxiway).

response *Not accepted*

The CS allows flexibility for non-compliant dimensions by use of a SC or DAAD.

comment **2212** ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment	2410	comment by: Airport St. Gallen-Altenrhein - ACH/LSZR
	The last sentence already in the GM related to this article. Delete from the CS.	
response	<i>Partially accepted</i>	
	The duplicate GM text will be deleted.	

comment	2531	comment by: AENA - Aeropuertos Españoles y Navegación Aérea
	<p>The duplication of the last sentence of both CS in the corresponding GM is very confusing as it is not known whether it should be regarded as a certification specification or only a guide. As written, they seem to be more guidance since they are already dealt with by CS-ADR-DSN.D.240.</p> <p>Moreover, the use of "should" in a guidance material is confusing.</p> <p>Thus the proposed modification:</p> <p>CS-ADR-DSN.D.250 – Taxiways curves</p> <p><i>"Changes in direction of taxiways should be as few and small as possible. The radii of the curves should be compatible with the manoeuvring capability and normal taxiing speeds of the aeroplanes for which the taxiway is intended. The design of the curve should be such that, when the cockpit of the aeroplane for which the taxiway is intended remains over the taxiway centre line markings, the clearance distance between the outer main wheels of the aeroplane and the edge of the taxiway should be not less than those specified in CS ADR-DSN.D.240."</i></p>	
response	<i>Partially accepted</i>	
	<p>The specification figures are identical to ICAO; therefore, they will stay in CS. The duplicate text in GM.250 paragraph (a) will be deleted and subsequent paragraphs promoted.</p>	

CS-ADR – Book 1 – CS-ADR-DSN.D.255 – Junction and intersection of taxiways

p. 25

comment	921 ❖	comment by: DGAC Direction Générale de l'aviation civile
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • BIII - CS-ADR - Book 1 – CS-ADR-DSN.D.250 – Taxiways curves (p25) • BIII - CS-ADR - Book 1 – CS-ADR-DSN.D.255 – Junction and intersection of taxiways (p25) • BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.250 – Taxiways curves (p229-230) • BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.255 – Junction and 	

intersection of taxiways (p230)

2. Proposed text / comment

The duplication of the last sentence of both CS in the corresponding GM is very confusing as it is not known whether it should be regarded as a certification specification or only a guide. As written, they seem to be more guidance since they are already dealt with by CS-ADR-DSN.D.240.

Moreover, the use of "should" in a guidance material is confusing. Thus the proposed modification:

CS-ADR-DSN.D.250 – Taxiways curves

"Changes in direction of taxiways should be as few and small as possible. The radii of the curves should be compatible with the manoeuvring capability and normal taxiing speeds of the aeroplanes for which the taxiway is intended. ~~The design of the curve should be such that, when the cockpit of the aeroplane for which the taxiway is intended remains over the taxiway centre line markings, the clearance distance between the outer main wheels of the aeroplane and the edge of the taxiway should be not less than those specified in CS-ADR-DSN.D.240.~~"

GM-ADR-DSN.D.250 – Taxiways curves

*"(a) The design of the curve ~~should~~ **needs to** be such that, when the cockpit of the aeroplane remains over the taxiway centre line markings, the clearance distance between the outer main wheels of the aeroplane and the edge of the taxiway ~~should~~ **may** not be less than those specified in CS-ADR-DSN.D.250~~240~~. [...]"*

CS-ADR-DSN.D.255 – Junction and intersection of taxiways ICAO

"To facilitate the movement of aeroplanes, fillets should be provided at junctions and intersections of taxiways with runways, aprons and other taxiways. ~~The design of the fillets should ensure that the minimum wheel clearances specified in CS-ADR-DSN.D.240 are maintained when aeroplanes are manoeuvring through the junctions or intersections.~~"

GM-ADR-DSN.D.255 – Junction and intersection of taxiways

*"(a) The design of the fillets ~~should~~ **needs to** ensure that the minimum wheel clearances specified in CS-ADR-DSN.D.240 are maintained when aeroplanes are manoeuvring through the junctions or intersections.*

*(b) Consideration ~~should~~ **needs to** be given to the aeroplane datum length when designing fillets. Guidance on the design of fillets and the definition of the term aeroplane datum length are given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).*

(c) Guidance on factors which may be considered in the aeronautical study is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2). [...]"

response *Not accepted*

The proposed deletion of CS text. The text remains, but the duplicate text in paragraph (a) of GM D.250 will be deleted.

comment 1488

comment by: Geneva International Airport (ROMIG)

	<p>The last sentence is found in the GM related to this article. Propose to delete from the CS. Inconsistant</p>
response	<p><i>Partially accepted</i></p> <p>The duplicate GM text will be deleted and subsequent paragraphs promoted.</p>
comment	<p>1914 comment by: <i>Aéroports De Lyon</i></p> <p>Les congés de raccordement mesurent 2 m (iso 4.5m) pour certains taxiways. Cependant, des actions correctives (convoyage, contrôle des accotements, publication aéronautique à jour préconisant de l'over steering) sont en place afin d'assurer un niveau de sécurité équivalent.</p> <p><u>Proposition</u>: Appliquer la loi du grand-père, c'est à dire n'appliquer cette exigence que sur les nouveaux taxiways (ou sur les modifications de taxiway).</p>
response	<p><i>Not accepted</i></p> <p>The CS allows flexibility for non-compliant dimensions by use of a SC or DAAD.</p>
comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2409 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>The last sentence already in the GM related to this article. Delete from the CS.</p>
response	<p><i>Partially accepted</i></p> <p>The duplicate GM text will be deleted.</p>
comment	<p>2532 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p> <p>CS-ADR-DSN.D.255 – Junction and intersection of taxiways ICAO "To facilitate the movement of aeroplanes, fillets should be provided at junctions and intersections of taxiways with runways, aprons and other taxiways. The design of the fillets should ensure that the minimum wheel clearances specified in CS-ADR-DSN.D.240 are maintained when aeroplanes are manoeuvring through the junctions or intersections."</p>

response *Not accepted*

The duplicate text will be deleted from GM, but remains in CS.

CS-ADR — Book 1 — CS-ADR-DSN.D.260 — Taxiway minimum separation distance p. 25-26

comment 227 comment by: *Danish Transport Authority*

Despite the "imminent ICAO changes" the NPA should still reflect the current version of ICAO Annex 14, Volume I as announced by EASA. Subject CS-ADR-DSN.L.580 regarding intermediate holding position display the current minimum separation distances of 57,5 m next to code letter F aircraft.

response *Noted*

The intermediate holding position separation does not yet feature in proposed ICAO design changes.

comment 265 comment by: *Belgian CAA*

The distance in column (7) for code B is not in compliance with Annex 14.

response *Accepted*

This will be amended from 42 metres to 52 metres.

comment 266 comment by: *Belgian CAA*

Note 3 has nothing to do with the TWY minimum separation distance.

response *Noted*

comment 501 comment by: *Union des Aéroports français - UAF*

Attachment [#205](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.260

Référence: CS-ADR-DSN.D.260

Taxiway minimum separation distance

	<p>Traduction de courtoisie It is appropriate to transfer into « guidance material » GM. The separation distances are just recommendations of ICAO. Some studies have demonstrated, notably for code F, that we can have lower distances than indicated in the figure. We propose to take up these values approved by most of European States.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>

comment	<p>609 comment by: <i>Avinor</i></p> <p>CS-ADR-DSN.D.260. Table D-2. Non-instrument runways code no. 2B, distance between TWY cl and RWY cl should be 52 m (not 42 m).</p>
response	<p><i>Accepted</i></p>

comment	<p>721 comment by: <i>ADP : Aeroports de Paris</i></p> <table border="1"> <tr> <td>Référence: CS-ADR-DSN.D.260</td> <td>Taxiway minimum separation distance</td> </tr> <tr> <td>Proposition/commentaire</td> <td> <p>Il convient de transférer cet article en Guidance Material. S'agissant du Code F du « table D-1 », des études ont démontré que des distances de séparation inférieures pouvaient être prises. ex: 91m au lieu de 95m pour la séparation entre voies de circulation de code F, 51m au lieu de 55m pour la séparation entre voie de circulation autre qu'une voie d'accès de poste de stationnement.</p> </td> </tr> <tr> <td>Justification</td> <td> <p>Les distances de séparation ne sont que des recommandations de l'OACI. Des études notamment pour le code F ont démontré que des distances inférieures à celles données dans le tableau peuvent convenir et nous proposons de reprendre ces valeurs reconnues par la plupart des autorités européennes.</p> </td> </tr> <tr> <td>Traduction de courtoisie</td> <td> <p>It is appropriate to transfer into « guidance material » GM.</p> <p>The separation distances are just recommendations of ICAO. Some studies have demonstrated, notably for code F, that we can have lower distances than indicated in the figure. We propose to take up</p> </td> </tr> </table>	Référence: CS-ADR-DSN.D.260	Taxiway minimum separation distance	Proposition/commentaire	<p>Il convient de transférer cet article en Guidance Material. S'agissant du Code F du « table D-1 », des études ont démontré que des distances de séparation inférieures pouvaient être prises. ex: 91m au lieu de 95m pour la séparation entre voies de circulation de code F, 51m au lieu de 55m pour la séparation entre voie de circulation autre qu'une voie d'accès de poste de stationnement.</p>	Justification	<p>Les distances de séparation ne sont que des recommandations de l'OACI. Des études notamment pour le code F ont démontré que des distances inférieures à celles données dans le tableau peuvent convenir et nous proposons de reprendre ces valeurs reconnues par la plupart des autorités européennes.</p>	Traduction de courtoisie	<p>It is appropriate to transfer into « guidance material » GM.</p> <p>The separation distances are just recommendations of ICAO. Some studies have demonstrated, notably for code F, that we can have lower distances than indicated in the figure. We propose to take up</p>
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	these values approved by most of European States.
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>815 comment by: <i>Finnish Transport Safety Agency</i></p> <p>Note 3- Please reword this, now it is unclear</p>
response	<p><i>Noted</i></p>
comment	<p>1027 comment by: <i>Federal Office of Civil Aviation FOCA</i></p> <p>According and in line with the number in the Table 1 of AMC2-ADR-OPS.B.075 the number in column 11 for code letter F aircraft should be changed to 57.5.</p>
response	<p><i>Noted</i></p> <p>The ICAO distance of 57.5 m will be used.</p>
comment	<p>1111 comment by: <i>DGAC Direction Générale de l'aviation civile</i></p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.260 — Taxiway minimum separation distance (p25-26) • BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.315 — Width of taxiway strips (p29) • BIII - CS-ADR - Book 1 - Figure D-1. Rapid exit taxiway (p28) • BIII - CS-ADR - Book 1 - CS-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad (p35) • BIII - CS-ADR - Book 1 - CS-ADR-DSN.Q.840 — Objects to be marked and/or lighted (p146-147) • BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.260 — Taxiway minimum separation distance • BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.315 — Width of taxiway strips (p232) • BIII - CS-ADR - Book 2 - GM-ADR-DSN.G.400 — Clearance distances on

- a de-icing/anti-icing pad (p239)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.255 — Junction and intersection of taxiways
- Explanatory Note – paragraph 18 (page 8)

2. Proposed text / comment

The figures for taxiway minimum separation distances are intended for design purposes only and can be far less large than indicated: indeed, these figures are no more applied when maintaining taxiways and consequently no more relevant.

No safety concern has been noticed until now on this point.

But above all, verifying that the separation distances between taxiways are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured" (paragraph 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) either the certification specification gives only the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision, and the figures are in guidance material.
- (ii) or the figures are kept in the CS but specifying each time that they should be met "where practicable" and the CS gives the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision.

The option (i) is proposed by DGAC because less confusing and far clearer, and therefore more appropriate for a regulation and for future standardization. This is a critical point for DGAC.

All CSs referring to figures in table D-1 are to be changed consequently: their provisions corresponding to such distance should be move to GM, except for CS-ADR-DSN.Q.840 — *Objects to be marked and/or lighted* because the objective is marking and/or lighting thus is quite different and it is proposed to add the figures of table D-1 in this CS as Table Q-3 – *Taxiway minimum marking and/or lighting distances*.

This option (i) and the consequences on CS referring to table D-1 are detailed below:

CS-ADR-DSN.D.260 — Taxiway minimum separation distance

"The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should ~~not~~ be sufficient for safe aircraft operations, in particular to prevent from aircraft collision less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

[...]

Table D-1. Taxiway minimum separation distances"

GM-ADR-DSN.D.260 — Taxiway minimum separation distance

"[...] (c) The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should

not be less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

[...]

Table GM-D-1. Taxiway minimum separation distances

(d) The separation distances of ~~Book 1~~, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

~~(d)~~(e) The separation distance between the centre line of an aircraft stand taxilane and an object shown in ~~Book 1~~, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

CS-ADR-DSN.D.315 – Width of taxiway strips

"A taxiway strip should extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table ADR-D-1, column 11."

GM-ADR-DSN.D.315 – Width of taxiway strips

"A taxiway strip may extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table GM-D-1, column 11."

CS-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

"[...] (b) ~~If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.~~

(c) ~~Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)~~

~~Figure G-1 Minimum separation distance on a de-icing/anti-icing facility"~~

GM-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

"[...] (d) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.

(e) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)

Figure GM-G-1 Minimum separation distance on a de-icing/anti-icing facility"

CS-ADR-DSN.Q.840 – Objects to be marked and/or lighted p146

"[...] (g) All obstacles within the distance specified in Table ~~D-1~~ Q-3, from the centre line of a taxiway, an apron taxiway or aircraft stand taxilane should be marked and, if the taxiway, apron taxiway or aircraft stand taxilane is used at night, lighted.

Table Q-3 – Taxiway minimum marking and/or lighting distances"

GM-ADR-DSN.D.255 – Junction and intersection of taxiways

"(e) The separation distances of Book 1, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(f) The separation distance between the centre line of an aircraft stand taxilane and an object shown in Book 1, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

response *Not accepted*

CS-ADR-DSN.D.260: The specifications are the same as ICAO; therefore, they will stay in the CS.

The remaining comments will be answered in their appropriate CS sector.

comment

1323

comment by: UK CAA

Page No: 25

Paragraph No: CS.ADR.DSN.D.260

Comment: In table (column 7, code letter B), the distance between taxiway centre line and runway centreline for Code 2 non-instrument runway should read 52m instead of 42m as currently written.

Justification: ICAO Annex 14, Table 3-1 specifies 52m

Proposed Text: Change from 42m to 52m (column 7, code letter B)

response

Accepted

comment

1330

comment by: UK CAA

Page No: 25

Paragraph No: CS.ADR.DSN.D.260

Comment: Additional text is required to highlight that, as a result of an aeronautical study, operational limitations may result.

Justification: The text infers that, having performed an aeronautical study, the practice studied can continue as planned, whereas this might not be the case. An additional sentence is required to clarify this.

Proposed Text: New final sentence: **"This may also result in operating limitations."**

response

Noted

Note 1 of Table D-1 has been moved to GM. This is an operational consideration.

comment	<p>1446 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #206</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.260</p> <p>Référence: CS-ADR-DSN.D.260 Taxiway minimum separation distance</p> <p>Traduction de courtoisie It is appropriate to transfer into « guidance material » GM. The separation distances are just recommendations of ICAO. Some studies have demonstrated, notably for code F, that we can have lower distances than indicated in the figure. We propose to take up these values approved by most of European States.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>1485 comment by: Geneva International Airport (ROMIG)</p> <p>The ends of Note 1 and Note 2 in this article make reference to ICAO documents. These notes should be removed. Inconsistent references.</p>
response	<p><i>Accepted</i></p> <p>Notes 1 and 2 will be deleted as they are in the GM.</p>
comment	<p>1556 comment by: Aéroport de Marseille - MRS/LFML</p> <p>It is appropriate to transfer into « guidance material » GM.</p> <p>The separation distances are just recommendations of ICAO. Some studies have demonstrated, notably for code F, that we can have lower distances than indicated in the figure. We propose to take up these values approved by most of European States.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>1661 comment by: CAA CZ</p>

	<p>Comment by Prague airport CS-ADR-DSN.D.260 — Taxiway minimum separation distance Separation distances in Table ADR-DSN-D-1, columns (10) and (11), Code F, have been modified to reflect imminent ICAO changes (small reduction from 97,5 m to 95 m and 57,5 m to 55 m). Unfortunately these values were not change in all related paragraphs.</p>
response	<p><i>Noted</i></p> <p>The current ICAO values — 97.5 m and 57.5 m — will be used in the CS. This will be reflected in the text.</p>
comment	<p>1812 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>Attachment #207</p> <p>We suggest to move this DSN-element to GM, see our comment relating CS-ADR-DSN.D.240.</p> <p>Additional comment: The figures are indiscriminately and not based on scientific findings, at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden. Studies around the world showed exorbitant safety buffer (e.g. the ACRP report 51 from FAA), already for simple body damages on taxiways and taxilanes in the area of 1×10^{-16}.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>1874 comment by: <i>Zürich Airport</i></p> <p>There is no risk based justification for the fact that the design criteria for instrument runways are more demanding than the ones for non-instrument runways. On the contrary it has been demonstrated that instrument approaches and most notably precision approaches are safer than visual approaches. From a safety perspective it would therefore be detrimental if non-instrument runways would be limited to visual approaches only, as safety can be increased if an visual approach is replaced or amended by an instrument approach, even if it is not possible to meet the required design criteria for an instrument runway. Under no way it should be concluded that a runway meeting only the less stringent requirements for a non-instrument runway should only be used for visual approaches.</p>
response	<p><i>Noted</i></p>

comment	<p>1889 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p>
	<p>Attachment #208</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.260</p> <p>Référence: CS-ADR-DSN.D.260 Taxiway minimum separation distance</p> <p>Traduction de courtoisie It is appropriate to transfer into « guidance material » GM. The separation distances are just recommendations of ICAO. Some studies have demonstrated, notably for code F, that we can have lower distances than indicated in the figure. We propose to take up these values approved by most of European States.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>1938 comment by: <i>Aéroports De Lyon</i></p>
	<p>Ce qui était une recommandation (conseillé) devient un CS (obligatoire). L'EASA doit apporter un peu de souplesse dans ses exigences car il ne sera pas possible (en termes de coûts) pour chaque aéroport de répondre à de telles exigences.</p> <p><u>Proposition:</u> Appliquer la loi du grand-père, c'est à dire n'appliquer cette exigence que sur les nouveaux taxiways (ou sur les modifications de taxiway).</p>
response	<p><i>Not accepted</i></p> <p>This is an ICAO specification.</p>
comment	<p>2127 comment by: <i>HIA - Highlands and Islands Airports Limited</i></p>
	<p>Table D-1 Distance between taxiway and runway centrelines for non instrument Runway code 2B is reduced to 42 whereas ICAO is 52m. Is thid deliberate or a typing error?</p>
response	<p><i>Accepted</i></p> <p>This will be amended from 42 to 52.</p>

comment	<p>2411 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>Note 1 and Note 2 in this article refer to ICAO documents. These notes should be removed.</p>
response	<p><i>Accepted</i></p> <p>The notes are in GM.260 (c) and (d).</p>
comment	<p>2536 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p> <p>This is a critical point.</p> <p>The figure for taxiway minimum separation distances are intended for design purposes only and can be far less large than indicated: indeed, these figures are no more applied when maintaining taxiways and consequently no more relevant.</p> <p>No safety concern has been noticed until now on this point.</p> <p>But above all, verifying that the separation distances between taxiways are applied everywhere on an aerodrome would generate huge costs without any added safety value.</p> <p>Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured" (paragraph 18 page 8). This is the case for this specification.</p> <p>Two possibilities could be chosen:</p> <p>(i) or the certification specification gives only the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision, and the figures are in guidance material.</p> <p>(ii) or the certification specifications gives the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision and the figures are given specifying each time that they should be met "where practicable".</p> <p>The option (i) is proposed because less confusing and far clearer, and consequently more appropriate for a regulation and for future standardization. This is a <u>critical</u> point for us.</p> <p>This option is detailed below:</p> <p>CS-ADR-DSN.D.260 – Taxiway minimum separation distance</p> <p><i>"The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be sufficient for safe aircraft operations, in particular to prevent from aircraft collision less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.</i></p> <p><i>[...]</i></p> <p><i>Table D-1. Taxiway minimum separation distances"</i></p>
response	<p><i>Not accepted</i></p>

The specification figures are identical to ICAO; therefore, they will stay in the CS.
The proposal is an operational consideration.

comment 2667 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#209](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.260

Référence: CS-ADR-DSN.D.260
Taxiway minimum separation distance

Traduction de courtoisie

It is appropriate to transfer into « guidance material » GM.

The separation distances are just recommendations of ICAO.

Some studies have demonstrated, notably for code F, that we can have lower distances than indicated in the figure. We propose to take up these values approved by most of European States.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 2691 comment by: *ECA - European Cockpit Association*

Attachment [#210](#)

Amend the table D-1 Taxiway Minimum Separation Distances with the following values:

Instrument runways:

- A (2): replace 82.5 with 85.25
- A (3): replace 82.5 with 85.25
- B (2) & (3): replace 87 with 91
- C (4) : replace 168 with 173.5
- D (4) & (5): replace 176 with 184
- E (5): replace 182.5 with 190.5
- F (5): replace 190 with 201

Non-instrument runways:

- A (6): replace 37.5 with 40.25
- A (7): replace 47.5 with 50.25
- B (6): replace 42 with 46
- B (7): replace 42 with 56
- C (8): replace 93 with 173.5
- D (8) & (9): replace 101 with 184
- E (9): replace 107.5 with 190.5
- F (9): replace 115 with 201

A (12): replace 12 with 13.25
 B (10): replace 33.5 with 35
 B (12): replace 16.5 with 19
 C (10): replace 44 with 51.5
 C (11): replace 26 with 31
 C (12): replace 24.5 with 28
 D (10): replace 66.5 with 75.5
 D (11): replace 40.5 with 46
 D (12): replace 36 with 41.5
 E (10): replace 80 with 88.5
 E (11): replace 47.5 with 52.5
 E (12): replace 42.5 with 48
 F (10): replace 95 with 112.5
 F (11): replace 55 with 63
 F (12): replace 50.5 with 59.5

Justification:

There is a downgrading from ICAO Annex 14 figures (F(10); F(11) and B(7)). We believe this is not safe. Furthermore, we consider it important for safety reasons to increase the figures from the ICAO Annex 14 for the following reasons:

Columns (2) to (9): These numbers are based on allowing the largest aircraft in each Code letter i.e. (longest wing span and main gear span) to be situated with its outer main gear wheel located on the edge of the widest taxiway for its Code (as contained in proposed Code amended by IFALPA) and with its wing tip located at the outer edge of the runway strip (as contained in Annex 14 and amended by IFALPA in the case of non-instrument runway).

COLUMN (10)

In this case the calculations are based on the formula:

$$\text{Distance} = U + V + W$$

Where U = wing span, i.e. two aircraft of equal size passing

V = twice maximum lateral deviation allowed in Annex

W = increment arbitrarily calculated to allow clearance as follows:

Code A and B = 3 m; Code C = 4.5 m;

Code D and E = 7.5 m; Code F = 10.5 m

Note: This increment should be used to calculate the minimum separation distance between taxiway centre line and taxiway centre line.

See also picture attached.

COLUMNS (11) AND (12)

In these cases the calculations are based on the formula:

$$\text{Distance} = R + S + T$$

Where R = 1/2 wing span (as in all cases separation is from a fixed object)

S = maximum lateral deviation

T = increment as before, as follows:

Taxiways and objects and apron taxiway and objects:

Code A = 4.5m; Code B = 5.25m;

Code C = 7.5m; Codes D and E = 12m;

Code F = 12m

Note: This increment should be used to calculate the minimum separation distance between taxiway and apron taxiway centre line to object.

Aircraft stand taxi lanes and object:
Codes A and B = 3m; Code - 4.5m
Codes D and E = 7.5m; Code F = 8.5m

Note: This increment should be used to calculate the minimum separation distance between aircraft stand taxi lane to object.

Reference: IFALPA Policy 14-I-3-20, table 3-1 "Taxiway Minimum Separation Distances"

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will not be amended.

comment 2794 comment by: *Swedavia AB - Swedish airports (currently 11 airports)*

CS-ADR-DSN.D.260. Table D-2. Non-instrument runways code no. 2B, distance between TWY cl and RWY cl should be 52 m (not 42 m).

response *Accepted*

This will be amended from 42 to 52.

comment 2851 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

<u>Référence: CS-ADR-DSN.D.260</u>	Taxiway minimum separation distance
Proposition/commentaire	Il convient de transférer cet article en Guidance Material. S'agissant du Code F du « table D-1 », des études ont démontré que des distances de séparation inférieures pouvaient être prises. ex: 91m au lieu de 95m pour la séparation entre voies de circulation de code F, 51m au lieu de 55m pour la séparation entre voie de circulation autre qu'une voie d'accès de poste de stationnement.
Justification	Les distances de séparation ne sont que des recommandations de l'OACI. Des études notamment pour le code F ont démontré que des distances inférieures à celles données dans le tableau peuvent convenir et nous proposons de reprendre ces valeurs reconnues par la plupart des autorités européennes.
Traduction de courtoisie	It is appropriate to transfer into « guidance

	<p>material » GM.</p> <p>The separation distances are just recommendations of ICAO. Some studies have demonstrated, notably for code F, that we can have lower distances than indicated in the figure. We propose to take up these values approved by most of European States.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>2932 comment by: AIRBUS</p> <p>A specific column should be added in Table D-1 Taxiway minimum separation distances to provide separation between taxiway centerline and taxilane centerline</p>
response	<p><i>Noted</i></p> <p>This is covered by the distances in Column 10.</p>
comment	<p>2933 comment by: AIRBUS</p> <p>Note 3 to Table D-1 Taxiway minimum separation distances should be reworded as it is difficult to read and understand.</p> <p>It could be reworded as follows Note 3: "For service roads with the height limited objects, the aeronautical study referred to above may include consideration of vertical clearance." Some additional information may be provided in guidance material.</p>
response	<p><i>Noted</i></p> <p>The note has been deleted from the table, and additional guidance is in GM.</p>

comment 502 comment by: *Union des Aéroports français - UAF*

Attachment [#211](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.265

Référence: CS-ADR-DSN.D.265
Longitudinal slopes on taxiways

Traduction de courtoisie

It is appropriate to transfer this provision to GM

In order to comply with drainage objectives it is necessary to add: "Longitudinal slopes on taxiways should be in coherency with the transversal slope to allow a rapid drainage".

All the rules concerning the slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

ICAO Annex 14 only mentions 'most rapid drainage of water' under the heading 'Transverse Slopes'.

comment 722

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.D.265	Longitudinal slopes on taxiways
Proposition/commentaire	Il convient de transférer cette disposition en Guidance Material. Par ailleurs, afin de respecter l'objectif de drainage, il convient d'ajouter: "Longitudinal slopes on taxiways should be in coherency with the transversal slope to allow a rapid drainage".
Justification	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM.
Traduction de courtoisie	It is appropriate to transfer this provision to GM In order to comply with drainage objectives it is necessary to add: "Longitudinal slopes on taxiways should be in coherency with the transversal slope to allow a rapid drainage". All the rules concerning the slopes fall into the

	scope of good practices and not certification. It is more appropriate to have these rules in GM.
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response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

ICAO Annex 14 only mentions 'most rapid drainage of water' under the heading 'Transverse Slopes'.

comment 843 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes

- on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met

"where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and*

(2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

(1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;

(2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and

(3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

(1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;

(2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and

(3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B;

~~except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface."~~

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"~~The slopes are the same as those on the adjacent runway pavement surface. Slopes should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."~~

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

~~(1) 1.5 % where the code number is 4;~~

~~(2) 1.75 % where the code number is 3; and~~

~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.185 – Transverse Slopes on runway strips**

"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface ~~but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

- ~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
- ~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

- (1) is perpendicular to the vertical plane containing the runway centre line; and
- (2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas****CS-ADR-DSN.C.230 - Slopes on runway end safety areas**

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA ~~should~~ **can** be amended accordingly."

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code

letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes should may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~
~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

~~(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 – Slopes on aprons —and GM

~~(a) The design of slopes should may direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures should may be taken to reduce the fire hazard resulting from fuel spillage.~~

~~(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.~~

~~(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope should may be kept as shallow as possible and should may be such that the operation of the aircraft and vehicles is not compromised. "~~

response

Noted

Comments will be addressed to under their individual CS reference.

comment	<p>1447 comment by: Euroairport Bâle-Mulhouse</p>
	<p>Attachment #212</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.265</p> <p>Référence: CS-ADR-DSN.D.265 Longitudinal slopes on taxiways Traduction de courtoisie It is appropriate to transfer this provision to GM. In order to comply with drainage objectives it is necessary to add: "Longitudinal slopes on taxiways should be in coherency with the transversal slope to allow a rapid drainage". All the rules concerning the slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS. ICAO Annex 14 only mentions 'most rapid drainage of water' under the heading 'Transverse Slopes'.</p>
comment	<p>1557 comment by: Aéroport de Marseille - MRS/LFML</p>
	<p>It is appropriate to transfer this provision to GM In order to comply with drainage objectives it is necessary to add: "Longitudinal slopes on taxiways should be in coherency with the transversal slope to allow a rapid drainage". All the rules concerning the slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS. ICAO Annex 14 only mentions 'most rapid drainage of water' under the heading 'Transverse Slopes'.</p>
comment	<p>1817 comment by: IDRF e.V. (association of regional airports)</p>
	<p>We suggest to move this DSN-element to GM, see our comment relating CS-ADR-DSN.D.240.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>

comment	<p>1890 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p>
	<p>Attachment #213</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.265</p> <p>Référence: CS-ADR-DSN.D.265 Longitudinal slopes on taxiways</p> <p>Traduction de courtoisie It is appropriate to transfer this provision to GM In order to comply with drainage objectives it is necessary to add: "Longitudinal slopes on taxiways should be in coherency with the transversal slope to allow a rapid drainage". All the rules concerning the slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM.</p>
response	<p><i>Not accepted</i></p>
	<p>The specification figures are identical to ICAO; therefore, they will stay in the CS. ICAO Annex 14 only mentions 'most rapid drainage of water' under the heading 'Transverse Slopes'.</p>
comment	<p>1949 comment by: <i>Aéroports De Lyon</i></p>
	<p>L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Elle peuvent même aller à l'encontre de l'objectif des pentes: le drainage de l'eau.</p> <p><u>Proposition</u>: Préciser la donnée en GM</p>
response	<p><i>Not accepted</i></p>
	<p>The specification figures are identical to ICAO; therefore, they will stay in CS. Longitudinal slopes are not intended to facilitate drainage of water.</p>
comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p>
	<p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2463 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p>
	<p>This must be moved to guidance material since it is for some existing</p>

aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!

If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.
ICAO Annex 14 only mentions 'most rapid drainage of water' under the heading 'Transverse Slopes'.

comment 2505 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.
ICAO Annex 14 only mentions 'most rapid drainage of water' under the heading 'Transverse Slopes'.
The proposal is GM.

comment 2668 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#214](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.265

Référence: CS-ADR-DSN.D.265

Longitudinal slopes on taxiways

Traduction de courtoisie

It is appropriate to transfer this provision to GMIn order to comply with drainage objectives it is necessary to add: "Longitudinal slopes on taxiways should be in coherency with the transversal slope to allow a rapid drainage".

All the rules concerning the slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.
ICAO Annex 14 only mentions 'most rapid drainage of water' under the heading 'Transverse Slopes'.

comment

2852

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

<u>Référence: CS-ADR-DSN.D.265</u>	Longitudinal slopes on taxiways
Proposition/commentaire	Il convient de transférer cette disposition en Guidance Material. Par ailleurs, afin de respecter l'objectif de drainage, il convient d'ajouter: "Longitudinal slopes on taxiways should be in coherency with the transversal slope to allow a rapid drainage".
Justification	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM.
Traduction de courtoisie	It is appropriate to transfer this provision to GM In order to comply with drainage objectives it is necessary to add: "Longitudinal slopes on taxiways should be in coherency with the transversal slope to allow a rapid drainage". All the rules concerning the slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.
ICAO Annex 14 only mentions 'most rapid drainage of water' under the heading 'Transverse Slopes'.

CS-ADR — Book 1 — CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways

p. 26

comment	239	comment by: <i>Flughafen Düsseldorf GmbH</i>
	b) Unklare Definition: <.....which will allow the safe operation of all aircraft in all weather conditions.>	
response	<i>Noted</i>	

comment	503	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #215	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.270	
	Référence: CS-ADR-DSN.D.270 Longitudinal slopes changes on taxiways	
	Traduction de courtoisie It is appropriate to transfer this provision to GM. All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM.	
response	<i>Not accepted</i>	
	The specification figures are identical to ICAO; therefore, they will stay in the CS.	

comment	723	comment by: <i>ADP : Aeroports de Paris</i>						
	<table border="1"> <tr> <td>Référence: CS-ADR-DSN.D.270</td> <td>Longitudinal slopes changes on taxiways</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de transférer cette disposition en Guidance Material.</td> </tr> <tr> <td>Justification</td> <td>L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM.</td> </tr> </table>		Référence: CS-ADR-DSN.D.270	Longitudinal slopes changes on taxiways	Proposition/commentaire	Il convient de transférer cette disposition en Guidance Material.	Justification	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM.
Référence: CS-ADR-DSN.D.270	Longitudinal slopes changes on taxiways							
Proposition/commentaire	Il convient de transférer cette disposition en Guidance Material.							
Justification	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM.							

Traduction de courtoisie

It is appropriate to transfer this provision to GM

All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment

843 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on

- runways (p212 – 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA,

and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

~~"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:~~

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

~~(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "~~

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

- (1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface."~~

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"~~The slopes are the same as those on the adjacent runway pavement surface.~~

Slopes ~~should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."~~

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

~~(1) 1.5 % where the code number is 4;~~

~~(2) 1.75 % where the code number is 3; and~~

~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.185 – Transverse Slopes on runway strips**

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

- ~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
- ~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

- (1) is perpendicular to the vertical plane containing the runway centre line; and
- (2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

(2) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~ Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.

(b) Transverse slopes

(1) ~~The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %.~~ Transitions between differing slopes should be as gradual as practicable."

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA ~~should~~ can be amended accordingly."

*** Longitudinal slopes on taxiways****CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways**

(a) The longitudinal slope of a taxiway should not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B.

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways****CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways**

"(a) ~~Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) ~~Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) ~~Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:~~

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes should may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B; the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~
~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

~~(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:~~

- ~~(1) 2.5 % for strips where the code letter is C, D, E or F; and
 (2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 – Slopes on aprons —and GM

~~(a) The design of slopes should may direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures should may be taken to reduce the fire hazard resulting from fuel spillage.~~

~~(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.~~

~~(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope should may be kept as shallow as possible and should may be such that the operation of the aircraft and vehicles is not compromised. "~~

response Noted

Comments will be addressed to under their individual CS reference.

comment	<p>1449 comment by: Euroairport Bâle-Mulhouse</p>
	<p>Attachment #216</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.270</p> <p>Référence: CS-ADR-DSN.D.270 Longitudinal slopes changes on taxiways</p> <p>Traduction de courtoisie It is appropriate to transfer this provision to GM. All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM.</p>
response	<p><i>Not accepted</i></p>
	<p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>1558 comment by: Aéroport de Marseille - MRS/LFML</p>
	<p>It is appropriate to transfer this provision to GM</p> <p>All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM</p>
response	<p><i>Not accepted</i></p>
	<p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>1819 comment by: IDRF e.V. (association of regional airports)</p>
	<p>We suggest to move this DSN-element to GM, see our comment relating CS-ADR-DSN.D.240.</p>
response	<p><i>Not accepted</i></p>
	<p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>1891 comment by: Aéroport Nantes Atlantique - NTE/LFRS</p>
	<p>Attachment #217</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.270</p>

	<p>Référence: CS-ADR-DSN.D.270 Longitudinal slopes changes on taxiways</p> <p>Traduction de courtoisie It is appropriate to transfer this provision to GM All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>

comment	<p>1950 comment by: <i>Aéroports De Lyon</i></p> <p>L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Elle peuvent même aller à l'encontre de l'objectif des pentes: le drainage de l'eau.</p> <p><u>Proposition</u>: Préciser la donnée en GM</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in CS. Longitudinal slopes are not intended to facilitate drainage of water.</p>

comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2464 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p> <p>This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!</p> <p>If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.</p>
response	<p><i>Not accepted</i></p>

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 2506 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

response Not accepted

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 2669 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#218](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.270

Référence: CS-ADR-DSN.D.270

Longitudinal slopes changes on taxiways

Traduction de courtoisie

It is appropriate to transfer this provision to GM

All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM.

response Not accepted

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 2853 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.D.270

Longitudinal slopes changes on taxiways

Proposition/commentaire

Il convient de transférer cette disposition en

	Guidance Material.
Justification	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM.
Traduction de courtoisie	It is appropriate to transfer this provision to GM All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM.
response	<i>Not accepted</i> The specification figures are identical to ICAO; therefore, they will stay in the CS.

CS-ADR – Book 1 – CS-ADR-DSN.D.275 – Sight distance of taxiways

p. 26

comment	504	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #219	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.275	
	Référence: CS-ADR-DSN.D.275 Sight distance of taxiways	
	Traduction de courtoisie It is appropriate to transfer this provision into GM All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.	
response	<i>Not accepted</i> The specification figures are identical to ICAO; therefore, they will stay in the CS.	
comment	724	comment by: <i>ADP : Aeroports de Paris</i>

Référence: CS-ADR-DSN.D.275	Sight distance of taxiways
Proposition/commentaire	Il convient de transférer cette disposition en Guidance Material.
Justification	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM. Par ailleurs, il est à remarquer que cette disposition prend de manière arbitraire des hauteurs qui devraient correspondre à la hauteur de l'œil du pilote or cette hauteur ne dépend pas directement du code lettre de l'aérodrome.
Traduction de courtoisie	It is appropriate to transfer this provision into GM All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 843 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)

- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are

applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observed at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

~~(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."~~

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 — Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways****CS-ADR-DSN.B.080 — Transverse slopes**

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 — Transverse slopes on runways

~~"The transverse slope may be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.~~

~~The transverse slope should may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

*** Slopes on runway turn pads****CS-ADR-DSN.B.100 Slopes on runway turn pads**

~~"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface."~~

GM-ADR-DSN.B.100 — Slopes on runway turn pads

~~"The slopes are the same as those on the adjacent runway pavement surface.~~

~~Slopes should be are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

*** Slopes on runway shoulders****CS-ADR-DSN.B.130 — Slopes on runway shoulders**

~~"The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 — Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips**

"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:

- (1) 1.5 % where the code number is 4;*
- (2) 1.75 % where the code number is 3; and*
- (3) 2 % where the code number is 1 or 2.*

(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."

GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;*
- (2) 1.75 % where the code number is 3; and*
- (3) 2 % where the code number is 1 or 2."*

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.185 — Transverse Slopes on runway strips**

"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:

- (1) 2.5 % where the code number is 3 or 4; and*
- (2) 3 % where the code number is 1 or 2;*

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."

GM-ADR-DSN.B.185 — Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and*
- (2) 3 % where the code number is 1 or 2;*

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

- (1) is perpendicular to the vertical plane containing the runway centre line; and*
- (2) passes through a point located on the runway centre line at the end of the*

~~take-off run available.
[...]"~~

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) ~~The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~
(1) ~~is perpendicular to the vertical plane containing the runway centre line; and~~
(2) ~~passes through a point located on the runway centre line at the end of the take-off run available.~~

~~Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"~~

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

(1) ~~The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.~~

(2) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

(1) ~~The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~

(b) ~~The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %~~

(c) ~~Where clearway is provided, the slope on the REASA should~~ **can** ~~be amended accordingly."~~

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

~~The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" ~~The longitudinal slope of a taxiway may not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B."~~

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 — Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes ~~should~~ **may** be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips****CS-ADR-DSN.D.330 — Slopes on taxiway strips**

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 — Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and

(2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons****CS-ADR-DSN.E.360 Slopes on aprons**

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

"(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the

slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "

response *Noted*

Comments will be addressed to under their individual CS reference.

comment

1451

comment by: Euroairport Bâle-Mulhouse

Attachment [#220](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.275

Référence: CS-ADR-DSN.D.275

Sight distance of taxiways

Traduction de courtoisie

It is appropriate to transfer this provision into GM

All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.

response

Not accepted

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment

1559

comment by: Aéroport de Marseille - MRS/LFML

It is appropriate to transfer this provision into GM

All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.

response

Not accepted

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment

1820

comment by: IDRF e.V. (association of regional airports)

response	<p>We suggest to move this DSN-element to GM, see our comment relating CS-ADR-DSN.D.240.</p> <p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>1892 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #221</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.275</p> <p>Référence: CS-ADR-DSN.D.275 Sight distance of taxiways</p> <p>Traduction de courtoisie It is appropriate to transfer this provision into GM All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>1952 comment by: <i>Aéroports De Lyon</i></p> <p>L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il serait donc approprié de retrouver ces règles en GM. Il est à remarquer que cette disposition prend de manière arbitraire des hauteurs qui devraient correspondre à la hauteur de l'œil du pilote or cette hauteur ne dépend pas directement du code lettre de l'aérodrome</p> <p><u>Proposition</u>: Préciser la donnée en GM</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>

response *Noted*

comment 2465 comment by: *Airport Nuremberg - NUE/EDDN*

This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!

If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 2507 comment by: *AENA - Aeropuertos Españoles y Navegación Aérea*

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 2671 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#222](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.275

Référence: CS-ADR-DSN.D.275
Sight distance of taxiways

Traduction de courtoisie

It is appropriate to transfer this provision into GM

All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment

2854

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.D.275	Sight distance of taxiways
Proposition/commentaire	Il convient de transférer cette disposition en Guidance Material.
Justification	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM. Par ailleurs, il est à remarquer que cette disposition prend de manière arbitraire des hauteurs qui devraient correspondre à la hauteur de l'œil du pilote or cette hauteur ne dépend pas directement du code lettre de l'aérodrome.
Traduction de courtoisie	It is appropriate to transfer this provision into GM All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment	<p>505</p> <p style="text-align: right;">comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #223</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.280</p> <p>Référence: CS-ADR-DSN.D.280 Transverse slopes on taxiways</p> <p>Traduction de courtoisie It is appropriate to keep into CS only the following part: « The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway. » The rest of the provision has to be transferred to « guidance material » GM. All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. But the beginning of the (a) gives the main objective of these slopes and has to be kept.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>

comment	<p>725</p> <p style="text-align: right;">comment by: <i>ADP : Aeroports de Paris</i></p> <table border="1" style="width: 100%;"> <tr> <td style="width: 30%;">Référence: CS-ADR-DSN.D.280</td> <td>Transverse slopes on taxiways</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de conserver en CS la partie suivante: « The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway. » Le reste de la disposition est à transférer en « guidance material » (GM).</td> </tr> <tr> <td>Justification</td> <td>L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM. En revanche le début du (a) permet de donner l'objectif principal de ces pentes et est donc à conserver.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>It is appropriate to keep into CS only the following part: « The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway. » The rest of the provision has to be transferred to « guidance material » GM.</td> </tr> </table>	Référence: CS-ADR-DSN.D.280	Transverse slopes on taxiways	Proposition/commentaire	Il convient de conserver en CS la partie suivante: « The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway. » Le reste de la disposition est à transférer en « guidance material » (GM).	Justification	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM. En revanche le début du (a) permet de donner l'objectif principal de ces pentes et est donc à conserver.	Traduction de courtoisie	It is appropriate to keep into CS only the following part: « The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway. » The rest of the provision has to be transferred to « guidance material » GM.
Référence: CS-ADR-DSN.D.280	Transverse slopes on taxiways								
Proposition/commentaire	Il convient de conserver en CS la partie suivante: « The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway. » Le reste de la disposition est à transférer en « guidance material » (GM).								
Justification	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM. En revanche le début du (a) permet de donner l'objectif principal de ces pentes et est donc à conserver.								
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	All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. But the beginning of the (a) gives the main objective of these slopes and has to be kept.
--	--

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 843 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on

- runways (p212 – 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX (“No CS but GM”) and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that “some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured”. (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes

on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two

consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

~~"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:~~

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

~~(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "~~

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

- (1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E

~~or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface."~~

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"~~The slopes are the same as those on the adjacent runway pavement surface. Slopes should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."~~

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

~~(1) 1.5 % where the code number is 4;~~

~~(2) 1.75 % where the code number is 3; and~~

~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes~~

should be avoided.”

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

“A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2.”

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

“(a)–Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface ~~but should not exceed:~~

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway.”~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

“(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway.”

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

“[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

- (1) is perpendicular to the vertical plane containing the runway centre line; and
- (2) passes through a point located on the runway centre line at the end of the take-off run available.

[...]”

GM-ADR-DSN.B.195 Clearways

“[...]”

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

- (1) is perpendicular to the vertical plane containing the runway centre line; and
- (2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]”

*** Slopes on runway end safety areas****CS-ADR-DSN.C.230 - Slopes on runway end safety areas**

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

(2) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~ Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.

(b) Transverse slopes

(1) ~~The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %.~~ Transitions between differing slopes should be as gradual as practicable."

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA ~~should~~ **can** be amended accordingly."

*** Longitudinal slopes on taxiways****CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways**

(a) ~~The longitudinal slope of a taxiway should not exceed:~~

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B.

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways****CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways**

"(a) ~~Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) ~~Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) ~~Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:~~

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code

letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes should may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and
 (2) 3 % for strips of taxiways where the code letter is A or B;
 the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and
 (2) 3 % for strips of taxiways where the code letter is A or B;
 the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~"(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 – Slopes on aprons —and GM

~~"(a) The design of slopes should may direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures should may be taken to reduce the fire hazard resulting from fuel spillage.~~

~~(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.~~

~~(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope should may be kept as shallow as possible and should may be such that the operation of the aircraft and vehicles is not compromised. "~~

response Noted

Comments will be addressed to under their individual CS reference.

comment	<p>1452</p> <p>comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #224</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.280</p> <p>Référence: CS-ADR-DSN.D.280 Transverse slopes on taxiways</p> <p>Traduction de courtoisie</p> <p>It is appropriate to keep into CS only the following part: « The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway. »</p> <p>The rest of the provision has to be transferred to « guidance material » GM.</p> <p>All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.</p> <p>But the beginning of the (a) gives the main objective of these slopes and has to be kept.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>1560</p> <p>comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>It is appropriate to keep into CS only the following part: « The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway. »</p> <p>The rest of the provision has to be transferred to « guidance material » GM.</p> <p>All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.</p> <p>But the beginning of the (a) gives the main objective of these slopes and has to be kept</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>1821</p> <p>comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>This CS is limited to adequate and constructive text; it is acceptable to keep the ICAO-recommendations within this CSs.</p>
response	<p><i>Accepted</i></p>

comment	<p>1894 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #225</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.280</p> <p>Référence: CS-ADR-DSN.D.280 Transverse slopes on taxiways</p> <p>Traduction de courtoisie It is appropriate to keep into CS only the following part: « The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway. » The rest of the provision has to be transferred to « guidance material » GM. All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. But the beginning of the (a) gives the main objective of these slopes and has to be kept.</p>
response	<p><i>Not accepted</i></p> <p>The specification figures are identical to ICAO; therefore, they will stay in the CS.</p>
comment	<p>1954 comment by: <i>Aéroports De Lyon</i></p> <p>L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Elle peuvent même aller à l'encontre de l'objectif des pentes: le drainage de l'eau.</p> <p><u>Proposition</u>: Préciser la donnée en GM</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2466 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p>

This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!

If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 2510 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed: (1) 1.5 % where the code letter is C, D, E or F; and (2) 2 % where the code letter is A or B."~~

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment 2672 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#226](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.280

Référence: CS-ADR-DSN.D.280
Transverse slopes on taxiways

Traduction de courtoisie

It is appropriate to keep into CS only the following part: « The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway. »

The rest of the provision has to be transferred to « guidance material » GM.

All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.

But the beginning of the (a) gives the main objective of these slopes and has to be kept.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment

2855

comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR- DSN.D.280	Transverse slopes on taxiways
Proposition/commentaire	Il convient de conserver en CS la partie suivante: « The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway. » Le reste de la disposition est à transférer en « guidance material » (GM).
Justification	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM. En revanche le début du (a) permet de donner l'objectif principal de ces pentes et est donc à conserver.
Traduction de courtoisie	It is appropriate to keep into CS only the following part: « The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway. » The rest of the provision has to be transferred to « guidance material » GM. All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. But the beginning of the (a) gives the main objective of these slopes and has to be kept.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment	267	comment by: <i>Belgian CAA</i>
	The second sentence is unclear.	
response	<i>Noted</i>	
	The first sentence will be retained. The rest will be moved to GM.	

comment	507	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #227	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.285	
	Référence: CS-ADR-DSN.D.285 Strength of taxiways	
	Traduction de courtoisie It is appropriate to keep into CS only the beginning of the article: « The strength of a taxiway should be suitable for the aircraft that the taxiway is intended to serve. » The rest of the provision has to be transferred into « guidance material » GM by modifying the following part: "the fact that some portions of a taxiway will could be subjected..." It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrom Design". Provisions which are good practices and not normative references of Annex 14 must be placed in GM and not CS. The use of "could" is more appropriate in GM than "will". Referring to a « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.	
response	<i>Accepted</i>	
	The first sentence will be retained. The rest will be moved to GM.	

comment	726	comment by: <i>ADP : Aeroports de Paris</i>
	Référence: CS-ADR-DSN.D.285	Strength of taxiways
	Proposition/commentaire	Il convient de conserver en CS uniquement le début de l'article: « The strength of a taxiway should be suitable for the aircraft that the taxiway is intended to serve. »

	<p>Le reste de la disposition est à transférer en « guidance material » (GM) en modifiant la partie suivante: "the fact that some portions of a taxiway will will could be subjected..."</p> <p>Par ailleurs, il convient de supprimer la référence "Book 2 - Guidance Material for Aerodrom Design".</p>
Justification	<p>Les dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI ont leur place en GM et non en CS.</p> <p>L'emploi de « could » est plus approprié en GM que celui de « will ».</p> <p>Faire référence à un GM à l'intérieur même d'un CS revient à lui donner une valeur de CS, ce qui n'est pas souhaitable.</p>
Traduction de courtoisie	<p>It is appropriate to keep into CS only the beginning of the article: « The strength of a taxiway should be suitable for the aircraft that the taxiway is intended to serve. »</p> <p>The rest of the provision has to be transferred into « guidance material » GM by modifying the following part: "the fact that some portions of a taxiway will will could be subjected..."</p> <p>It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrom Design".</p> <p>Provisions which are good practices and not normative references of Annex 14 must be placed in GM and not CS.</p> <p>The use of "could" is more appropriate in GM than "will".</p> <p>Referring to a « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.</p>

response *Accepted*

The first sentence will be retained. The rest will be moved to GM.

comment 938

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.285 — Strength of taxiways (p27)

2. Proposed text / comment

Making such a reference to a Guidance Material in this Certification Specification is confusing and not particularly useful in a regulation. Indeed, **from a legal perspective**, such a reference may make the content of the GM become binding, through the introduction of the CS in the certification Basis, which is absolutely not the intent of a guidance material. Consequently, DGAC proposes to delete the reference.

Note: if it is decided to keep such reference, DGAC proposes to make it as a note in the CS, as it is done in IACO Annex 14.

Moreover, some modifications are proposed below to clarify the provision.

CS-ADR-DSN.D.285 — Strength of taxiways

"The strength of a taxiway should be suitable for the aircraft that the taxiway is intended to serve. (~~Book 2 — Guidance Material for Aerodrome Design~~), due consideration being given to the fact that some portions of a taxiway ~~will~~ could be subjected to a greater density of traffic and, as a result of slow moving and stationary aeroplanes, to higher stresses than the runway it serves."

response Noted

The first sentence will be retained. The rest will be moved to GM.

comment 1453

comment by: Euroairport Bâle-Mulhouse

Attachment [#228](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.285

Référence: CS-ADR-DSN.D.285
Strength of taxiways

Traduction de courtoisie

It is appropriate to keep into CS only the beginning of the article: « The strength of a taxiway should be suitable for the aircraft that the taxiway is intended to serve. »

The rest of the provision has to be transferred into « guidance material » GM by modifying the following part: "the fact that some portions of a taxiway ~~will~~ could be subjected..."

It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrom Design".

Provisions which are good practices and not normative references of Annex 14 must be placed in GM and not CS.

The use of "could" is more appropriate in GM than "will".

Referring to a « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.

response *Accepted*

The first sentence will be retained. The rest will be moved to GM.

comment *1561* comment by: *Aéroport de Marseille - MRS/LFML*

It is appropriate to keep into CS only the beginning of the article: « The strength of a taxiway should be suitable for the aircraft that the taxiway is intended to serve. »

The rest of the provision has to be transferred into « guidance material » GM by modifying the following part: "the fact that **some portions** of a taxiway **will** **could** be subjected..."

It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrom Design".

Provisions which are good practices and not normative references of Annex 14 must be placed in GM and not CS.

The use of "could" is more appropriate in GM than "will".

Referring to a « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.

response *Accepted*

The first sentence will be retained. The rest will be moved to GM.

comment *1831* comment by: *IDRF e.V. (association of regional airports)*

This CS is limited to adequate and constructive text; it is acceptable to keep the ICAO-recommendations within this CSs.

response *Accepted*

The first sentence will be retained. The rest will be moved to GM.

comment *1895* comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#229](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.285

Référence: CS-ADR-DSN.D.285
Strength of taxiways

Traduction de courtoisie

	<p>It is appropriate to keep into CS only the beginning of the article: « The strength of a taxiway should be suitable for the aircraft that the taxiway is intended to serve. »</p> <p>The rest of the provision has to be transferred into « guidance material » GM by modifying the following part: "the fact that some portions of a taxiway will could be subjected..."</p> <p>It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrom Design".</p> <p>Provisions which are good practices and not normative references of Annex 14 must be placed in GM and not CS.</p> <p>The use of "could" is more appropriate in GM than "will".</p> <p>Referring to a « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.</p>
response	<p><i>Accepted</i></p> <p>The first sentence will be retained. The rest will be moved to GM.</p>

comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2673 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #230</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.285</p> <p>Référence: CS-ADR-DSN.D.285 Strength of taxiways</p> <p>Traduction de courtoisie</p> <p>It is appropriate to keep into CS only the beginning of the article: « The strength of a taxiway should be suitable for the aircraft that the taxiway is intended to serve. »</p> <p>The rest of the provision has to be transferred into « guidance material » GM by modifying the following part: "the fact that some portions of a taxiway will could be subjected..."</p> <p>It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrom Design".</p> <p>Provisions which are good practices and not normative references of Annex 14 must be placed in GM and not CS.</p> <p>The use of "could" is more appropriate in GM than "will".</p> <p>Referring to a « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.</p>
response	<p><i>Accepted</i></p>

The first sentence will be retained. The rest moved to GM.

comment

2856

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.D.285	Strength of taxiways
Proposition/commentaire	<p>Il convient de conserver en CS uniquement le début de l'article: « The strength of a taxiway should be suitable for the aircraft that the taxiway is intended to serve. »</p> <p>Le reste de la disposition est à transférer en « guidance material » (GM) en modifiant la partie suivante: "the fact that some portions of a taxiway will could be subjected..."</p> <p>Par ailleurs, il convient de supprimer la référence "Book 2 - Guidance Material for Aerodrom Design".</p>
Justification	<p>Les dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI ont leur place en GM et non en CS.</p> <p>L'emploi de « could » est plus approprié en GM que celui de « will ».</p> <p>Faire référence à un GM à l'intérieur même d'un CS revient à lui donner une valeur de CS, ce qui n'est pas souhaitable.</p>
Traduction de courtoisie	<p>It is appropriate to keep into CS only the beginning of the article: « The strength of a taxiway should be suitable for the aircraft that the taxiway is intended to serve. »</p> <p>The rest of the provision has to be transferred into « guidance material » GM by modifying the following part: "the fact that some portions of a taxiway will could be subjected..."</p> <p>It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrom Design".</p> <p>Provisions which are good practices and not normative references of Annex 14 must be placed in GM and not CS.</p> <p>The use of "could" is more appropriate in GM than "will".</p> <p>Referring to a « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is</p>

	not wanted.
response	<p><i>Accepted</i></p> <p>The first sentence will be retained. The rest will be moved to GM.</p>

CS-ADR – Book 1 – CS-ADR-DSN.D.290 – Surface of taxiways

p. 27

comment	<p>73</p> <p>comment by: <i>CAA-NL</i></p> <p>We suggest to add after (b) a new (c) 'The friction characteristics of a paved rapid exit taxiway should not be substantially less than that of the runway with which the rapid exit taxiway is associated'. Friction characteristics of a paved rapid exit taxiway are important for safety because of the speed of aircraft using the rapid exit taxiway.</p>
response	<p><i>Noted</i></p> <p>Paragraph (b) will be amended to reflect ICAO SL 41.</p>
comment	<p>508</p> <p>comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #231</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.290</p> <p>Référence: CS-ADR-DSN.D.290 Surface of taxiways</p> <p>Traduction de courtoisie It is appropriate to modify the (b) by taking the ICAO State letter 41: "The surface of a paved taxiway should be so constructed or resurfaced as to provide good suitable surface friction characteristics when the taxiway is wet." The EASA has to anticipate the future revision of Annex 14 by integrating directly the changes of the ICAO State letter 41.</p>
response	<p><i>Accepted</i></p> <p>Paragraph (b) will be amended to reflect ICAO SL 41.</p>

comment 727

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.D.290	Surface of taxiways
Proposition/commentaire	(b) Il convient de modifier le (b) en reprenant la lettre aux Etats n°41 de l'OACI: "The surface of a paved taxiway should be so constructed or resurfaced as to provide good suitable surface friction characteristics when the taxiway is wet. "
Justification	Nous estimons que l'AESA doit anticiper la future modification de l'annexe 14 de l'OACI en intégrant directement les changements adoptés dans sa lettre aux Etats n°41.
Traduction de courtoisie	It is appropriate to modify the (b) by taking the ICAO State letter 41: "The surface of a paved taxiway should be so constructed or resurfaced as to provide good suitable surface friction characteristics when the taxiway is wet. " The EASA has to anticipate the future revision of Annex 14 by integrating directly the changes of the ICAO State letter 41.

response Accepted

Paragraph (b) will be amended to reflect ICAO SL 41.

comment 944

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.290 — Surface of taxiways (p27)

2. Proposed text / comment

DGAC proposes to anticipate the future revision of ICAO Annex 14 volume 1 and thus to modify paragraph (b) of this CS by taking what has been agreed in ICAO State Letter 11/41.

CS-ADR-DSN.D.290 — Surface of taxiways

“(a) The surface of a taxiway should not have irregularities that cause damage to aeroplane structures.

(b) The surface of a ~~paved~~ taxiway should be so constructed or resurfaced as to

	<i>provide good suitable surface friction characteristics when the taxiway is wet."</i>
response	<i>Accepted</i>
	Paragraph (b) will be amended to reflect ICAO SL 41.

comment	1455	comment by: <i>Euroairport Bâle-Mulhouse</i>
	Attachment #232	
	Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.290	
	Référence: CS-ADR-DSN.D.290 Surface of taxiways	
	Traduction de courtoisie It is appropriate to modify the (b) by taking the ICAO State letter 41: "The surface of a paved taxiway should be so constructed or resurfaced as to provide good suitable surface friction characteristics when the taxiway is wet." The EASA has to anticipate the future revision of Annex 14 by integrating directly the changes of the ICAO State letter 41.	

response	<i>Accepted</i>
	Paragraph (b) will be amended to reflect ICAO SL 41.

comment	1562	comment by: <i>Aéroport de Marseille - MRS/LFML</i>
	It is appropriate to modify the (b) by taking the ICAO State letter 41: "The surface of a paved taxiway should be so constructed or resurfaced as to provide good suitable surface friction characteristics when the taxiway is wet." The EASA has to anticipate the future revision of Annex 14 by integrating directly the changes of the ICAO State letter 41.	

response	<i>Accepted</i>
	Paragraph (b) will be amended to reflect ICAO SL 41.

comment	1834	comment by: <i>IDRF e.V. (association of regional airports)</i>
	This CS is limited to adequate and constructive text; it is acceptable to keep the ICAO-recommendations within this CSs.	

response	<i>Partially accepted</i>
	Paragraph (b) will be amended to reflect ICAO SL 41.

comment	<p>1896 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #233</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.290</p> <p>Référence: CS-ADR-DSN.D.290 Surface of taxiways</p> <p>Traduction de courtoisie It is appropriate to modify the (b) by taking the ICAO State letter 41: "The surface of a paved taxiway should be so constructed or resurfaced as to provide good suitable surface friction characteristics when the taxiway is wet." The EASA has to anticipate the future revision of Annex 14 by integrating directly the changes of the ICAO State letter 41.</p>
response	<p><i>Accepted</i></p> <p>Paragraph (b) will be amended to reflect ICAO SL 41.</p>

comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2674 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #234</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.290</p> <p>Référence: CS-ADR-DSN.D.290 Surface of taxiways</p> <p>Traduction de courtoisie It is appropriate to modify the (b) by taking the ICAO State letter 41: "The surface of a paved taxiway should be so constructed or resurfaced as to provide good suitable surface friction characteristics when the taxiway is wet." The EASA has to anticipate the future revision of Annex 14 by integrating directly the changes of the ICAO State letter 41.</p>
response	<p><i>Accepted</i></p> <p>Paragraph (b) will be amended to reflect ICAO SL 41.</p>

comment 2857

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.D.290	Surface of taxiways
Proposition/commentaire	(b) Il convient de modifier le (b) en reprenant la lettre aux Etats n°41 de l'OACI: "The surface of a paved taxiway should be so constructed or resurfaced as to provide good suitable surface friction characteristics when the taxiway is wet. "
Justification	Nous estimons que l'AESA doit anticiper la future modification de l'annexe 14 de l'OACI en intégrant directement les changements adoptés dans sa lettre aux Etats n°41.
Traduction de courtoisie	It is appropriate to modify the (b) by taking the ICAO State letter 41: "The surface of a paved taxiway should be so constructed or resurfaced as to provide good suitable surface friction characteristics when the taxiway is wet. " The EASA has to anticipate the future revision of Annex 14 by integrating directly the changes of the ICAO State letter 41.

response *Accepted*

Paragraph (b) will be amended to reflect ICAO SL 41.

comment 509

comment by: Union des Aéroports français - UAF

Attachment [#235](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.295

Référence: CS-ADR-DSN.D.295

Rapid exit taxiways

Traduction de courtoisie

It is appropriate to transfer this provision into GM

This provisions being only good practices and not normative references of the

	Annex 14 have to be put in GM and not CS. Speed values might be different but they must be mentioned in the AIP. There are other methods for best rapid exit of runways such as clothoïdes.
response	<i>Not accepted</i>
	The specifications are the same as ICAO, with a minor text amendment to paragraph (d). Therefore, they will stay in the CS.

comment	728	comment by: <i>ADP : Aeroports de Paris</i>								
	<table border="1"> <tr> <td>Référence: CS-ADR-DSN.D.295</td> <td>Rapid exit taxiways</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de transférer cette disposition en Guidance Material.</td> </tr> <tr> <td>Justification</td> <td>Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS. Par ailleurs, les valeurs de vitesse peuvent être différentes. Il convient cependant que les valeurs de vitesse soient indiquées dans l'AIP. Il existe d'autres méthodes pour concevoir et permettre une meilleure sortie rapide de piste, par exemple avec l'utilisation de clothoïdes.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>It is appropriate to transfer this provision into GM This provisions being only good practices and not normative references of the Annex 14 have to be put in GM and not CS. Speed values might be different but they must be mentioned in the AIP. There are other methods for best rapid exit of runways such as clothoïdes.</td> </tr> </table>	Référence: CS-ADR-DSN.D.295	Rapid exit taxiways	Proposition/commentaire	Il convient de transférer cette disposition en Guidance Material.	Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS. Par ailleurs, les valeurs de vitesse peuvent être différentes. Il convient cependant que les valeurs de vitesse soient indiquées dans l'AIP. Il existe d'autres méthodes pour concevoir et permettre une meilleure sortie rapide de piste, par exemple avec l'utilisation de clothoïdes.	Traduction de courtoisie	It is appropriate to transfer this provision into GM This provisions being only good practices and not normative references of the Annex 14 have to be put in GM and not CS. Speed values might be different but they must be mentioned in the AIP. There are other methods for best rapid exit of runways such as clothoïdes.	
Référence: CS-ADR-DSN.D.295	Rapid exit taxiways									
Proposition/commentaire	Il convient de transférer cette disposition en Guidance Material.									
Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS. Par ailleurs, les valeurs de vitesse peuvent être différentes. Il convient cependant que les valeurs de vitesse soient indiquées dans l'AIP. Il existe d'autres méthodes pour concevoir et permettre une meilleure sortie rapide de piste, par exemple avec l'utilisation de clothoïdes.									
Traduction de courtoisie	It is appropriate to transfer this provision into GM This provisions being only good practices and not normative references of the Annex 14 have to be put in GM and not CS. Speed values might be different but they must be mentioned in the AIP. There are other methods for best rapid exit of runways such as clothoïdes.									
response	<i>Not accepted</i>									
	The specifications are the same as ICAO, with a minor text amendment to paragraph (d). Therefore, they will stay in the CS.									

comment 945

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.D.295 — Rapid exit taxiways (p27-28)

2. Proposed text / comment

This comment is linked to comment xxx (reco ICAO into CS)

(See comments 1087 in book I and 839 in book II)

This CS details a method to design rapid exit taxiways; however this is not the sole method. Moreover, clothoid rapid exit taxiways are not dealt with.

Figure D-1 is only an example, which besides is also in the Guidance Material associated; thus it should be deleted from the CS.

DGAC proposes to move a part of this CS and Figure D-1 into guidance material:

CS-ADR-DSN.D.295 — Rapid exit taxiways TXT

~~"(a) A rapid exit taxiway should be designed with a radius of turn-off curve of at least:~~

~~(1) 550 m where the code number is 3 or 4; and~~

~~(2) 275 m where the code number is 1 or 2; to enable exit speeds under wet conditions of:~~

~~(i) 93 km/h where the code number is 3 or 4; and~~

~~(ii) 65 km/h where the code number is 1 or 2.~~

~~(ba) The radius of the fillet on the inside of the curve at a rapid exit taxiway should be sufficient to provide a widened taxiway throat in order to facilitate early recognition of the entrance and turn-off onto the taxiway.~~

~~(eb) A rapid exit taxiway should include a straight distance after the turn-off curve sufficient for an exiting aircraft to come to a full stop clear of any intersecting taxiway (Figure D-1).~~

~~(d) The intersection angle of a rapid exit taxiway with the runway should not be greater than 45°, preferably be 30°, but lower angles may be suitable depending on the aerodrome layout and traffic mix."~~

Figure D-1. Rapid exit taxiway**GM-ADR-DSN.D.295 — Rapid exit taxiways TXT**

"(a) The following specifications detail requirements particular to rapid exit taxiways. See ~~Book 1, Figure D-1~~ GM-D-2. General requirements for taxiways also apply to this type of taxiway. Guidance on the provision, location and design of rapid exit taxiways is included in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

~~(b) A rapid exit taxiway may be designed with a radius of turn-off curve of at least:~~

~~(1) 550 m where the code number is 3 or 4; and~~

~~(2) 275 m where the code number is 1 or 2; to enable exit speeds under wet conditions of:~~

~~(i) 93 km/h where the code number is 3 or 4; and~~

~~(ii) 65 km/h where the code number is 1 or 2.~~

~~(bc) The locations of rapid exit taxiways along a runway are based on several criteria described in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2), in addition to different speed criteria.~~

~~(ed) The intersection angle of a rapid exit taxiway with the runway should may not be greater than 45°, preferably be 30°, but lower angles may be suitable depending on the aerodrome layout and traffic mix."~~

Figure GM-D-2 Rapid exit taxiway

response *Not accepted*

CS D.295: the specifications are the same as ICAO, with a minor text amendment to paragraph (d).Therefore, they will stay in the CS.

GM D.295: this is from ICAO design criteria and will stay in CS.

comment

1304

comment by: *ECA - European Cockpit Association*

Modify the position of the references (i) & (ii), so they apply to both paragraphs (1) & (2).

Justification:

They refer to paragraphs (1) & (2), not only (2).

response

Accepted

comment

1305

comment by: *ECA - European Cockpit Association*

Delete paragraph (c) and replace with:

A runway exit taxiway should include a straight portion following the turnoff curve sufficient for an exiting aircraft to come to a full stop, clear of both the duty runway and an intersecting taxiway.

Justification:

On most aircraft it is not recommended to stop an aircraft while turning as it needs extensive thrust/power to commence taxi again out of a turn.

As you are not allowed to vacate a runway and continue taxi on a different taxiway than the exit taxiway from your runway, there needs to be some straight EXIT taxiway to bring your aircraft to a stop. Otherwise you can not comply with the requirement to clear the runway after landing AND comply with the requirement to not enter a taxiway without a clearance to do so.

Reference: IFALPA Annex 14, paragraph 3.9.xx

response

Not accepted

This an operational consideration. Wording used in this paragraph is the same as ICAO.

comment

1456

comment by: *Euroairport Bâle-Mulhouse*

Attachment [#236](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.295

Référence: CS-ADR-DSN.D.295

	<p>Rapid exit taxiways</p> <p>Traduction de courtoisie It is appropriate to transfer this provision into GM This provisions being only good practices and not normative references of the Annex 14 have to be put in GM and not CS. Speed values might be different but they must be mentioned in the AIP. There are other methods for best rapid exit of runways such as clothoïdes.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO, with a minor text amendment to paragraph (d). Therefore, they will stay in the CS.</p>

comment	<p>1563 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>It is appropriate to transfer this provision into GM</p> <p>This provisions being only good practices and not normative references of the Annex 14 have to be put in GM and not CS. Speed values might be different but they must be mentioned in the AIP. There are other methods for best rapid exit of runways such as clothoïdes</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO, with a minor text amendment to paragraph (d). Therefore, they will stay in the CS.</p>

comment	<p>1898 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #237</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.295</p> <p>Référence: CS-ADR-DSN.D.295 Rapid exit taxiways</p> <p>Traduction de courtoisie It is appropriate to transfer this provision into GM This provisions being only good practices and not normative references of the Annex 14 have to be put in GM and not CS. Speed values might be different but they must be mentioned in the AIP. There are other methods for best rapid exit of runways such as clothoïdes.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO, with a minor text amendment to paragraph (d). Therefore, they will stay in the CS.</p>

comment	<p>2016 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>We suggest to move this DSN-element to GM, see our comment relating CS-ADR-DSN.D.240.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO, with a minor text amendment to paragraph (d). Therefore, they will stay in the CS.</p>
comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2467 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p> <p>To avoid misunderstandings and possible misinterpretations concerning the angles in subpart (d) it is essential to change the wording according to Annex 14:</p> <p>Recommendation.— <i>The intersection angle of a rapid exit taxiway with the runway should not be greater than 45° nor less than 25° and preferably should be 30°.</i></p>
response	<p><i>Noted</i></p>
comment	<p>2537 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p> <p>This CS details a method to design rapid exit taxiways; however this is not the sole method. Moreover, clothoid rapid exit taxiways are not dealt with. Figure D-1 is only an example, which besides is also in the Guidance Material associated; thus it should be deleted from the CS. DGAC proposes to move a part of this CS and Figure D-1 into guidance material:</p> <p>CS-ADR-DSN.D.295 – Rapid exit taxiways TXT</p> <p>"(a) A rapid exit taxiway should be designed with a radius of turn-off curve of at least:</p> <p>(1) 550 m where the code number is 3 or 4; and</p> <p>(2) 275 m where the code number is 1 or 2; to enable exit speeds under wet conditions of:</p> <p>(i) 93 km/h where the code number is 3 or 4; and</p> <p>(ii) 65 km/h where the code number is 1 or 2.</p> <p>(ba) The radius of the fillet on the inside of the curve at a rapid exit taxiway should be sufficient to provide a widened taxiway throat in order to facilitate early recognition of the entrance and turn-off onto the taxiway.</p>

~~(c)~~ A rapid exit taxiway should include a straight distance after the turn-off curve sufficient for an exiting aircraft to come to a full stop clear of any intersecting taxiway (Figure D-1).

~~(d) The intersection angle of a rapid exit taxiway with the runway should not be greater than 45°, preferably be 30°, but lower angles may be suitable depending on the aerodrome layout and traffic mix."~~

Figure D-1. Rapid exit taxiway

response Not accepted

The specifications are the same as ICAO, with a minor text amendment to paragraph (d). Therefore, they will stay in the CS.

comment 2676 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#238](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.295

Référence: CS-ADR-DSN.D.295

Rapid exit taxiways

Traduction de courtoisie

It is appropriate to transfer this provision into GM

This provisions being only good practices and not normative references of the Annex 14 have to be put in GM and not CS.

Speed values might be different but they must be mentioned in the AIP.

There are other methods for best rapid exit of runways such as clothoïdes.

response Not accepted

The specifications are the same as ICAO, with a minor text amendment to paragraph (d). Therefore, they will stay in the CS.

comment 2858 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.D.295

Rapid exit taxiways

Proposition/commentaire

Il convient de transférer cette disposition en Guidance Material.

Justification

Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.

Par ailleurs, les valeurs de vitesse peuvent être différentes.

Il convient cependant que les valeurs de vitesse soient indiquées dans l'AIP.

Il existe d'autres méthodes pour concevoir et

	<p>permettre une meilleure sortie rapide de piste, par exemple avec l'utilisation de clothoïdes.</p>
Traduction de courtoisie	<p>It is appropriate to transfer this provision into GM</p> <p>This provisions being only good practices and not normative references of the Annex 14 have to be put in GM and not CS. Speed values might be different but they must be mentioned in the AIP. There are other methods for best rapid exit of runways such as clothoïdes.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO, with a minor text amendment to paragraph (d). Therefore, they will stay in the CS.</p>

CS-ADR – Book 1 – Figure D-1 Rapid exit taxiway

p. 28

comment	<p>509 ❖ comment by: <i>Union des Aéroports français - UAF</i></p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.295</p> <p>Référence: CS-ADR-DSN.D.295 Rapid exit taxiways</p> <p>Traduction de courtoisie It is appropriate to transfer this provision into GM This provisions being only good practices and not normative references of the Annex 14 have to be put in GM and not CS. Speed values might be different but they must be mentioned in the AIP. There are other methods for best rapid exit of runways such as clothoïdes.</p>
response	<p><i>Noted</i></p> <p>This sector refers to Table D-1 — the comment has been addressed in CS-ADR-DSN.D.295</p>
comment	<p>1111 ❖ comment by: <i>DGAC Direction Générale de l'aviation civile</i></p>

1. Affected paragraphs

- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.260 — Taxiway minimum separation distance (p25-26)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.315 — Width of taxiway strips (p29)
- BIII - CS-ADR - Book 1 - Figure D-1. Rapid exit taxiway (p28)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad (p35)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.Q.840 — Objects to be marked and/or lighted (p146-147)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.260 — Taxiway minimum separation distance
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.315 — Width of taxiway strips (p232)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad (p239)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.255 — Junction and intersection of taxiways
- Explanatory Note – paragraph 18 (page 8)

2. Proposed text / comment

The figures for taxiway minimum separation distances are intended for design purposes only and can be far less large than indicated: indeed, these figures are no more applied when maintaining taxiways and consequently no more relevant.

No safety concern has been noticed until now on this point.

But above all, verifying that the separation distances between taxiways are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured" (paragraph 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) either the certification specification gives only the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision, and the figures are in guidance material.
- (ii) or the figures are kept in the CS but specifying each time that they should be met "where practicable" and the CS gives the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision.

The option (i) is proposed by DGAC because less confusing and far clearer, and therefore more appropriate for a regulation and for future standardization. This is a critical point for DGAC.

All CSs referring to figures in table D-1 are to be changed consequently: their provisions corresponding to such distance should be move to GM, except for CS-ADR-DSN.Q.840 — *Objects to be marked and/or lighted* because the objective is marking and/or lighting thus is quite different and it is proposed to add the figures of table D-1 in this CS as Table Q-3 – *Taxiway minimum marking and/or lighting distances*.

This option (i) and the consequences on CS referring to table D-1 are detailed below:

CS-ADR-DSN.D.260 – Taxiway minimum separation distance

"The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be sufficient for safe aircraft operations, in particular to prevent from aircraft collision less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

[...]

Table D-1. Taxiway minimum separation distances"

GM-ADR-DSN.D.260 – Taxiway minimum separation distance

"[...] (c) The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

[...]

Table GM-D-1. Taxiway minimum separation distances

(d) The separation distances of Book 1, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(e) The separation distance between the centre line of an aircraft stand taxilane and an object shown in Book 1, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

CS-ADR-DSN.D.315 – Width of taxiway strips

"A taxiway strip should extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table ADR-D-1, column 11."

GM-ADR-DSN.D.315 – Width of taxiway strips

"A taxiway strip may extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table GM-D-1, column 11."

CS-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

"[...] (b) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.

(c) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)

Figure G-1 Minimum separation distance on a de-icing/anti-icing facility"

GM-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

"[...] (d) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.

(e) Where the de-icing/anti-icing facility is located adjoining a regular taxiway,

the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)
 Figure GM-G-1 Minimum separation distance on a de-icing/anti-icing facility”

CS-ADR-DSN.Q.840 – Objects to be marked and/or lighted p146

“[...] (g) All obstacles within the distance specified in Table D-1 Q-3, from the centre line of a taxiway, an apron taxiway or aircraft stand taxilane should be marked and, if the taxiway, apron taxiway or aircraft stand taxilane is used at night, lighted.

Table Q-3 – Taxiway minimum marking and/or lighting distances”

GM-ADR-DSN.D.255 – Junction and intersection of taxiways

“(e) The separation distances of Book 1, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(f) The separation distance between the centre line of an aircraft stand taxilane and an object shown in Book 1, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing.”

response Noted

These comments do not apply to this sector — Table D-1 — and are answered in the appropriate sector comments.

comment 2212 ❖

comment by: HIA - Highlands and Islands Airports Limited

Noted

response Noted

CS-ADR – Book 1 – CS-ADR-DSN.D.300 – Taxiways on bridges

p. 28

comment 511

comment by: Union des Aéroports français - UAF

Attachment [#239](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.300

Référence: CS-ADR-DSN.D.300

Taxiways on bridges

Traduction de courtoisie

It is appropriate to transfer this provision to GM.

Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment

729

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.D.300	Taxiways on bridges
Proposition/commentaire	(c) Il convient de transférer cette disposition en Guidance Material.
Justification	Cette disposition n'étant qu'une règle de l'art et non une référence normative dans l'Annexe 14 de l'OACI, elle a sa place en GM et non en CS.
Traduction de courtoisie	It is appropriate to transfer this provision to GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment

1306

comment by: *ECA - European Cockpit Association*

Delete paragraphs (a) & (b) and replace with:
(a) All taxiway bridges shall have a width at least equal to that of the taxiway plus the width of the shoulder. Additional width shall be provided in the form of a traffic lane to ensure the simultaneous use of the bridge by aircraft and emergency vehicles.

Justification:

This is to be prepared for emergency situations as they can occur everywhere on very short notice. This everywhere includes bridges so chances for successful evacuation must be given on a bridge as well.

Reference: IFALPA Annex 14, paragraph 3.9.20

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment	<p>1457 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #240</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.300</p> <p>Référence: CS-ADR-DSN.D.300 Taxiways on bridges</p> <p>Traduction de courtoisie It is appropriate to transfer this provision to GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>1564 comment by: Aéroport de Marseille - MRS/LFML</p> <p>It is appropriate to transfer this provision to GM.</p> <p>Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>1899 comment by: Aéroport Nantes Atlantique - NTE/LFRS</p> <p>Attachment #241</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.300</p> <p>Référence: CS-ADR-DSN.D.300 Taxiways on bridges</p> <p>Traduction de courtoisie It is appropriate to transfer this provision to GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>

comment	2133	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	(b)	
	Consider adding - <i>if aircraft engines overhang the bridge structure protection from engine blast should be considered for areas below.</i>	
response	<i>Noted</i>	

comment	2677	comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
	Attachment #242	
	ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.300	
	Référence: CS-ADR-DSN.D.300 Taxiways on bridges	
	Traduction de courtoisie It is appropriate to transfer this provision to GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	

comment	2709	comment by: <i>ECA - European Cockpit Association</i>
	Add the following subsections under (c): (i) Where longitudinal slopes cannot be avoided, the gradient should not exceed <u>0.75%</u> . (ii) The surface of a bridge should be so constructed as to provide good friction characteristics under all weather conditions or in any operational environment.	
	Justification: <u>Reference: IFALPA Annex 14, paragraphs 3.8.22x & 3.8.22y</u>	
response	<i>Noted</i>	
	Existing taxiway specifications are considered adequate.	

comment	2859	comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i>
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Référence: CS-ADR-DSN.D.300	Taxiways on bridges
Proposition/commentaire	(c) Il convient de transférer cette disposition en Guidance Material.
Justification	Cette disposition n'étant qu'une règle de l'art et non une référence normative dans l'Annexe 14 de l'OACI, elle a sa place en GM et non en CS.
Traduction de courtoisie	It is appropriate to transfer this provision to GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.
response	<i>Not accepted</i> The specifications are the same as ICAO; therefore, they will stay in the CS.

CS-ADR – Book 1 – CS-ADR-DSN.D.305 – Taxiway shoulders

p. 28-29

comment	50	comment by: <i>Belfast International Airport - BFS/EGAA</i>
		Please define the requirements for a taxiway shoulder and does this mean similar surface material as a runway shoulder?
response	<i>Noted</i>	
		GM.305 has guidance on characteristics of taxiway shoulders and on shoulder treatment as given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).
comment	512	comment by: <i>Union des Aéroports français - UAF</i>
		Attachment #243
		UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.305
		Référence: CS-ADR-DSN.D.305 Taxiway shoulders

	<p>Traduction de courtoisie It is appropriate to delete the (b) This provision is useless because it is more important to respect the objectives of minimal widths and shoulders.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>

comment	<p>730</p> <p>comment by: <i>ADP : Aeroports de Paris</i></p> <table border="1"> <tr> <td>Référence: CS-ADR-DSN.D.305</td> <td>Taxiway shoulders</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de supprimer le (b).</td> </tr> <tr> <td>Justification</td> <td>Cette disposition est inutile car il s'agit surtout de respecter l'objectif des accotements et les largeurs minimales.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td> <p>It is appropriate to delete the (b)</p> <p>This provision is useless because it is more important to respect the objectives of minimal widths and shoulders.</p> </td> </tr> </table>	Référence: CS-ADR-DSN.D.305	Taxiway shoulders	Proposition/commentaire	Il convient de supprimer le (b).	Justification	Cette disposition est inutile car il s'agit surtout de respecter l'objectif des accotements et les largeurs minimales.	Traduction de courtoisie	<p>It is appropriate to delete the (b)</p> <p>This provision is useless because it is more important to respect the objectives of minimal widths and shoulders.</p>
Référence: CS-ADR-DSN.D.305	Taxiway shoulders								
Proposition/commentaire	Il convient de supprimer le (b).								
Justification	Cette disposition est inutile car il s'agit surtout de respecter l'objectif des accotements et les largeurs minimales.								
Traduction de courtoisie	<p>It is appropriate to delete the (b)</p> <p>This provision is useless because it is more important to respect the objectives of minimal widths and shoulders.</p>								
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>								

comment	<p>1308</p> <p>comment by: <i>ECA - European Cockpit Association</i></p> <p>Amend text as follows:</p> <p>Straight portions of a taxiway where the code letter is C, D, E or F should be provided with shoulders which extend symmetrically on each side of the taxiway so that the overall width of the taxiway and its shoulders on straight portions is not less than:</p> <p>(1) 60 75 m where the code letter is F; (2) 44 60 m where the code letter is E; (3) 38 60 m where the code letter is D; and (4) 25 53 m where the code letter is C. <u>(5) 39 m where the code letter is B and</u> <u>(6) 34 m where the code letter is A.</u></p>
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	<p>Justification: The ICAO requirement for an overall width of taxiway plus shoulders of 44 metres (for code E) is only just sufficient to accommodate the engine span of a B-747 (42.4m). For code D (38m), the ICAO requirement is not sufficient for a B-747. The amended dimensions are considered to be much more realistic in terms of the need to cover the engine spans of all aircraft likely to use the respective taxiways and thus avoid the danger of damage to the engines caused by ingestion of surface debris. Reference: IFALPA Annex 14, paragraph 3.10.1</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>

comment	<p>1338 comment by: UK CAA</p> <p>Page No: 28</p> <p>Paragraph No: CS-ADR-DSN.D.305</p> <p>Comment: The term 'Taxiway Shoulder' is inappropriate for use in the EU. There is a general misunderstanding between what constitutes a taxiway shoulder and the taxiway graded area. Both contain the same intent and cover the same distances from the taxiway centreline. This misunderstanding is also reflected in the ICAO SARPs. EASA should take the initiative to clarify what the area should be called and what specifications apply to it.</p> <p>Justification: There is a widespread misconception that a taxiway needs a shoulder, graded area and strip to balance those requirements attributed to a runway. However, there is a significant difference between the justification for a shoulder attached to a runway and that required for a taxiway. Aircraft operations on a runway involve high speeds and a greater potential for loss of directional control. The area adjacent to the runway is also subjected to greater jet blast from the higher power demands during take-off and reverse thrust during landing. Therefore, the graded area adjoining the runway is subjected to different conditions than that adjoining a taxiway. To manage those differences, the graded area adjoining the runway has an additional protection area adjoining the runway known as the shoulder. The role of the runway shoulder is to allow an aircraft to run off the side of the runway without causing structural damage (and preferable not compound the direction control problems experience by the flight crew) and provide erosion and ingestion protection from/for aircraft engines. This requirement for a runway shoulder effectively divides the runway graded area in two with different specifications attributed to both areas. In the case of the taxiway graded area and shoulder, both areas are of identical specifications and intent. The decision, therefore, is what the area should be known as. Whereas the runway requires the graded area to be divided and puts greater protection on the shoulder area, the taxiway, due to the lower speeds, greater directional control and reduced jet blast exposure, does not need an area with greater protection than the graded area already provided. Therefore, the UK proposal is to remove the term 'shoulder' from the taxiway requirements.</p>
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	Proposed Text: DELETE CS-ADR-DSN.D.305	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in CS. GM.305 has guidance on characteristics of taxiway shoulders and on shoulder treatment as given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).	
comment	1458	comment by: <i>Euroairport Bâle-Mulhouse</i>
	Attachment #244	
	Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.305	
	Référence: CS-ADR-DSN.D.305 Taxiway shoulders	
	Traduction de courtoisie It is appropriate to delete the (b) This provision is useless because it is more important to respect the objectives of minimal widths and shoulders.	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	
comment	1565	comment by: <i>Aéroport de Marseille - MRS/LFML</i>
	It is appropriate to delete the (b)	
	This provision is useless because it is more important to respect the objectives of minimal widths and shoulders.	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	
comment	1900	comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	Attachment #245	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.305	
	Référence: CS-ADR-DSN.D.305 Taxiway shoulders	
	Traduction de courtoisie	

	<p>It is appropriate to delete the (b) This provision is useless because it is more important to respect the objectives of minimal widths and shoulders.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>2017 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>We suggest to move this DSN-element to GM, see our comment relating CS-ADR-DSN.D.240.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>2143 comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Title and reference to shoulders in (a) (b) and (c) should read <i>taxiway strip</i> not shoulders otherwise taxiway shoulders would be wider than those for a runway. CS-ADR-DSN D.310 - Taxiway Strip - should be removed and added to this paragraph.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS. Taxiway strip dimensions are in Table D-1 and are in excess of the width of shoulders.</p>
comment	<p>2468 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p> <p>Forcing aerodromes to provide shoulders in taxiways places a high financial, constructional and operational burdon on the aerodrome operator by additionally generating minimal to no benefit to the level of safety. This is being far too unreasonable and unproportional, especially disadvantaging small and medium sized airports and must therefore be moved to the guidance material.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>

comment	<p>2678 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #246</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.305</p> <p>Référence: CS-ADR-DSN.D.305 Taxiway shoulders</p> <p>Traduction de courtoisie It is appropriate to delete the (b) This provision is useless because it is more important to respect the objectives of minimal widths and shoulders.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>

comment	<p>2860 comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i></p> <table border="1"> <tr> <td>Référence: CS-ADR-DSN.D.305</td> <td>Taxiway shoulders</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de supprimer le (b).</td> </tr> <tr> <td>Justification</td> <td>Cette disposition est inutile car il s'agit surtout de respecter l'objectif des accotements et les largeurs minimales.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>It is appropriate to delete the (b) This provision is useless because it is more important to respect the objectives of minimal widths and shoulders.</td> </tr> </table>	Référence: CS-ADR-DSN.D.305	Taxiway shoulders	Proposition/commentaire	Il convient de supprimer le (b).	Justification	Cette disposition est inutile car il s'agit surtout de respecter l'objectif des accotements et les largeurs minimales.	Traduction de courtoisie	It is appropriate to delete the (b) This provision is useless because it is more important to respect the objectives of minimal widths and shoulders.
Référence: CS-ADR-DSN.D.305	Taxiway shoulders								
Proposition/commentaire	Il convient de supprimer le (b).								
Justification	Cette disposition est inutile car il s'agit surtout de respecter l'objectif des accotements et les largeurs minimales.								
Traduction de courtoisie	It is appropriate to delete the (b) This provision is useless because it is more important to respect the objectives of minimal widths and shoulders.								
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>								

comment	2145	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Consider re-naming CS-ADR-DSN.D.305 taxiway strip and moving this statement to CS-ADR-DSN.D.305.	
response	<i>Noted</i>	
	Dimensions for the taxiway strip are not the same as for shoulders; Therefore, no change is necessary.	

CS-ADR – Book 1 – CS-ADR-DSN.D.315 – Width of taxiway strips

p. 29

comment	513	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #247	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.315	
	Référence: CS-ADR-DSN.D.315 Width of taxiway strips	
	Traduction de courtoisie It is appropriate to keep into CS only the beginning of the article: « A taxiway strip should extend symmetrically on each side of the centre line of the taxiway. » The rest of the provision has to be transferred to « guidance material » GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put into GM and not CS.	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO (with Code E and F modified to take account of proposed ICAO changes). Therefore, they will stay in the CS.	

comment	731	comment by: <i>ADP : Aeroports de Paris</i>
	Référence: CS-ADR-DSN.D.315	Width of taxiway strips
	Proposition/commentaire	Il convient de conserver en CS uniquement le début de l'article: « A taxiway strip should extend symmetrically on each side of the centre line of the taxiway. » Le reste de la disposition est à transférer en « guidance material ».

Justification	Les dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, ont leur place en GM et non en CS.
Traduction de courtoisie	<p>It is appropriate to keep into CS only the beginning of the article: « A taxiway strip should extend symmetrically on each side of the centre line of the taxiway. »</p> <p>The rest of the provision has to be transferred to « guidance material » GM.</p> <p>Being only good practices and not normative references of the Annex 14, these provisions have to be put into GM and not CS.</p>

response *Not accepted*

The specifications are the same as ICAO (with Code E and F modified to take account of proposed ICAO changes). Therefore, they will stay in the CS.

comment

1111 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.260 — Taxiway minimum separation distance (p25-26)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.315 — Width of taxiway strips (p29)
- BIII - CS-ADR - Book 1 - Figure D-1. Rapid exit taxiway (p28)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad (p35)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.Q.840 — Objects to be marked and/or lighted (p146-147)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.260 — Taxiway minimum separation distance
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.315 — Width of taxiway strips (p232)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad (p239)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.255 — Junction and intersection of taxiways
- Explanatory Note – paragraph 18 (page 8)

2. Proposed text / comment

The figures for taxiway minimum separation distances are intended for design

purposes only and can be far less large than indicated: indeed, these figures are no more applied when maintaining taxiways and consequently no more relevant.

No safety concern has been noticed until now on this point.

But above all, verifying that the separation distances between taxiways are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured" (paragraph 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) either the certification specification gives only the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision, and the figures are in guidance material.
- (ii) or the figures are kept in the CS but specifying each time that they should be met "where practicable" and the CS gives the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision.

The option (i) is proposed by DGAC because less confusing and far clearer, and therefore more appropriate for a regulation and for future standardization. This is a critical point for DGAC.

All CSs referring to figures in table D-1 are to be changed consequently: their provisions corresponding to such distance should be move to GM, except for CS-ADR-DSN.Q.840 — *Objects to be marked and/or lighted* because the objective is marking and/or lighting thus is quite different and it is proposed to add the figures of table D-1 in this CS as Table Q-3 — *Taxiway minimum marking and/or lighting distances*.

This option (i) and the consequences on CS referring to table D-1 are detailed below:

CS-ADR-DSN.D.260 — Taxiway minimum separation distance

"The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should ~~not~~ be sufficient for safe aircraft operations, in particular to prevent from aircraft collision less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

[...]

Table D-1. Taxiway minimum separation distances"

GM-ADR-DSN.D.260 — Taxiway minimum separation distance

"[...] (c) The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

[...]

Table GM-D-1. Taxiway minimum separation distances

~~(d)~~ The separation distances of ~~Book 1~~, Table ~~GM-D-1~~, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

~~(d)~~(e) The separation distance between the centre line of an aircraft stand taxilane and an object shown in ~~Book 1~~, Table ~~GM-D-1~~, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

CS-ADR-DSN.D.315 – Width of taxiway strips

"A taxiway strip should extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table ~~ADR-D-1~~, column 11."

GM-ADR-DSN.D.315 – Width of taxiway strips

"A taxiway strip may extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table ~~GM-D-1~~, column 11."

CS-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

~~"[...] (b) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table ~~D-1~~, column (12) should be provided.~~

~~(c) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table ~~D-1~~, column (11) should be provided. (See Figure ~~G-1~~.)~~

~~Figure ~~G-1~~ Minimum separation distance on a de-icing/anti-icing facility"~~

GM-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

~~"[...] (d) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table ~~D-1~~, column (12) should be provided.~~

~~(e) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table ~~D-1~~, column (11) should be provided. (See Figure ~~G-1~~.)~~

~~Figure ~~GM-G-1~~ Minimum separation distance on a de-icing/anti-icing facility"~~

CS-ADR-DSN.Q.840 – Objects to be marked and/or lighted p146

~~"[...] (g) All obstacles within the distance specified in Table ~~D-1~~ ~~Q-3~~, from the centre line of a taxiway, an apron taxiway or aircraft stand taxilane should be marked and, if the taxiway, apron taxiway or aircraft stand taxilane is used at night, lighted.~~

~~Table ~~Q-3~~ - Taxiway minimum marking and/or lighting distances"~~

GM-ADR-DSN.D.255 – Junction and intersection of taxiways

"(e) The separation distances of Book 1, Table ~~GM-D-1~~, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(f) The separation distance between the centre line of an aircraft stand taxilane and an object shown in Book 1, Table ~~GM-D-1~~, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

response Not accepted

CS-ADR-DSN.D.315: the specifications will remain in the CS as they are the same as ICAO.
The remaining comments are answered in the appropriate CS sector.

comment 1459 comment by: Euroairport Bâle-Mulhouse

Attachment [#248](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.315

Référence: CS-ADR-DSN.D.315
Width of taxiway strips

Traduction de courtoisie

It is appropriate to keep into CS only the beginning of the article: « A taxiway strip should extend symmetrically on each side of the centre line of the taxiway. »

The rest of the provision has to be transferred to « guidance material » GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put into GM and not CS.

response *Not accepted*

The specifications are the same as ICAO (with Code E and F modified to take account of proposed ICAO changes). Therefore, they will stay in the CS.

comment 1566 comment by: Aéroport de Marseille - MRS/LFML

It is appropriate to keep into CS only the beginning of the article: « A taxiway strip should extend symmetrically on each side of the centre line of the taxiway. »

The rest of the provision has to be transferred to « guidance material » GM.

Being only good practices and not normative references of the Annex 14, these provisions have to be put into GM and not CS.

response *Not accepted*

The specifications are the same as ICAO (with Code E and F modified to take account of proposed ICAO changes). Therefore, they will stay in the CS.

comment 1897 comment by: ENAC Ente Nazionale per l'Aviazione Civile

We suggest to stay with the present Table ICAO Table 3-1. Taxiway minimum separation distances column 11 Code F "57.5"

response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO (with Code E and F modified to take account of proposed ICAO changes). Therefore, they will stay in the CS.</p>
comment	<p>2021 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>We suggest to move this DSN-element to GM, see our comment relating CS-ADR-DSN.D.240.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO (with Code E and F modified to take account of proposed ICAO changes). Therefore, they will stay in the CS.</p>
comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2549 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p> <p>CS-ADR-DSN.D.315 – Width of taxiway strips <i>"A taxiway strip should extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table ADR-D-1, column 11."</i></p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO (with Code E and F modified to take account of proposed ICAO changes). Therefore, they will stay in the CS.</p>
comment	<p>2679 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #249</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.315</p> <p>Référence: CS-ADR-DSN.D.315 Width of taxiway strips</p> <p>Traduction de courtoisie It is appropriate to keep into CS only the beginning of the article: « A taxiway</p>

strip should extend symmetrically on each side of the centre line of the taxiway. »
 The rest of the provision has to be transferred to « guidance material » GM.
 Being only good practices and not normative references of the Annex 14, these provisions have to be put into GM and not CS.

response *Not accepted*

The specifications are the same as ICAO (with Code E and F modified to take account of proposed ICAO changes). Therefore, they will stay in the CS.

comment 2861 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

<u>Référence: CS-ADR-DSN.D.315</u>	Width of taxiway strips
Proposition/commentaire	Il convient de conserver en CS uniquement le début de l'article: « A taxiway strip should extend symmetrically on each side of the centre line of the taxiway. » Le reste de la disposition est à transférer en « guidance material ».
Justification	Les dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, ont leur place en GM et non en CS.
Traduction de courtoisie	It is appropriate to keep into CS only the beginning of the article: « A taxiway strip should extend symmetrically on each side of the centre line of the taxiway. » The rest of the provision has to be transferred to « guidance material » GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put into GM and not CS.

response *Not accepted*

The specifications are the same as ICAO (with Code E and F modified to take account of proposed ICAO changes). Therefore, they will stay in the CS.

comment 2 comment by: *Manchester Airport plc*

This suggests that it is acceptable to have equipment parked within taxiway strips, albeit in specified and marked locations. We believe that no objects other than essential aids, such as lights and signage, should be kept within a taxiway strip.

response *Accepted*

This sentence will be deleted.

comment 24 comment by: *ACI EUROPE - Airports Council International*

reference should be CS.ADR.DSN.T.915

Justification: wrong numbering

response *Accepted*

comment 74 comment by: *CAA-NL*

Please change the reference into CS.ADR.DSN.T.915, because this CS is dealing with the siting of equipment and installations on operational areas.

response *Accepted*

comment 113 comment by: *Swedavia AB - Swedish airports (currently 11 airports)*

Reference should be CS.ADR.DSN.T.915.

response *Accepted*

comment 448 comment by: *Cologne/Bonn Airport*

Reference should be CS.ADR.DSN.T.915

response *Accepted*

comment	491	comment by: <i>East Midlands Airport - EMA/EGNX</i>
	This suggests that it is acceptable to have equipment parked within taxiway strips, albeit in specified and marked locations. We believe that no objects other than essential aids, such as lights and signage, should be kept within a taxiway strip.	
response	<i>Accepted</i>	
	This sentence will be deleted.	

comment	514	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #250	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.320	
	Référence: CS-ADR-DSN.D.320 Objects on taxiway strips	
	Traduction de courtoisie It is appropriate to delete this article The provisions of this article are already in CS-ADR-DSN.T.915.	
response	<i>Not accepted</i>	
	CS D.320 relates to objects on the taxiway strip. CS T.915 relates to equipment and installations on operational areas. Wording used is taken from the respective ICAO source.	

comment	610	comment by: <i>Avinor</i>
	CS.ADR.DSN.D.320. Reference should be CS.ADR.DSN.T.915. More than 50% of the European Airports will not be able to meet these requirements. Mainly due to surrounding limitations and the cost implication can not be estimated. In the worst case this might lead into the closure of runways or reduction in runway length which will affect operations of certain aircraft types.	
response	<i>Noted</i>	
	CS amendment and Noted	

comment	732	comment by: <i>ADP : Aeroports de Paris</i>
	Référence: CS-ADR-DSN.D.320	Objects on taxiway strips

Proposition/commentaire	Il convient de supprimer cet article.
Justification	Les dispositions de cet article se trouvent déjà en CS-ADR-DSN.T.915.
Traduction de courtoisie	It is appropriate to delete this article The provisions of this article are already in CS-ADR-DSN.T.915.

response *Not accepted*

CS D.320 relates to objects on the taxiway strip. CS T.915 relates to equipment and installations on operational areas. Wording used is taken from the respective ICAO source.

comment	798	comment by: <i>Munich Airport International</i>
	reference should be CS.ADR.DSN.T.915	
	Justification: wrong numbering	
response	<i>Accepted</i>	

comment	816	comment by: <i>Finnish Transport Safety Agency</i>
	Reference CS-ADR-DSN.T.925 should be CS-ADR-DSN.T.915	
response	<i>Accepted</i>	

comment	1121 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<u>1. Affected paragraphs</u>	
	<ul style="list-style-type: none"> • BIII - CS-ADR - Book 1 – CS-ADR-DSN.A.002 — Definitions (p4-9) • BIII - CS-ADR - Book 1 – CS-ADR-DSN.D.320 — Objects on taxiway strips (p29) 	
	<u>2. Justification and proposed text / comment</u>	
	The first sentence is a duplication of what is detailed in the definition of taxiway strip in CS-ADR-DSN.A.002: “an area including a taxiway intended to protect an	

aircraft operating on the taxiway and to reduce the risk of damage to an aircraft accidentally running off the taxiway".

The other sentences are already dealt with in CS-ADR-DSN.T.915 - *Siting of equipment and installations on operational areas*.

Such duplications are to be avoided in a regulation as much as possible to avoid any confusion, in particular for the future modifications.

~~CS-ADR-DSN.D.320 — Objects on taxiway strips~~

~~"The taxiway strip should provide an area which should be free from objects which might create an unacceptable risk to taxiing aeroplanes. This should not preclude parking equipment required for that area in specifically identified positions or zones. The detailed requirements for siting objects on taxiway strips are in CS-ADR-DSN.T.925 (Siting of equipment and installations on operational areas)."~~

response *Accepted*

comment 1310 comment by: ECA - European Cockpit Association

Comment:

The reference to CS-ADR-DSN.T.925 should be to CD-ADR-DSN.T.915.

Justification:

Editorial comment

response *Accepted*

comment 1315 comment by: ECA - European Cockpit Association

Comment:

The sentence "This should not preclude parking equipment required for that area in specifically identified positions or zones" should be deleted.

Justification:

This sentence implies a clear downgrading from ICAO recommendation and there is no sustainable motivation for such a downgrading.

response *Accepted*

comment 1460 comment by: Euroairport Bâle-Mulhouse

Attachment [#251](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.320

	<p>Référence: CS-ADR-DSN.D.320 Objects on taxiway strips</p> <p>Traduction de courtoisie It is appropriate to delete this article The provisions of this article are already in CS-ADR-DSN.T.915.</p>
response	<p><i>Not accepted</i></p> <p>CS D.320 relates to objects on the taxiway strip. CS T.915 relates to equipment and installations on operational areas. Wording used is taken from the respective ICAO source.</p>

comment	<p>1489 comment by: <i>Geneva International Airport (ROMIG)</i></p> <p>Reference should be CS.ADR.DSN.T.915 formatting</p>
response	<p><i>Accepted</i></p>

comment	<p>1567 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>It is appropriate to delete this article The provisions of this article are already in CS-ADR-DSN.T.915</p>
response	<p><i>Not accepted</i></p> <p>CS D.320 relates to objects on the taxiway strip. CS T.915 relates to equipment and installations on operational areas. Wording used is taken from the respective ICAO source.</p>

comment	<p>1901 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #252</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.320</p> <p>Référence: CS-ADR-DSN.D.320 Objects on taxiway strips</p> <p>Traduction de courtoisie It is appropriate to delete this article The provisions of this article are already in CS-ADR-DSN.T.915.</p>
response	<p><i>Not accepted</i></p>

CS D.320 relates to objects on the taxiway strip. CS T.915 relates to equipment and installations on operational areas. Wording used is taken from the respective ICAO source.

comment 2091 comment by: *IDRF e.V. (association of regional airports)*

Non-ICAO, but helpful additional text. We appreciate such approaches.

response *Noted*

comment 2146 comment by: *HIA - Highlands and Islands Airports Limited*

Add - *The area should be free from holes, ditches and debris, and suitably designed drain covers*

response *Noted*

This is covered by grading of the taxiway strip.

comment 2408 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

Reference should be CS.ADR.DSN.T.915

response *Accepted*

comment 2469 comment by: *Airport Nuremberg - NUE/EDDN*

This must be adapted according to ICAO Annex 14, 3.11.3 to avoid misunderstandings and potential safety risks:

The taxiway strip should provide an area clear of objects which may endanger taxiing aeroplanes.

The added sentence: This should not preclude parking equipment required for that area in specifically identified positions or zones ... must be cancelled.

response *Accepted*

comment 2680 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#253](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.320

Référence: CS-ADR-DSN.D.320
Objects on taxiway strips

Traduction de courtoisie
It is appropriate to delete this article
The provisions of this article are already in CS-ADR-DSN.T.915.

response *Not accepted*

CS D.320 relates to objects on the taxiway strip. CS T.915 relates to equipment and installations on operational areas. Wording used is taken from the respective ICAO source.

comment 2862 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.D.320	Objects on taxiway strips
Proposition/commentaire	Il convient de supprimer cet article.
Justification	Les dispositions de cet article se trouvent déjà en CS-ADR-DSN.T.915.
Traduction de courtoisie	It is appropriate to delete this article The provisions of this article are already in CS-ADR-DSN.T.915.

response *Not accepted*

CS D.320 relates to objects on the taxiway strip. CS T.915 relates to equipment and installations on operational areas. Wording used is taken from the respective ICAO source.

comment 2947 comment by: *Isavia*

CS.ADR.DSN.D.320. Reference should be CS.ADR.DSN.T.915. More than 50% of the European Airports will not be able to meet these requirements. Mainly due to surrounding limitations and the cost implication cannot be estimated. In the worst case this might lead into the closure of runways or reduction in runway length which will affect operations of certain aircraft types.

response	<i>Noted</i>
	The reference has been amended. Other comments are noted.
comment	<p>3020 comment by: <i>ADV -German Airports Association</i></p> <p>CS.ADR.DSN.D.320 reference should be CS.ADR.DSN.T.915</p> <p>Justification wrong numbering</p>
response	<i>Accepted</i>
comment	<p>3055 comment by: <i>MST / STR - Stuttgart Airport</i></p> <p>CS.ADR.DSN.D.320 reference should be CS.ADR.DSN.T.915</p> <p>Justification wrong numbering</p>
response	<i>Accepted</i>
comment	<p>3088 comment by: <i>Fraport AG</i></p> <p>CS-ADR-DSN.D.320 – Objects on taxiway strips</p> <p>Editorial ... taxiway strips are in CS-ADR-DSN.T.925 (Siting of equipment and installations on operational areas).</p> <p>Proposed Text ... taxiway strips are in CS-ADR-DSN.T.915 (Siting of equipment and installations on operational areas).</p> <p>Fraport AG Wrong cross reference</p>
response	<i>Accepted</i>

comment	489	comment by: <i>East Midlands Airport - EMA/EGNX</i>
	For a Code 3 or 4 instrument runway the width of the graded strip should be 105m. We would not consider 75m sufficient to achieve an acceptable level of safety except for a temporary duration, for example during work in progress.	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	

comment	515	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #254	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.325	
	Référence: CS-ADR-DSN.D.325 Grading of taxiway strips	
	Traduction de courtoisie It is appropriate to transfer this provision into GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	

comment	733	comment by: <i>ADP : Aeroports de Paris</i>
	Référence: CS-ADR-DSN.D.325	Grading of taxiway strips
	Proposition/commentaire	Il convient de transférer cette disposition en Guidance Material.
	Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.
	Traduction de courtoisie	It is appropriate to transfer this provision into GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment 1126

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.325 — Grading of taxiway strips (p29)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.325 — Grading of taxiway strips (p233)

2. Justification and proposed text / comment

This comment is critical.

This ICAO recommendation in Annex 14 Volume 1 is not binding in France where it is more good practices.

These figures are not verified during audits as no safety concern has been noticed on this point until now. Systematically verifying that these figures are met, as required to deliver a certificate, will generate huge costs without any identified safety value.

Moreover, there is no possibility of proposing an ELOS since there is no identified purpose.

DGAC proposes to move the whole CS to guidance material:

CS-ADR-DSN.D.325 — Grading of taxiway strips

~~"(a) The centre portion of a taxiway strip should provide a graded area to a distance from the centre line of the taxiway of at least:~~

- ~~(1) 11 m where the code letter is A;~~
- ~~(2) 12.5 m where the code letter is B or C;~~
- ~~(3) 19 m where the code letter is D;~~
- ~~(4) 22 m where the code letter is E; and~~
- ~~(5) 30 m where the code letter is F."~~

GM-ADR-DSN.D.325 — Grading of taxiway strips

"The centre portion of a taxiway strip may provide a graded area to a distance from the centre line of the taxiway of at least:

- (1) 11 m where the code letter is A;
- (2) 12.5 m where the code letter is B or C;
- (3) 19 m where the code letter is D;
- (4) 22 m where the code letter is E; and
- (5) 30 m where the code letter is F."

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment	<p>1461 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #255</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.325</p> <p>Référence: CS-ADR-DSN.D.325 Grading of taxiway strips</p> <p>Traduction de courtoisie It is appropriate to transfer this provision into GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>1568 comment by: Aéroport de Marseille - MRS/LFML</p> <p>It is appropriate to transfer this provision into GM.</p> <p>Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>1902 comment by: Aéroport Nantes Atlantique - NTE/LFRS</p> <p>Attachment #256</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.325</p> <p>Référence: CS-ADR-DSN.D.325 Grading of taxiway strips</p> <p>Traduction de courtoisie It is appropriate to transfer this provision into GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>

comment	2022	comment by: <i>IDRF e.V. (association of regional airports)</i>
	We suggest to move this DSN-element to GM, see our comment relating CS-ADR-DSN.D.240.	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	

comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

comment	2540	comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	This ICAO recommendation in Annex 14 Volume 1 is proposed include it as a GM.	
	It is proposed to move the whole CS to guidance material:	
	CS-ADR-DSN.D.325 – Grading of taxiway strips	
	<i>“(a) The centre portion of a taxiway strip should provide a graded area to a distance from the centre line of the taxiway of at least:</i>	
	<i>(1) 11 m where the code letter is A;</i>	
	<i>(2) 12.5 m where the code letter is B or C;</i>	
	<i>(3) 19 m where the code letter is D;</i>	
	<i>(4) 22 m where the code letter is E; and</i>	
	<i>(5) 30 m where the code letter is F.”</i>	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	

comment	2682	comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
	Attachment #257	
	ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.325	
	Référence: CS-ADR-DSN.D.325 Grading of taxiway strips	

	Traduction de courtoisie It is appropriate to transfer this provision into GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.
response	<i>Not accepted</i> The specifications are the same as ICAO; therefore, they will stay in the CS.

comment	2863 comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i>								
	<table border="1"> <tr> <td>Référence: CS-ADR-DSN.D.325</td> <td>Grading of taxiway strips</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de transférer cette disposition en Guidance Material.</td> </tr> <tr> <td>Justification</td> <td>Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>It is appropriate to transfer this provision into GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.</td> </tr> </table>	Référence: CS-ADR-DSN.D.325	Grading of taxiway strips	Proposition/commentaire	Il convient de transférer cette disposition en Guidance Material.	Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.	Traduction de courtoisie	It is appropriate to transfer this provision into GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.
Référence: CS-ADR-DSN.D.325	Grading of taxiway strips								
Proposition/commentaire	Il convient de transférer cette disposition en Guidance Material.								
Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.								
Traduction de courtoisie	It is appropriate to transfer this provision into GM. Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.								
response	<i>Not accepted</i> The specifications are the same as ICAO; therefore, they will stay in the CS.								

CS-ADR – Book 1 – CS-ADR-DSN.D.330 – Slopes on taxiway strips

p. 29-30

comment	516 comment by: <i>Union des Aéroports français - UAF</i> Attachment #258 UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.330 Référence: CS-ADR-DSN.D.330
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	<p>Slopes on taxiway strips</p> <p>Traduction de courtoisie It is appropriate to transfer this provision into GM All the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>

comment	<p>734</p> <p>comment by: <i>ADP : Aeroports de Paris</i></p> <table border="1"> <tr> <td>Référence: CS-ADR-DSN.D.330</td> <td>Slopes on taxiway strips</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de transférer cette disposition en Guidance Material.</td> </tr> <tr> <td>Justification</td> <td>L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td> <p>It is appropriate to transfer this provision into GM</p> <p>All the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.</p> </td> </tr> </table>	Référence: CS-ADR-DSN.D.330	Slopes on taxiway strips	Proposition/commentaire	Il convient de transférer cette disposition en Guidance Material.	Justification	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM.	Traduction de courtoisie	<p>It is appropriate to transfer this provision into GM</p> <p>All the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.</p>
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comment	<p>843 ❖</p> <p>comment by: <i>DGAC Direction Générale de l'aviation civile</i></p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13) • CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13) • CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on
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- runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
 - CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
 - CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter*

of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and

(3) 2 % where the code number is 1 or 2.

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

(1) 1.5 % where the code number is 3 or 4; and

(2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

(1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;

(2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and

(3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

(1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;

(2) any point 2 m above a runway to all other points 2 m above the runway

within a distance of at least half the length of the runway where the code letter is B; and

(3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface."

GM-ADR-DSN.B.100 — Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface. Slopes ~~should be~~ are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders****CS-ADR-DSN.B.130 — Slopes on runway shoulders**

"The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."

GM-ADR-DSN.B.130 — Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips**

"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:

- (1) 1.5 % where the code number is 4;*
- (2) 1.75 % where the code number is 3; and*
- (3) 2 % where the code number is 1 or 2.*

(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."

GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;*
- (2) 1.75 % where the code number is 3; and*
- (3) 2 % where the code number is 1 or 2."*

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.185 — Transverse Slopes on runway strips**

"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface ~~but should not exceed:~~

- (1) 2.5 % where the code number is 3 or 4; and*
- (2) 3 % where the code number is 1 or 2;*

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."

GM-ADR-DSN.B.185 — Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and*
- (2) 3 % where the code number is 1 or 2;*

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

~~(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas****CS-ADR-DSN.C.230 - Slopes on runway end safety areas**

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA ~~should~~ **can** be amended accordingly."

*** Longitudinal slopes on taxiways****CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways**

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

"The longitudinal slope of a taxiway may not exceed:

- (1) 1.5 % where the code letter is C, D, E or F; and
- (2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways****CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways**

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways****CS-ADR-DSN.D.275 – Sight distance of taxiways**

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the

taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~
~~(1) 1.5 % where the code letter is C, D, E or F; and~~
~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:
 (1) 1.5 % where the code letter is C, D, E or F; and
 (2) 2 % where the code letter is A or B.
 (b) Slopes should may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~
~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~
~~(2) 3 % for strips of taxiways where the code letter is A or B;~~
~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~
~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:
 (1) 2.5 % for strips where the code letter is C, D, E or F; and
 (2) 3 % for strips of taxiways where the code letter is A or B;
 the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~
~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

"(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "

response *Noted*

Comments will be addressed to under their individual CS reference.

comment

1462

comment by: Euroairport Bâle-Mulhouse

Attachment [#259](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.330

Référence: CS-ADR-DSN.D.330
Slopes on taxiway strips

Traduction de courtoisie

It is appropriate to transfer this provision into GM

All the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.

response

Not accepted

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment

1490

comment by: Geneva International Airport (ROMIG)

Keep the first half of article (a) up until taxiway or sholder. Move the rest of the article to GM.

This level of detail is too high.

response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>1569 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>It is appropriate to transfer this provision into GM</p> <p>All the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>1903 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #260</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.330</p> <p>Référence: CS-ADR-DSN.D.330 Slopes on taxiway strips</p> <p>Traduction de courtoisie It is appropriate to transfer this provision into GM All the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>1963 comment by: <i>Aéroports De Lyon</i></p> <p>L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Elle peuvent même aller à l'encontre de l'objectif des pentes: le drainage de l'eau.</p> <p><u>Proposition</u>: préciser la donnée en GM</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>

comment	2023	comment by: <i>IDRF e.V. (association of regional airports)</i>
	We suggest to move this DSN-element to GM, see our comment relating CS-ADR-DSN.D.240.	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	
comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	
comment	2407	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	The first half of article (a) up until taxiway or sholder is helpful. Suggest moving the rest of the article to GM, too complicated.	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	
comment	2470	comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!	
	If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	
comment	2509	comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment 2684 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#261](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.330

Référence: CS-ADR-DSN.D.330

Slopes on taxiway strips

Traduction de courtoisie

It is appropriate to transfer this provision into GM

All the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment 2864 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.D.330

Slopes on taxiway strips

Proposition/commentaire

Il convient de transférer cette disposition en Guidance Material.

Justification

L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM.

Traduction de courtoisie

It is appropriate to transfer this provision into GM

	All the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>

CS-ADR — Book 1 — CS-ADR-DSN.D.335 — Holding Bays, runway-holding positions, intermediate holding positions and road-holding positions

p. 30

comment

3

comment by: *Manchester Airport plc*

(e) It would be better to use a Pattern A marking at a road holding position leading on to a runway, rather than a road holding position marking. This would reinforce the awareness to drivers of a runway situated ahead. Runway Guard Lights should also be positioned alongside these markings. Road holding markings are appropriate where there is a taxiway ahead.

response

Noted

comment

143

comment by: *CAA Norway*

We suggest to add these words to the end of the sentence in CS-ADR-DSN.D.335 (b) on page 30: "...**on a runway.**" Then suggest to add in a new subparagraph (c) containing the text in 3.12.3 in Annex 14: "**A runway-holding position should be established on a taxiway if the location or alignment of the taxiway is such that a taxiing aircraft or vehicle can infringe an obstacle limitation surface or interfere with the operation of radio navigation aids.**"

response

Noted

The CS has been reviewed and the text will be amended to reflect the ICAO design standards.

comment	<p>144 comment by: CAA Norway</p> <p>Editorial: We suggest to reverse CS-ADR-DSN.D.335 d and e on page 30 for more logical order.</p>
response	<p><i>Noted</i></p> <p>The CS has been reviewed and the text will be amended to reflect the ICAO design standards.</p>
comment	<p>287 comment by: Icelandic Civil Aviation Administration</p> <p>We suggest to add these words to the end of the sentence in CS-ADR-DSN.D.335 (b) on page 30: "...on a runway." Then suggest to add in a new subparagraph (c) containing the text in 3.12.3 in Annex 14: "A runway-holding position should be established on a taxiway if the location or alignment of the taxiway is such that a taxiing aircraft or vehicle can infringe an obstacle limitation surface or interfere with the operation of radio navigation aids."</p>
response	<p><i>Noted</i></p> <p>The CS has been reviewed and the text will be amended to reflect the ICAO design standards.</p>
comment	<p>288 comment by: Icelandic Civil Aviation Administration</p> <p>Editorial: We suggest to reverse CS-ADR-DSN.D.335 d and e on page 30 for more logical order.</p>
response	<p><i>Noted</i></p> <p>The CS has been reviewed and the text will be amended to reflect the ICAO design standards.</p>
comment	<p>357 comment by: Estonian CAA</p> <p>We suggest to add these words to the end of the sentence in CS-ADR-DSN.D.335 (b) on page 30: "...on a runway." Then suggest to add in a new subparagraph (c) containing the text in 3.12.3 in Annex 14: "A runway-holding position should be established on a taxiway if the location or alignment of the taxiway is such that a taxiing aircraft or vehicle can infringe an obstacle limitation surface or interfere with the operation of radio navigation aids."</p>
response	<p><i>Noted</i></p> <p>The CS has been reviewed and the text will be amended to reflect the ICAO</p>

design standards.

comment 492 comment by: *East Midlands Airport - EMA/EGNX*

(e) It would be better to use a Pattern A marking at a road holding position leading on to a runway, rather than a road holding position marking. This would reinforce the awareness to drivers of a runway situated ahead. Runway Guard Lights should also be positioned alongside these markings. Road holding markings are appropriate where there is a taxiway ahead.

response *Noted*

comment 639 comment by: *Finnish Transport Safety Agency*

We suggest to add these words to the end of the sentence in CS-ADR-DSN.D.335 (b) on page 30: "...on a runway." Then suggest to add in a new subparagraph (c) containing the text in 3.12.3 in Annex 14: "A runway-holding position should be established on a taxiway if the location or alignment of the taxiway is such that a taxiing aircraft or vehicle can infringe an obstacle limitation surface or interfere with the operation of radio navigation aids."

response *Noted*

The CS has been reviewed and the text will be amended to reflect the ICAO design standards.

comment 640 comment by: *Finnish Transport Safety Agency*

Editorial: We suggest to reverse CS-ADR-DSN.D.335 d and e on page 30 for more logical order.

response *Noted*

The CS has been reviewed and the text will be amended to reflect the ICAO design standards.

comment 1154 comment by: *Swedish Transport Agency*

We suggest to add these words to the end of the sentence in CS-ADR-DSN.D.335 (b) on page 30: "...on a runway." Then suggest to add in a new subparagraph (c) containing the text in 3.12.3 in Annex 14: "A runway-holding position should be established on a taxiway if the location or alignment of the taxiway is such that a taxiing aircraft or vehicle can infringe an obstacle limitation surface or interfere with the operation of radio navigation aids."

response	<i>Noted</i>
	The CS has been reviewed and the text will be amended to reflect the ICAO design standards.
comment	1155 comment by: <i>Swedish Transport Agency</i>
	Editorial: We suggest to reverse CS-ADR-DSN.D.335 d and e on page 30 for more logical order.
response	<i>Noted</i>
	The CS has been reviewed and the text will be amended to reflect the ICAO design standards.
comment	2128 comment by: <i>IDRF e.V. (association of regional airports)</i>
	Non-ICAO, but helpful additional text. We appreciate such approaches.
response	<i>Noted</i>
	The CS has been reviewed and the text will be amended to reflect the ICAO design standards.
comment	2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>
response	<i>Noted</i>
comment	2471 comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	Subparts (a) is efficient enough in that CS. All other subparts (b) to (e) should be moved to the guidance material due to their lack of detail and clear instruction. If it should not however be possible to move those subpart, further specification on what is meant is essential.
response	<i>Noted</i>
	The CS has been reviewed and the text will be amended to reflect the ICAO design standards.

comment	<p>2588 comment by: <i>Danish Transport Authority</i></p> <p>We suggest to add these words to the end of the sentence in CS-ADR-DSN.D.335 (b) on page 30: "...on a runway." Then suggest to add in a new subparagraph (c) containing the text in 3.12.3 in Annex 14: "A runway-holding position should be established on a taxiway if the location or alignment of the taxiway is such that a taxiing aircraft or vehicle can infringe an obstacle limitation surface or interfere with the operation of radio navigation aids."</p>
response	<p><i>Noted</i></p> <p>The CS has been reviewed and the text will be amended to reflect the ICAO design standards.</p>

CS-ADR – Book 1 – CS-ADR-DSN.D.340 – Location of holding Bays, runway-holding positions, intermediate holding positions and road-holding positions	p. 30
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comment	<p>517 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #262</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.340</p> <p>Référence: CS-ADR-DSN.D.340 Location of holding Bays, runway-holding positions, intermediate holding positions and road-holding positions</p> <p>Traduction de courtoisie (b) It is appropriate to transfer this provision into GM Table D-2</p> <ul style="list-style-type: none"> - It is appropriate to transfer the note 3 to GM. - (b) It is appropriate to transfer to GM the following part: « Information on critical and sensitive areas of ILS and MLS is contained in Annex 10, Volume I, Attachements C and G, respectively » which only relates to GM. - It is appropriate to add a (d): "Elevation of the aerodrome should be taken into account for possible increase of the values indicated in this table." <p>What we propose to place into GM are much good practices than normative rules or give explanations.</p>
response	<p><i>Noted</i></p> <p><i>Not Agreed:</i> The specifications are the same as ICAO; therefore, they will stay in the CS.</p> <p><i>Noted:</i> Table D-2. Paragraph (b) will be deleted (reference to ICAO). For completeness of the CS, the relevant information is retained in the same place. (d) is already covered by (b).</p>

comment 735

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.D.340	Location of holding Bays, runway-holding positions, intermediate holding positions and road-holding positions
Proposition/commentaire	<p>(b) Il convient de transférer cette disposition en Guidance Material (GM).</p> <p>Table D-2:</p> <ul style="list-style-type: none"> - Il convient de transférer la note 3 en GM. - (b) Il convient de transférer en GM la partie suivante : « Information on critical and sensitive areas of ILS and MLS is contained in Annex 10, Volume I, Attachements C and G, respectively » qui ne concerne que des éléments informatifs. <p>Nous souhaitons également supprimer le renvoi suivant : "see CS-ADR-DSN.D.340"</p> <ul style="list-style-type: none"> - Il convient d'ajouter un (d): "Elevation of the aerodrome should be taken into account for possible increase of the values indicated in this table."
Justification	Ce que nous préconisons de placer en GM relève plus des règles de l'art et non des règles normatives ou donne des explications.
Traduction de courtoisie	<p>(b) It is appropriate to transfer this provision into GM</p> <p>Table D-2</p> <ul style="list-style-type: none"> - It is appropriate to transfer the note 3 to GM. - (b) It is appropriate to transfer to GM the following part: « Information on critical and sensitive areas of ILS and MLS is contained in Annex 10, Volume I, Attachements C and G, respectively » which only relates to GM. - It is appropriate to add a (d): "Elevation of the aerodrome should be taken into account for possible increase of the values indicated in this table." <p>What we propose to place into GM are much good practices than normative rules or give explanations.</p>

response *Noted*

Not Agreed: The specifications are the same as ICAO; therefore, they will stay in the CS.

Noted: For completeness of the CS, the relevant information is retained in the same place. (d) is already covered by (b).

comment

1328

comment by: ECA - European Cockpit Association

The whole paragraph should be rewritten as follows:

The distance between a holding bay or a taxi holding position and the centre line of a runway shall be not less than:

a) 155 m where the runway code number is 3 or 4;
155 m where the runway code number is 2 and the runway is an instrument runway; 75 m where the runway code number is 2 and the runway is a non-instrument runway; and 40 m where the runway code number is 1.

b) Such that a holding aircraft will not infringe an obstacle limitation surface taking into account the largest aircraft which could operate into the aerodrome. Furthermore, such a holding aircraft shall present a collision risk of less than 1×10^{-7} (one in ten million) when the collision risk model is used; and

c) Such that a holding aircraft will not interfere with the operation of radio aids.

Justification:

The increased distances from the runway centre line for the location of holding bays in the following amending text conform with IFALPA policy related to the widths of runway strips (see IFALPA Annex 14, para. 3.4.5). The taxiway holding position provided for all Operational Categories should be in such a position that the tail of the largest aeroplane is outside, or lies under, the Obstacle Assessment Surface. ICAO PANS-OPS specifies that the acceptable risk of collisions between an overshooting aeroplane and one parked at the holding point should not exceed 1×10^{-7} .

The dimensions proposed here exceed those of the ICAO criteria by a considerable margin, (except in unusual circumstances) even when the provisions of ICAO paragraphs 3.12.7 and 3.12.8 are applied. For example, if the elevation of the airport were 4000m (13320 ft), for a precision runway, the holding bay distance would be 90m plus 43m of the elevation correction (= 133m). If the holding bay were 1m higher than the threshold elevation, an additional 5m of clearance would be required to produce a total of 138m. The required distance we propose however is 155m. This distance would be greater in all but very unusual circumstances, that is very high elevations and at those high elevations where the holding bay is far above the threshold elevation. Reference: IFALPA Annex 14, paragraph 3.12.6

response

Noted

Not Agreed: The specifications are the same as ICAO; therefore, they will stay in the CS.

Noted: For completeness of the CS, the relevant information is retained in the same place. (d) is already covered by (b).

comment	<p>1463 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #263</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.D.340</p> <p>Référence: CS-ADR-DSN.D.340 Location of holding Bays, runway-holding positions, intermediate holding positions and road-holding positions</p> <p>Traduction de courtoisie (b) It is appropriate to transfer this provision into GM Table D-2</p> <ul style="list-style-type: none"> - It is appropriate to transfer the note 3 to GM. - (b) It is appropriate to transfer to GM the following part: « Information on critical and sensitive areas of ILS and MLS is contained in Annex 10, Volume I, Attachements C and G, respectively » which only relates to GM. - It is appropriate to add a (d): "Elevation of the aerodrome should be taken into account for possible increase of the values indicated in this table." <p>What we propose to place into GM are much good practices than normative rules or give explanations.</p>
response	<p><i>Noted</i></p> <p><i>Not Agreed:</i> The specifications are the same as ICAO; therefore, they will stay in the CS. <i>Noted:</i> For completeness of the CS, the relevant information is retained in the same place. (d) is already covered by (b).</p>

comment	<p>1571 comment by: Aéroport de Marseille - MRS/LFML</p> <p>(b) It is appropriate to transfer this provision into GM</p> <p>Table D-2</p> <ul style="list-style-type: none"> - It is appropriate to transfer the note 3 to GM. - (b) It is appropriate to transfer to GM the following part: « Information on critical and sensitive areas of ILS and MLS is contained in Annex 10, Volume I, Attachements C and G, respectively » which only relates to GM. - It is appropriate to add a (d): "Elevation of the aerodrome should be taken into account for possible increase of the values indicated in this table." <p>What we propose to place into GM are much good practices than normative rules or give explanations</p>
response	<p><i>Noted</i></p> <p><i>Not Agreed:</i> The specifications are the same as ICAO; therefore, they will stay in the CS. <i>Noted:</i> For completeness of the CS, the relevant information is retained in the same place. (d) is already covered by (b).</p>

comment	<p>1904 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p>
	<p>Attachment #264</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.340</p> <p>Référence: CS-ADR-DSN.D.340 Location of holding Bays, runway-holding positions, intermediate holding positions and road-holding positions</p> <p>Traduction de courtoisie (b) It is appropriate to transfer this provision into GM Table D-2</p> <ul style="list-style-type: none"> - It is appropriate to transfer the note 3 to GM. - (b) It is appropriate to transfer to GM the following part: « Information on critical and sensitive areas of ILS and MLS is contained in Annex 10, Volume I, Attachements C and G, respectively » which only relates to GM. - It is appropriate to add a (d): "Elevation of the aerodrome should be taken into account for possible increase of the values indicated in this table." <p>What we propose to place into GM are much good practices than normative rules or give explanations.</p>
response	<p><i>Noted</i></p> <p><i>Not Agreed:</i> The specifications are the same as ICAO; therefore, they will stay in the CS. <i>Noted:</i> For completeness of the CS, the relevant information is retained in the same place. (d) is already covered by (b).</p>
comment	<p>2130 comment by: <i>IDRF e.V. (association of regional airports)</i></p>
	<p>We suggest to move this DSN-element to GM, see our comment relating CS-ADR-DSN.D.240.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p>
	<p><i>Noted</i></p>
response	<p><i>Noted</i></p>
comment	<p>2685 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p>

Attachment [#265](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.D.340

Référence: CS-ADR-DSN.D.340

Location of holding Bays, runway-holding positions, intermediate holding positions and road-holding positions

Traduction de courtoisie

(b) It is appropriate to transfer this provision into GM

Table D-2

- It is appropriate to transfer the note 3 to GM.

- (b) It is appropriate to transfer to GM the following part: « Information on critical and sensitive areas of ILS and MLS is contained in Annex 10, Volume I, Attachements C and G, respectively » which only relates to GM.

- It is appropriate to add a (d): "Elevation of the aerodrome should be taken into account for possible increase of the values indicated in this table."

What we propose to place into GM are much good practices than normative rules or give explanations.

response *Noted**Not Agreed:* The specifications are the same as ICAO; therefore, they will stay in the CS.*Noted:* For completeness of the CS, the relevant information is retained in the same place. (d) is already covered by (b).

comment

2865

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

<u>Référence: CS-ADR-DSN.D.340</u>	Location of holding Bays, runway-holding positions, intermediate holding positions and road-holding position
Proposition/commentaire	(b) Il convient de transférer cette disposition en Guidance Material (GM). Table D-2: - Il convient de transférer la note 3 en GM. - (b) Il convient de transférer en GM la partie suivante : « Information on critical and sensitive areas of ILS and MLS is contained in Annex 10, Volume I, Attachements C and G, respectively » qui ne concerne que des éléments informatifs. Nous souhaitons également supprimer le renvoi suivant : " see CS-ADR-DSN.D.340 " - Il convient d'ajouter un (d): "Elevation of the aerodrome should be taken into account for possible increase of the values indicated in this table."
Justification	Ce que nous préconisons de placer en GM relève plus des règles de l'art et non des règles normatives ou donne des explications.

Traduction de courtoisie	<p>(b) It is appropriate to transfer this provision into GM</p> <p>Table D-2</p> <ul style="list-style-type: none"> - It is appropriate to transfer the note 3 to GM. - (b) It is appropriate to transfer to GM the following part: « Information on critical and sensitive areas of ILS and MLS is contained in Annex 10, Volume I, Attachements C and G, respectively » which only relates to GM. - It is appropriate to add a (d): "Elevation of the aerodrome should be taken into account for possible increase of the values indicated in this table." <p>What we propose to place into GM are much good practices than normative rules or give explanations.</p>
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response *Noted*

Not Agreed: The specifications are the same as ICAO; therefore, they will stay in the CS.

Noted: For completeness of the CS, the relevant information is retained in the same place. (d) is already covered by (b).

CS-ADR – Book 1 – Table D-2 – Minimum distance from the runway centre line to a holding bay, runway-holding point or road-holding position

p. 31

comment 517 ❖

comment by: *Union des Aéroports français - UAF*

UAF NPA 2011-20 (B.III) CS-ADR-DSN.D.340

Référence: CS-ADR-DSN.D.340

Location of holding Bays, runway-holding positions, intermediate holding positions and road-holding positions

Traduction de courtoisie

(b) It is appropriate to transfer this provision into GM

Table D-2

- It is appropriate to transfer the note 3 to GM.

- (b) It is appropriate to transfer to GM the following part: « Information on

critical and sensitive areas of ILS and MLS is contained in Annex 10, Volume I, Attachments C and G, respectively » which only relates to GM.
 - It is appropriate to add a (d): "Elevation of the aerodrome should be taken into account for possible increase of the values indicated in this table."
 What we propose to place into GM are much good practices than normative rules or give explanations.

response *Noted*

Not Agreed: The specifications are the same as ICAO; therefore, they will stay in the CS.

Noted: Table D-2. Paragraph (b) will be deleted (reference to ICAO). For completeness of the CS, the relevant information is retained in the same place. (d) is already covered by (b).

comment

1130

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - Table D-2 — Minimum distance from the runway centre line to a holding bay, runway-holding point or road-holding position (p31)

2. Justification and proposed text / comment

The last sentence of paragraph (b) of Table D-2 is to be deleted for several reasons:

- it is more guidance material than certification specification
- a reference to ICAO Annex 10 is not appropriate in this regulation
- most of all, this is equipment matters and will be dealt with by group "ATM005".

Table D-2 — Minimum distance from the runway centre line to a holding bay, runway-holding point or road-holding position

"[...]b. This distance may need to be increased to avoid interference with radio navigation aids, particularly the glide path and localiser facilities (see CS-ADR-DSN.D.340). ~~Information on critical and sensitive areas of ILS and MLS is contained in Annex 10, Volume I, Attachments C and G, respectively.~~"

response *Noted*

Not Agreed: The specifications are the same as ICAO; therefore, they will stay in the CS.

Noted: For completeness of the CS, the relevant information is retained in the same place. (d) is already covered by (b).

comment

1322

comment by: ECA - European Cockpit Association

Comment:

	In paragraph b, when referring to Annex 10, it should be stated that it is ICAO Annex.
	Justification: For clarity purposes
response	<i>Noted</i>
	The reference to ICAO Annex 10 has been deleted.

comment	1424 <i>comment by: DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> CS-ADR - Book 1 - Table D-2 — Minimum distance from the runway centre line to a holding bay, runway-holding point or road-holding position (p31) <p><u>2. Justification and proposed text / comment</u></p> <p>In France, it has been deemed necessary to impose higher distances in some cases than the ones proposed in Table D-2, in particular where the elevation of the taxiway does not permit to safeguard obstacle free zone.</p> <p>As examples, In France, for non precision approach, the distance is 75 m for all code numbers and for precision approach categories II or III, the distance is 150 m.</p> <p>Thus DGAC proposes to add a paragraph d to indicate that elevation of taxiway should be taken into account.</p> <p>Table D-2 — Minimum distance from the runway centre line to a holding bay, runway-holding point or road-holding position</p> <p>"[...]</p> <p><i>d. Elevation of taxiway should be taken into account for possible increase of the distances indicated in this table."</i></p>
response	<i>Accepted</i>
	The proposed paragraph (d) has been added to the table.

comment	2132 <i>comment by: IDRF e.V. (association of regional airports)</i>
	We suggest to move this DSN-element to GM, see our comment relating CS-ADR-DSN.D.240.
response	<i>Not accepted</i>
	The specifications are the same as ICAO; therefore, they will stay in the CS.

comment	2156	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Table D-2	
	ICAO Runway Taxi Holding Position Distances – retains ICAO minima of 90m for Cat II/III Code Number 3 and 4 (UK has 107.7m and 137m) which the National Authority may wish to retain.	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.E.345 – General

p. 32

comment	403	comment by: <i>Cologne/Bonn Airport</i>		
	<table border="1"> <tr> <td>delete "without causing damage to aircraft"</td> <td>According to ICAO Annex 14 Vol. I 3.13.1</td> </tr> </table>		delete "without causing damage to aircraft"	According to ICAO Annex 14 Vol. I 3.13.1
delete "without causing damage to aircraft"	According to ICAO Annex 14 Vol. I 3.13.1			
response	<i>Accepted</i>			

comment	786	comment by: <i>Munich Airport International</i>
	<u>delete:</u> "without causing damage to aircraft"	
	Justification: According to ICAO Annex 14 Vol. I 3.13.1	
response	<i>Accepted</i>	

comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>	
response	<i>Noted</i>	

comment	2413	comment by: <i>IDRF e.V. (association of regional airports)</i>
	This DSN-element is based on an modified ICAO Annex 14 recommendation	

	with a generic text, written in an adequate and constructive way, therefore it is also adequate to keep it within the CS.
response	<i>Noted</i>

comment	2443 comment by: <i>SWISS AERODROMES ASSOCIATION</i>
	Specs of aprons, as other physical characteristics, are published or may be asked for. Safe use of an aerodrome is in the responsibility of the aircraft operator. Aerodrome operators will have to meet BRs and ERs. There is therefore no reason to set requirements in a CS.
	As for other CSs, the whole chapter should be moved to GM
response	<i>Not accepted</i>

comment	2472 comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	This should be adapted according to the ICAO Annex 14 Recommendation:
	<i>Aprons should be provided where necessary to permit the on- and off-loading of passengers, cargo or mail as well as the servicing of aircraft without interfering with the aerodrome traffic.</i>
	Leaving this passage as suggested seems arbitrary and goes without any recognizable reasonable principle. Placing this burdon on the aerodromes within the European Union could lead to claims by airlines interpreting this CS to their favour in case of accidents and incidents on the aprons.
response	<i>Partially accepted</i>
	The text 'and without causing damage to aircraft' will be deleted.

comment	3008 comment by: <i>ADV -German Airports Association</i>
	CS-ADR-DSN.E.345 — General Aprons
	Aprons should be provided to permit the safe loading and off-loading of passengers, cargo or mail as well as the servicing of aircraft without interfering with the aerodrome traffic and without causing damage to aircraft.
	delete "without causing damage to aircraft"
	Justification According to ICAO Annex 14 Vol. I 3.13.1
response	<i>Accepted</i>

comment	3043	comment by: <i>MST / STR - Stuttgart Airport</i>
	<p>CS-ADR-DSN.E.345 — General Aprons Aprons should be provided to permit the safe loading and off-loading of passengers, cargo or mail as well as the servicing of aircraft without interfering with the aerodrome traffic and without causing damage to aircraft.</p> <p>delete "without causing damage to aircraft"</p> <p>Justificaiton According to ICAO Annex 14 Vol. I 3.13.1</p>	
response	<i>Accepted</i>	

CS-ADR — Book 1 — CS-ADR-DSN.E.350 — Size of aprons
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p. 32

comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR — Book 1 — CS-ADR-DSN.E.355 — Strength of aprons
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p. 32

comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

comment	2414	comment by: <i>IDRF e.V. (association of regional airports)</i>
	<p>This DSN-element is based on an ICAO Annex 14 recommendation with a generic text, written in an adequate and constructive way, therefore it is also adequate to keep it within the CS.</p>	
response	<i>Accepted</i>	

comment	26	comment by: <i>ACI EUROPE - Airports Council International</i>
	(b) move to GM	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	

comment	114	comment by: <i>Swedavia AB - Swedish airports (currently 11 airports)</i>
	(b) Move to GM.	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	

comment	133	comment by: <i>MWEBWV Ministerium für Wirtschaft, Energie, Bauen, Wohnen und Verkehr des Landes Nordrhein-Westfalen</i>
	Comment to (b): b) should be ammended in that way, to keep only the qualitative objective of the CSs (e.g. drainage, prevent accumulation of water) and move values of slopes to GM	
	(b) Cannot be verified so precisely: Such verification would generate huge costs without any added safety value. For this reasons, they are only recommended by ICAO Annex 14.	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	

comment	449	comment by: <i>Cologne/Bonn Airport</i>
	move to Guidance Material	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	

comment 519 comment by: *Union des Aéroports français - UAF*

Attachment [#266](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.E.360

Référence: CS-ADR-DSN.E.360
Slopes on aprons

Traduction de courtoisie

(b) It is appropriate to transfer this provision into GM

All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment 611 comment by: *Avinor*

CS.ADR.DSN.E.360 (b). Move to GM. Wrong numbering.

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment 736 comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.E.360

Slopes on aprons

Proposition/commentaire

(b) Il convient de transférer cette disposition en Guidance Material.

Justification

L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM.

Traduction de courtoisie

(b) It is appropriate to transfer this provision into GM

All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment 799 comment by: *Munich Airport International*

(b): move to GM

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment 843 ❖ comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)

- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:

- (1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and
- (2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface."~~

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface.

Slopes ~~should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5%."

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5%."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

~~"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

~~(1) 1.5 % where the code number is 4;~~

~~(2) 1.75 % where the code number is 3; and~~

~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

- ~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
- ~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

- (1) is perpendicular to the vertical plane containing the runway centre line; and
- (2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

- (1) The slopes of a runway end safety area should be such that no part of the

runway end safety area penetrates the approach or take-off climb surface.

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

~~"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~

~~(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %~~

~~(c) Where clearway is provided, the slope on the REASA should can be amended accordingly."~~

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a

taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B."

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes should may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and

(2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse

~~slope should not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and

(2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~"(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 – Slopes on aprons —and GM

"(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "

response

Not accepted

CS-ADR-DSN.E.360: The specifications are the same as ICAO; therefore, they will stay in the CS.

The remaining comments are answered in the appropriate CS sector.

comment 1064 comment by: *Bezirksregierung Düsseldorf / Luftverkehr*

Die Neigung in CS-ADR-DSN.E.360(b) sollte nicht derart niedrigen (1%) bzw. absoluten Werten festgelegt werden. Eine derartige Forderung kann zu erheblichen Kosten führen, die jedoch keinen Gewinn an Sicherheit mit sich bringen. Nicht ohne Grund ist diese nur eine Empfehlung in ICAO Annex 14.

The slope in CS-ADR-DSN.E360(b) should not be fixed in such a low (1%) and absolute value. Such verification would generate huge costs without any added safety profit. For this reason, the slope is only recommended in ICAO Annex 14.

response *Noted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment 1341 comment by: *UK CAA*

Page No: 32

Paragraph No: CS-ADR-DSN.E.360

Comment: New text is needed to explain that the apron should preferably be laterally level to help reduce the hazard of ULDs rolling out of the aircraft when the locks are released during removal of cargo. This is particularly important on nose-in/push-back stands.

Justification: Experience has shown that cargo can move under its own weight once the locks are removed and aircraft that tilt slightly towards the door can cause a hazard to safety when the ULDs move towards the exit. This hazard can be removed by ensuring and slopes on the apron run longitudinally only and that any lateral slope is either level or sloping towards the port side of the aircraft.

Proposed Text: New text: (c) On nose-in/pushback stands, any lateral slope should preferably be 0% or slope towards the port side of the stand.

response *Not accepted*

The proposed text addition is guidance for aircraft stands. The CS gives scope for a slope up to a maximum of 1 %, i.e. 0-1 %, and paraphrases Annex 14 in that slopes 'should be kept as level as drainage requirements permit'.

comment 1465 comment by: *Euroairport Bâle-Mulhouse*

Attachment [#267](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.E.360

	<p>Référence: CS-ADR-DSN.E.360 Slopes on aprons</p> <p>Traduction de courtoisie (b) It is appropriate to transfer this provision into GM All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>1492 comment by: <i>Geneva International Airport (ROMIG)</i></p> <p>b) Move to GM, too detailed.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>1572 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>(b) It is appropriate to transfer this provision into GM All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>1734 comment by: <i>Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH</i></p> <p>move to GM</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>1906 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #268</p>

	<p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.E.360</p> <p>Référence: CS-ADR-DSN.E.360 Slopes on aprons</p> <p>Traduction de courtoisie (b) It is appropriate to transfer this provision into GM All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>1967 comment by: <i>Aéroports De Lyon</i></p> <p>Certains parkings avions présentent une pente supérieure à 1 % mais ne sont pas rectifiable à ce jour (ensemble complexe à reprendre) Le respect de cet article pourrait même empêcher le drainage de l'eau (dangereux)</p> <p><u>Proposition</u>: préciser la donnée en GM</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>2159 comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Add - aprons or stands should not slope down towards the Terminal buildings</p>
response	<p><i>Noted</i></p> <p>This information is in GM-ADR-DSN.E.360.</p>
comment	<p>2415 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).</p> <p>The figures are indiscriminately and not based on scientific findings, at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden.</p> <p>We suggest to move letter (b) of this DSN-element to GM.</p>

response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>2432 ❖ comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>Suggest moving the "CS" to "GM"</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>2473 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p> <p>This must be moved to guidance material since it is for some existing aerodromes in no way possible to reach this ICAO recommendation. By transferring it into a CS it places an immense financial and operational burden on aerodromes within the European Union that aerodromes outside of the EU do not have. Therefore it is disadvantaging the aerodromes within the European Union!</p> <p>If it is not possible to move it to the guidance material, it should only be applicable for a newly built aerodromes, not for the ones already operating! Implementing this ICAO Annex 14 recommendation does not necessarily increase the level of safety.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>2508 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p> <p>CS-ADR-DSN.E.360 Slopes on aprons "(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device. -(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>

comment	2686	comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
	Attachment #269	
	ADBM NPA 2011-20 (B.III) CS-ADR-DSN.E.360	
	Référence: CS-ADR-DSN.E.360 Slopes on aprons	
	Traduction de courtoisie (b) It is appropriate to transfer this provision into GM All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	

comment	2866	comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i>								
	<table border="1"> <tr> <td>Référence: CS-ADR-DSN.E.360</td> <td>Slopes on aprons</td> </tr> <tr> <td>Proposition/commentaire</td> <td>(b) Il convient de transférer cette disposition en Guidance Material.</td> </tr> <tr> <td>Justification</td> <td>L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>(b) It is appropriate to transfer this provision into GM All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.</td> </tr> </table>		Référence: CS-ADR-DSN.E.360	Slopes on aprons	Proposition/commentaire	(b) Il convient de transférer cette disposition en Guidance Material.	Justification	L'ensemble des règles concernant les pentes est du ressort des règles de l'art et non pas des règles de certification. Il est donc approprié de retrouver ces règles en GM.	Traduction de courtoisie	(b) It is appropriate to transfer this provision into GM All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.
Référence: CS-ADR-DSN.E.360	Slopes on aprons									
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Traduction de courtoisie	(b) It is appropriate to transfer this provision into GM All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.									
response	<i>Not accepted</i>									
	The specifications are the same as ICAO; therefore, they will stay in the CS.									

comment	3021	comment by: <i>ADV -German Airports Association</i>
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	CS.ADR.DSN.E.360 (b) move to GM
response	<i>Not accepted</i>
	The specifications are the same as ICAO; therefore, they will stay in the CS.

comment	3056 comment by: <i>MST / STR - Stuttgart Airport</i>
	CS.ADR.DSN.E.360 (b) move to GM
response	<i>Not accepted</i>
	The specifications are the same as ICAO; therefore, they will stay in the CS.

comment	3089 comment by: <i>Fraport AG</i>
	CS-ADR-DSN.E.360 Slopes on aprons (b) Editorial Complete paragraph Move complete paragraph to GM
response	<i>Not accepted</i>
	The specifications are the same as ICAO; therefore, they will stay in the CS.

CS-ADR — Book 1 — CS-ADR-DSN.E.365 Clearance distances on aircraft stands p. 32-33

comment	13 comment by: <i>Manchester Airport plc</i>
	Permitted clearance dimensions should differentiate between those where the pilot has a good view of the obstacle in front of or beside the cockpit windows (i.e. airbridges, front of terminal building) and those where the pilot has limited or no view of the obstacle close to the contact point (i.e. objects close to wingtips or tail). Greater clearance needs to be required where the view is limited.
response	<i>Noted</i>

comment	25	comment by: <i>ACI EUROPE - Airports Council International</i>
	(b) (2) replace "charecteristics" by "dimensions"	
response	<i>Accepted</i>	
comment	75	comment by: <i>CAA-NL</i>
	We suggest to replace in (b) (2) 'characteristics' by 'dimensions', because the dimensions are relevant for the clearance distances on aircraft stands.	
response	<i>Accepted</i>	
comment	115	comment by: <i>Swedavia AB - Swedish airports (currently 11 airports)</i>
	(b) Minimum clearence shall also include code C aircraft.	
response	<i>Not accepted</i>	
comment	228	comment by: <i>Danish Transport Authority</i>
	GM on (b) (1) height limited objects. Clarification needed.	
response	<i>Noted</i>	
	The text will be reviewed.	
comment	248	comment by: <i>Brussels Airport - BRU/EBBR</i>
	CS-ADR-DSN.E.365(b)(1)(2)(3) is more restrictive than Annex 14.	
	The conditions mentioned under (b)(1)(2)(3) are more stringent than the corresponding text in Annex 14. The Annex 14 text is preferred.	
response	<i>Not accepted</i>	
	The ICAO requirements are in the CS at paragraphs (b)(3), (i) and (ii). Paragraphs (b)(1) and (b)(2) allow more flexibility for reducing clearance distances where objects in the stand area are limited by height or there are restrictions on aeroplane size using the stand.	

comment	268	comment by: <i>Belgian CAA</i>
	More guidance is needed on what exactly is meant by "aircraft with specific characteristics".	
response	<i>Noted</i>	
	The word 'characteristics' will be replaced by 'dimensions'.	
comment	450	comment by: <i>Cologne/Bonn Airport</i>
	(b)(2): replace "characteristics" by "dimensions"	
response	<i>Accepted</i>	
comment	520	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #270	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.E.365	
	Référence: CS-ADR-DSN.E.365 Clearance distances on aircraft stands	
	Traduction de courtoisie (a) It is appropriate to modify as follow : "An aircraft stand should be provide sufficient clearances between an aircraft using ..." en déplaçant le tableau chiffré en GM. (b) It is appropriate to transfer this provision to GM The values of the (a) are only informative elements because it is possible to have inferior values regarding some process, equipments or apron configurations, which in consistency with the (b). But a study has to demonstrate that these margins are sufficient. In these conditions, the (b) does not give additional information.	
response	<i>Not accepted</i>	
	The clearances are derived from ICAO. (b) is retained to allow flexibility.	
comment	612	comment by: <i>Avinor</i>
	CS.ADR.DSN.E.365 (b) (2). Replace "charecteristics" by "dimensions".	
response	<i>Accepted</i>	

comment	688	comment by: <i>MWEBWV Ministerium für Wirtschaft, Energie, Bauen, Wohnen und Verkehr des Landes Nordrhein-Westfalen</i>
		Comment to b) 2) replace "characteristics" by "dimensions"
response		<i>Accepted</i>

comment	737	comment by: <i>ADP : Aeroports de Paris</i>
	Référence: CS-ADR-DSN.E.365	Clearance distances on aircraft stands
	Proposition/commentaire	(a) Il convient de modifier de la manière suivante : "An aircraft stand should be provide sufficient clearances between an aircraft using ..." en déplaçant le tableau chiffré en GM. (b) Il convient de transférer cette disposition en Guidance Material.
	Justification	Les valeurs du (a) ne sont que des éléments informatifs car il est possible d'avoir des valeurs inférieures en fonction de l'utilisation de certaines procédures, de certains équipements et en fonction de certaines configurations de l'aire de stationnement, ce qui est en complète cohérence avec le (b). En revanche, il faut qu'une étude démontre que ces marges sont suffisantes. Dans ces conditions, le (b) ne donne que des informations supplémentaires.
	Traduction de courtoisie	(a) It is appropriate to modify as follow : "An aircraft stand should be provide sufficient clearances between an aircraft using ..." en déplaçant le tableau chiffré en GM. (b) It is appropriate to transfer this provision to GM The values of the (a) are only informative elements because it is possible to have inferior values regarding some process, equipments or apron configurations, which in consistency with the (b). But a study has to demonstrate that these margins are sufficient. In these conditions, the (b) does not give additional information.

response *Not accepted*

The clearances are derived from ICAO. (b) is retained to allow flexibility.

comment 800

comment by: *Munich Airport International*

(b)

(2): replace "charecteristics" by "dimensions"

response *Accepted*

comment 842

comment by: *Brussels Airport*

CS-ADR-DSN.E.365(b)(2)

Text to be clarified

What is meant by aircraft with specific characteristics ? We suggest to clarify this in GM with a definition.

response *Noted*

The word 'characteristics' will be replaced by 'dimensions'.

comment 1131

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.E.365 Clearance distances on aircraft stands (p32-33)
- CS-ADR - Book 2 – GM-ADR-DSN.E.365 — Clearance distances on aircraft stands (p236)

2. Proposed text / comment

This comment is linked to comment on some ICAO recommendations that should not be put in CS.

(See comments n° 1087 in book I and 839 in book II)

Flexibility is needed for aircraft stands on apron. These specifications should be

in GM to allow having adaptable stands; in particular two stands for small aircraft can be located on the same place as one stand for a bigger aircraft. Besides, these specifications are only recommended by Annex 14 Volume 1. Two possibilities could be chosen:

- (i) either the certification specification gives only the objective of providing sufficient clearance between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects, in particular to prevent from collisions, and the figures are move to guidance material.
- (ii) or the figures are kept in the CS but specifying each time that they should be met "*where practicable*" and the CS gives the objective of providing sufficient clearance between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects, in particular to prevent from collisions.

The option (i) is proposed by DGAC because less confusing and far clearer, and therefore more appropriate for a regulation and for future standardization. A study has in any ways to be provided to demonstrate safety is not compromised.

DGAC proposes to move parts of the CS to guidance material:

CS-ADR-DSN.E.365 Clearance distances on aircraft stands

"(a) An aircraft stand should provide the following minimum sufficient clearances between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects, in particular to prevent from collision.:"

Code Letter Clearance

A 3 m

B 3 m

C 4.5 m

D 7.5 m

E 7.5 m

F 7.5 m

(b) The minimum clearance distance for code letters D, E and F can be reduced.:"

(1) for height limited objects,

(2) if the stand is restricted for aircraft with specific characteristics,

(3) in the following locations (for aircraft using a taxi in, push-back procedure only):

(i) between the terminal (including passenger loading bridges) and the nose of an aircraft; and

(ii) over a portion of the stand provided with azimuth guidance by a visual docking guidance system."

GM-ADR-DSN.E.365 – Clearance distances on aircraft stands

"(a) An aircraft stand may provide the following minimum clearances between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects:

Code Letter Clearance

A 3 m

B 3 m

C 4.5 m

D 7.5 m

E 7.5 m

F 7.5 m

(b) The minimum clearance distance for code letters D, E and F can be reduced:

- (1) for height limited objects,
- (2) if the stand is restricted for aircraft with specific characteristics,
- (3) in the following locations (for aircraft using a taxi-in, push-back procedure only):
 - (i) between the terminal (including passenger loading bridges) and the nose of an aircraft; and
 - (ii) over a portion of the stand provided with azimuth guidance by a visual docking guidance system.

(ac) Reduced separation at the gate is possible where azimuth guidance by a visual docking guidance system is provided, in combination with additional mitigation measures, such as:

- (1) good condition of marking and signage;
- (2) apron stand in lights;
- (3) maintenance of visual docking systems.

(bd) Reduced Clearance Distances on Aircraft Stands:

- (1) On aircraft stands where reduced clearance distances exist, guidance by visual docking guidance system ~~should~~ **may** be provided.
- (2) All objects for which reduced clearances apply ~~should~~ **may** be properly marked or lighted (ICAO Annex 14, chapter 6).
- (3) Aircraft stands where reduced clearance distances apply ~~should~~ **may** be identified and the information published in the AIP.
- (4) An aircraft stand equipped with a visual docking guidance system ~~should~~ **may** provide the minimum clearance of 5.0 metres between an aircraft using the stand and any adjacent building, aircraft on another stand or other objects.

(ee) The clearance distance between an aircraft on a stand provided with azimuth guidance by visual docking guidance system and an object or edge of service road may further be reduced subject to local circumstances provided that the object (e.g. blast fence) does not exceed a height of 3.0 metres above the surface of the relative aircraft stand."

response *Not accepted*

The clearances are derived from ICAO. (b) is retained to allow flexibility.

comment 1334

comment by: ECA - European Cockpit Association

Comment on (a):
Substitute code F value 7,5m with 8,5m.

Justification:
Reference: IFALPA Annex 14, paragraph 3.13.6

response *Not accepted*

The clearances are derived from ICAO.

comment 1339

comment by: ECA - European Cockpit Association

Substitute (b)(3)(ii) with the following paragraph:

	<p>"When precise positioning of an aircraft on an aircraft stand is required to assure the clearances in (a), a visual docking guidance system shall be provided."</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 3.13.x</p>
response	<p><i>Noted</i></p> <p>The NPA CS does not use the modal verb 'shall'.</p>
comment	<p>1466 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #271</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.E.365</p> <p>Référence: CS-ADR-DSN.E.365 Clearance distances on aircraft stands</p> <p>Traduction de courtoisie (a) It is appropriate to modify as follow : "An aircraft stand should be provide sufficient clearances between an aircraft using ..." en déplaçant le tableau chiffré en GM. (b) It is appropriate to transfer this provision to GM The values of the (a) are only informative elements because it is possible to have inferior values regarding some process, equipments or apron configurations, which in consistency with the (b). But a study has to demonstrate that these margins are sufficient. In these conditions, the (b) does not give additional information.</p>
response	<p><i>Not accepted</i></p> <p>The clearances are derived from ICAO. (b) is retained to allow flexibility.</p>
comment	<p>1493 comment by: <i>Geneva International Airport (ROMIG)</i></p> <p>b)2) Replace "charecteristics" by "dimensions" The charateristics of an aircraft is too general the dimentions, wingspan / length / etc. is more appropriate.</p>
response	<p><i>Accepted</i></p>
comment	<p>1498 comment by: <i>Flughafen Linz-Hörsching - LNZ/LOWL</i></p> <p>(b) add code letter C</p>

response	<p><i>Not accepted</i></p> <p>The clearances are derived from ICAO.</p>
comment	<p>1573 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>(a) It is appropriate to modify as follow : "An aircraft stand should be provide sufficient clearances between an aircraft using ..." en déplaçant le tableau chiffré en GM.</p> <p>(b) It is appropriate to transfer this provision to GM</p> <p>The values of the (a) are only informative elements because it is possible to have inferior values regarding some process, equipments or apron configurations, which in consistency with the (b).</p> <p>But a study has to demonstrate that these margins are sufficient.</p> <p>In these conditions, the (b) does not give additional information</p>
response	<p><i>Not accepted</i></p> <p>The clearances are derived from ICAO. (b) is retained to allow flexibility.</p>
comment	<p>1907 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #272</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.E.365</p> <p>Référence: CS-ADR-DSN.E.365 learance distances on aircraft stands</p> <p>Traduction de courtoisie</p> <p>(a) It is appropriate to modify as follow : "An aircraft stand should be provide sufficient clearances between an aircraft using ..." en déplaçant le tableau chiffré en GM.</p> <p>(b) It is appropriate to transfer this provision to GM</p> <p>The values of the (a) are only informative elements because it is possible to have inferior values regarding some process, equipments or apron configurations, which in consistency with the (b).</p> <p>But a study has to demonstrate that these margins are sufficient.</p> <p>In these conditions, the (b) does not give additional information.</p>
response	<p><i>Not accepted</i></p> <p>The clearances are derived from ICAO. (b) is retained to allow flexibility.</p>

comment	<p>2004 comment by: <i>Tarbes-Lourdes-Pyrénées airport</i></p> <p>Attachment #273</p> <p>NPA 2011-20 (B.III) CS-ADR-DSN.E.365</p> <p>Référence: CS-ADR-DSN.E.365 Clearance distances on aircraft stands</p> <p>Traduction de courtoisie (a) It is appropriate to modify as follow : "An aircraft stand should be provide sufficient clearances between an aircraft using ..." en déplaçant le tableau chiffré en GM. (b) It is appropriate to transfer this provision to GM The values of the (a) are only informative elements because it is possible to have inferior values regarding some process, equipments or apron configurations, which in consistency with the (b). But a study has to demonstrate that these margins are sufficient. In these conditions, the (b) does not give additional information.</p>
response	<p><i>Not accepted</i></p> <p>The clearances are derived from ICAO. (b) is retained to allow flexibility.</p>

comment	<p>2135 comment by: <i>Aéroport Paris Vatry - XCR/LFOK</i></p> <p>Attachment #274</p> <p>NPA 2011-20 (B.III) CS-ADR-DSN.E.365</p> <p>Référence: CS-ADR-DSN.E.365 Clearance distances on aircraft stands</p> <p>Traduction de courtoisie (a) It is appropriate to modify as follow : "An aircraft stand should be provide sufficient clearances between an aircraft using ..." en déplaçant le tableau chiffré en GM. (b) It is appropriate to transfer this provision to GM The values of the (a) are only informative elements because it is possible to have inferior values regarding some process, equipments or apron configurations, which in consistency with the (b). But a study has to demonstrate that these margins are sufficient. In these conditions, the (b) does not give additional information.</p>
response	<p><i>Not accepted</i></p> <p>The clearances are derived from ICAO; (b) is retained to allow flexibility.</p>

comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2404 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>suggest using "dimensions" instead of "charecteristics"</p>
response	<p><i>Accepted</i></p>
comment	<p>2417 comment by: <i>IDRF e.V. (association of regional airports)</i></p> <p>This DSN-element is based on an ICAO Annex 14 recommendation. To state the figures within the CS is inadequate, see also our general comment regarding NPA 2011-20 (B.III).</p> <p>The figures are indiscriminately and not based on scientific findings, at most an orientation and could be verified in a lot of ways. To set them into a CS tends to result in unnecessary burden.</p> <p>We suggest to move this DSN-element to GM.</p>
response	<p><i>Not accepted</i></p> <p>The clearances are derived from ICAO.</p>
comment	<p>2541 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p> <p>Flexibility is needed for aircraft stands on apron. These specifications should be in GM to allow having adaptable stands; in particular two stands for small aircraft can be located on the same place as one stand for a bigger aircraft. Besides, these specifications are only recommended by Annex 14 Volume 1. Two possibilities could be chosen:</p> <p>(i) either the certification specification gives only the objective of providing sufficient clearance between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects, in particular to prevent from collisions, and the figures are move to guidance material.</p> <p>(ii) or the figures are kept in the CS but specifying each time that they should be met "<u>where practicable</u>" and the CS gives the <u>objective</u> of providing sufficient clearance between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects, in particular to prevent from collisions.</p> <p>The option (i) is proposed because less confusing and far clearer, and therefore more appropriate for a regulation and for future standardization. A study has in any ways to be provided to demonstrate safety is not compromised.</p>

It is proposed to move parts of the CS to guidance material:

Also it is proposed to change the word using (what is the meaning of this word when the aircraft is stopped, moving or both?) for entering or leaving the stand, because this distances apply when the aircraft is moving not when it is stopped (handling equipment...)

CS-ADR-DSN.E.365 Clearance distances on aircraft stands

~~"(a) An aircraft stand should provide the following minimum~~ **sufficient clearances** ~~between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects, in particular to prevent from collision.~~"

~~Code Letter Clearance~~

~~A 3 m~~

~~B 3 m~~

~~C 4.5 m~~

~~D 7.5 m~~

~~E 7.5 m~~

~~F 7.5 m~~

~~(b) The minimum clearance distance for code letters D, E and F can be reduced:~~

~~(1) for height limited objects,~~

~~(2) if the stand is restricted for aircraft with specific characteristics,~~

~~(3) in the following locations (for aircraft using a taxi in, push-back procedure only):~~

~~(i) between the terminal (including passenger loading bridges) and the nose of an aircraft; and~~

~~(ii) over a portion of the stand provided with azimuth guidance by a visual docking guidance system."~~

response *Not accepted*

The clearances are derived from ICAO. (b) is retained to allow flexibility.

comment 2688 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#275](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.E.365

Référence: CS-ADR-DSN.E.365

Clearance distances on aircraft stands

Traduction de courtoisie

(a) It is appropriate to modify as follow : "An aircraft stand should ~~be~~ **provide sufficient clearances** between an aircraft using ..." en déplaçant le tableau chiffré en GM.

(b) It is appropriate to transfer this provision to GM

The values of the (a) are only informative elements because it is possible to have inferior values regarding some process, equipments or apron configurations, which in consistency with the (b).

response

But a study has to demonstrate that these margins are sufficient. In these conditions, the (b) does not give additional information.

Not accepted

The clearances are derived from ICAO. (b) is retained to allow flexibility.

comment

2693

comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#276](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.F.370

Référence: CS-ADR-DSN.F.370
Isolated aircraft parking position

Traduction de courtoisie

(a) It is appropriate to transfer this provision into IR-OPS

(b) It is appropriate to transfer this provision into GM

The designation of an Isolated aircraft parking position falls within the competences of the aerodrome operator or the local authorities for safety/security reasons. Thus the (a) is an IR-OPS.

The (b) is a best practice considering that the final choice takes into account more imperatives elements outside of the safety scope.

response

Noted

Not Agreed: CS E.365. The clearances are derived from ICAO. (b) is retained to allow flexibility.

Partially Agreed: CS-ADR-DSN.F.370. Paragraph (b) had a second sentence in ICAO text. It has been moved to GM. The remainder is from ICAO design criteria; therefore, it will remain in the CS (*incorrectly placed comment*).

comment

2867

comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.E.365

Clearance distances on aircraft stands

Proposition/commentaire

(a) Il convient de modifier de la manière suivante : "An aircraft stand should be provide sufficient clearances between an aircraft using ..." en déplaçant le tableau chiffré en GM.

(b) Il convient de transférer cette disposition en Guidance Material.

Justification

Les valeurs du (a) ne sont que des éléments informatifs car il est possible d'avoir des valeurs inférieures en fonction de l'utilisation de certaines procédures, de certains équipements

	<p>et en fonction de certaines configurations de l'aire de stationnement, ce qui est en complète cohérence avec le (b). En revanche, il faut qu'une étude démontre que ces marges sont suffisantes.</p> <p>Dans ces conditions, le (b) ne donne que des informations supplémentaires.</p>
Traduction de courtoisie	<p>(a) It is appropriate to modify as follow : "An aircraft stand should be provide sufficient clearances between an aircraft using ..." en déplaçant le tableau chiffré en GM.</p> <p>(b) It is appropriate to transfer this provision to GM</p> <p>The values of the (a) are only informative elements because it is possible to have inferior values regarding some process, equipments or apron configurations, which in consistency with the (b).</p> <p>But a study has to demonstrate that these margins are sufficient.</p> <p>In these conditions, the (b) does not give additional information.</p>

response *Not accepted*

The clearances are derived from ICAO. (b) is retained to allow flexibility.

comment

2892 comment by: *SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard*

Attachment [#277](#)

SEARD NPA 2011-20 (B.III) CS-ADR-DSN.E.365

Référence: CS-ADR-DSN.E.365
Clearance distances on aircraft stands

Traduction de courtoisie

(a) It is appropriate to modify as follow : "An aircraft stand should be provide sufficient clearances between an aircraft using ..." en déplaçant le tableau

	<p>chiffre en GM. (b) It is appropriate to transfer this provision to GM The values of the (a) are only informative elements because it is possible to have inferior values regarding some process, equipments or apron configurations, which in consistency with the (b). But a study has to demonstrate that these margins are sufficient. In these conditions, the (b) does not give additional information.</p>
response	<p><i>Not accepted</i></p> <p>The clearances are derived from ICAO. (b) is retained to allow flexibility.</p>
comment	<p>2928 comment by: AIRBUS</p> <p>(2) if the stand is restricted for aircraft with specific characteristics</p> <p>The wording "specific characteristics" is not clear. Explanation or example of the kind of special characteristics should be provided.</p>
response	<p><i>Noted</i></p> <p>The word 'characteristics' has been replaced by 'dimensions' to clarify the meaning.</p>
comment	<p>3022 comment by: ADV -German Airports Association</p> <p>CS.ADR.DSN.E.365 (b) (2) replace "charecteristics" by "dimensions"</p>
response	<p><i>Accepted</i></p>
comment	<p>3057 comment by: MST / STR - Stuttgart Airport</p> <p>CS.ADR.DSN.E.365 (b) (2) replace "charecteristics" by "dimensions"</p>
response	<p><i>Accepted</i></p>
comment	<p>3090 comment by: Fraport AG</p> <p>CS-ADR-DSN.E.365 Clearance distances on aircraft stands (b) (2)</p> <p>Editorial</p> <p>if the stand is restricted for aircraft with specific characteristics</p> <p>Proposed Text</p>

response	<p>if the stand is restricted for aircraft with specific dimensions</p> <p><i>Accepted</i></p>
comment	<p>3119 comment by: <i>ATB Aéroport Toulouse-Blagnac - TLS/LFBO</i></p> <p>Attachment #278</p> <p>ATB NPA 2011-20 (B.III) CS-ADR-DSN.E.365</p> <p>Référence: CS-ADR-DSN.E.365 Clearance distances on aircraft stands</p> <p>Traduction de courtoisie (a) It is appropriate to modify as follow : "An aircraft stand should be provide sufficient clearances between an aircraft using ..." en déplaçant le tableau chiffré en GM. (b) It is appropriate to transfer this provision to GM The values of the (a) are only informative elements because it is possible to have inferior values regarding some process, equipments or apron configurations, which in consistency with the (b). But a study has to demonstrate that these margins are sufficient. In these conditions, the (b) does not give additional information.</p>
response	<p><i>Not accepted</i></p> <p>The clearances are derived from ICAO. (b) is retained to allow flexibility.</p>

comment	<p>523 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #279</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.G.375</p> <p>Référence: CS-ADR-DSN.G.375 « Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where icing conditions are expected to occur. »</p> <p>Traduction de courtoisie Replace by: « Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where it has been decided to operate during icing conditions are expected to occur. » This redaction enables the aerodrome operator to open or not the aerodrome when there are icing conditions.</p>
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response *Not accepted*

This is ICAO wording. The suggestion is an operational consideration.

comment

738

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.F.370	Isolated aircraft parking position Comment reference F.370 is missing
Proposition/commentaire	(a) Il convient de transférer cette disposition en IR-OPS. (b) Il convient de transférer cette disposition en GM.
Justification	La désignation d'un poste isolé est une action relevant de l'exploitant d'aérodrome voire des autorités locales pour des raisons de sécurité et/ou de sûreté. Il s'agit donc au (a) d'un IR-OPS. Le (b) est une règle de l'art sachant que le choix final doit prendre en compte des éléments plus impératifs qui sortent du cadre de la sécurité.
Traduction de courtoisie	(a) It is appropriate to transfer this provision into IR-OPS (b) It is appropriate to transfer this provision into GM The designation of an Isolated aircraft parking position falls within the competences of the aerodrome operator or the local authorities for safety/security reasons. Thus the (a) is an IR-OPS. The (b) is a best practice considering that the final choice takes into account more imperatives elements outside of the safety scope.

response *Noted*

Partially Agreed: CS-ADR-DSN.F.370. Paragraph (b) had a second sentence in ICAO text. It has been moved to GM. The remainder is from ICAO design criteria; therefore, it will remain in the CS (*incorrectly placed comment*).
Not Agreed: CS-ADR-DSN.G.375. This is ICAO wording. The suggestion is an operational consideration.

comment 739

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.G.375	« Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where icing conditions are expected to occur. »
Proposition/commentaire	Il convient de remplacer cette disposition par: « Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where it has been decided to operate during icing conditions are expected to occur. »
Justification	Cette formulation laisse à l'exploitant l'opportunité d'ouvrir ou non l'aérodrome lorsqu'il y a des conditions météorologiques givrantes.
Traduction de courtoisie	Replace by: « Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where it has been decided to operate during icing conditions are expected to occur. » This redaction enables the aerodrome operator to open or not the aerodrome when there are icing conditions.

response *Not accepted*

This is ICAO wording. The suggestion is an operational consideration.

comment 1135

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.F.370 — Isolated aircraft parking position (p34)
- CS-ADR - Book 2 - GM- ADR-DSN.F.370 — Isolated aircraft parking position (p237)

2. Proposed text / comment

This comment is linked to comment on some ICAO recommendations that should not be put in CS.

(See comments n° 1087 in book I and 839 in book II)

The location of isolated aircraft parking position is adapted case by case to the threat. On small aerodromes with very few traffic, the isolated aircraft parking position could be located safely at a distance less than 100m from other parking positions. Besides, paragraph (b) is only recommended by Annex 14

Volume 1.

Two possibilities could be chosen:

- (i) either the certification specification gives only the objective that is parking of aircraft that needs isolation from normal aerodrome activities, and the figures are move to guidance material.
- (ii) or the figures are kept in the CS but specifying each time that they should be met "*where practicable*" and the CS gives the objective that is parking of aircraft that needs isolation from normal aerodrome activities.

The option (i) is proposed by DGAC because less confusing and far clearer, and therefore more appropriate for a regulation and for future standardization. DGAC proposes to move parts of the CS to GM:

CS-ADR-DSN.F.370 – Isolated aircraft parking position

~~"(a) General~~

An isolated aircraft parking position should be designated by the aerodrome operator for parking of aircraft that needs isolation from normal aerodrome activities.

~~"(b) Location~~

~~*The isolated aircraft parking position should be located at the maximum distance practicable and in any case never less than 100 m from other parking positions, buildings or public areas, etc.*~~

GM-ADR-DSN.F.370 – Isolated aircraft parking position

"The isolated aircraft parking position may be located at the maximum distance practicable and in any case never less than 100 m from other parking positions, buildings or public areas, etc. Care ~~should~~ may be taken to ensure that the position is not located over underground utilities, such as gas and aviation fuel and, to the extent feasible, electrical or communication cables. The aerodrome control tower ~~should~~ may be advised of an area or areas suitable for the parking of an aircraft."

response *Partially accepted*

Paragraph (b) had a second sentence in ICAO text. It has been moved to GM. The remainder is from ICAO design criteria; therefore, it will remain in the CS.

comment 1138

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.G.375 General (p35)

2. Proposed text / comment

At some aerodromes, icing conditions are seldom and these aerodromes can decide not to operate in such conditions. This CS is consequently too much generic.

This CS could be written as follows:

CS-ADR-DSN.G.375 General

"Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where aircraft operations during icing conditions are intended ~~expected to~~

response	<p><i>occur."</i></p> <p><i>Not accepted</i></p> <p>This is ICAO wording. The suggestion is an operational consideration.</p>
comment	<p>1349 comment by: <i>ECA - European Cockpit Association</i></p> <p>Comment on <u>CS-ADR-DSN.F.370 (not 375):</u></p> <p>Second part of the paragraph in GM-ADR-DSN.F.370 should be merged in CS-ADR-DSN.F.370 and rewritten as follows: (a) An isolated aircraft parking position should be designated or the aerodrome control tower should be advised of an area or areas suitable for the parking of an aircraft which is known or believed to be the subject of unlawful interference, or which for other reasons needs isolation from normal aerodrome activities.</p> <p>Justification: The wording now is confusing as it is not clear than an alternative for the isolated parking position is the designation of an area to be communicated to the tower. Lack of clear reference to unlawful interference makes it difficult to understand the aim of the section without previous background. We therefore suggest to go back to the ICAO wording (Reference: ICAO Annex 14, paragraph 3.14.1).</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (b) had a second sentence in ICAO text. It has been moved to GM. The remainder is from ICAO design criteria; therefore, it will remain in the CS.</p>
comment	<p>1469 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #280</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.G.375</p> <p>Référence: CS-ADR-DSN.G.375 « Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where icing conditions are expected to occur. »</p> <p>Traduction de courtoisie Replace by: « Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where it has been decided to operate during icing conditions are expected to occur. »</p> <p>This redaction enables the aerodrome operator to open or not the aerodrome when there are icing conditions.</p>

response *Not accepted*

This is ICAO wording. The suggestion is an operational consideration.

comment

1574

comment by: *Aéroport de Marseille - MRS/LFML*

Replace by: « Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where it has been decided to operate during icing conditions ~~are expected to occur.~~ »

This redaction enables the aerodrome operator to open or not the aerodrome when there are icing conditions

response

Not accepted

This is ICAO wording. The suggestion is an operational consideration.

comment

1908

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#281](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.G.375

Référence: CS-ADR-DSN.G.375

« Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where icing conditions are expected to occur. »

Traduction de courtoisie

Replace by: « Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where it has been decided to operate during icing conditions ~~are expected to occur.~~ »

This redaction enables the aerodrome operator to open or not the aerodrome when there are icing conditions.

response

Not accepted

This is ICAO wording. The suggestion is an operational consideration.

comment

2054

comment by: *Pau Pyrénées Airport - PUF/LFBP*

Replace by: « Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where it has been decided to operate during icing conditions ~~are expected to occur.~~ »

This redaction enables the aerodrome operator to open or not the aerodrome when there are icing conditions.

response	<i>Not accepted</i>
	This is ICAO wording. The suggestion is an operational consideration.
comment	2164 comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Permanent and fixed deicing facilities would not be cost effective for the smaller airports where there are only a few aircraft movements. Suggest rewording to <i>deicing facilities should be provided commensurate with airport size and aircraft operations.</i>
response	<i>Noted</i>
comment	2423 comment by: <i>IDRF e.V. (association of regional airports)</i>
	Between chapter E and G, the chapter F (isolated A/C parking position) seemed to be lost?
response	<i>Noted</i>
	Chapter F is in the NPA on the CRT.
comment	2444 comment by: <i>SWISS AERODROMES ASSOCIATION</i>
	De-icing and anti-icing facilities specs are published or may be asked for. Safe use of an aerodrome is in the responsibility of the aircraft operator. Aerodrome operators will have to meet BRs and ERs. There is therefore no reason to set such requirements in a CS. As for other CSs, the whole chapter should be moved to GM
response	<i>Not accepted</i>
	This is ICAO wording. The suggestion is an operational consideration.
comment	2555 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	At some aerodromes, icing conditions are seldom and these aerodromes can decide not to operate in such conditions. This CS is consequently too much generic. This CS could be written as follows: CS-ADR-DSN.G.375 General <i>"Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where aircraft operations during icing conditions are intended expected to</i>

	<i>occur."</i>
response	<i>Not accepted</i>
	This is ICAO wording. The suggestion is an operational consideration.

comment	2696 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
	Attachment #282
	ADBM NPA 2011-20 (B.III) CS-ADR-DSN.G.375
	Référence: CS-ADR-DSN.G.375 « Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where icing conditions are expected to occur. »
	Traduction de courtoisie Replace by: « Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where it has been decided to operate during icing conditions are expected to occur. » This redaction enables the aerodrome operator to open or not the aerodrome when there are icing conditions.
response	<i>Not accepted</i>
	This is ICAO wording. The suggestion is an operational consideration.

comment	2868 comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i>								
	<table border="1"> <tr> <td>Référence: CS-ADR-DSN.F.370</td> <td>Isolated aircraft parking position</td> </tr> <tr> <td>Proposition/commentaire</td> <td>(a) Il convient de transférer cette disposition en IR-OPS. (b) Il convient de transférer cette disposition en GM. nota : L'application n'a pas prévu de lien avec le chapitre et la page 34 !!!!</td> </tr> <tr> <td>Justification</td> <td>La désignation d'un poste isolé est une action relevant de l'exploitant d'aérodrome voire des autorités locales pour des raisons de sécurité et/ou de sûreté. Il s'agit donc au (a) d'un IR-OPS. Le (b) est une règle de l'art sachant que le choix final doit prendre en compte des éléments plus impératifs qui sortent du cadre de la sécurité.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>(a) It is appropriate to transfer this provision into IR-OPS</td> </tr> </table>	Référence: CS-ADR-DSN.F.370	Isolated aircraft parking position	Proposition/commentaire	(a) Il convient de transférer cette disposition en IR-OPS. (b) Il convient de transférer cette disposition en GM. nota : L'application n'a pas prévu de lien avec le chapitre et la page 34 !!!!	Justification	La désignation d'un poste isolé est une action relevant de l'exploitant d'aérodrome voire des autorités locales pour des raisons de sécurité et/ou de sûreté. Il s'agit donc au (a) d'un IR-OPS. Le (b) est une règle de l'art sachant que le choix final doit prendre en compte des éléments plus impératifs qui sortent du cadre de la sécurité.	Traduction de courtoisie	(a) It is appropriate to transfer this provision into IR-OPS
Référence: CS-ADR-DSN.F.370	Isolated aircraft parking position								
Proposition/commentaire	(a) Il convient de transférer cette disposition en IR-OPS. (b) Il convient de transférer cette disposition en GM. nota : L'application n'a pas prévu de lien avec le chapitre et la page 34 !!!!								
Justification	La désignation d'un poste isolé est une action relevant de l'exploitant d'aérodrome voire des autorités locales pour des raisons de sécurité et/ou de sûreté. Il s'agit donc au (a) d'un IR-OPS. Le (b) est une règle de l'art sachant que le choix final doit prendre en compte des éléments plus impératifs qui sortent du cadre de la sécurité.								
Traduction de courtoisie	(a) It is appropriate to transfer this provision into IR-OPS								

	<p>(b) It is appropriate to transfer this provision into GM</p> <p>The designation of an Isolated aircraft parking position falls within the competences of the aerodrome operator or the local authorities for safety/security reasons. Thus the (a) is an IR-OPS.</p> <p>The (b) is a best practice considering that the final choice takes into account more imperatives elements outside of the safety scope.</p>
<p>response</p> <p><i>Not accepted</i></p> <p>The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.</p>	

comment

2869

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

<p>Référence: CS-ADR-DSN.G.375</p>	<p>« Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where icing conditions are expected to occur. »</p>
<p>Proposition/commentaire</p>	<p>Il convient de remplacer cette disposition par: « Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where it has been decided to operate during icing conditions are expected to occur. »</p>
<p>Justification</p>	<p>Cette formulation laisse à l'exploitant l'opportunité d'ouvrir ou non l'aérodrome lorsqu'il y a des conditions météorologiques givrantes.</p>
<p>Traduction de courtoisie</p>	<p>Replace by: « Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where it has been decided to operate during icing conditions are expected to occur. »</p> <p>This redaction enables the aerodrome operator to open or not the aerodrome when there are icing conditions.</p>

response *Not accepted*

This is ICAO wording. The suggestion is an operational consideration.

CS-ADR – Book 1 – CS-ADR-DSN.G.380 - Location

p. 35

comment 525 comment by: *Union des Aéroports français - UAF*

Attachment [#283](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.G.380

Référence: CS-ADR-DSN.G.380
Location

Traduction de courtoisie

It is appropriate to modify the title as follow : "Location **and number**"
There is a relation between the localisation and the number of de-icing facilities. It depends on the configuration of the aerodrome and respects the objective that an aircraft can take off in a limited time after de-icing in order to keep the efficiency of the de-icing.

response *Not accepted*

The number of de-icing facilities is an operational consideration.

comment 740 comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.G.380	Location
Proposition/commentaire	Il convient de modifier l'intitulé comme suit: "Location and number "
Justification	Il existe une corrélation entre la localisation et le nombre d'installation de dégivrage/antigivrage. Cette corrélation dépend de la configuration de l'aérodrome et répond à l'objectif qu'un aéronef traité pour le dégivrage/antigivrage puisse décoller en un temps donné afin que le traitement reste

	efficace.
Traduction de courtoisie	It is appropriate to modify the title as follow : ""Location and number" There is a relation between the localisation and the number of de-icing facilities. It depends on the configuration of the aerodrome and respects the objective that an aircraft can take off in a limited time after de-icing in order to keep the efficiency of the de-icing.

response *Not accepted*

The number of de-icing facilities is an operational consideration.

comment

1139

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.G.380 Location (p35)

2. Proposed text / comment

This CS should indicate the purpose for the location of such facilities, which is indicated in a note in Annex 14 Volume 1 (3.15.2, note1). See proposed paragraph (a2) below.

Paragraph (c) of this CS is related to capacity and not safety and is up to the aerodrome operator. Besides, these specifications are only recommended by Annex 14 Volume 1.

DGAC proposes to move parts of the CS to GM:

CS-ADR-DSN.G.380 Location

"(a) De-icing/anti-icing facilities should be provided either at aircraft stands or at specified remote areas.

(a2) The location of a de-icing/anti-icing facility should be so as to ensure that the holdover time of the anti-icing treatment is still in effect at the end of taxiing and when take-off clearance of the treated aeroplane is given.

(b) The de-icing/anti-icing facilities should be located to be clear of the obstacle limitation surfaces to not cause interference to the radio navigation aids and be clearly visible from the air traffic control tower for clearing the treated aeroplane.

~~(c) The de-icing/anti-icing facilities should be so located as to provide for an expeditious traffic flow, perhaps with a bypass configuration, and not require unusual taxiing manoeuvre into and out of the pads."~~

GM-ADR-DSN.G.380 – Location

*"(a) The de-icing/anti-icing facilities ~~should~~ **may** be so located as to ensure that*

the holdover time of the anti-icing treatment is still in effect at the end of taxiing and when take-off clearance of the treated aeroplane is given.

(b) The de-icing/anti-icing facilities may be so located as to provide for an expeditious traffic flow and not require unusual taxiing manoeuvre into and out of the pads. To further maximise departure flow rates for all aeroplanes, the location and size of deicing/anti-icing facilities ~~should~~ **may** be such that they allow for bypass taxiing during deicing/anti-icing operations. (Doc 9640: — Manual of aircraft ground de-icing/anti-icing operations, paragraph 8.5(e).)

(c) Remote de-icing/anti-icing facilities located near departure runway ends or along taxiways are recommended when taxi times from terminals or off-terminal de-icing/antiicing locations frequently exceed holdover times.

(d) Remote facilities compensate for changing weather conditions when icing conditions or blowing snow are expected to occur along the taxi-route taken by the aeroplane to the runway meant for take-off.

(e) The jet blast effects caused by a moving aeroplane on other aeroplanes receiving the anti-icing treatment or taxiing behind will have to be taken into account to prevent degradation of the treatment."

response *Partially accepted*

Paragraph (c) will be moved to GM.

comment

1157

comment by: *Swedish Transport Agency*

Replace air traffic control tower with air traffic services unit. This might be applicable also elsewhere.

response

Not accepted

comment

1353

comment by: *ECA - European Cockpit Association*

Delete paragraph (a) and replace with:

(a) De-icing/anti-icing facilities should be located so that the time interval between the start of aircraft de/anti-icing and the start of take-off does not exceed the established holdover times of de/anti-icing fluids used.

(1) Consideration must be given to, inter alia, typical weather conditions, traffic volume and density, typical air traffic delays, airport configuration and expected taxi speeds under adverse conditions.

(2) To avoid exceeding the established holdover times of de/antiicing fluids, locating de/anti-icing facilities in the vicinity of departure runway ends may be necessary at large airports with high traffic volume and density.

Delete paragraph (b) and replace with:

(b) De-icing/anti-icing facilities should be located so that aircraft and ground equipment (fixed or mobile) should not penetrate any obstacle clearance surfaces.

Add paragraph (d) as follows:

	<p>De-icing/anti-icing facilities shall be designed with proper drainage capabilities so that environmental concerns do not limit de-icing/antiicing operations.</p> <p>Justification: Self-explanatory. Reference: IFALPA Annex 14, paragraphs 3.15.2; 3.15.3; and 3.15.x</p>
response	<p><i>Not accepted</i></p> <p>These are operational considerations.</p>
comment	<p>1470 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #284</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.G.380</p> <p>Référence: CS-ADR-DSN.G.380 Location</p> <p>Traduction de courtoisie It is appropriate to modify the title as follow : "Location and number" There is a relation between the localisation and the number of de-icing facilities. It depends on the configuration of the aerodrome and respects the objective that an aircraft can take off in a limited time after de-icing in order to keep the efficiency of the de-icing.</p>
response	<p><i>Not accepted</i></p> <p>The number of de-icing facilities is an operational consideration.</p>
comment	<p>1495 comment by: <i>Geneva International Airport (ROMIG)</i></p> <p>c) Move to GM. This article is not safety relevant material and refers more to efficiency of operations.</p>
response	<p><i>Accepted</i></p>
comment	<p>1575 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>It is appropriate to modify the title as follow : ""Location and number""</p> <p>There is a relation between the localisation and the number of de-icing facilities. It depends on the configuration of the aerodrome and respects the objective that an aircraft can take off in a limited time after de-icing in order to keep the efficiency of the de-icing.</p>

response	<p><i>Not accepted</i></p> <p>The number of de-icing facilities is an operational consideration.</p>	
comment	1909	comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	<p>Attachment #285</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.G.380</p> <p>Référence: CS-ADR-DSN.G.380</p> <p>Location</p> <p>Traduction de courtoisie</p> <p>It is appropriate to modify the title as follow : "Location and number"</p> <p>There is a relation between the localisation and the number of de-icing facilities. It depends on the configuration of the aerodrome and respects the objective that an aircraft can take off in a limited time after de-icing in order to keep the efficiency of the de-icing.</p>	
response	<p><i>Not accepted</i></p> <p>The number of de-icing facilities is an operational consideration.</p>	
comment	2053	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	<p>It is appropriate to modify the title as follow : ""Location and number"</p> <p>There is a relation between the localisation and the number of de-icing facilities. It depends on the configuration of the aerodrome and respects the objective that an aircraft can take off in a limited time after de-icing in order to keep the efficiency of the de-icing</p>	
response	<p><i>Not accepted</i></p> <p>The number of de-icing facilities is an operational consideration.</p>	
comment	2296	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<p>Permanent and fixed deicing facilities would not be cost effective for the smaller airports where there are only a few aircraft movements.</p> <p>Suggest rewording to <i>deicing facilities should be provided commesurate with airport size and aircraft operations.</i></p>	
response	<p><i>Noted</i></p>	

comment	2432 ❖	comment by: Airport St. Gallen-Altenrhein - ACH/LSZR
	Suggest moving the "CS" to "GM"	
response	<i>Partially accepted</i>	
	Paragraph (c) will be moved to GM.	

comment	2544	comment by: AENA - Aeropuertos Españoles y Navegación Aérea
	<p>This CS should indicate the purpose for the location of such facilities, which is indicated in a note in Annex 14 Volume 1 (3.15.2, note1). See proposed paragraph (a2) below.</p> <p>Paragraph (c) of this CS is related to capacity and not safety and is up to the aerodrome operator. Besides, these specifications are only recommended by Annex 14 Volume 1.</p> <p>It is proposed to move parts of the CS to GM:</p> <p>CS-ADR-DSN.G.380 Location</p> <p><i>"(a) De-icing/anti-icing facilities should be provided either at aircraft stands or at specified remote areas.</i></p> <p><i>(a2) The location of a de-icing/anti-icing facility should be so as to ensure that the holdover time of the anti-icing treatment is still in effect at the end of taxiing and when take-off clearance of the treated aeroplane is given.</i></p> <p><i>(b) The de-icing/anti-icing facilities should be located to be clear of the obstacle limitation surfaces to not cause interference to the radio navigation aids and be clearly visible from the air traffic control tower for clearing the treated aeroplane.</i></p> <p><i>(c) The de-icing/anti-icing facilities should be so located as to provide for an expeditious traffic flow, perhaps with a bypass configuration, and not require unusual taxiing manoeuvre into and out of the pads."</i></p>	
response	<i>Partially accepted</i>	
	Paragraph (c) will be moved to GM.	

comment	2697	comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD
	Attachment #286	
	ADBM NPA 2011-20 (B.III) CS-ADR-DSN.G.380	
	Référence: CS-ADR-DSN.G.380	
	Location	
	Traduction de courtoisie	
	It is appropriate to modify the title as follow : "Location and number"	

There is a relation between the localisation and the number of de-icing facilities. It depends on the configuration of the aerodrome and respects the objective that an aircraft can take off in a limited time after de-icing in order to keep the efficiency of the de-icing.

response *Not accepted*

The number of de-icing facilities is an operational consideration.

comment 2870 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.G.380	Location
Proposition/commentaire	Il convient de modifier l'intitulé comme suit: "Location and number"
Justification	Il existe une corrélation entre la localisation et le nombre d'installation de dégivrage/antigivrage. Cette corrélation dépend de la configuration de l'aérodrome et répond à l'objectif qu'un aéronef traité pour le dégivrage/antigivrage puisse décoller en un temps donné afin que le traitement reste efficace.
Traduction de courtoisie	It is appropriate to modify the title as follow : ""Location and number"" There is a relation between the localisation and the number of de-icing facilities. It depends on the configuration of the aerodrome and respects the objective that an aircraft can take off in a limited time after de-icing in order to keep the efficiency of the de-icing.

response *Not accepted*

The number of de-icing facilities is an operational consideration.

comment 2998 comment by: *IFATCA*

CS-ADR-DSN.G.380 Location *TXT MOVE to GM*
 (b) The de-icing/anti-icing facilities should be located to be clear of the obstacle limitation surfaces to not cause interference to the radio navigation aids and be clearly visible from the air traffic control tower for clearing the treated

	aeroplane. <i>Clear of obstacle limitation surfaces seems important enough for IFATCA to keep this as an IR. And also the need for visual observation of the aerodrome traffic by ATC.</i>
response	<i>Noted</i>

CS-ADR – Book 1 – CS-ADR-DSN.G.385 Size and number of de-icing/anti-icing pads

p. 35

comment	269	comment by: <i>Belgian CAA</i>
	The title of this CS is not correct: there is no information on the number of de-icing pads.	
response	<i>Accepted</i>	
	The title has been amended to remove reference to the number of de-icing pads.	

comment	527	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #287	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.G.385	
	Référence: CS-ADR-DSN.G.385 Size and number of the de-icing/anti-icing pads	
	Traduction de courtoisie Modify the title as follow : " Size and number of the de-icing/anti-icing pads" Modify as follow : "The size of a de-icing/anti-icing pads should be equal to the parking area required by sufficient, appropriate and adequate according to the de-icing/anti-icing facilities used and to the most demanding aeroplane in a given category with at least 3.8 m clear paved area all allowing the movement of the de-icing/anti-icing vehicles around aeroplane"	
	The margin around the aircraft is 3m regarding the ICAO text. This value has to be replaced into GM. The number of the de-icing/anti-icing pads depends on its localisation and not their size. The size depends also of the facilities operated. The value of 3 is indicative because it relates to the facilities and it has to be in GM	
response	<i>Not accepted</i>	

ICAO text used for the clearance distance is 3.8 metres. The number of pads will be modified to reflect ICAO design criteria relating to vehicle movement and adjacent pads not overlapping.

comment 741

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.G.385	Size and number of the de-icing/anti-icing pads
Proposition/commentaire	<p>Il convient de modifier l'intitulé comme suit: " Size and number of the de-icing/anti-icing pads"</p> <p>Il convient également de modifier la disposition comme suit: "The size of a de-icing/anti-icing pads should be equal to the parking area required by sufficient, appropriate and adequate according to the de-icing/anti-icing facilities used and to the most demanding aeroplane in a given category with at least 3.8 m clear paved area all allowing the movement of the de-icing/anti-icing vehicles around aeroplane".</p> <p>La marge autour de l'avion est de 3 m si nous nous référons au texte de l'OACI. Cette valeur est à déplacer en GM.</p>
Justification	<p>Le nombre d'aires de dégivrage/antigivrage est lié à leur localisation et pas à leur taille.</p> <p>La taille de l'aire de dégivrage/antigivrage dépend aussi des installations qui sont mises en place.</p> <p>La valeur de 3 m n'est qu'indicative puisqu'elle dépend également du type d'installations et doit donc se trouver en GM.</p>
Traduction de courtoisie	<p>Modify the title as follow : " Size and number of the de-icing/anti-icing pads"</p> <p>Modify as follow : "The size of a de-icing/anti-icing pads should be equal to the parking area required by sufficient, appropriate and adequate according to the de-icing/anti-icing facilities used and to the most demanding aeroplane in a given category with at least 3.8 m clear paved area all allowing the movement of the de-icing/anti-icing vehicles around aeroplane".</p> <p>The margin around the aircraft is 3m regarding the ICAO text. This value has to be replaced into GM.</p> <p>The number of the de-icing/anti-icing pads depends on its localisation and not their size. The size depends also of the facilities operated.</p>

	The value of 3 is indicative because it relates to the facilities and it has to be in GM
response	<p><i>Not accepted</i></p> <p>ICAO text used for the clearance distance is 3.8 metres. The number of pads will be modified to reflect ICAO design criteria relating to vehicle movement and adjacent pads not overlapping.</p>

comment	<p>1356 comment by: <i>ECA - European Cockpit Association</i></p>
	<p>Delete paragraph and replace with: The size and number of de-icing/anti-icing facilities should be appropriate to the type and volume of aircraft to be accommodated and the required design capacity of an airport's de-icing/anti-icing system.</p> <p>Operating procedures, using properly trained and authorised personnel, should be established to ensure inspection of aircraft before take-off in order to verify the "Clean aircraft concept."</p> <p>Justification: These paragraphs are important for the safety of the personnel. There have been some instances of injuries and fatalities because of the lack of clear coordination procedures. Reference: IFALPA Annex 14, paragraphs 3.15.5 and 3.15.y</p>
response	<p><i>Not accepted</i></p> <p>ICAO wording will be used. The remainder of the comments are operational considerations.</p>

comment	<p>1427 comment by: <i>DGAC Direction Générale de l'aviation civile</i></p>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN.G.385 - Size and number of de-icing/anti-icing pads (p35) • CS-ADR - Book 2 - GM-ADR-DSN.G.385 — Size and number of de-icing/anti-icing pads —and GM (p238) • CS-ADR - Book 2 - GM-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad <p>.</p>

2. Proposed text / comment

The title of this CS does not suit its content because the number of pads is not dealt with in it.

Moreover, the size is provided depending on the size most demanding aeroplane for which it is intended, that's why it is not relevant to impose a minimum size of 3.8m.

This figure can be proposed as guidance, but rather in the GM corresponding to the size (GM-ADR-DSN.G.385) than in paragraph(b) of GM-ADR-DSN.G.400 — *Clearance distances*.

Thus the proposed modifications:

CS-ADR-DSN.G.385 Size and number of de-icing/anti-icing pads

"The size of a de-icing/anti-icing pad should be equal to the parking area required by the most demanding aeroplane for which the pad is intended in a given category with at least 3.8 m a clear paved area all around the aeroplane for the movement of the de-icing/anti-icing vehicles."

GM-ADR-DSN.G.385 — Size and number of de-icing/anti-icing pads — and GM

"[...] (c) An aeroplane de-icing/anti-icing pad consists of:

(1) an inner area for parking of an aeroplane to be treated; and

(2) an outer area for movement of two or more mobile de-icing/anti-icing equipment. In the absence of specific requirements, a 3.8 m cleared paved area for the movement of deicing/anti-icing vehicles round the aircraft may be considered suitable.

[...]"

GM-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad

"[...] (b) The minimum clearance distance of 3.8 m is necessary for the movement of deicing/anti-icing vehicles round the aircraft. [...]"

response

Not accepted

ICAO text used for the clearance distance is 3.8 metres. The number of pads will be modified to reflect ICAO design criteria relating to vehicle movement and adjacent pads not overlapping.

comment

1471

comment by: Euroairport Bâle-Mulhouse

Attachment [#288](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.G.385

Référence: CS-ADR-DSN.G.385

Size and number of the de-icing/anti-icing pads

Traduction de courtoisie

Modify the title as follow : " Size and number of the de-icing/anti-icing pads"

Modify as follow : "The size of a de-icing/anti-icing pads should be equal to the parking area required by sufficient, appropriate and adequate according to the de-icing/anti-icing facilities used and to the most demanding aeroplane in a given category with at least 3.8 m clear paved area all allowing the movement of the de-icing/anti-icing vehicles around aeroplane".

	<p>The margin around the aircraft is 3m regarding the ICAO text. This value has to be replaced into GM. The number of the de-icing/anti-icing pads depends on its localisation and not their size. The size depends also of the facilities operated. The value of 3 is indicative because it relates to the facilities and it has to be in GM</p>
response	<p><i>Not accepted</i></p> <p>ICAO text used for the clearance distance is 3.8 metres. The number of pads will be modified to reflect ICAO design criteria relating to vehicle movement and adjacent pads not overlapping.</p>

comment	<p>1576 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>Modify the title as follow : " Size and number of the de-icing/anti-icing pads"</p> <p>Modify as follow : "The size of a de-icing/anti-icing pads should be equal to the parking area required by sufficient, appropriate and adequate according to the de-icing/anti-icing facilities used and to the most demanding aeroplane in a given category with at least 3.8 m clear paved area all allowing the movement of the de-icing/anti-icing vehicles around aeroplane".</p> <p>The margin around the aircraft is 3m regarding the ICAO text. This value has to be replaced into GM.</p> <p>The number of the de-icing/anti-icing pads depends on its localisation and not their size. The size depends also of the facilities operated.</p> <p>The value of 3 is indicative because it relates to the facilities and it has to be in GM</p>
response	<p><i>Not accepted</i></p> <p>ICAO text used for the clearance distance is 3.8 metres. The number of pads will be modified to reflect ICAO design criteria relating to vehicle movement and adjacent pads not overlapping.</p>

comment	<p>1911 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #289</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.G.385</p> <p>Référence: CS-ADR-DSN.G.385 Size and number of the de-icing/anti-icing pads</p> <p>Traduction de courtoisie Modify the title as follow : " Size and number of the de-icing/anti-icing pads" Modify as follow : "The size of a de-icing/anti-icing pads should be equal to the</p>
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~~parking area required by~~ sufficient, appropriate and adequate according to the de-icing/anti-icing facilities used and to the most demanding aeroplane in a given category ~~with at least 3.8 m clear paved area all~~ allowing the movement of the de-icing/anti-icing vehicles ~~around aeroplane~~".

The margin around the aircraft is 3m regarding the ICAO text. This value has to be replaced into GM.

The number of the de-icing/anti-icing pads depends on its localisation and not their size. The size depends also of the facilities operated.

The value of 3 is indicative because it relates to the facilities and it has to be in GM

response *Not accepted*

ICAO text used for the clearance distance is 3.8 metres; the number of pads will be modified to reflect ICAO design criteria relating to vehicle movement and adjacent pads not overlapping.

comment

2052

comment by: *Pau Pyrénées Airport - PUF/LFBP*

Modify the title as follow : " Size ~~and number~~ of the de-icing/anti-icing pads"

Modify as follow : "The size of a de-icing/anti-icing pads should be ~~equal to the~~ ~~parking area required by~~ sufficient, appropriate and adequate according to the de-icing/anti-icing facilities used and to the most demanding aeroplane in a given category ~~with at least 3.8 m clear paved area all~~ allowing the movement of the de-icing/anti-icing vehicles ~~around aeroplane~~".

The margin around the aircraft is 3m regarding the ICAO text. This value has to be replaced into GM.

The number of the de-icing/anti-icing pads depends on its localisation and not their size. The size depends also of the facilities operated.

The value of 3 is indicative because it relates to the facilities and it has to be in GM

response *Not accepted*

ICAO text used for the clearance distance is 3.8 metres; the number of pads will be modified to reflect ICAO design criteria relating to vehicle movement and adjacent pads not overlapping.

comment

2297

comment by: *HIA - Highlands and Islands Airports Limited*

Permanent and fixed deicing facilities would not be cost effective for the smaller airports where there are only a few aircraft movements.

Suggest rewording to *deicing facilities should be provided commensurate with airport size and aircraft operations.*

response *Noted*

comment 2557 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

The title of this CS does not suit its content because the number of pads is not dealt with in it.
 Moreover, the size is provided depending on the size most demanding aeroplane for which it is intended, that's why it is not relevant to impose a minimum size of 3.8m.
 This figure can be proposed as guidance, but rather in the GM corresponding to the size (GM-ADR-DSN.G.385) than in paragraph(b) of GM-ADR-DSN.G.400 — *Clearance distances*.
 Thus the proposed modifications:

CS-ADR-DSN.G.385 Size and number of de-icing/anti-icing pads
 "The size of a de-icing/anti-icing pad should be equal to the parking area required by the most demanding aeroplane for which the pad is intended in a given category with at least 3.8 m a clear paved area all around the aeroplane for the movement of the de-icing/anti-icing vehicles."

response *Not accepted*

ICAO text used for the clearance distance is 3.8 metres; the number of pads will be modified to reflect ICAO design criteria relating to vehicle movement and adjacent pads not overlapping.

comment 2698 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#290](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.G.385

Référence: CS-ADR-DSN.G.385
 Size and number of the de-icing/anti-icing pads

Traduction de courtoisie
 Modify the title as follow : " Size and number of the de-icing/anti-icing pads"
 Modify as follow : "The size of a de-icing/anti-icing pads should be equal to the parking area required by sufficient, appropriate and adequate according to the de-icing/anti-icing facilities used and to the most demanding aeroplane in a given category with at least 3.8 m clear paved area all allowing the movement of the de-icing/anti-icing vehicles around aeroplane".
 The margin around the aircraft is 3m regarding the ICAO text. This value has to be replaced into GM.
 The number of the de-icing/anti-icing pads depends on its localisation and not their size. The size depends also of the facilities operated.
 The value of 3 is indicative because it relates to the facilities and it has to be in GM

response *Not accepted*

ICAO text used for the clearance distance is 3.8 metres. The number of pads will be modified to reflect ICAO design criteria relating to vehicle movement and adjacent pads not overlapping.

comment

2871

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.G.385	Size and number of the de-icing/anti-icing pads
Proposition/commentaire	<p>Il convient de modifier l'intitulé comme suit: " Size and number of the de-icing/anti-icing pads"</p> <p>Il convient également de modifier la disposition comme suit: "The size of a de-icing/anti-icing pads should be equal to the parking area required by sufficient, appropriate and adequate according to the de-icing/anti-icing facilities used and to the most demanding aeroplane in a given category with at least 3.8 m clear paved area all allowing the movement of the de-icing/anti-icing vehicles around aeroplane".</p> <p>La marge autour de l'avion est de 3 m si nous nous référons au texte de l'OACI. Cette valeur est à déplacer en GM.</p>
Justification	<p>Le nombre d'aires de dégivrage/antigivrage est lié à leur localisation et pas à leur taille. La taille de l'aire de dégivrage/antigivrage dépend aussi des installations qui sont mises en place.</p> <p>La valeur de 3 m n'est qu'indicative puisqu'elle dépend également du type d'installations et doit donc se trouver en GM.</p>
Traduction de courtoisie	<p>Modify the title as follow : " Size and number of the de-icing/anti-icing pads"</p> <p>Modify as follow : "The size of a de-icing/anti-icing pads should be equal to the parking area required by sufficient, appropriate and adequate according to the de-icing/anti-icing facilities used and to the most demanding aeroplane in a given category with at least 3.8 m clear paved area all allowing the movement of the de-icing/anti-icing vehicles around aeroplane".</p> <p>The margin around the aircraft is 3m regarding the ICAO text. This value has to be replaced into GM.</p> <p>The number of the de-icing/anti-icing pads depends on its localisation and not their size.</p>

	<p>The size depends also of the facilities operated.</p> <p>The value of 3 is indicative because it relates to the facilities and it has to be in GM</p>
<p>response <i>Not accepted</i></p> <p>ICAO text used for the clearance distance is 3.8 metres. The number of pads will be modified to reflect ICAO design criteria relating to vehicle movement and adjacent pads not overlapping.</p>	

CS-ADR – Book 1 – CS-ADR-DSN.G.390 Slopes on de-icing/anti-icing pads	p. 35
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comment	<p>2298 comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Permanent and fixed deicing facilities would not be cost effective for the smaller airports where there are only a few aircraft movements.</p> <p>Suggest rewording to <i>deicing facilities should be provided commensurate with airport size and aircraft operations.</i></p>
response	<p><i>Noted</i></p>

CS-ADR – Book 1 – CS-ADR-DSN.G.395 Strength of de-icing/anti-icing pads	p. 35
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comment	<p>2300 comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Permanent and fixed deicing facilities would not be cost effective for the smaller airports where there are only a few aircraft movements.</p> <p>Suggest rewording to <i>deicing facilities should be provided commensurate with airport size and aircraft operations.</i></p>
response	<p><i>Noted</i></p>

CS-ADR — Book 1 — CS-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad	p. 35-36
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comment	27	<p style="text-align: right; margin: 0;"><i>comment by: ACI EUROPE - Airports Council International</i></p> <p>clearance should be changed to "3m"</p> <p>Justification: to be consistent with CS.ADR.DSN.E.365</p>
response		<p><i>Not accepted</i></p> <p>Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.</p>
comment	116	<p style="text-align: right; margin: 0;"><i>comment by: Swedavia AB - Swedish airports (currently 11 airports)</i></p> <p>(a) Clearance should be changed to "3m" for code A and B- acft to be consistent with CS.ADR.DSN.E.365.</p>
response		<p><i>Not accepted</i></p> <p>Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.</p>
comment	218	<p style="text-align: right; margin: 0;"><i>comment by: CAA Austria - Ministry of Transport</i></p> <p>Clearance should be change to 3m To be consistent with CS.ADR.DSN.E.365</p>
response		<p><i>Not accepted</i></p> <p>Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.</p>
comment	270	<p style="text-align: right; margin: 0;"><i>comment by: Belgian CAA</i></p> <p>The clearances for code A and B are different from ICAO Annex 14.</p>
response		<p><i>Not accepted</i></p> <p>Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this</p>

is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.

comment	271	comment by: <i>Belgian CAA</i>
	The referencing towards ICAO Annex 14 tables are not valid anymore, there should be links towards the NPA material itself.	
response	<i>Accepted</i>	
	References will be amended.	

comment	451	comment by: <i>Cologne/Bonn Airport</i>
	Code letter A clearance should change to 3m; Consistency with CS.ADR.DSN.E.365	
response	<i>Not accepted</i>	
	Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.	

comment	528	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #291	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.G.400	
	Référence: CS-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad	
	Traduction de courtoisie It is appropriate to transfer this provision into GM At the (a) the distance for letters A and B (3.8m) does not correspond to the distance of article CS-ADR-DSN.E.365 (3m). This one must be taken. This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS	
response	<i>Partially accepted</i>	
	Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane. The ICAO reference in Figure G-1 will be amended to EASA reference.	

comment 594 comment by: *Cologne/Bonn Airport*

response *Noted*

No comment has been made.

comment 613 comment by: *Avinor*

CS.ADR.DSN.G.400 (a). Clearance should be changed to "3m".

response *Not accepted*

Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.

comment 742 comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.G.400

Clearance distances on a de-icing/anti-icing pad

Proposition/commentaire

Il convient de transférer cet article en GM.

Par ailleurs au (a), la distance demandée pour les lettres codes A et B (3.8m) ne correspond pas à celle de l'article CS-ADR-DSN.E.365 (3m); cette dernière étant à reprendre.

Justification

Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.

Traduction de courtoisie

It is appropriate to transfer this provision into GM

At the (a) the distance for letters A and B (3.8m) does not correspond to the distance of article CS-ADR-DSN.E.365 (3m). This one must be taken.

This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS

response *Partially accepted*

Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane. The ICAO reference in Figure G-1 will be amended to EASA reference.

comment 801 comment by: *Munich Airport International*

(a): clearance should be changed to "3m"

Justification: to be consistent with CS.ADR.DSN.E.365

response *Not accepted*

Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.

comment 1111 ❖ comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.260 — Taxiway minimum separation distance (p25-26)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.315 — Width of taxiway strips (p29)
- BIII - CS-ADR - Book 1 - Figure D-1. Rapid exit taxiway (p28)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad (p35)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.Q.840 — Objects to be marked and/or lighted (p146-147)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.260 — Taxiway minimum separation distance
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.315 — Width of taxiway strips (p232)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad (p239)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.255 — Junction and intersection of taxiways
- Explanatory Note – paragraph 18 (page 8)

2. Proposed text / comment

The figures for taxiway minimum separation distances are intended for design purposes only and can be far less large than indicated: indeed, these figures are no more applied when maintaining taxiways and consequently no more relevant.

No safety concern has been noticed until now on this point.

But above all, verifying that the separation distances between taxiways are

applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured" (paragraph 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) either the certification specification gives only the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision, and the figures are in guidance material.
- (ii) or the figures are kept in the CS but specifying each time that they should be met "where practicable" and the CS gives the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision.

The option (i) is proposed by DGAC because less confusing and far clearer, and therefore more appropriate for a regulation and for future standardization. This is a critical point for DGAC.

All CSs referring to figures in table D-1 are to be changed consequently: their provisions corresponding to such distance should be move to GM, except for CS-ADR-DSN.Q.840 — *Objects to be marked and/or lighted* because the objective is marking and/or lighting thus is quite different and it is proposed to add the figures of table D-1 in this CS as Table Q-3 — *Taxiway minimum marking and/or lighting distances*.

This option (i) and the consequences on CS referring to table D-1 are detailed below:

CS-ADR-DSN.D.260 — Taxiway minimum separation distance

"The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should ~~not~~ be sufficient for safe aircraft operations, in particular to prevent from aircraft collision less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

[...]

Table D-1. Taxiway minimum separation distances"

GM-ADR-DSN.D.260 — Taxiway minimum separation distance

"[...] (c) The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

[...]

Table GM-D-1. Taxiway minimum separation distances

(d) The separation distances of ~~Book 1~~, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(~~d~~)(e) The separation distance between the centre line of an aircraft stand

taxilane and an object shown in Book 1, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

CS-ADR-DSN.D.315 – Width of taxiway strips

"A taxiway strip should extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table ADR-D-1, column 11."

GM-ADR-DSN.D.315 – Width of taxiway strips

"A taxiway strip may extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table GM-D-1, column 11."

CS-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

~~"[...] (b) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.~~

~~(c) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)~~

~~Figure G-1 Minimum separation distance on a de-icing/anti-icing facility"~~

GM-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

"[...] (d) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.

(e) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)

Figure GM-G-1 Minimum separation distance on a de-icing/anti-icing facility"

CS-ADR-DSN.Q.840 – Objects to be marked and/or lighted p146

"[...] (g) All obstacles within the distance specified in Table D-1 Q-3, from the centre line of a taxiway, an apron taxiway or aircraft stand taxilane should be marked and, if the taxiway, apron taxiway or aircraft stand taxilane is used at night, lighted.

Table Q-3 – Taxiway minimum marking and/or lighting distances"

GM-ADR-DSN.D.255 – Junction and intersection of taxiways

"(e) The separation distances of Book 1, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(f) The separation distance between the centre line of an aircraft stand taxilane and an object shown in Book 1, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

response

Not accepted

Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.

comment	<p>1472 comment by: Euroairport Bâle-Mulhouse</p>
	<p>Attachment #292</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.G.400</p> <p>Référence: CS-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad</p> <p>Traduction de courtoisie It is appropriate to transfer this provision into GM At the (a) the distance for letters A and B (3.8m) does not correspond to the distance of article CS-ADR-DSN.E.365 (3m). This one must be taken. This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS</p>
response	<p><i>Partially accepted</i></p> <p>Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane. The ICAO reference in Figure G-1 will be amended to EASA reference.</p>
comment	<p>1496 comment by: Geneva International Airport (ROMIG)</p> <p>a) Clearance should be change to "3m" To be consistent with CS.ADR.DSN.E.365</p>
response	<p><i>Not accepted</i></p> <p>Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.</p>
comment	<p>1577 comment by: Aéroport de Marseille - MRS/LFML</p> <p>It is appropriate to transfer this provision into GM</p> <p>At the (a) the distance for letters A and B (3.8m) does not correspond to the distance of article CS-ADR-DSN.E.365 (3m). This one must be taken.</p> <p>This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS</p>
response	<p><i>Partially accepted</i></p> <p>Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for</p>

de-icing vehicles to manoeuvre around the aeroplane. The ICAO reference in Figure G-1 will be amended to EASA reference.

comment 1913 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#293](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.G.400

Référence: CS-ADR-DSN.G.400
Clearance distances on a de-icing/anti-icing pad

Traduction de courtoisie

It is appropriate to transfer this provision into GM

At the (a) the distance for letters A and B (3.8m) does not correspond to the distance of article CS-ADR-DSN.E.365 (3m). This one must be taken.

This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS

response *Partially accepted*

Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane. The ICAO reference in Figure G-1 will be amended to EASA reference.

comment 2050 comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate to transfer this provision into GM

At the (a) the distance for letters A and B (3.8m) does not correspond to the distance of article CS-ADR-DSN.E.365 (3m). This one must be taken.

This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS

response *Partially accepted*

Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane. The ICAO reference in Figure G-1 will be amended to EASA reference.

comment 2301 comment by: *HIA - Highlands and Islands Airports Limited*

Permanent and fixed deicing facilities would not be cost effective for the smaller airports where there are only a few aircraft movements.

response	Suggest rewording to <i>deicing facilities should be provided commensurate with airport size and aircraft operations.</i>	
	Noted	
comment	2402	comment by: Airport St. Gallen-Altenrhein - ACH/LSZR
	Change the clearance to "3m", inconsistent with other CS	
response	Not accepted	
	Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.	
comment	2474	comment by: Airport Nuremberg - NUE/EDDN
	It is not clear where the additional 0.8m in comparison with the minimum clearance distance of aircraft stands originate from. Since it is specified in CS-ADR-DSN.G.380 that de-icing/anti-icing can also be conducted at aircraft stands this claim is questionable.	
response	Noted	
	This is the paved area of a de-icing pad to allow for movement of de-icing vehicles.	
comment	2550	comment by: AENA - Aeropuertos Españoles y Navegación Aérea
	<p>CS-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad</p> <p>"[...] (b) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.</p> <p>(c) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)</p> <p><i>Figure G-1 Minimum separation distance on a de-icing/anti-icing facility"</i></p>	
response	Not accepted	
comment	2699	comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD
	Attachment #294	

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.G.400

Référence: CS-ADR-DSN.G.400

Clearance distances on a de-icing/anti-icing pad

Traduction de courtoisie

It is appropriate to transfer this provision into GM

At the (a) the distance for letters A and B (3.8m) does not correspond to the distance of article CS-ADR-DSN.E.365 (3m). This one must be taken.

This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS

response *Partially accepted*

Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane. The ICAO reference in Figure G-1 will be amended to EASA reference.

comment 2872

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

<u>Référence: CS-ADR-DSN.G.400</u>	Clearance distances on a de-icing/anti-icing pad
Proposition/commentaire	Il convient de transférer cet article en GM. Par ailleurs au (a), la distance demandée pour les lettres codes A et B (3.8m) ne correspond pas à celle de l'article CS-ADR-DSN.E.365 (3m); cette dernière étant à reprendre.
Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.
Traduction de courtoisie	It is appropriate to transfer this provision into GM At the (a) the distance for letters A and B (3.8m) does not correspond to the distance of article CS-ADR-DSN.E.365 (3m). This one must be taken. This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS

response *Partially accepted*

Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane. The ICAO reference in Figure G-1 will be amended to EASA reference.

comment 3023 comment by: *ADV -German Airports Association*

CS.ADR.DSN.G.400 (a)
clearance should be change to "3m"

Justification
to be consistent with CS.ADR.DSN.E.365

response *Not accepted*

Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.

comment 3058 comment by: *MST / STR - Stuttgart Airport*

CS.ADR.DSN.G.400 (a)
clearance should be change to "3m"

Justification
to be consistent with CS.ADR.DSN.E.365

response *Not accepted*

Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.

comment 3091 comment by: *Fraport AG*

CS-ADR-DSN.G.400 Clearance distances on a deicing/ anti-icing pad (a)

Editorial

Code Letter A
Clearance **3.8 m**

Proposed Text
Code Letter A
Clearance **3.0 m**

	Fraport to be consistent with CS.ADR.DSN.E.365	AG
response	<i>Not accepted</i>	
	Although the clearance distance (for Code A and B aeroplanes) is 3 metres, this is for aeroplanes on stand. The 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.	

CS-ADR – Book 1 – Figure G-1 Minimum separation distance on a de-icing/anti-icing facility

p. 36

comment	219	comment by: <i>CAA Austria - Ministry of Transport</i>
	Rewrite completely with EASA references	
response	<i>Noted</i>	

comment	400	comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	Table refers to Chapter numbers of ICAO Annex 14 (cross reference to 3.15.10 and Table 3-1) and should be adapted to the according Chapters in the EASA document.	
response	<i>Noted</i>	
	The reference has been amended to show EASA reference.	

comment	817	comment by: <i>Finnish Transport Safety Agency</i>
	Text in the figure G-1 points to Annex 14.	
response	<i>Noted</i>	
	The reference has been amended to show EASA reference.	

comment	2302	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Permanent and fixed deicing facilities would not be cost effective for the smaller airports where there are only a few aircraft movements.	

	Suggest rewording to <i>deicing facilities should be provided commensurate with airport size and aircraft operations.</i>
response	<i>Noted</i>
	CS-ADR-DSN.G.375 and G.380 make provision for non-fixed de-icing facilities.

comment	2475 comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	The explanation in this figure still contains the references to the according ICAO chapters and table and must therefore be adapted to EASA counterparts.
response	<i>Noted</i>
	The reference has been amended to show EASA reference.

CS-ADR – Book 1 – CS-ADR-DSN.H.405 – Applicability

p. 37

comment	1976 comment by: <i>Aéroports De Lyon</i>
	Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.
	<u>Proposition</u> : Déplacer en AR
response	<i>Not accepted</i>
	This CS does not assign responsibility for action.

comment	2167 comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Consider making reference to aerodrome survey requirements.
response	<i>Noted</i>

comment	2445 comment by: <i>SWISS AERODROMES ASSOCIATION</i>
	There shouldn't be in the whole chapter related to obstacles any more stringent requirements - ore requirement levels - than those is required by ICAO.
response	<i>Noted</i>

comment	2784	comment by: <i>Brussels Airport</i>
	<p><i>NPA 2011-20 (B.III)</i> <i>CS ADR DSN – BOOK 1</i> <i>CHAPTER H – OBSTACLE LIMITATION SURFACES</i></p> <p>To move whole section of chapter H to GM</p>	
response	<p><i>Not accepted</i></p> <p>The chapter contains ICAO design criteria.</p>	

CS-ADR – Book 1 – CS-ADR-DSN.H.410 – Outer horizontal surface
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p. 37

comment	28	comment by: <i>ACI EUROPE - Airports Council International</i>
	<p>move to GM</p>	
response	<p><i>Accepted</i></p> <p>This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.</p>	

comment	76	comment by: <i>CAA-NL</i>
	<p>Is the mentioned length of 1860 meter correct? A distance of 1800 meter in line with ICAO Annex 14 is expected.</p>	
response	<p><i>Accepted</i></p> <p>This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.</p>	

comment	229	comment by: <i>Danish Transport Authority</i>
	<p>The proposed text is not in line with ICAO Doc 9137, part 6 regarding guidance to extend the OLS at code 3 and 4 runways. The reference to have parts of the text to GM is left out in the explanation under the cross reference document NPA 1120-20 C.</p>	
response	<p><i>Accepted</i></p>	

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 452 comment by: *Cologne/Bonn Airport*

Move to GM

response *Accepted*

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 531 comment by: *Union des Aéroports français - UAF*

Attachment [#296](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.H.410

Référence: CS-ADR-DSN.H.410

Outer horizontal surface

Traduction de courtoisie

It is appropriate to transfer this article to GM.

The outer horizontal surfaces are not even recommended practices in the Annex 14 but only informative elements contained in the Airport services manual, Part 6 "Control of obstacles" (Doc 9137).

There is no reason to put this kind of surface in CS. However, it can remain GM as is already the case in the ICAO Annex 14.

response *Accepted*

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 614 comment by: *Avinor*

CS.ADR.DSN.H.410. Move to GM to be consistent with CS.ADR.DSN.E.365.

response *Noted*

Agreed: Noted: This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

No relevance to CS E.365.

comment 743

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.H.410	Outer horizontal surface
Proposition/commentaire	Il convient de transférer cet article en GM.
Justification	Les surfaces horizontales extérieures ne sont même pas des recommandations dans l'annexe 14 mais uniquement des éléments informatifs contenus dans la partie 6 du Manuel des services d'aéroport (Document 9137). Il n'y a aucune raison de mettre ce type de surface en CS. En revanche ça peut rester des éléments informatifs comme c'est déjà le cas à l'OACI.
Traduction de courtoisie	It is appropriate to transfer this article to GM. The outer horizontal surfaces are not even recommended practices in the Annex 14 but only informative elements contained in the Airport services manual, Part 6 "Control of obstacles" (Doc 9137). There is no reason to put this kind of surface in CS. However, it can remain GM as is already the case in the ICAO Annex 14.

response *Accepted*

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 802

comment by: *Munich Airport International*

move to GM

response *Accepted*

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 822

comment by: *DGAC Direction Générale de l'aviation civile***1. Affected paragraphs**

- CS-ADR - Book 1 - CS-ADR-DSN. H.410 — Outer horizontal surface (p37)
- CS-ADR - Book 2 - GM-ADR-DSN.H.410 — Outer horizontal surface (p241)

2. Justification and proposed text / comment

This obstacle limitation surface is not binding in France and comes from an ICAO Manual introduced by a note in Annexe 14 Volume 1.

Besides, to prevent the erection of obstacles outside the OLS (so it is no more an aerodrome matter, but rather an ATM matter), France introduced a law so that the DGAC is systemically consulted for every construction above 50 meters high outside towns, and 100 meters high inside towns. This law is more efficient than the Outer horizontal surface. That's why the Outer horizontal surface is not binding in France.

DGAC proposes to move the whole CS to GM:

CS-ADR-DSN.H.410 — Outer horizontal surface

~~"The outer horizontal surface should extend from the periphery of the conical surface to a minimum radius of 15 000 m from the aerodrome reference point when the main runway is 1860 m or more in length and to a minimum radius of 10 000 m where the main runway is 1100 m or more but less than 1860 m in length."~~

GM-ADR-DSN.H.410 — Outer horizontal surface

"(a) An outer horizontal surface is a specified portion of a horizontal plane around an aerodrome beyond the limits of the conical surface. It represents the level above which consideration needs to be given to the control of new obstacles in order to facilitate practicable and efficient instrument approach procedures, and together with the conical and inner horizontal surfaces to ensure safe visual manoeuvring in the vicinity of an aerodrome.

(b) The OHS is of particular importance for safe operations in areas of high ground or where there are concentrations of obstacles.

(c) The outer horizontal surface should extend from the periphery of the conical surface to a minimum radius of 15 000 m from the aerodrome reference point when the main runway is 1860 m or more in length and to a minimum radius of 10 000 m where the main runway is 1100 m or more but less than 1860 m in length."

response *Accepted*

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment *1028*

comment by: *Federal Office of Civil Aviation FOCA*

FOCA suggests to remove Chapter "CS-ADR-DSN.H.410 - Outer horizontal surface". Switzerland has other means of compliance for the control of obstacles beyond the conical surface by establish of a nationwide announcement system for objects with a height of 25m or 60m AGL, depending on the location.

response *Noted*

Agreed: This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

Noted: Other comments.

comment 1473 comment by: Euroairport Bâle-Mulhouse

Attachment [#297](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.H.410

Référence: CS-ADR-DSN.H.410

Outer horizontal surface

Traduction de courtoisie

It is appropriate to transfer this article to GM.

The outer horizontal surfaces are not even recommended practices in the Annex 14 but only informative elements contained in the Airport services manual, Part 6 "Control of obstacles" (Doc 9137).

There is no reason to put this kind of surface in CS. However, it can remain GM as is already the case in the ICAO Annex 14.

response *Accepted*

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 1578 comment by: Aéroport de Marseille - MRS/LFML

It is appropriate to transfer this article to GM.

The outer horizontal surfaces are not even recommended practices in the Annex 14 but only informative elements contained in the Airport services manual, Part 6 "Control of obstacles" (Doc 9137).

There is no reason to put this kind of surface in CS. However, it can remain GM as is already the case in the ICAO Annex 14.

response *Accepted*

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 1805 comment by: Geneva International Airport (ROMIG)

Move to GM. Too detailed

response *Accepted*

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 1915 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#298](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.H.410

Référence: CS-ADR-DSN.H.410

Outer horizontal surface

Traduction de courtoisie

It is appropriate to transfer this article to GM.

The outer horizontal surfaces are not even recommended practices in the Annex 14 but only informative elements contained in the Airport services manual, Part 6 "Control of obstacles" (Doc 9137).

There is no reason to put this kind of surface in CS. However, it can remain GM as is already the case in the ICAO Annex 14.

response *Accepted*

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 1980 comment by: *Aéroports De Lyon*

Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.

Proposition: Déplacer en AR

response *Not accepted*

This CS does not assign responsibility for action. the OHS is moved to GM.

comment 2046 comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate to transfer this article to GM.

The outer horizontal surfaces are not even recommended practices in the Annex 14 but only informative elements contained in the Airport services manual, Part 6 "Control of obstacles" (Doc 9137).

There is no reason to put this kind of surface in CS. However, it can remain GM as is already the case in the ICAO Annex 14.

response *Accepted*

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 2212 ❖ comment by: HIA - Highlands and Islands Airports Limited

Noted

response Noted

comment 2401 comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

Delete the CS. Switzerland has established other means of compliance for the control of obstacles beyond the conical surface by establishing a nationwide announcement system for objects with a height of 25m or 60m AGL, depending on the location.

response Noted

Agreed: This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 2432 ❖ comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

Suggest moving the "CS" to "GM"

response Accepted

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 2476 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

This obstacle limitation surface is not binding in Spain and comes from an ICAO Manual introduced by a note in Annexe 14 Volume 1. Besides, to prevent the erection of obstacles outside the OLS (so it is no more an aerodrome matter, but rather an ATM matter).

It is proposed to move the whole CS to GM:

CS-ADR-DSN.H.410 – Outer horizontal surface

~~"The outer horizontal surface should extend from the periphery of the conical surface to a minimum radius of 15 000 m from the aerodrome reference point when the main runway is 1860 m or more in length and to a minimum radius of~~

~~10 000 m where the main runway is 1100 m or more but less than 1860 m in length."~~

response *Accepted*

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 2700 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#299](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.H.410

Référence: CS-ADR-DSN.H.410
Outer horizontal surface

Traduction de courtoisie

It is appropriate to transfer this article to GM.

The outer horizontal surfaces are not even recommended practices in the Annex 14 but only informative elements contained in the Airport services manual, Part 6 "Control of obstacles" (Doc 9137).

There is no reason to put this kind of surface in CS. However, it can remain GM as is already the case in the ICAO Annex 14.

response *Accepted*

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 2873 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.H.410	Outer horizontal surface
Proposition/commentaire	Il convient de transférer cet article en GM.
Justification	Les surfaces horizontales extérieures ne sont même pas des recommandations dans l'annexe 14 mais uniquement des éléments informatifs contenus dans la partie 6 du Manuel des services d'aéroport (Document 9137). Il n'y a aucune raison de mettre ce type de surface en CS. En revanche ça peut rester des éléments informatifs comme c'est déjà le cas à l'OACI.
Traduction de courtoisie	It is appropriate to transfer this article to GM. The outer horizontal surfaces are not even recommended practices in the Annex 14 but only informative elements contained in the

	<p>Airport services manual, Part 6 "Control of obstacles" (Doc 9137). There is no reason to put this kind of surface in CS. However, it can remain GM as is already the case in the ICAO Annex 14.</p>
response	<p><i>Accepted</i></p> <p>This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.</p>
comment	<p>3024 comment by: <i>ADV -German Airports Association</i></p> <p>CS.ADR.DSN.H.410 move to GM</p>
response	<p><i>Accepted</i></p> <p>This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.</p>
comment	<p>3059 comment by: <i>MST / STR - Stuttgart Airport</i></p> <p>CS.ADR.DSN.H.410 move to GM</p>
response	<p><i>Accepted</i></p> <p>This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.</p>
comment	<p>3092 comment by: <i>Fraport AG</i></p> <p>CS-ADR-DSN.H.410 – Outer horizontal surface</p> <p>Editorial</p> <p>Complete paragraph</p> <p>Move complete paragraph to GM</p>

response *Accepted*

This CS has been moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

CS-ADR – Book 1 – CS-ADR-DSN.H.415 – Conical surface

p. 37

comment 54

comment by: *Belfast International Airport - BFS/EGAA*

Dimensions required for the conical surface

response *Noted*

Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA, but is in the corrigendum). Table J-1 will be inserted in the NPA.

comment 823

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN. H.415 – conical surface (p37)
- CS-ADR - Book 1 – CS-ADR-DSN. H.420 – Inner horizontal surface (p37-38)
- CS-ADR - Book 1 – CS-ADR-DSN.H.430 – Transitional surface (p38-39)
- CS-ADR - Book 1 – CS-ADR-DSN.H.450 – Inner approach surface (p43)
- CS-ADR - Book 1 – CS-ADR-DSN.H.455 – Inner transitional surface (p43-44)
- CS-ADR - Book 1 – CS-ADR-DSN.H.460 – Balked landing surface (p44)

2. Justification and proposed text / comment

It is understood the part "Applicability" of the CS describing each OLS provides for the objective of the given OLS, which DGAC finds essential.

DGAC proposes to make these objectives in accordance with what is currently proposed for the revision of the part 6 of ICAO airport services manual by the ICAO task force common to the ICAO instrument flight procedures panel and the ICAO aerodrome panel.

Indeed, the proposed objectives have been determined after some studies conducted within this group.

* For the inner horizontal and conical surfaces, they share the same objective which is to protect aircraft performing aerodrome pattern.

Thus the proposed modification:

CS-ADR-DSN.H.415 – Conical surface

"(a) Applicability: The purpose of the conical surface is mainly to facilitate protect airspace for aerodrome pattern and visual manoeuvring prior to landing in the vicinity of the aerodrome.

[...]"

CS-ADR-DSN.H.420 – Inner horizontal surface

"(a) *Applicability:* The purpose of the inner horizontal surface is to protect airspace for aerodrome pattern and visual manoeuvring prior to landing.

[...]"

CS-ADR-DSN.H.430 – Transitional surface

"(a) *Applicability:* The purpose of the transitional surface is to define the limit of the area available for buildings or other structures protect aircraft from deviations from the runway axis.

[...]"

CS-ADR-DSN.H.450 – Inner approach surface

"(a) *Applicability:* The purpose of the inner approach surface is to protect final precision approaches.

Description: A rectangular portion of the approach surface immediately preceding the threshold. [...]"

CS-ADR-DSN.H.455 – Inner transitional surface

"(a) *Applicability:* The purpose of the inner transitional surface is to protect aeroplanes during precision approaches and balked landing from deviations from the runway axis.

Description: A surface similar to the transitional surface but closer to the runway. [...]"

CS-ADR-DSN.H.460 – Balked landing surface

"(a) *Applicability:* The purpose of the balked landing surface is to protect balked landing with all engines operating.

Description: An inclined plane located at a specified distance after the threshold, extending between the inner transitional surfaces. [...]"

response Not accepted

comment 1120 comment by: Flughafen Düsseldorf GmbH

Dimensionen / Neigungen gemäß ICAO (Table 4-1) ergänzen!

response Noted

Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.

comment 1981 comment by: Aéroports De Lyon

Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.

Proposition: Déplacer en AR

response *Not accepted*

This CS does not assign responsibility for action.

comment 2212 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2391 comment by: *MWEBWV Ministerium für Wirtschaft, Energie, Bauen, Wohnen und Verkehr des Landes Nordrhein-Westfalen*

Dimensions / slopes complement according to ICAO (Table 4-1)!

response *Noted*

Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.

CS-ADR – Book 1 – CS-ADR-DSN.H.420 – Inner horizontal surface

p. 37

comment 51 comment by: *Belfast International Airport - BFS/EGAA*

We strongly support this wording. However please clarify if the aerodrome authority decides which criteria are used?

response *Accepted*

The aerodrome operator will propose to the NAA which criteria are to be used as part of the CB construction.

comment 819 comment by: *Finavia*

To be formulated: The outer limits of the inner horizontal surface are defined by circular arcs centred on the intersection of the extended RWY centre line with **the RWY end** joined tangentially by straight lines.

response *Not accepted*

The circular arcs are centred where the extended centre line intersects the end of the runway strip, or they can be a circle centred on the geometric centre of the runway.

comment 823 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN. H.415 — conical surface (p37)
- CS-ADR - Book 1 - CS-ADR-DSN. H.420 — Inner horizontal surface (p37-38)
- CS-ADR - Book 1 - CS-ADR-DSN.H.430 — Transitional surface (p38-39)
- CS-ADR - Book 1 - CS-ADR-DSN.H.450 — Inner approach surface (p43)
- CS-ADR - Book 1 - CS-ADR-DSN.H.455 — Inner transitional surface (p43-44)
- CS-ADR - Book 1 - CS-ADR-DSN.H.460 — Balked landing surface (p44)

2. Justification and proposed text / comment

It is understood the part "Applicability" of the CS describing each OLS provides for the objective of the given OLS, which DGAC finds essential.

DGAC proposes to make these objectives in accordance with what is currently proposed for the revision of the part 6 of ICAO airport services manual by the ICAO task force common to the ICAO instrument flight procedures panel and the ICAO aerodrome panel.

Indeed, the proposed objectives have been determined after some studies conducted within this group.

* For the inner horizontal and conical surfaces, they share the same objective which is to protect aircraft performing aerodrome pattern.

Thus the proposed modification:

CS-ADR-DSN.H.415 — Conical surface

"(a) Applicability: ~~The purpose of the conical surface is mainly to facilitate~~ protect airspace for aerodrome pattern and visual manoeuvring prior to landing in the vicinity of the aerodrome.

[...]"

CS-ADR-DSN.H.420 — Inner horizontal surface

"(a) Applicability: ~~The purpose of the inner horizontal surface is to protect~~ airspace for aerodrome pattern and visual manoeuvring prior to landing.

[...]"

CS-ADR-DSN.H.430 — Transitional surface

"(a) Applicability: ~~The purpose of the transitional surface is to define the limit of the area available for buildings or other structures~~ protect aircraft from deviations from the runway axis.

[...]"

CS-ADR-DSN.H.450 — Inner approach surface

"(a) Applicability: ~~The purpose of the inner approach surface is to protect final~~ precision approaches.

Description: A rectangular portion of the approach surface immediately preceding the threshold. [...]"

CS-ADR-DSN.H.455 – Inner transitional surface

"(a) Applicability: The purpose of the inner transitional surface is to protect aeroplanes during precision approaches and balked landing from deviations from the runway axis.

Description: A surface similar to the transitional surface but closer to the runway. [...]"

CS-ADR-DSN.H.460 – Balked landing surface

"(a) Applicability: The purpose of the balked landing surface is to protect balked landing with all engines operating.

Description: An inclined plane located at a specified distance after the threshold, extending between the inner transitional surfaces. [...]"

response Not accepted

The ICAO concept will be used.

comment 826 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.002 — Definitions (p4-9)
- CS-ADR - Book 1 - CS-ADR-DSN. H.420 — Inner horizontal surface (p37-38)
- CS-ADR - Book 1 - CS-ADR-DSN.H.430 — Transitional surface (p38-39)
- CS-ADR - Book 1 - CS-ADR-DSN.H.455 — Inner transitional surface (p43-44)
- (B.III) corrigendum - Table J-1 – Dimensions and slopes of obstacle limitation surfaces — Approach runways (p3-4)

2. Justification and proposed text / comment

This comment is linked with comment 10 in (B.III) corrigendum.

These provisions are to be reviewed to take into account the concept of "support line" that has been adopted by the group ADR.003 as an alternative of the contour the runway strip.

For recall, this concept permits to solve the issues raised when the dimensions of the runway strip are much greater than the minimum value required. In these cases, the "support line" of OLS, particularly the support line of the transitional surfaces, is not coincident with the contour of the runway strip. Thus it is essential to be able to establish OLS independently from the contour of the runway strip, which is allowed by this concept.

For instance, the distance of 60m in note (c) of table J-1 corresponds to the minimal length of the runway strip beyond the runway end. It is frequent to have runway strips ending beyond this distance. For technical reasons, the obstacle limitation surfaces related to interrupted take-off surface are related to this distance and not to the end of the runway strip.

Note: the concept of the support line enables to manage both the case where the runway strip is coincident with the support line and the cases where it is not coincident. Thus, the redaction with the strip could be deleted without any consequence.

This concept has already been taken into account in CS on transitional surfaces (for instance CS-ADR-DSN.H.430), which is a good thing, but it is essential to

use it also for other OLS when the strip is used in order to harmonize the design.

Thus the following proposed modifications:

“Obstacle free zone (OFZ)’ means the airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces or, when the support line is not coincident with the strip, the portion of ground bounded by the support line which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes.”

Table J-1 – Dimensions and slopes of obstacle limitation surfaces – Approach runways * Note (c)

“c. Distance to the end of strip or, when the runway strip is not coincident with the inner edge of the approach surface, to 60 m beyond the runway end.”

CS-ADR-DSN. H.420 – Inner horizontal surface

“[...] (c) Characteristics: The outer limits of the inner horizontal surface are defined by circular arcs centred on the intersection of the extended RWY centre line with the end of the RWY strip or, when the runway strip is not coincident with the inner edge of the approach surface, with the vertical line passing through the middle of the inner edge of the approach surface, joined tangentially by straight lines. (Figure H-1.)
[...]”

Editorial improvement of CS-ADR-DSN.H.430 – Transitional surface

“[...]”

(b) Description: [...]

(2) Where the transitional surface is not coincident with the runway strip: a complex surface along the side of a support line, parallel to and at a specified distance specified in table H-1 from the runway centre line, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface.

(c) Characteristics: The limits of a transitional surface should comprise:

(1) Where the transitional surface is coincident with the runway strip:

(i) a lower edge beginning at the intersection of the side of the approach surface with the inner horizontal surface and extending down the side of the approach surface to the inner edge of the approach surface and from there along the length of the strip parallel to the runway centre line; and

(ii) An upper edge located in the plane of the inner horizontal surface;

(2) Where the transitional surface is not coincident with the runway strip:

(i) a lower edge beginning at the intersection of the side of the approach surface with the inner horizontal surface and extending down the side of the approach surface to the inner edge of the approach surface and from there along a support line parallel to the runway centre line, whose distance to the runway centre line is according to table H-1 below; and

(ii) An upper edge located in the plane of the inner horizontal surface.

“[...]”

CS-ADR-DSN.H.455 – Inner transitional surface

“[...]”

(b) Characteristics: The limits of an inner transitional surface should comprise:

(1) Where the transitional surface is coincident with the runway strip:

(i) a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that

surface, from there along the strip parallel to the runway centre line to the inner edge of the balked landing surface and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and
 (2)(ii) an upper edge located in the plane of the inner horizontal surface.
 (2) Where the transitional surface is not coincident with the runway strip:
 (i) a lower edge beginning at the intersection of the side of the approach surface with the inner horizontal surface and extending down the side of the approach surface to the inner edge of the approach surface and from there along the support line parallel to the runway centre line, at a specified distance to the runway centre line indicated in table H-2 below; and
 (ii) An upper edge located in the plane of the inner horizontal surface.
 (c) The elevation of a point on the lower edge should be:
 (1) along the side of the inner approach surface and balked landing surface – equal to the elevation of the particular surface at that point; and
 (2) along the strip – equal to the elevation of the nearest point on the centre line of the runway or its extension.
 (3) Along the transitional surface support line – equal to the elevation of this line at that point.
 [...]”

Table H-2: distance between inner transitional surface support line and runway centre line

	Precision approach Category I		Precision approach Category II or III
Runway code	1,2	3,4	60 m
	45 m	60 m	

response *Not accepted*

The ICAO concept will be used.

comment

827

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN. H.420 — Inner horizontal surface (p37)
- CS-ADR - Book 1 - Figure H-1. Inner horizontal surface where the runway is code 4 (p40)
- CS-ADR - Book 1 - Figure H-2. Obstacle limitation surfaces (p41)
- CS-ADR - Book 2 - GM-ADR-DSN.H.420 — Inner horizontal surface (p241)

2. Justification and proposed text / comment

The elevation datum is "established for such purpose" (as specified in ICAO Annex 14 Volume1).

Moreover, paragraph (d)(1) of CS-ADR-DSN. H.420 proposes four possibilities to determine this elevation point, with the use of the word "may". These different possibilities are meant to be in guidance material.

Finally, figure H-1 and figure H-2 are meant to be in guidance material because they are only an example of a possible design of the OLS, particularly concerning the design of the inner horizontal surface which is not, as said truly in the GM associated, necessary circular. The option of designing the OLS from the transitional surface support line (see CS-ADR-DSN.H.430 paragraphs (c)(3) and (d)(3)) is not taken into account either by these examples.

Thus DGAC proposes to move parts of this CS to GM and proposes to move figure H-1 and figure H-2 to GM as "figure GM-H-1" and "Figure GM-H-2" respectively. Existing figure GM-H-1 thus becomes "Figure GM-H-3".

Moreover, to avoid any confusion in the numbering of the figures, it is proposed to delete the words "figure 1.2" from the title of existing Figure GM-H-1 (which is the numbering of ICAO Annex 14 volume 1).

See detailed modifications below:

CS-ADR-DSN.H.420 – Inner horizontal surface

"(a) Applicability: The purpose of the inner horizontal surface is to protect airspace for visual manoeuvring prior to landing.

(b) Description: A surface located in a horizontal plane above an aerodrome and its environs.

(c) Characteristics: The outer limits of the inner horizontal surface are defined by circular arcs centred on the intersection of the extended RWY centre line with the end of the RWY strip joined tangentially by straight lines. ~~(Figure H-1.)~~

(d) The height of the inner horizontal surface should be measured above an established elevation datum established for such purpose.

~~*(1) The elevation datum used for the height of the inner horizontal surface may be:*~~

~~*(i) the elevation of the highest point of the lowest threshold of the related runway;*~~

~~*(ii) the elevation of the highest point of the highest threshold of the related runway;*~~

~~*(iii) the elevation of the highest point of the runway;*~~

~~*(iv) the aerodrome elevation."*~~

~~**Figure H-1 Inner horizontal surface where the runway is code 4**~~

~~**Figure H-2 Obstacle limitation surfaces**~~

GM-ADR-DSN.H.420 – Inner horizontal surface

"(a) The shape of the inner horizontal surface need not necessarily be circular. Guidance on determining the extent of the inner horizontal surface is contained in the Airport Services Manual (ICAO, Doc 9137, Part 6).

(b) The limits of the inner horizontal surface for longer runways (1 800 m or more in length) are defined as circles of radius 4 000 m centred on the strip ends of the runway. These circles are joined by common tangents parallel to the runway centre line to form a racetrack pattern. The boundary of this pattern is the boundary of the inner horizontal surface.

(c) For runways less than 1 800 m in length, the inner horizontal surface is defined as a circles centred on the midpoint of the runway.

(d) The elevation datum used for the height of the inner horizontal surface may be:

(1) the elevation of the highest point of the lowest threshold of the related runway;

(2) the elevation of the highest point of the highest threshold of the related

runway;
 (3) the elevation of the highest point of the runway;
 (4) the aerodrome elevation.”
 (de) To protect two or more runways, a more complex pattern could become necessary. In this situation, all the circles are joined tangentially by straight lines: illustrated at the Figure GM-H-1.
 (ef) For more complex inner horizontal surfaces, with runways on different levels or runways where the thresholds differ more than 6 m, a common elevation is not essential, but where surfaces overlap, the lower surface should be regarded as dominant.
 (fg) Further guidance is contained in the Airport Services Manual (ICAO, DOC 9137, part 6).”
Figure GM-H-1 Inner horizontal surface where the runway is code 4
Figure GM-H-2 Obstacle limitation surfaces
Figure ~~GM-H-1~~ GM-H-3 Example of composite inner horizontal surface for two parallel runways (where the runway code number is 4)

response *Not accepted*

The CS provides four options to allow flexibility in selecting a datum for the Inner Horizontal Surface.
 Figures H-1 and H-2 are illustrative of the relationship between the obstacle limitation surfaces, not an example of construction of those surfaces.

comment 962

comment by: *Belgian CAA*

As the center of circular arcs has changed (the intersection of the extended RWY centre line with the end of the RWY strip), the Figure H-1 has to be updated.

response *Accepted*

comment 1029

comment by: *Federal Office of Civil Aviation FOCA*

Change provision to: [...] where the code number is 4 or the aerodrome reference point (ARP) where the code number is 3 or less. All established OLS for runways with code number 3 or less in Switzerland are defined by circular arcs centred on the ARP, as showed in Figure H-2 and described in the GM-ADR-DSN.H.420 (c) in this NPA.

response *Partially accepted*

The circular arcs are centred where the extended centre line intersects the end of the runway strip, or they can be a circle centred on the geometric centre of the runway.

comment 1122

comment by: *Flughafen Düsseldorf GmbH*

	Dimensionen / Neigungen gemäß ICAO (Table 4-1) ergänzen!	
response	<i>Noted</i>	
	Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.	
comment	1806	comment by: <i>Geneva International Airport (ROMIG)</i>
	d)1) Move to GM This article provides propositions for the determination of the elevation datum which are more appropriate as guidance material.	
response	<i>Not accepted</i>	
	The CS provides four options to allow flexibility in selecting a datum for the Inner Horizontal Surface.	
comment	1982	comment by: <i>Aéroports De Lyon</i>
	Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels. <u>Proposition</u> : Déplacer en AR	
response	<i>Not accepted</i>	
	This CS does not assign responsibility for action.	
comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>	
response	<i>Noted</i>	
comment	2393	comment by: <i>MWEBWV Ministerium für Wirtschaft, Energie, Bauen, Wohnen und Verkehr des Landes Nordrhein-Westfalen</i>
	Dimensionen / slopes complement according to ICAO (Table 4-1)!	
response	<i>Noted</i>	
	Chapter H describes the obstacle limitation surfaces. Dimensions are in	

Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum).
Table J-1 will be inserted in the NPA.

comment	2398	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	Suggest moving (d,1) to "GM"	
response	<i>Not accepted</i>	
	The CS provides four options to allow flexibility in selecting a datum for the Inner Horizontal Surface.	

CS-ADR – Book 1 – CS-ADR-DSN.H.425 – Approach surface

p. 38

comment	52	comment by: <i>Belfast International Airport - BFS/EGAA</i>
	We see a requirement to provide physical dimensions for this surface	
response	<i>Noted</i>	
	Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.	

comment	55	comment by: <i>Belfast International Airport - BFS/EGAA</i>
	Dimensions required for the approach surface	
response	<i>Noted</i>	
	Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.	

comment	145	comment by: <i>CAA Norway</i>
	Editorial: Part of the text in CS-ADR-DSN.H.425 on page 38 can be deleted as last part of c) is identical to f), d) is identical to g) and e) is identical to h).	
response	<i>Accepted</i>	
	Duplications will be deleted.	

comment	290	comment by: <i>Icelandic Civil Aviation Administration</i>
	Editorial: Part of the text in CS-ADR-DSN.H.425 on page 38 can be deleted as last part of c) is identical to f), d) is identical to g) and e) is identical to h).	
response	<i>Accepted</i>	
	Duplications will be deleted.	

comment	391	comment by: <i>AIRBUS</i>
	PROPOSED TEXT / COMMENT: Paragraphs (f), (g) and (h) should be removed.	
	RATIONALE / REASON / JUSTIFICATION for the Comment: "Shall" should be replaced by "should" (refer to Explanatory Note on the use of "should" for CSs). Consequently, paragraphs (f), (g) and (h) become identical to (c), (d) and (e).	
response	<i>Accepted</i>	

comment	641	comment by: <i>Finnish Transport Safety Agency</i>
	Editorial: Part of the text in CS-ADR-DSN.H.425 on page 38 can be deleted as last part of c) is identical to f), d) is identical to g) and e) is identical to h).	
response	<i>Accepted</i>	
	Duplications will be deleted.	

comment	828	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<u>1. Affected paragraphs</u>	
	<ul style="list-style-type: none"> CS-ADR - Book 1 -ADR-DSN.H.425 — Approach surface (p38) 	
	<u>2. Justification and proposed text / comment</u>	
	They are several duplicated paragraphs in this CS. Moreover, the word "shall" is used in these duplicated paragraphs, which is not appropriate in a certification specification. Thus the proposed editorial modifications:	
	CS-ADR-DSN.H.425 — Approach surface ADD	
	"[...] (c)[...]The above surfaces should be varied when lateral offset, offset or curved	

approaches are utilised, specifically, two sides originating at the ends of the inner edge and diverging uniformly at a specified rate from the extended centre line of the lateral offset, offset or curved ground track.

(d) The elevation of the inner edge should be equal to the elevation of the midpoint of the threshold.

(e) The slope(s) of the approach surface should be measured in the vertical plane containing the centre line of the runway and should continue containing the centre line of any lateral offset or curved ground track.

~~(f) The above surfaces shall be varied when lateral offset, offset or curved approaches are utilised, specifically, two sides originating at the ends of the inner edge and diverging uniformly at a specified rate from the extended centre line of the lateral offset, offset or curved ground track.~~

~~(g) The elevation of the inner edge shall be equal to the elevation of the midpoint of the threshold.~~

~~(h) The slope(s) of the approach surface shall be measured in the vertical plane containing the centre line of the runway and shall continue containing the centre line of any lateral offset or curved ground track."~~

response Accepted

Duplications will be deleted (the word 'shall' in these paragraphs will therefore be deleted as well).

comment

1123

comment by: Flughafen Düsseldorf GmbH

Dimensionen / Neigungen gemäß ICAO (Table 4-1) ergänzen!

response

Noted

Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.

comment

1159

comment by: Swedish Transport Agency

Editorial: Part of the text in CS-ADR-DSN.H.425 on page 38 can be deleted as last part of c) is identical to f), d) is identical to g) and e) is identical to h).

response

Accepted

Duplications will be deleted.

comment

1807

comment by: Geneva International Airport (ROMIG)

f)g)h) Delete

These article are copies of other paragraphes in the same article.

response	<i>Accepted</i>
	Duplications will be deleted.
comment	1983 comment by: <i>Aéroports De Lyon</i>
	Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.
	<u>Proposition</u> : Déplacer en AR
response	<i>Not accepted</i>
	This CS does not assign responsibility for action.
comment	2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>
comment	2395 comment by: <i>MWEBWV Ministerium für Wirtschaft, Energie, Bauen, Wohnen und Verkehr des Landes Nordrhein-Westfalen</i>
	Dimensions / slopes complement according to ICAO (Table 4-1)!
response	<i>Noted</i>
	Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.
comment	2397 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	(f), (g), (h) are repetitions; remove
response	<i>Accepted</i>
	Duplications will be deleted.
comment	2589 comment by: <i>Danish Transport Authority</i>

	Editorial: Part of the text in CS-ADR-DSN.H.425 on page 38 can be deleted as last part of c) is identical to f), d) is identical to g) and e) is identical to h).
response	<i>Accepted</i>
	Duplications will be deleted.

comment	2619 comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	The paragraph listed under (3) is listed again under (f), the paragraph listed under (d) is listed again under (g) with different spelling and the paragraph listed under (e) is exactly listed again under (h). It seems obvious that a copying error has occurred and the paragraphs mentioned twice need to be deleted accordingly.
response	<i>Accepted</i>
	Duplications will be deleted.

CS-ADR – Book 1 – CS-ADR-DSN.H.430 – Transitional surface

p. 38-39

comment	4 comment by: <i>Manchester Airport plc</i>
	(a) Applicability refers to 'buildings and other structures', it does not refer to trees and vegetation. Are these to be treated as frangible and therefore not expressly prohibited? We would consider shrubs, and the upper parts of trees to be frangible and therefore permitted to infringe the transitional surface by a limited margin, perhaps 2 metres.
response	<i>Noted</i>
	The CS has been amended to include 'natural obstructions, such as trees'.

comment	53 comment by: <i>Belfast International Airport - BFS/EGAA</i>
	The ratio for the transitional slope is not specified.
response	<i>Noted</i>
	Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.

comment	<p>77 comment by: CAA-NL</p> <p>In table H-1 the term 'runway code' is used. We suggest to use the term 'code number' because this is used in the aerodrome reference code.</p>
response	<p><i>Accepted</i></p>
comment	<p>493 comment by: East Midlands Airport - EMA/EGNX</p> <p>(a) Applicability refers to 'buildings and other structures', it does not refer to trees and vegetation. Are these to be treated as frangible and therefore not expressly prohibited? We would consider shrubs, and the upper parts of trees to be frangible and therefore permitted to infringe the transitional surface by a limited margin.</p>
response	<p><i>Partially accepted</i></p> <p>'natural obstructions, such as trees' will be added.</p>
comment	<p>533 comment by: Union des Aéroports français - UAF</p> <p>Attachment #300</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.H.430</p> <p>Référence: CS-ADR-DSN.H.430 Transitional surface</p> <p>Traduction de courtoisie</p> <p>b) (1) It is appropriate to delete this point. (b) (2) The following redaction is more appropriate: « Where the transitional surface is not coincident with the runway strip: A complex surface along the side of a support line, parallel to and at a specified distance from the runway centre line indicated in Table H-1, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface. »</p> <p>(d) (2) It is appropriate to delete this point. Figure H-1: It is appropriate to transfer this provision into GM. Figure H-2: It is appropriate to transfer this provision into GM. Figure H-3: It is appropriate to transfer this provision into GM The proposed redaction enables to manage all situations even the ones where runway strip width does not correspond to minimal dimensions mentioned in CS-ADR-DSN.B.160. and associated GM. With this redaction (b) (1) and the (d) (2) become useless Figures H-1, H-2 and H-3 are only informative and should be GM.</p>
response	<p><i>Not accepted</i></p> <p>The proposed text supersedes (and deletes) the ICAO text. The 'support line' is additional to the ICAO specification for aerodromes whose individual runway</p>

strip characteristics do not meet the ICAO criteria.

comment 744

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.H.430	Transitional surface
Proposition/commentaire	<p>(b) (1) Il convient de supprimer ce point.</p> <p>(b) (2) La rédaction suivante est plus adaptée: « Where the transitional surface is not coincident with the runway strip: A complex surface along the side of a support line, parallel to and at a specified distance from the runway centre line indicated in Table H-1, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface. »</p> <p>(d) (2) Il convient de supprimer ce point.</p> <p>Figure H-1: il convient de transférer cette disposition en GM.</p> <p>Figure H-2: il convient de transférer cette disposition en GM.</p> <p>Figure H-3: il convient de transférer cette disposition en GM.</p>
Justification	<p>La rédaction proposée permet de traiter tous les cas de figure même ceux où la largeur de la bande de piste ne correspond pas avec les dimensions minimales indiquées dans le CS-ADR-DSN.B.160. et les GM associés. En effet, la surface de transition doit commencer à une distance spécifiée de l'axe de piste et non à une distance variable même si celle-ci est liée à la bande de piste. Ceci parce que la surface de transition est liée à la piste et à ses caractéristiques (Code chiffre) et non à la bande de piste.</p> <p>Avec la rédaction que nous proposons, le (b) (1) et le (d) (2) deviennent totalement inutiles.</p> <p>Les figures H-1, H-2 et H-3 ne sont que des éléments informatifs et devraient donc être en GM.</p>
Traduction de courtoisie	<p>b) (1) It is appropriate to delete this point.</p> <p>(b) (2) The following redaction is more appropriate: « Where the transitional surface is not coincident with the runway strip: A complex surface along the side of a support line, parallel</p>

	<p>to and at a specified distance from the runway centre line indicated in Table H-1, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface. »</p> <p>(d) (2) It is appropriate to delete this point.</p> <p>Figure H-1: It is appropriate to transfer this provision into GM.</p> <p>Figure H-2: It is appropriate to transfer this provision into GM.</p> <p>Figure H-3: It is appropriate to transfer this provision into GM</p> <p>The proposed redaction enables to manage all situations even the ones where runway strip width does not correspond to minimal dimensions mentioned in CS-ADR-DSN.B.160. and associated GM.</p> <p>With this redaction (b) (1) and the (d) (2) become useless</p> <p>Figures H-1, H-2 and H-3 are only informative and should be GM.</p>
<p>response</p>	<p><i>Not accepted</i></p> <p>The proposed text supersedes (and deletes) the ICAO text. The 'support line' is additional to the ICAO specification for aerodromes whose individual runway strip characteristics do not meet the ICAO criteria.</p>

comment 823 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN. H.415 — conical surface (p37)
- CS-ADR - Book 1 - CS-ADR-DSN. H.420 — Inner horizontal surface (p37-38)
- CS-ADR - Book 1 - CS-ADR-DSN.H.430 — Transitional surface (p38-39)
- CS-ADR - Book 1 - CS-ADR-DSN.H.450 — Inner approach surface (p43)
- CS-ADR - Book 1 - CS-ADR-DSN.H.455 — Inner transitional surface (p43-44)

- CS-ADR - Book 1 – CS-ADR-DSN.H.460 — Balked landing surface (p44)

2. Justification and proposed text / comment

It is understood the part "Applicability" of the CS describing each OLS provides for the objective of the given OLS, which DGAC finds essential.

DGAC proposes to make these objectives in accordance with what is currently proposed for the revision of the part 6 of ICAO airport services manual by the ICAO task force common to the ICAO instrument flight procedures panel and the ICAO aerodrome panel.

Indeed, the proposed objectives have been determined after some studies conducted within this group.

* For the inner horizontal and conical surfaces, they share the same objective which is to protect aircraft performing aerodrome pattern.

Thus the proposed modification:

CS-ADR-DSN.H.415 — Conical surface

"(a) Applicability: ~~The purpose of the conical surface is mainly to facilitate protect airspace for aerodrome pattern and visual manoeuvring prior to landing in the vicinity of the aerodrome.~~

[...]"

CS-ADR-DSN.H.420 — Inner horizontal surface

"(a) Applicability: ~~The purpose of the inner horizontal surface is to protect airspace for aerodrome pattern and visual manoeuvring prior to landing.~~

[...]"

CS-ADR-DSN.H.430 — Transitional surface

"(a) Applicability: ~~The purpose of the transitional surface is to define the limit of the area available for buildings or other structures~~ protect aircraft from deviations from the runway axis.

[...]"

CS-ADR-DSN.H.450 — Inner approach surface

"(a) Applicability: ~~The purpose of the inner approach surface is to protect final precision approaches.~~

Description: ~~A rectangular portion of the approach surface immediately preceding the threshold. [...]"~~

CS-ADR-DSN.H.455 — Inner transitional surface

"(a) Applicability: ~~The purpose of the inner transitional surface is to protect aeroplanes during precision approaches and balked landing from deviations from the runway axis.~~

Description: ~~A surface similar to the transitional surface but closer to the runway. [...]"~~

CS-ADR-DSN.H.460 — Balked landing surface

"(a) Applicability: ~~The purpose of the balked landing surface is to protect balked landing with all engines operating.~~

Description: ~~An inclined plane located at a specified distance after the threshold, extending between the inner transitional surfaces. [...]"~~

response

Not accepted

CS-ADR-DSN.H.430: The ICAO stated purpose is to limit obstacles to permit safe operation of aircraft. The existing wording, defining the area to be free of obstacles, gives that implicit protection to aircraft.

The remaining comments are answered in the relevant CS segment.

comment 826 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.002 — Definitions (p4-9)
- CS-ADR - Book 1 - CS-ADR-DSN. H.420 — Inner horizontal surface (p37-38)
- CS-ADR - Book 1 - CS-ADR-DSN.H.430 — Transitional surface (p38-39)
- CS-ADR - Book 1 - CS-ADR-DSN.H.455 — Inner transitional surface (p43-44)
- (B.III) corrigendum - Table J-1 – Dimensions and slopes of obstacle limitation surfaces — Approach runways (p3-4)

2. Justification and proposed text / comment

This comment is linked with comment 10 in (B.III) corrigendum.

These provisions are to be reviewed to take into account the concept of "support line" that has been adopted by the group ADR.003 as an alternative of the contour the runway strip.

For recall, this concept permits to solve the issues raised when the dimensions of the runway strip are much greater than the minimum value required. In these cases, the "support line" of OLS, particularly the support line of the transitional surfaces, is not coincident with the contour of the runway strip. Thus it is essential to be able to establish OLS independently from the contour of the runway strip, which is allowed by this concept.

For instance, the distance of 60m in note (c) of table J-1 corresponds to the minimal length of the runway strip beyond the runway end. It is frequent to have runway strips ending beyond this distance. For technical reasons, the obstacle limitation surfaces related to interrupted take-off surface are related to this distance and not to the end of the runway strip.

Note: the concept of the support line enables to manage both the case where the runway strip is coincident with the support line and the cases where it is not coincident. Thus, the redaction with the strip could be deleted without any consequence.

This concept has already been taken into account in CS on transitional surfaces (for instance CS-ADR-DSN.H.430), which is a good thing, but it is essential to use it also for other OLS when the strip is used in order to harmonize the design.

Thus the following proposed modifications:

"Obstacle free zone (OFZ)" means the airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces or, when the support line is not coincident with the strip, the portion of ground bounded by the support line which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes."

Table J-1 – Dimensions and slopes of obstacle limitation surfaces — Approach runways * Note (c)

"c. Distance to the end of strip or, when the runway strip is not coincident with the inner edge of the approach surface, to 60 m beyond the runway end."

CS-ADR-DSN. H.420 — Inner horizontal surface

"[...] (c) Characteristics: The outer limits of the inner horizontal surface are defined by circular arcs centred on the intersection of the extended RWY centre line with the end of the RWY strip or, when the runway strip is not coincident with the inner edge of the approach surface, with the vertical line passing through the middle of the inner edge of the approach surface, joined tangentially by straight lines. (Figure H-1.)
[...]"

Editorial improvement of CS-ADR-DSN.H.430 — Transitional surface

"[...]"

(b) Description:[...]"

(2) Where the transitional surface is not coincident with the runway strip: a complex surface along the side of a support line, parallel to and at a specified distance specified in table H-1 from the runway centre line, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface.

(c) Characteristics: The limits of a transitional surface should comprise:

(1) Where the transitional surface is coincident with the runway strip:

(i) a lower edge beginning at the intersection of the side of the approach surface with the inner horizontal surface and extending down the side of the approach surface to the inner edge of the approach surface and from there along the length of the strip parallel to the runway centre line; and

~~(2)~~(ii) An upper edge located in the plane of the inner horizontal surface; or

~~(3)~~ (2) Where the transitional surface is not coincident with the runway strip:

(i) a lower edge beginning at the intersection of the side of the approach surface with the inner horizontal surface and extending down the side of the approach surface to the inner edge of the approach surface and from there along a support line parallel to the runway centre line, whose distance to the runway centre line is according to table H-1 below; and

(ii) An upper edge located in the plane of the inner horizontal surface.

"[...]"

CS-ADR-DSN.H.455 — Inner transitional surface

"[...]"

(b) Characteristics: The limits of an inner transitional surface should comprise:

(1) Where the transitional surface is coincident with the runway strip:

(i) a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that surface, from there along the strip parallel to the runway centre line to the inner edge of the balked landing surface and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and

~~(2)~~(ii) an upper edge located in the plane of the inner horizontal surface.

(2) Where the transitional surface is not coincident with the runway strip:

(i) a lower edge beginning at the intersection of the side of the approach surface with the inner horizontal surface and extending down the side of the approach surface to the inner edge of the approach surface and from there along the support line parallel to the runway centre line, at a specified distance to the runway centre line indicated in table H-2 below; and

(ii) An upper edge located in the plane of the inner horizontal surface.

(c) The elevation of a point on the lower edge should be:

(1) along the side of the inner approach surface and balked landing surface —

equal to the elevation of the particular surface at that point; and
 (2) along the strip — equal to the elevation of the nearest point on the centre line of the runway or its extension.

(3) Along the transitional surface support line — equal to the elevation of this line at that point.

[...]”

Table H-2: distance between inner transitional surface support line and runway centre line

	Precision approach Category I	Precision approach Category II or III
Runway code	1,2	3,4
	45 m	60 m

response *Noted*

The improved editorial comment — this is confusing, as the proposed distances for the ‘support line’ in Table H-1 are the same as those in ICAO for the Transitional Surface.

comment 1125

comment by: Flughafen Düsseldorf GmbH

Dimensionen / Neigungen gemäß ICAO (Table 4-1) ergänzen!

response *Noted*

Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.

comment 1474

comment by: Euroairport Bâle-Mulhouse

Attachment [#301](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.H.430

Référence: CS-ADR-DSN.H.430
 Transitional surface

Traduction de courtoisie

b) (1) It is appropriate to delete this point.

b) (2) The following redaction is more appropriate: « ~~Where the transitional~~

~~surface is not coincident with the runway strip: A complex surface along the side of a support line, parallel to and at a specified distance from the runway centre line indicated in Table H-1, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface. »~~

(d) (2) It is appropriate to delete this point.

Figure H-1: It is appropriate to transfer this provision into GM.

Figure H-2: It is appropriate to transfer this provision into GM.

Figure H-3: It is appropriate to transfer this provision into GM

The proposed redaction enables to manage all situations even the ones where runway strip width does not correspond to minimal dimensions mentioned in CS-ADR-DSN.B.160. and associated GM.

With this redaction (b) (1) and the (d) (2) become useless

Figures H-1, H-2 and H-3 are only informative and should be GM.

response *Not accepted*

The proposed text supersedes (and deletes) the ICAO text. The 'support line' is additional to the ICAO specification for aerodromes whose individual runway strip characteristics do not meet the ICAO criteria.

comment

1579

comment by: *Aéroport de Marseille - MRS/LFML*

b) (1) It is appropriate to delete this point.

(b) (2) The following redaction is more appropriate: « ~~Where the transitional surface is not coincident with the runway strip: A complex surface along the side of a support line, parallel to and at a specified distance from the runway centre line indicated in Table H-1, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface. »~~

(d) (2) It is appropriate to delete this point.

Figure H-1: It is appropriate to transfer this provision into GM.

Figure H-2: It is appropriate to transfer this provision into GM.

Figure H-3: It is appropriate to transfer this provision into GM

response *Not accepted*

The proposed text supersedes (and deletes) the ICAO text. The 'support line' is additional to the ICAO specification for aerodromes whose individual runway strip characteristics do not meet the ICAO criteria.

comment

1916

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#302](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.H.430

Référence: CS-ADR-DSN.H.430
Transitional surface

Traduction de courtoisie

b) (1) It is appropriate to delete this point.

(b) (2) The following redaction is more appropriate: « ~~Where the transitional surface is not coincident with the runway strip:~~ A complex surface along the side of a support line, parallel to and at a specified distance from the runway centre line indicated in Table H-1, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface. »

(d) (2) It is appropriate to delete this point.

Figure H-1: It is appropriate to transfer this provision into GM.

Figure H-2: It is appropriate to transfer this provision into GM.

Figure H-3: It is appropriate to transfer this provision into GM

The proposed redaction enables to manage all situations even the ones where runway strip width does not correspond to minimal dimensions mentioned in CS-ADR-DSN.B.160. and associated GM.

With this redaction (b) (1) and the (d) (2) become useless

Figures H-1, H-2 and H-3 are only informative and should be GM.

response *Not accepted*

The proposed text supersedes (and deletes) the ICAO text. The 'support line' is additional to the ICAO specification for aerodromes whose individual runway strip characteristics do not meet the ICAO criteria.

comment 1984

comment by: *Aéroports De Lyon*

Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.

Proposition: Déplacer en AR

response *Not accepted*

This CS does not assign responsibility for action.

comment 2044

comment by: *Pau Pyrénées Airport - PUF/LFBP*

b) (1) It is appropriate to delete this point.

(b) (2) The following redaction is more appropriate: « ~~Where the transitional surface is not coincident with the runway strip:~~ A complex surface along the side of a support line, parallel to and at a specified distance from the runway centre line indicated in Table H-1, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface. »

(d) (2) It is appropriate to delete this point.

The proposed redaction enables to manage all situations even the ones where runway strip width does not correspond to minimal dimensions mentioned in

response	<p>CS-ADR-DSN.B.160. and associated GM.</p> <p>With this redaction (b) (1) and the (d) (2) become useless</p> <p>Figures H-1, H-2 and H-3 are only informative and should be GM.</p> <p><i>Not accepted</i></p> <p>The proposed text supersedes (and deletes) the ICAO text. The 'support line' is additional to the ICAO specification for aerodromes whose individual runway strip characteristics do not meet the ICAO criteria.</p>
comment	<p>2170 comment by: <i>HIA - Highlands and Islands Airports Limited</i></p>
response	<p>Consider including a capability which brings in a 1:10 surface to permit frangible items such as nav aids within runway strip, as described in B.165. (and as current UK regulations)</p> <p><i>Noted</i></p> <p>This provision is not covered by ICAO specifications. It could be considered via the ELOS or SC mechanisms.</p>
comment	<p>2396 comment by: <i>MWEBWV Ministerium für Wirtschaft, Energie, Bauen, Wohnen und Verkehr des Landes Nordrhein-Westfalen</i></p>
response	<p>Dimensions / slopes complement according to ICAO (Table 4-1)!</p> <p><i>Noted</i></p> <p>Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.</p>
comment	<p>2701 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p>
	<p>Attachment #303</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.H.430</p> <p>Référence: CS-ADR-DSN.H.430 Transitional surface</p> <p>Traduction de courtoisie</p> <p>b) (1) It is appropriate to delete this point.</p> <p>b) (2) The following redaction is more appropriate: « Where the transitional surface is not coincident with the runway strip: A complex surface along the</p>

side of a support line, parallel to and at a specified distance from the runway centre line indicated in Table H-1, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface. »

(d) (2) It is appropriate to delete this point.

Figure H-1: It is appropriate to transfer this provision into GM.

Figure H-2: It is appropriate to transfer this provision into GM.

Figure H-3: It is appropriate to transfer this provision into GM

The proposed redaction enables to manage all situations even the ones where runway strip width does not correspond to minimal dimensions mentioned in CS-ADR-DSN.B.160. and associated GM.

With this redaction (b) (1) and the (d) (2) become useless

Figures H-1, H-2 and H-3 are only informative and should be GM.

response

Not accepted

The proposed text supersedes (and deletes) the ICAO text. The 'support line' is additional to the ICAO specification for aerodromes whose individual runway strip characteristics do not meet the ICAO criteria.

comment

2874

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.H.430	Transitional surface
Proposition/commentaire	<p>(b) (1) Il convient de supprimer ce point.</p> <p>(b) (2) La rédaction suivante est plus adaptée: « Where the transitional surface is not coincident with the runway strip: A complex surface along the side of a support line, parallel to and at a specified distance from the runway centre line indicated in Table H-1, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface. »</p> <p>(d) (2) Il convient de supprimer ce point.</p> <p>Figure H-1: il convient de transférer cette disposition en GM.</p> <p>Figure H-2: il convient de transférer cette disposition en GM.</p> <p>Figure H-3: il convient de transférer cette disposition en GM.</p>
Justification	<p>La rédaction proposée permet de traiter tous les cas de figure même ceux où la largeur de la bande de piste ne correspond pas avec les dimensions minimales indiquées dans le CS-ADR-DSN.B.160. et les GM associés. En effet, la surface de transition doit commencer à une distance spécifiée de l'axe de piste et non à une</p>

	<p>distance variable même si celle-ci est liée à la bande de piste. Ceci parce que la surface de transition est liée à la piste et à ses caractéristiques (Code chiffre) et non à la bande de piste.</p> <p>Avec la rédaction que nous proposons, le (b) (1) et le (d) (2) deviennent totalement inutiles.</p> <p>Les figures H-1, H-2 et H-3 ne sont que des éléments informatifs et devraient donc être en GM.</p>
<p>Traduction de courtoisie</p>	<p>b) (1) It is appropriate to delete this point.</p> <p>(b) (2) The following redaction is more appropriate: « Where the transitional surface is not coincident with the runway strip: A complex surface along the side of a support line, parallel to and at a specified distance from the runway centre line indicated in Table H-1, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface. »</p> <p>(d) (2) It is appropriate to delete this point.</p> <p>Figure H-1: It is appropriate to transfer this provision into GM.</p> <p>Figure H-2: It is appropriate to transfer this provision into GM.</p> <p>Figure H-3: It is appropriate to transfer this provision into GM</p> <p>The proposed redaction enables to manage all situations even the ones where runway strip width does not correspond to minimal dimensions mentioned in CS-ADR-DSN.B.160. and associated GM.</p> <p>With this redaction (b) (1) and the (d) (2) become useless</p> <p>Figures H-1, H-2 and H-3 are only informative and should be GM.</p>
<p>response</p>	<p><i>Not accepted</i></p> <p>The proposed text supersedes (and deletes) the ICAO text. The 'support line' is</p>

additional to the ICAO specification for aerodromes whose individual runway strip characteristics do not meet the ICAO criteria.

CS-ADR – Book 1 – Figure H-1 Inner horizontal surface where the runway is code 4

p. 40

comment 533 ❖

comment by: *Union des Aéroports français - UAF*

UAF NPA 2011-20 (B.III) CS-ADR-DSN.H.430

Référence: CS-ADR-DSN.H.430
Transitional surface

Traduction de courtoisie

b) (1) It is appropriate to delete this point.

(b) (2) The following redaction is more appropriate: « ~~Where the transitional surface is not coincident with the runway strip:~~ A complex surface along the side of a support line, parallel to and at a specified distance from the runway centre line indicated in Table H-1, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface. »

(d) (2) It is appropriate to delete this point.

Figure H-1: It is appropriate to transfer this provision into GM.

Figure H-2: It is appropriate to transfer this provision into GM.

Figure H-3: It is appropriate to transfer this provision into GM

The proposed redaction enables to manage all situations even the ones where runway strip width does not correspond to minimal dimensions mentioned in CS-ADR-DSN.B.160. and associated GM.

With this redaction (b) (1) and the (d) (2) become useless

Figures H-1, H-2 and H-3 are only informative and should be GM.

response *Not accepted*

The proposed text supersedes (and deletes) the ICAO text. The 'support line' is additional to the ICAO specification for aerodromes whose individual runway strip characteristics do not meet the ICAO criteria.

comment 827 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN. H.420 — Inner horizontal surface (p37)
- CS-ADR - Book 1 - Figure H-1. Inner horizontal surface where the runway is code 4 (p40)
- CS-ADR - Book 1 - Figure H-2. Obstacle limitation surfaces (p41)

- CS-ADR - Book 2 - GM-ADR-DSN.H.420 — Inner horizontal surface (p241)

2. Justification and proposed text / comment

The elevation datum is "established for such purpose" (as specified in ICAO Annex 14 Volume1).

Moreover, paragraph (d)(1) of CS-ADR-DSN. H.420 proposes four possibilities to determine this elevation point, with the use of the word "may". These different possibilities are meant to be in guidance material.

Finally, figure H-1 and figure H-2 are meant to be in guidance material because they are only an example of a possible design of the OLS, particularly concerning the design of the inner horizontal surface which is not, as said truly in the GM associated, necessary circular. The option of designing the OLS from the transitional surface support line (see CS-ADR-DSN.H.430 paragraphs (c)(3) and (d)(3)) is not taken into account either by these examples.

Thus DGAC proposes to move parts of this CS to GM and proposes to move figure H-1 and figure H-2 to GM as "figure GM-H-1" and "Figure GM-H-2" respectively. Existing figure GM-H-1 thus becomes "Figure GM-H-3".

Moreover, to avoid any confusion in the numbering of the figures, it is proposed to delete the words "figure 1.2" from the title of existing Figure GM-H-1 (which is the numbering of ICAO Annex 14 volume 1).

See detailed modifications below:

CS-ADR-DSN.H.420 — Inner horizontal surface

"(a) Applicability: The purpose of the inner horizontal surface is to protect airspace for visual manoeuvring prior to landing.

(b) Description: A surface located in a horizontal plane above an aerodrome and its environs.

(c) Characteristics: The outer limits of the inner horizontal surface are defined by circular arcs centred on the intersection of the extended RWY centre line with the end of the RWY strip joined tangentially by straight lines. (Figure H-1.)

(d) The height of the inner horizontal surface should be measured above an established elevation datum established for such purpose.

~~(1) The elevation datum used for the height of the inner horizontal surface may be:~~

~~(i) the elevation of the highest point of the lowest threshold of the related runway;~~

~~(ii) the elevation of the highest point of the highest threshold of the related runway;~~

~~(iii) the elevation of the highest point of the runway;~~

~~(iv) the aerodrome elevation."~~

~~Figure H-1 Inner horizontal surface where the runway is code 4~~

~~Figure H-2 Obstacle limitation surfaces~~

GM-ADR-DSN.H.420 — Inner horizontal surface

"(a) The shape of the inner horizontal surface need not necessarily be circular. Guidance on determining the extent of the inner horizontal surface is contained in the Airport Services Manual (ICAO, Doc 9137, Part 6).

(b) The limits of the inner horizontal surface for longer runways (1 800 m or more in length) are defined as circles of radius 4 000 m centred on the strip ends of the runway. These circles are joined by common tangents parallel to the runway centre line to form a racetrack pattern. The boundary of this pattern is the boundary of the inner horizontal surface.

(c) For runways less than 1 800 m in length, the inner horizontal surface is defined as a circles centred on the midpoint of the runway.

(d) The elevation datum used for the height of the inner horizontal surface may

be:

(1) the elevation of the highest point of the lowest threshold of the related runway;

(2) the elevation of the highest point of the highest threshold of the related runway;

(3) the elevation of the highest point of the runway;

(4) the aerodrome elevation."

(de) To protect two or more runways, a more complex pattern could become necessary. In this situation, all the circles are joined tangentially by straight lines: illustrated at the Figure GM-H-1.

(ef) For more complex inner horizontal surfaces, with runways on different levels or runways where the thresholds differ more than 6 m, a common elevation is not essential, but where surfaces overlap, the lower surface should be regarded as dominant.

(fg) Further guidance is contained in the Airport Services Manual (ICAO, DOC 9137, part 6)."

Figure GM-H-1 Inner horizontal surface where the runway is code 4

Figure GM-H-2 Obstacle limitation surfaces

Figure ~~GM-H-1~~ GM-H-3 Example of composite inner horizontal surface for two parallel runways (where the runway code number is 4)

response *Not accepted*

The CS provides four options to allow flexibility in selecting a datum for the Inner Horizontal Surface.

Figures H-1 and H-2 are illustrative of the relationship between the obstacle limitation surfaces, not an example of construction of those surfaces.

comment 1985

comment by: *Aéroports De Lyon*

Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.

Proposition: Déplacer en AR

response *Not accepted*

This CS does not assign responsibility for action.

comment 2212 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 533 ❖ comment by: *Union des Aéroports français - UAF*

UAF NPA 2011-20 (B.III) CS-ADR-DSN.H.430

Référence: CS-ADR-DSN.H.430
Transitional surface

Traduction de courtoisie

b) (1) It is appropriate to delete this point.

(b) (2) The following redaction is more appropriate: « ~~Where the transitional surface is not coincident with the runway strip:~~ A complex surface along the side of a support line, parallel to and at a specified distance from the runway centre line indicated in Table H-1, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface. »

(d) (2) It is appropriate to delete this point.

Figure H-1: It is appropriate to transfer this provision into GM.

Figure H-2: It is appropriate to transfer this provision into GM.

Figure H-3: It is appropriate to transfer this provision into GM

The proposed redaction enables to manage all situations even the ones where runway strip width does not correspond to minimal dimensions mentioned in CS-ADR-DSN.B.160. and associated GM.

With this redaction (b) (1) and the (d) (2) become useless

Figures H-1, H-2 and H-3 are only informative and should be GM.

response *Not accepted*

The proposed text supersedes (and deletes) the ICAO text. The 'support line' is additional to the ICAO specification for aerodromes whose individual runway strip characteristics do not meet the ICAO criteria.

comment 827 ❖ comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN. H.420 — Inner horizontal surface (p37)
- CS-ADR - Book 1 - Figure H-1. Inner horizontal surface where the runway is code 4 (p40)
- CS-ADR - Book 1 - Figure H-2. Obstacle limitation surfaces (p41)
- CS-ADR - Book 2 - GM-ADR-DSN.H.420 — Inner horizontal surface (p241)

2. Justification and proposed text / comment

The elevation datum is "established for such purpose" (as specified in ICAO Annex 14 Volume1).

Moreover, paragraph (d)(1) of CS-ADR-DSN. H.420 proposes four possibilities to determine this elevation point, with the use of the word "may". These different possibilities are meant to be in guidance material.

Finally, figure H-1 and figure H-2 are meant to be in guidance material because they are only an example of a possible design of the OLS, particularly concerning the design of the inner horizontal surface which is not, as said truly in the GM associated, necessary circular. The option of designing the OLS from

the transitional surface support line (see CS-ADR-DSN.H.430 paragraphs (c)(3) and (d)(3)) is not taken into account either by these examples.

Thus DGAC proposes to move parts of this CS to GM and proposes to move figure H-1 and figure H-2 to GM as "figure GM-H-1" and "Figure GM-H-2" respectively. Existing figure GM-H-1 thus becomes "Figure GM-H-3".

Moreover, to avoid any confusion in the numbering of the figures, it is proposed to delete the words "figure 1.2" from the title of existing Figure GM-H-1 (which is the numbering of ICAO Annex 14 volume 1).

See detailed modifications below:

CS-ADR-DSN.H.420 – Inner horizontal surface

"(a) Applicability: The purpose of the inner horizontal surface is to protect airspace for visual manoeuvring prior to landing.

(b) Description: A surface located in a horizontal plane above an aerodrome and its environs.

(c) Characteristics: The outer limits of the inner horizontal surface are defined by circular arcs centred on the intersection of the extended RWY centre line with the end of the RWY strip joined tangentially by straight lines. ~~(Figure H-1.)~~

(d) The height of the inner horizontal surface should be measured above an ~~established~~ elevation datum established for such purpose.

~~*(1) The elevation datum used for the height of the inner horizontal surface may be:*~~

~~*(i) the elevation of the highest point of the lowest threshold of the related runway;*~~

~~*(ii) the elevation of the highest point of the highest threshold of the related runway;*~~

~~*(iii) the elevation of the highest point of the runway;*~~

~~*(iv) the aerodrome elevation."*~~

~~Figure H-1 Inner horizontal surface where the runway is code 4~~

~~Figure H-2 Obstacle limitation surfaces~~

GM-ADR-DSN.H.420 – Inner horizontal surface

"(a) The shape of the inner horizontal surface need not necessarily be circular. Guidance on determining the extent of the inner horizontal surface is contained in the Airport Services Manual (ICAO, Doc 9137, Part 6).

(b) The limits of the inner horizontal surface for longer runways (1 800 m or more in length) are defined as circles of radius 4 000 m centred on the strip ends of the runway. These circles are joined by common tangents parallel to the runway centre line to form a racetrack pattern. The boundary of this pattern is the boundary of the inner horizontal surface.

(c) For runways less than 1 800 m in length, the inner horizontal surface is defined as a circles centred on the midpoint of the runway.

(d) The elevation datum used for the height of the inner horizontal surface may be:

(1) the elevation of the highest point of the lowest threshold of the related runway;

(2) the elevation of the highest point of the highest threshold of the related runway;

(3) the elevation of the highest point of the runway;

(4) the aerodrome elevation."

~~*(de) To protect two or more runways, a more complex pattern could become necessary. In this situation, all the circles are joined tangentially by straight lines: illustrated at the Figure GM-H-1.*~~

~~*(ef) For more complex inner horizontal surfaces, with runways on different levels or runways where the thresholds differ more than 6 m, a common elevation is not essential, but where surfaces overlap, the lower surface should*~~

be regarded as dominant.

(fg) Further guidance is contained in the Airport Services Manual (ICAO, DOC 9137, part 6)."

Figure GM-H-1 Inner horizontal surface where the runway is code 4

Figure GM-H-2 Obstacle limitation surfaces

Figure ~~GM-H-1~~ GM-H-3 Example of composite inner horizontal surface for two parallel runways (where the runway code number is 4)

response *Not accepted*

The CS provides four options to allow flexibility in selecting a datum for the Inner Horizontal Surface.

Figures H-1 and H-2 are illustrative of the relationship between the obstacle limitation surfaces, not an example of construction of those surfaces.

comment

1986

comment by: *Aéroports De Lyon*

Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.

Proposition: Déplacer en AR

response

Not accepted

This CS does not assign responsibility for action.

comment

2212 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response

Noted

comment

2620

comment by: *Airport Nuremberg - NUE/EDDN*

Figures in this Figure still refer to chapters and sections of the ICAO Annex 14 and need therefore to be adapted to the according EASA chapters.

response

Accepted

The references have been amended to EASA references.

comment	533 ❖ comment by: <i>Union des Aéroports français - UAF</i>
	<p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.H.430</p> <p>Référence: CS-ADR-DSN.H.430 Transitional surface</p> <p>Traduction de courtoisie</p> <p>b) (1) It is appropriate to delete this point.</p> <p>(b) (2) The following redaction is more appropriate: « Where the transitional surface is not coincident with the runway strip: A complex surface along the side of a support line, parallel to and at a specified distance from the runway centre line indicated in Table H-1, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface. »</p> <p>(d) (2) It is appropriate to delete this point.</p> <p>Figure H-1: It is appropriate to transfer this provision into GM.</p> <p>Figure H-2: It is appropriate to transfer this provision into GM.</p> <p>Figure H-3: It is appropriate to transfer this provision into GM</p> <p>The proposed redaction enables to manage all situations even the ones where runway strip width does not correspond to minimal dimensions mentioned in CS-ADR-DSN.B.160. and associated GM.</p> <p>With this redaction (b) (1) and the (d) (2) become useless Figures H-1, H-2 and H-3 are only informative and should be GM.</p>
response	<i>Not accepted</i>
	<p>The proposed text supersedes (and deletes) the ICAO text. The 'support line' is additional to the ICAO specification for aerodromes whose individual runway strip characteristics do not meet the ICAO criteria.</p>
comment	1987 comment by: <i>Aéroports De Lyon</i>
	<p>Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.</p> <p><u>Proposition</u>: Déplacer en AR</p>
response	<i>Not accepted</i>
	<p>This CS does not assign responsibility for action.</p>
comment	2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<p>Noted</p>
response	<i>Noted</i>

comment	56	comment by: <i>Belfast International Airport - BFS/EGAA</i>
	Dimensions required for the take off climb surface	
response	<i>Noted</i>	
	Chapter H describes the obstacle limitation surfaces; dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.	
comment	1033	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	There is no need to add an abbreviation in this context. Furthermore, it is not re-used on the next pages. Please remove the abbreviation "TOCS".	
response	<i>Accepted</i>	
	'TOCS' will be deleted.	
comment	1358	comment by: <i>ECA - European Cockpit Association</i>
	Amend description as follows: "An inclined plane or other specified surface beyond the end of a runway or clearway starting 60m (200ft) beyond the upwind end of a runway or clearway when such is provided.	
	Justification: Reference: IFALPA Annex 14, paragraph 4.1.25	
response	<i>Not accepted</i>	
	Not all runway codes require 60 metres.	
comment	1360	comment by: <i>ECA - European Cockpit Association</i>
	Amend (c) (1) as follows:	
	(c) (1) an inner edge horizontal and perpendicular to the centre line of the runway and located either at a specified distance beyond the end of the runway or at the end of the clearway <u>located either at 60m (200ft) beyond the upwind end of the runway or the clearway</u> when such is provided and its length exceeds the specified distance;	

response	<p>Justification: This sub-paragraph requires amendment to render it more specific. Reference: IFALPA Annex 14, paragraph 4.1.26</p> <p><i>Not accepted</i></p> <p>This is ICAO wording.</p>
comment	<p>1361 comment by: ECA - European Cockpit Association</p> <p>Amend as follows:</p> <p>(d) The elevation of the inner edge should be equal to the highest point on the extended runway centre line between the end of the runway and the inner edge 60m (200ft) beyond the upwind end of the runway and the inner edge, except that when a clearway plus 60m (200ft) is provided, the elevation should be equal to the highest point on the ground on the centre line of the extended clearway.</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 4.1.27</p>
response	<p><i>Not accepted</i></p> <p>ICAO wording will be used.</p>
comment	<p>1989 comment by: Aéroports De Lyon</p> <p>Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.</p> <p><u>Proposition</u>: Déplacer en AR</p>
response	<p><i>Not accepted</i></p> <p>This CS does not assign responsibility for action.</p>
comment	<p>2212 ❖ comment by: HIA - Highlands and Islands Airports Limited</p> <p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2479 comment by: AENA - Aeropuertos Españoles y Navegación Aérea</p>

It is confused paragraph (f), because we do not know when we have to apply it.

It should be apply every time there are a curved flight procedure?.

It is noticed there can be more than one published procedure on a same departure QFU, notably there can be one straight and some curved. In this case, several take off climb surfaces should be established?:

- a straight one for the straight procedure and
- some curved for the curved procedures.

It is important clarify this point, because we need so many take-off climb surfaces as take-off procedured? (some times there are a lot of them for noise reasons....)

Before to establish a new take-off procedured, Is it needed to establish a new take-off climb surface?

It is a critical point for us. We think that it shall not joint Aerodrome issues with ATM issues.

It is proposed as follows:

(f) In the case of a **principal** take-off flight path involving a turn, the take-off climb surface should be a complex surface containing the horizontal normal to its centre line, and the slope of the centre line should be the same as that for a straight take-off flight path.

response *Noted*

The CS contains the design parameters. These questions relate to operational procedures.

comment

538

comment by: *Union des Aéroports français - UAF*

Attachment [#304](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.H.440

Référence: CS-ADR-DSN.H.440

Slewled Take-off climb surface (évasement de la trouée de décollage)

Traduction de courtoisie

It is appropriate to keep in CS only the following part of the provision: "The edge of a TOCS may be slewled in the direction of a turn away" and to transfer the rest of the provision into GM.

Moreover, the maximal value of 15° does not allow handling all possible cases.

It is important to put the possibility to handle curved trajectories into CS. Nevertheless, the way to handle it is a matter of recommendations and not of CS.

Indeed, we can have several methods to define these surfaces which have to be correlated to take-off trajectories in all cases. In France, we may have a value higher than 15°. Moreover, the take-off funnel can have a shape different from the one described in the CS.

response *Accepted*

The CS will be moved to GM.

comment

745

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.H.440	Slewed Take-off climb surface (évasement de la trouée de décollage)
Proposition/commentaire	<p>Il convient de ne garder de cette disposition que la partie suivante: "The edge of a TOCS may be slewed in the direction of a turn away" et de transférer le reste de la disposition en GM.</p> <p>Par ailleurs, la valeur maximum de 15° pour l'évasement ne permet pas de traiter tous les cas de figure.</p>
Justification	<p>Il est important de pouvoir mettre en CS la possibilité de traiter des trajectoires courbes. Cependant la manière de la traiter relève des règles de l'art et non des CS. En effet nous pouvons avoir plusieurs méthodes pour définir ces surfaces qui, dans tous les cas doivent être corrélées avec les trajectoires de décollage. En France, nous pouvons avoir une courbure qui donnerait un évasement supérieur à 15°. De plus, la trouée de décollage peut avoir une forme différente que celle décrite dans la CS.</p>
Traduction de courtoisie	<p>It is appropriate to keep in CS only the following part of the provision: "The edge of a TOCS may be slewed in the direction of a turn away" and to transfer the rest of the provision into GM.</p> <p>Moreover, the maximal value of 15° does not allow handling all possible cases.</p> <p>It is important to put the possibility to handle curved trajectories into CS. Nevertheless, the way to handle it is a matter of recommendations and not of CS. Indeed, we can have several methods to define these surfaces which have to be correlated to take-off trajectories in all cases. In France, we may have a value higher than 15°. Moreover, the take-off funnel can have a shape different from the one described in the CS.</p>

response *Accepted*

The CS will be moved to GM.

comment 824

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN. H.440 — Slew'd Take-off climb surface (p43)

2. Justification and proposed text / comment

DGAC is pleased with this provision that permit to deal with the curved surfaces that can be needed in several cases, notably when departure flight procedures are curved because of terrain and obstacles.

But the maximum 15° splay does not allow handling all possible cases. There are several methods to define curved surfaces and shapes may differ a lot from the one proposed. It is essential that this CS provides the general objective and a general method to design such surfaces.

Such surfaces are curved when they is a curved flight procedure. It is noticed there can be more than one published procedure on a same departure QFU, notably there can be one straight and one curved. In this case, two take off climb surfaces are established: a straight one for the straight procedure and a curved one for the curved procedures. Concerning the curved procedure, it is thus the centre line of the surface which is curved, not only one edge.

The possibility for curved approach surfaces is dealt with in paragraph (c) of CS-ADR-DSN.H.425, according to provision 4.1.8 of ICAO Annex 14 volume 1: *The above surfaces should be varied when lateral offset, offset or curved approaches are utilised, specifically, two sides originating at the ends of the inner edge and diverging uniformly at a specified rate from the extended centre line of the lateral offset, offset or curved ground track.*

This paragraph is clearer and corresponds to the need of general method aforementioned. Thus DGAC proposes to take it as the reference to write the one for the take-off.

CS-ADR-DSN. H.440 — Slew'd Curved Take-off climb surface

~~The edge of a TOCS~~ A take-off climb surface may be slew'd curved when lateral offset, offset or curved departures are utilised in the direction of a turn away from the extended runway centre line up to a maximum of 15° splay. The axis of the curved surface should follow the lateral offset, offset or curved ground track and should have the same slope as the one specified for a straight surface. The two sides should begin at the ends of the inner edge and diverge uniformly at a specified rate from the extended centre line of the lateral offset, offset or curved ground track.

~~The portion of TOCS encompassing the new departure track should be the same shape and dimensions as the original TOCS measured relative to the new~~

~~departure track. The opposite edge of the TOCS should remain unchanged unless there is another turning departure towards that side as well, in which case, the edge may be slewed in that direction too."~~

response *Noted*

The CS will be moved to GM.

comment

1475

comment by: Euroairport Bâle-Mulhouse

Attachment [#305](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.H.440

Référence: CS-ADR-DSN.H.440

Slewéd Take-off climb surface (évasement de la trouée de décollage)

Traduction de courtoisie

It is appropriate to keep in CS only the following part of the provision: "The edge of a TOCS may be slewed in the direction of a turn away" and to transfer the rest of the provision into GM.

Moreover, the maximal value of 15° does not allow handling all possible cases.

It is important to put the possibility to handle curved trajectories into CS. Nevertheless, the way to handle it is a matter of recommendations and not of CS.

Indeed, we can have several methods to define these surfaces which have to be correlated to take-off trajectories in all cases. In France, we may have a value higher than 15°. Moreover, the take-off funnel can have a shape different from the one described in the CS.

response

Accepted

The CS will be moved to GM.

comment

1580

comment by: Aéroport de Marseille - MRS/LFML

It is appropriate to keep in CS only the following part of the provision: "The edge of a TOCS may be slewed in the direction of a turn away" and to transfer the rest of the provision into GM.

Moreover, the maximal value of 15° does not allow handling all possible cases.

It is important to put the possibility to handle curved trajectories into CS. Nevertheless, the way to handle it is a matter of recommendations and not of CS.

Indeed, we can have several methods to define these surfaces which have to be correlated to take-off trajectories in all cases. In France, we may have a value higher than 15°. Moreover, the take-off funnel can have a shape different from the one described in the CS.

response	<i>Accepted</i>
	The CS will be moved to GM.
comment	<p>1990 comment by: <i>Aéroports De Lyon</i></p> <p>Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.</p> <p><u>Proposition</u>: Déplacer en AR</p>
response	<i>Not accepted</i>
	Tthe CS will be moved to GM.
comment	<p>2040 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i></p> <p>It is appropriate to keep in CS only the following part of the provision: "The edge of a TOCS may be slewed in the direction of a turn away" and to transfer the rest of the provision into GM.</p> <p>Moreover, the maximal value of 15° does not allow handling all possible cases.</p> <p>It is important to put the possibility to handle curved trajectories into CS. Nevertheless, the way to handle it is a matter of recommendations and not of CS.</p>
response	<i>Accepted</i>
	The CS will be moved to GM.
comment	<p>2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<i>Noted</i>
comment	<p>2478 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p> <p>We are pleased with this provision that permit to deal with the curved surfaces that can be needed in several cases, notably when departure flight procedures are curved because of terrain and obstacles.</p> <p>But the maximum 15° splay does not allow handling all possible cases. There are several methods to define curved surfaces and shapes may differ a lot from</p>

the one proposed. It is essential that this CS provides the general objective and a general method to design such surfaces.

Such surfaces are curved when they are a curved flight procedure. It is noticed there can be more than one published procedure on a same departure QFU, notably there can be one straight and one curved. In this case, two take off climb surfaces are established: a straight one for the straight procedure and a curved one for the curved procedures. Concerning the curved procedure, it is thus the centre line of the surface which is curved, not only one edge.

The possibility for curved approach surfaces is dealt with in paragraph (c) of CS-ADR-DSN.H.425, according to provision 4.1.8 of ICAO Annex 14 volume 1: *The above surfaces should be varied when lateral offset, offset or curved approaches are utilised, specifically, two sides originating at the ends of the inner edge and diverging uniformly at a specified rate from the extended centre line of the lateral offset, offset or curved ground track.*"

This paragraph is clearer and corresponds to the need of general method aforementioned. Thus It is proposed to take it as the reference to write the one for the take-off.

CS-ADR-DSN. H.440 – Slew Curved Take-off climb surface

~~"The edge of a TOCS A take-off climb surface may be slewed curved when lateral offset, offset or curved departures are utilised in the direction of a turn away from the extended runway centre line up to a maximum of 15° splay. The axis of the curved surface should follow the lateral offset, offset or curved ground track and should have the same slope as the one specified for a straight surface. The two sides should begin at the ends of the inner edge and diverge uniformly at a specified rate from the extended centre line of the lateral offset, offset or curved ground track.~~

~~The portion of TOCS encompassing the new departure track should be the same shape and dimensions as the original TOCS measured relative to the new departure track. The opposite edge of the TOCS should remain unchanged unless there is another turning departure towards that side as well, in which case, the edge may be slewed in that direction too."~~

response Accepted

The CS will be moved to GM.

comment 2590 comment by: Danish Transport Authority

GM should be implemented to support the meaning of the paragraph.

response Accepted

This CS has been moved to GM.

comment 2703 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#306](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.H.440

Référence: CS-ADR-DSN.H.440

Slewed Take-off climb surface (évasement de la trouée de décollage)

Traduction de courtoisie

It is appropriate to keep in CS only the following part of the provision: "The edge of a TOCS may be slewed in the direction of a turn away" and to transfer the rest of the provision into GM

Moreover, the maximal value of 15° does not allow handling all possible cases. It is important to put the possibility to handle curved trajectories into CS. Nevertheless, the way to handle it is a matter of recommendations and not of CS.

Indeed, we can have several methods to define these surfaces which have to be correlated to take-off trajectories in all cases. In France, we may have a value higher than 15°. Moreover, the take-off funnel can have a shape different from the one described in the CS.

response *Accepted*

The CS will be moved to GM.

comment

2875

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.H.440	Slewed Take-off climb surface (évasement de la trouée de décollage)
Proposition/commentaire	Il convient de ne garder de cette disposition que la partie suivante: et de transférer le reste de la disposition en GM. Par ailleurs, la valeur maximum de 15° pour l'évasement ne permet pas de traiter tous les cas de figure.
Justification	Il est important de pouvoir mettre en CS la possibilité de traiter des trajectoires courbes. Cependant la manière de la traiter relève des règles de l'art et non des CS. En effet nous pouvons avoir plusieurs méthodes pour définir ces surfaces qui, dans tous les cas doivent être corrélées avec les trajectoires de décollage. En France, nous pouvons avoir une courbure qui donnerait un évasement supérieur à 15°. De plus, la trouée de décollage peut avoir une forme différente que celle décrite dans la CS.
Traduction de courtoisie	It is appropriate to keep in CS only the following part of the provision: "The edge of a TOCS may be slewed in the direction of a turn away" and to transfer the rest of the provision into GM. Moreover, the maximal value of 15° does not allow handling all possible cases.

	<p>It is important to put the possibility to handle curved trajectories into CS. Nevertheless, the way to handle it is a matter of recommendations and not of CS. Indeed, we can have several methods to define these surfaces which have to be correlated to take-off trajectories in all cases. In France, we may have a value higher than 15°. Moreover, the take-off funnel can have a shape different from the one described in the CS.</p>
<p>response <i>Accepted</i></p> <p>The CS will be moved to GM.</p>	

<p>comment</p>	<p>57 comment by: <i>Belfast International Airport - BFS/EGAA</i></p> <p>Dimensions required for the Obstacle Free Zone</p>
<p>response</p>	<p><i>Noted</i></p> <p>Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.</p>
<p>comment</p>	<p>393 comment by: <i>AIRBUS</i></p> <p>PROPOSED TEXT / COMMENT: (a) Applicability: The purpose of the An OFZ is intended to protect aeroplanes from fixed and mobile obstacles during Category I, II or III operations when approaches are continued below decision height and during any subsequent missed approach or balked landing with all engines operating normally. It is not intended to supplant the requirement of other surfaces or areas where these are more demanding.</p> <p>RATIONALE / REASON / JUSTIFICATION for the Comment: Consistency in presentation</p>

response *Noted*

The ICAO OFZ definition does not contain an objective. Paragraph (a) of the CS states that the OFZ applies only to Category I, II and III instrument approaches and describes the objective.

comment 539

comment by: *Union des Aéroports français - UAF*

Attachment [#307](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.H.445

Référence: CS-ADR-DSN.H.445
Obstacle Free Zone (OFZ)

Traduction de courtoisie
It is appropriate to delete the (a) from this provision.
It limits the objective of the OFZ which is already in the definitions.

response *Not accepted*

The ICAO OFZ definition does not contain an objective. Paragraph (a) of the CS states that the OFZ applies only to Category I, II and III instrument approaches and describes the objective.

comment 746

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.H.445	Obstacle Free Zone (OFZ)
Proposition/commentaire	Il convient de supprimer le (a) de cette disposition.
Justification	Ceci restreint l'objectif de l'OFZ qui se trouve déjà dans les définitions.
Traduction de courtoisie	It is appropriate to delete the (a) from this provision. It limits the objective of the OFZ which is already in the definitions.

response *Not accepted*

The ICAO OFZ definition does not contain an objective. Paragraph (a) of the CS

states that the OFZ applies only to Category I, II and III instrument approaches and describes the objective.

comment 825

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.H.445 — Obstacle Free Zone (p43)

2. Justification and proposed text / comment

Paragraph (a) is not consistent with the objective of OFZ in the definition in CS-ADR-DSN.A.002: *"the airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces or, when the support line is not coincident with the strip, the portion of ground bounded by the support line which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes, which is larger than specified in paragraph (a).*

DGAC proposes to delete it.

CS-ADR-DSN.H.445 — Obstacle Free Zone ADD

~~"(a) An OFZ is intended to protect aeroplanes from fixed and mobile obstacles during Category I, II or III operations when approaches are continued below decision height and during any subsequent missed approach or balked landing with all engines operating normally. It is not intended to supplant the requirement of other surfaces or areas where these are more demanding.~~

~~(b) The OFZ is made up of the following obstacle limitation surfaces:~~

- ~~(1) inner approach surface;~~
- ~~(2) inner transitional surfaces; and~~
- ~~(3) balked landing surface."~~

response Not accepted

The ICAO OFZ definition does not contain an objective. Paragraph (a) of the CS states that the OFZ applies only to Category I, II and III instrument approaches and describes the objective.

comment 1034

comment by: Federal Office of Civil Aviation FOCA

Use ICAO Definitions in Annex 14 and delete para. (a). OFZ deals exclusively with the surface mentioned in para. (b).

response Not accepted

The ICAO OFZ definition does not contain an objective. Paragraph (a) of the CS states that the OFZ applies only to Category I, II and III instrument approaches and describes the objective.

comment 1342 comment by: UK CAA

Page No: 43

Paragraph No: CS.ADR.DSN.H.445

Comment: This paragraph could usefully include additional material describing the purpose and limits of the Obstacle Free Zone

Justification: Greater clarity and understanding about the purpose and characteristics

Proposed Text: New H.445 (c): "It is designed to protect an aeroplane with a wingspan of up to 60 m which has descended below a height of 100 ft, and has been correctly aligned with the runway at that height by visual reference to the runway or approach lighting. The length of runway enclosed is based on an assumption that a go-around is initiated not later than the end of the touchdown zone and that a further 900 m distance is sufficient for the pilot to make any necessary changes of the aircraft configuration and to achieve a positive rate of climb of at least 3.33% with a deviation from track contained within a 10% splay either side of centreline. When an aeroplane's wingspan is greater than 60 m or its performance is worse than the basis used in defining the surfaces, the OFZ will need to be redesigned or operations for the particular aeroplane restricted. Conversely a narrower OFZ may be acceptable if the wingspan of aeroplanes at a particular aerodrome are limited to less than 60 m. For the OFZ where the code number is 1 or 2 the rationale is similar to that detailed in above except that the maximum wingspan is reduced to 30 m, the rate of climb on missed approach increased to 4%, and the origin of the baulked landing surface is at the upwind end of the runway strip."

response *Noted*

The proposed additional text describes operational considerations. The purpose of the OFZ described in paragraph (a) of the CS is considered appropriate for ADR design.

comment 1476 comment by: Euroairport Bâle-Mulhouse

Attachment [#308](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.H.445

Référence: CS-ADR-DSN.H.445
Obstacle Free Zone (OFZ)

Traduction de courtoisie

It is appropriate to delete the (a) from this provision.

It limits the objective of the OFZ which is already in the definitions.

response	<p><i>Not accepted</i></p> <p>The ICAO OFZ definition does not contain an objective. Paragraph (a) of the CS states that the OFZ applies only to Category I, II and III instrument approaches and describes the objective.</p>
comment	<p>1581 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>It is appropriate to delete the (a) from this provision. It limits the objective of the OFZ which is already in the definitions</p>
response	<p><i>Not accepted</i></p> <p>The ICAO OFZ definition does not contain an objective. Paragraph (a) of the CS states that the OFZ applies only to Category I, II and III instrument approaches and describes the objective.</p>
comment	<p>1917 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #309</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.H.445</p> <p>Référence: CS-ADR-DSN.H.445 Obstacle Free Zone (OFZ)</p> <p>Traduction de courtoisie It is appropriate to delete the (a) from this provision. It limits the objective of the OFZ which is already in the definitions.</p>
response	<p><i>Not accepted</i></p> <p>The ICAO OFZ definition does not contain an objective. Paragraph (a) of the CS states that the OFZ applies only to Category I, II and III instrument approaches and describes the objective.</p>
comment	<p>1991 comment by: <i>Aéroports De Lyon</i></p> <p>Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.</p> <p><u>Proposition</u>: Déplacer en AR</p>
response	<p><i>Not accepted</i></p> <p>This CS does not assign responsibility for action.</p>

comment	2037	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	It is appropriate to delete the (a) from this provision. It limits the objective of the OFZ which is already in the definitions.	
response	<i>Not accepted</i>	
	The ICAO OFZ definition does not contain an objective. Paragraph (a) of the CS states that the OFZ applies only to Category I, II and III instrument approaches and describes the objective.	
comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	
comment	2394	comment by: <i>Airport St. Gallen-Altentrhein - ACH/LSZR</i>
	Using ICAO Definitions in Annex 14 eliminates the need for (a).	
response	<i>Not accepted</i>	
	The ICAO OFZ definition does not contain an objective. Paragraph (a) of the CS states that the OFZ applies only to Category I, II and III instrument approaches and describes the objective.	
comment	2705	comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
	Attachment #310	
	ADBM NPA 2011-20 (B.III) CS-ADR-DSN.H.445	
	Référence: CS-ADR-DSN.H.445 Obstacle Free Zone (OFZ)	
	Traduction de courtoisie It is appropriate to delete the (a) from this provision. It limits the objective of the OFZ which is already in the definitions.	
response	<i>Not accepted</i>	
	The ICAO OFZ definition does not contain an objective. Paragraph (a) of the CS states that the OFZ applies only to Category I, II and III instrument approaches and describes the objective.	

comment

2876

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR- DSN.H.445	Obstacle Free Zone (OFZ)
Proposition/commentaire	Il convient de supprimer le (a) de cette disposition.
Justification	Ceci restreint l'objectif de l'OFZ qui se trouve déjà dans les définitions.
Traduction de courtoisie	It is appropriate to delete the (a) from this provision. It limits the objective of the OFZ which is already in the definitions.

response

Not accepted

The ICAO OFZ definition does not contain an objective. Paragraph (a) of the CS states that the OFZ applies only to Category I, II and III instrument approaches and describes the objective.

CS-ADR – Book 1 – CS-ADR-DSN.H.450 – Inner approach surface

p. 43

comment

58

comment by: Belfast International Airport - BFS/EGAA

Dimensions required for the inner approach surface

response

Noted

Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.

comment

394

comment by: AIRBUS

PROPOSED TEXT / COMMENT:

(a) **Description Applicability:** A rectangular portion of the approach surface immediately preceding the threshold.

RATIONALE / REASON / JUSTIFICATION for the Comment:

Consistency in presentation

response *Noted*

Paragraph (a) text now reads:

- Applicability: The purpose of the inner approach surface is to protect final precision approaches.

comment 823 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN. H.415 — conical surface (p37)
- CS-ADR - Book 1 - CS-ADR-DSN. H.420 — Inner horizontal surface (p37-38)
- CS-ADR - Book 1 - CS-ADR-DSN.H.430 — Transitional surface (p38-39)
- CS-ADR - Book 1 - CS-ADR-DSN.H.450 — Inner approach surface (p43)
- CS-ADR - Book 1 - CS-ADR-DSN.H.455 — Inner transitional surface (p43-44)
- CS-ADR - Book 1 - CS-ADR-DSN.H.460 — Balked landing surface (p44)

2. Justification and proposed text / comment

It is understood the part "Applicability" of the CS describing each OLS provides for the objective of the given OLS, which DGAC finds essential.

DGAC proposes to make these objectives in accordance with what is currently proposed for the revision of the part 6 of ICAO airport services manual by the ICAO task force common to the ICAO instrument flight procedures panel and the ICAO aerodrome panel.

Indeed, the proposed objectives have been determined after some studies conducted within this group.

* For the inner horizontal and conical surfaces, they share the same objective which is to protect aircraft performing aerodrome pattern.

Thus the proposed modification:

CS-ADR-DSN.H.415 — Conical surface

"(a) Applicability: ~~The purpose of the conical surface is mainly to facilitate~~ protect airspace for aerodrome pattern and visual manoeuvring prior to landing in the vicinity of the aerodrome.

[...]"

CS-ADR-DSN.H.420 — Inner horizontal surface

"(a) Applicability: ~~The purpose of the inner horizontal surface is to protect~~ airspace for aerodrome pattern and visual manoeuvring prior to landing.

[...]"

CS-ADR-DSN.H.430 — Transitional surface

"(a) Applicability: ~~The purpose of the transitional surface is to define the limit of the area available for buildings or other structures~~ protect aircraft from deviations from the runway axis.

[...]"

CS-ADR-DSN.H.450 — Inner approach surface

"(a) *Applicability:* The purpose of the inner approach surface is to protect final precision approaches.

Description: A rectangular portion of the approach surface immediately preceding the threshold. [...]"

CS-ADR-DSN.H.455 – Inner transitional surface

"(a) *Applicability:* The purpose of the inner transitional surface is to protect aeroplanes during precision approaches and balked landing from deviations from the runway axis.

Description: A surface similar to the transitional surface but closer to the runway. [...]"

CS-ADR-DSN.H.460 – Balked landing surface

"(a) *Applicability:* The purpose of the balked landing surface is to protect balked landing with all engines operating.

Description: An inclined plane located at a specified distance after the threshold, extending between the inner transitional surfaces. [...]"

response *Partially accepted*

CS-ADR-DSN.H.455: The proposed text will be inserted at the beginning of paragraph (a), but without the reference to deviation from the runway access.

comment 1132

comment by: Flughafen Düsseldorf GmbH

Dimensionen / Neigungen gemäß ICAO (Table 4-1) ergänzen!

response *Noted*

Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.

comment 1992

comment by: Aéroports De Lyon

Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.

Proposition: Déplacer en AR

response *Not accepted*

This CS does not assign responsibility for action.

comment 2212 ❖

comment by: HIA - Highlands and Islands Airports Limited

Noted

response *Noted*

CS-ADR – Book 1 – CS-ADR-DSN.H.455 – Inner transitional surface

p. 43-44

comment 59 comment by: *Belfast International Airport - BFS/EGAA*

Dimensions required for the inner transitional surface

response *Noted*

Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.

comment 395 comment by: *AIRBUS*

PROPOSED TEXT / COMMENT:

(a) **Description Applicability:** A surface similar to the transitional surface but closer to the runway.

RATIONALE / REASON / JUSTIFICATION for the Comment:

Consistency in presentation

response *Noted*

Paragraph (a) text now reads:

- **Applicability:** The purpose of the inner transitional surface is to protect aeroplanes during precision approaches and bailed landing.

comment 540 comment by: *Union des Aéroports français - UAF*

Attachment [#311](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.H.455

Référence: CS-ADR-DSN.H.455

Inner transitional surface

Traduction de courtoisie

(b) (1) in order to manage every situations and notably where the dimensions of the runway strip are different from minimal dimensions of CS-ADR-DSN.B.155, it is appropriate to modify the (b) (1)as follow : « a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that surface, from there along the side of a support line parallel to and at a specified distance indicated in table H-2 from the runway centre line to the inner edge of the balked landing surface and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and »

(c)(2) For the same reason it is necessary to modify (c) (2) as follow: « along the strip transitional surface support line — equal to the elevation of the nearest point on the centre line of the runway or its extension this line at that point.»

The proposed redaction enables to manage all situations even the runway strip does not correspond to minimal dimensions mentioned in CS-ADR-DSN.B.155 and 160. and associated GM.

response *Not accepted*

The inner transitional surface and transitional surface are not coincident. The inner transitional surface is not related to the runway strip.

comment 747

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.H.455	Inner transitional surface									
Proposition/commentaire	<p>(b) (1) Pour pouvoir traiter tous les cas de figure et notamment les cas où les dimensions de la bande de piste sont autres que les dimensions minimales indiquées dans les CS-ADR-DSN.B.155 et 160, il convient de modifier le (b) (1) de la manière suivante: « a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that surface, from there along the side of a support line parallel to and at a specified distance indicated in table H-2 from the runway centre line to the inner edge of the balked landing surface and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and »</p> <p>Table H-2</p> <table border="1"> <thead> <tr> <th>Approach category</th> <th>Category I</th> <th>Category II - III</th> </tr> </thead> <tbody> <tr> <td>Runway code</td> <td>1, 2</td> <td>3, 4</td> </tr> <tr> <td></td> <td colspan="2">60 m</td> </tr> </tbody> </table>	Approach category	Category I	Category II - III	Runway code	1, 2	3, 4		60 m	
Approach category	Category I	Category II - III								
Runway code	1, 2	3, 4								
	60 m									

	<table border="1"> <tr> <td></td> <td>45 m</td> <td>60 m</td> <td></td> </tr> </table> <p>(c)(2) Pour la même raison il convient de modifier le (c) (2) de la manière suivante: « along the strip transitional surface support line — equal to the elevation of the nearest point on the centre line of the runway or its extension this line at that point.»</p>		45 m	60 m									
	45 m	60 m											
<p>Justification</p>	<p>La rédaction proposée permet de traiter tous les cas de figure même ceux où la largeur de la bande de piste ne correspond pas avec les dimensions minimales indiquées dans les CS-ADR-DSN.B.155 et 160. et les GM associés. En effet, la surface intérieure de transition doit commencer à une distance spécifiée de l’axe de piste et non à une distance variable même si celle-ci est liée à la bande de piste. Ceci parce que la surface intérieure de transition est liée à la piste et à ses caractéristiques (Code chiffre) et non à la bande de piste.</p>												
<p>Traduction de courtoisie</p>	<p>(b) (1) in order to manage every situations and notably where the dimensions of the runway strip are different from minimal dimensions of CS-ADR-DSN.B.155, it is appropriate to modify the (b) (1)as follow : « a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that surface, from there along the side of a support line parallel to and at a specified distance indicated in table H-2 from the runway centre line to the inner edge of the balked landing surface and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and »</p> <p>Table H-2</p> <table border="1"> <thead> <tr> <th>Approach category</th> <th colspan="2">Category I</th> <th>Category II - III</th> </tr> </thead> <tbody> <tr> <td>Runway code</td> <td>1, 2</td> <td>3, 4</td> <td>60 m</td> </tr> <tr> <td></td> <td>45 m</td> <td>60 m</td> <td></td> </tr> </tbody> </table> <p>(c)(2) For the same reason it is necessary to modify (c) (2) as follow: « along the strip transitional surface support line — equal to the elevation of the nearest point on the centre line of the runway or its extension this line at that point.»</p> <p>The proposed redaction enables to manage all situations even the runway strip does not</p>	Approach category	Category I		Category II - III	Runway code	1, 2	3, 4	60 m		45 m	60 m	
Approach category	Category I		Category II - III										
Runway code	1, 2	3, 4	60 m										
	45 m	60 m											

	correspond to minimal dimensions mentioned in CS-ADR-DSN.B.155 and 160. and associated GM.
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response *Not accepted*

The inner transitional surface and transitional surface are not coincident. The inner transitional surface is not related to the runway strip.

comment

823 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN. H.415 — conical surface (p37)
- CS-ADR - Book 1 - CS-ADR-DSN. H.420 — Inner horizontal surface (p37-38)
- CS-ADR - Book 1 - CS-ADR-DSN.H.430 — Transitional surface (p38-39)
- CS-ADR - Book 1 - CS-ADR-DSN.H.450 — Inner approach surface (p43)
- CS-ADR - Book 1 - CS-ADR-DSN.H.455 — Inner transitional surface (p43-44)
- CS-ADR - Book 1 - CS-ADR-DSN.H.460 — Balked landing surface (p44)

2. Justification and proposed text / comment

It is understood the part "Applicability" of the CS describing each OLS provides for the objective of the given OLS, which DGAC finds essential.

DGAC proposes to make these objectives in accordance with what is currently proposed for the revision of the part 6 of ICAO airport services manual by the ICAO task force common to the ICAO instrument flight procedures panel and the ICAO aerodrome panel.

Indeed, the proposed objectives have been determined after some studies conducted within this group.

* For the inner horizontal and conical surfaces, they share the same objective which is to protect aircraft performing aerodrome pattern.

Thus the proposed modification:

CS-ADR-DSN.H.415 — Conical surface

"(a) Applicability: *The purpose of the conical surface is mainly to facilitate protect airspace for aerodrome pattern and visual manoeuvring prior to landing in the vicinity of the aerodrome.*

[...]"

CS-ADR-DSN.H.420 — Inner horizontal surface

"(a) Applicability: *The purpose of the inner horizontal surface is to protect airspace for aerodrome pattern and visual manoeuvring prior to landing.*

[...]"

CS-ADR-DSN.H.430 — Transitional surface

"(a) *Applicability:* The purpose of the transitional surface is to define the limit of the area available for buildings or other structures protect aircraft from deviations from the runway axis.

[...]"

CS-ADR-DSN.H.450 — Inner approach surface

"(a) *Applicability:* The purpose of the inner approach surface is to protect final precision approaches.

Description: A rectangular portion of the approach surface immediately preceding the threshold. [...]"

CS-ADR-DSN.H.455 — Inner transitional surface

"(a) *Applicability:* The purpose of the inner transitional surface is to protect aeroplanes during precision approaches and balked landing from deviations from the runway axis.

Description: A surface similar to the transitional surface but closer to the runway. [...]"

CS-ADR-DSN.H.460 — Balked landing surface

"(a) *Applicability:* The purpose of the balked landing surface is to protect balked landing with all engines operating.

Description: An inclined plane located at a specified distance after the threshold, extending between the inner transitional surfaces. [...]"

response Partially accepted

CS-ADR-DSN.H.455: The proposed text will be inserted at the beginning of paragraph (a) (omitting the text relating to deviations from the runway axis).

The remaining comments are answered in the appropriate CS segment.

comment 826 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.A.002 — Definitions (p4-9)
- CS-ADR - Book 1 - CS-ADR-DSN. H.420 — Inner horizontal surface (p37-38)
- CS-ADR - Book 1 - CS-ADR-DSN.H.430 — Transitional surface (p38-39)
- CS-ADR - Book 1 - CS-ADR-DSN.H.455 — Inner transitional surface (p43-44)
- (B.III) corrigendum - Table J-1 - Dimensions and slopes of obstacle limitation surfaces — Approach runways (p3-4)

2. Justification and proposed text / comment

This comment is linked with comment 10 in (B.III) corrigendum.

These provisions are to be reviewed to take into account the concept of "support line" that has been adopted by the group ADR.003 as an alternative of the contour the runway strip.

For recall, this concept permits to solve the issues raised when the dimensions of the runway strip are much greater than the minimum value required. In these cases, the "support line" of OLS, particularly the support line of the

transitional surfaces, is not coincident with the contour of the runway strip. Thus it is essential to be able to establish OLS independently from the contour of the runway strip, which is allowed by this concept.

For instance, the distance of 60m in note (c) of table J-1 corresponds to the minimal length of the runway strip beyond the runway end. It is frequent to have runway strips ending beyond this distance. For technical reasons, the obstacle limitation surfaces related to interrupted take-off surface are related to this distance and not to the end of the runway strip.

Note: the concept of the support line enables to manage both the case where the runway strip is coincident with the support line and the cases where it is not coincident. Thus, the redaction with the strip could be deleted without any consequence.

This concept has already been taken into account in CS on transitional surfaces (for instance CS-ADR-DSN.H.430), which is a good thing, but it is essential to use it also for other OLS when the strip is used in order to harmonize the design.

Thus the following proposed modifications:

“Obstacle free zone (OFZ)’ means the airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces or, when the support line is not coincident with the strip, the portion of ground bounded by the support line which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes.”

Table J-1 – Dimensions and slopes of obstacle limitation surfaces – Approach runways * Note (c)

“c. Distance to the end of strip or, when the runway strip is not coincident with the inner edge of the approach surface, to 60 m beyond the runway end.”

CS-ADR-DSN. H.420 – Inner horizontal surface

“[...] (c) Characteristics: The outer limits of the inner horizontal surface are defined by circular arcs centred on the intersection of the extended RWY centre line with the end of the RWY strip or, when the runway strip is not coincident with the inner edge of the approach surface, with the vertical line passing through the middle of the inner edge of the approach surface, joined tangentially by straight lines. (Figure H-1-)

[...]”

Editorial improvement of CS-ADR-DSN.H.430 – Transitional surface

“[...]”

(b) Description:[...]

(2) Where the transitional surface is not coincident with the runway strip: a complex surface along the side of a support line, parallel to and at a specified distance specified in table H-1 from the runway centre line, and part of the side of the approach surface, that slopes upwards and outwards to the inner horizontal surface.

(c) Characteristics: The limits of a transitional surface should comprise:

(1) Where the transitional surface is coincident with the runway strip:

(i) a lower edge beginning at the intersection of the side of the approach surface with the inner horizontal surface and extending down the side of the approach surface to the inner edge of the approach surface and from there along the length of the strip parallel to the runway centre line; and

(2)(ii) An upper edge located in the plane of the inner horizontal surface; or

(3) (2) Where the transitional surface is not coincident with the runway strip:
 (i) a lower edge beginning at the intersection of the side of the approach surface with the inner horizontal surface and extending down the side of the approach surface to the inner edge of the approach surface and from there along a support line parallel to the runway centre line, whose distance to the runway centre line is according to table H-1 below; and
 (ii) An upper edge located in the plane of the inner horizontal surface.
 [...]”

CS-ADR-DSN.H.455 – Inner transitional surface

[...]”

(b) Characteristics: The limits of an inner transitional surface should comprise:

(1) Where the transitional surface is coincident with the runway strip:

(i) a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that surface, from there along the strip parallel to the runway centre line to the inner edge of the balked landing surface and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and

(ii) an upper edge located in the plane of the inner horizontal surface.

(2) Where the transitional surface is not coincident with the runway strip:

(i) a lower edge beginning at the intersection of the side of the approach surface with the inner horizontal surface and extending down the side of the approach surface to the inner edge of the approach surface and from there along the support line parallel to the runway centre line, at a specified distance to the runway centre line indicated in table H-2 below; and

(ii) An upper edge located in the plane of the inner horizontal surface.

(c) The elevation of a point on the lower edge should be:

(1) along the side of the inner approach surface and balked landing surface – equal to the elevation of the particular surface at that point; and

(2) along the strip – equal to the elevation of the nearest point on the centre line of the runway or its extension.

(3) Along the transitional surface support line – equal to the elevation of this line at that point.

[...]”

Table H-2: distance between inner transitional surface support line and runway centre line

	Precision approach Category I	Precision approach Category II or III
Runway code	1,2	3,4
	45 m	60 m

response Partially accepted

CS-ADR-DSN.H.455: The proposed text will be inserted at the beginning of paragraph (a) (omitting the text relating to deviations from the runway axis).

The remaining comments are answered in the appropriate CS segment.

comment 1133 comment by: Flughafen Düsseldorf GmbH

Dimensionen / Neigungen gemäß ICAO (Table 4-1) ergänzen!

response *Noted*

Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.

comment 1477 comment by: Euroairport Bâle-Mulhouse

Attachment [#312](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.L.555

Référence: CS-ADR-DSN.L.555
Taxiway centre line marking

Traduction de courtoisie

This CS does not take into account the possibilities of double marking on an apron taxiway which is very penalizing for the aerodrome that receive several types of aircraft. It must be possible to keep this possibility. The way to realize this double marking could be in GM.

response *Not accepted*

If multiple taxiways are required for operational purposes, an ELOS or SC should be used.

comment 1582 comment by: Aéroport de Marseille - MRS/LFML

(b) (1) in order to manage every situations and notably where the dimensions of the runway strip are different from minimal dimensions of CS-ADR-DSN.B.155, it is appropriate to modify the (b) (1) as follow : « a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that surface, from there along the side of a support line parallel to and at a specified distance indicated in table H-2 from the runway centre line to the inner edge of the balked landing surface and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and »

response *Not accepted*

The inner transitional surface and transitional surface are not coincident. The inner transitional surface is not related to the runway strip.

comment

1918

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#313](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.H.455

Référence: CS-ADR-DSN.H.455

Inner transitional surface

Traduction de courtoisie

(b) (1) in order to manage every situations and notably where the dimensions of the runway strip are different from minimal dimensions of CS-ADR-DSN.B.155, it is appropriate to modify the (b) (1) as follow : « a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that surface, from there along the side of a support line parallel to and at a specified distance indicated in table H-2 from the runway centre line to the inner edge of the balked landing surface and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and »

(c)(2) For the same reason it is necessary to modify (c) (2) as follow: « along the ~~strip~~ transitional surface support line — equal to the elevation of the nearest point on the centre line of the runway or its extension this line at that point. »

The proposed redaction enables to manage all situations even the runway strip does not correspond to minimal dimensions mentioned in CS-ADR-DSN.B.155 and 160. and associated GM.

response *Not accepted*

The inner transitional surface and transitional surface are not coincident. The inner transitional surface is not related to the runway strip.

comment

1993

comment by: *Aéroports De Lyon*

Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.

Proposition: Déplacer en AR

response *Not accepted*

This CS does not assign responsibility for action.

comment

2034

comment by: Pau Pyrénées Airport - PUF/LFBP

(b) (1) in order to manage every situations and notably where the dimensions of the runway strip are different from minimal dimensions of CS-ADR-DSN.B.155, it is appropriate to modify the (b) (1) as follow : « a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that surface, from there along the side of a support line parallel to and at a specified distance indicated in table H-2 from the runway centre line to the inner edge of the balked landing surface and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and »

Table H-2

Approach category	Category I		Category II - III
Runway code	1, 2	3, 4	60 m
	45 m	60 m	

(c)(2) For the same reason it is necessary to modify (c) (2) as follow: « along the strip transitional surface support line — equal to the elevation of the nearest point on the centre line of the runway or its extension this line at that point.»

The proposed redaction enables to manage all situations even the runway strip does not correspond to minimal dimensions mentioned in CS-ADR-DSN.B.155 and 160. and associated GM.

response

Not accepted

The inner transitional surface and transitional surface are not coincident. The inner transitional surface is not related to the runway strip.

comment

2212 ❖

comment by: HIA - Highlands and Islands Airports Limited

Noted

response

Noted

comment

2706

comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#314](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.H.455

Référence: CS-ADR-DSN.H.455

Inner transitional surface

Traduction de courtoisie

(b) (1) in order to manage every situations and notably where the dimensions of the runway strip are different from minimal dimensions of CS-ADR-DSN.B.155, it is appropriate to modify the (b) (1) as follow : « a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that surface, from there along the side of a support line parallel to and at a specified distance indicated in table H-2 from the runway centre line to the inner edge of the balked landing surface and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and »

(c)(2) For the same reason it is necessary to modify (c) (2) as follow: « along the ~~strip transitional surface support line~~ — equal to the elevation of the nearest point on the centre line of the runway or its extension ~~this line at that point.~~ »

The proposed redaction enables to manage all situations even the runway strip does not correspond to minimal dimensions mentioned in CS-ADR-DSN.B.155 and 160. and associated GM.

response

Not accepted

The inner transitional surface and transitional surface are not coincident. The inner transitional surface is not related to the runway strip.

comment

2877

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.H.455

Inner transitional surface

Proposition/commentaire

(b) (1) Pour pouvoir traiter tous les cas de figure et notamment les cas où les dimensions de la bande de piste sont autres que les dimensions minimales indiquées dans les CS-ADR-DSN.B.155 et 160, il convient de modifier le (b) (1) de la manière suivante: « a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that surface, from there along the side of a support

	<p>line parallel to and at a specified distance indicated in table H-2 from the runway centre line to the inner edge of the balked landing surface and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and »</p> <p>Table H-2</p> <table border="1"> <thead> <tr> <th>Approach category</th> <th colspan="2">Category I</th> <th>Category II - III</th> </tr> </thead> <tbody> <tr> <td>Runway code</td> <td>1, 2</td> <td>3, 4</td> <td>60 m</td> </tr> <tr> <td></td> <td>45 m</td> <td>60 m</td> <td></td> </tr> </tbody> </table> <p>(c)(2) Pour la même raison il convient de modifier le (c) (2) de la manière suivante: « along the strip transitional surface support line — equal to the elevation of the nearest point on the centre line of the runway or its extension this line at that point.»</p>	Approach category	Category I		Category II - III	Runway code	1, 2	3, 4	60 m		45 m	60 m	
Approach category	Category I		Category II - III										
Runway code	1, 2	3, 4	60 m										
	45 m	60 m											
<p>Justification</p>	<p>La rédaction proposée permet de traiter tous les cas de figure même ceux où la largeur de la bande de piste ne correspond pas avec les dimensions minimales indiquées dans les CS-ADR-DSN.B.155 et 160. et les GM associés. En effet, la surface intérieure de transition doit commencer à une distance spécifiée de l’axe de piste et non à une distance variable même si celle-ci est liée à la bande de piste. Ceci parce que la surface intérieure de transition est liée à la piste et à ses caractéristiques (Code chiffre) et non à la bande de piste.</p>												
<p>Traduction de courtoisie</p>	<p>(b) (1) in order to manage every situations and notably where the dimensions of the runway strip are different from minimal dimensions of CS-ADR-DSN.B.155, it is appropriate to modify the (b) (1)as follow : « a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that surface, from there along the side of a support line parallel to and at a specified distance indicated in table H-2 from the runway centre line to the inner edge of the balked landing surface and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and »</p> <p>Table H-2</p> <table border="1"> <thead> <tr> <th>Approach category</th> <th colspan="2">Category I</th> <th>Category II - III</th> </tr> </thead> <tbody> <tr> <td>Runway code</td> <td>1, 2</td> <td>3, 4</td> <td>60 m</td> </tr> <tr> <td></td> <td>45 m</td> <td>60 m</td> <td></td> </tr> </tbody> </table>	Approach category	Category I		Category II - III	Runway code	1, 2	3, 4	60 m		45 m	60 m	
Approach category	Category I		Category II - III										
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	<table border="1"> <tr> <td></td> <td>m</td> <td></td> </tr> </table> <p>(c)(2) For the same reason it is necessary to modify (c) (2) as follow: « along the strip transitional surface support line – equal to the elevation of the nearest point on the centre line of the runway or its extension this line at that point.»</p> <p>The proposed redaction enables to manage all situations even the runway strip does not correspond to minimal dimensions mentioned in CS-ADR-DSN.B.155 and 160. and associated GM.</p>		m	
	m			
<p>response <i>Not accepted</i></p> <p>The inner transitional surface and transitional surface are not coincident. The inner transitional surface is not related to the runway strip.</p>				

CS-ADR – Book 1 – CS-ADR-DSN.H.460 – Balked landing surface	p. 44
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comment	<p>60 comment by: <i>Belfast International Airport - BFS/EGAA</i></p> <p>Dimensions required for the balked landing surface</p>
response	<p><i>Noted</i></p> <p>Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.</p>

comment	<p>396 comment by: <i>AIRBUS</i></p> <p>PROPOSED TEXT / COMMENT: (a) Description Applicability: An inclined plane located at a specified distance after the threshold, extending between the inner transitional surfaces.</p> <p>RATIONALE / REASON / JUSTIFICATION for the Comment: Consistency in presentation</p>
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response *Noted*

Paragraph (a) text now reads:

- Applicability: The purpose of the balked landing surface is to protect balked landing.

comment 823 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN. H.415 — conical surface (p37)
- CS-ADR - Book 1 - CS-ADR-DSN. H.420 — Inner horizontal surface (p37-38)
- CS-ADR - Book 1 - CS-ADR-DSN.H.430 — Transitional surface (p38-39)
- CS-ADR - Book 1 - CS-ADR-DSN.H.450 — Inner approach surface (p43)
- CS-ADR - Book 1 - CS-ADR-DSN.H.455 — Inner transitional surface (p43-44)
- CS-ADR - Book 1 - CS-ADR-DSN.H.460 — Balked landing surface (p44)

2. Justification and proposed text / comment

It is understood the part "Applicability" of the CS describing each OLS provides for the objective of the given OLS, which DGAC finds essential.

DGAC proposes to make these objectives in accordance with what is currently proposed for the revision of the part 6 of ICAO airport services manual by the ICAO task force common to the ICAO instrument flight procedures panel and the ICAO aerodrome panel.

Indeed, the proposed objectives have been determined after some studies conducted within this group.

* For the inner horizontal and conical surfaces, they share the same objective which is to protect aircraft performing aerodrome pattern.

Thus the proposed modification:

CS-ADR-DSN.H.415 — Conical surface

"(a) Applicability: *The purpose of the conical surface is mainly to facilitate protect airspace for aerodrome pattern and visual manoeuvring prior to landing in the vicinity of the aerodrome.*

[...]"

CS-ADR-DSN.H.420 — Inner horizontal surface

"(a) Applicability: *The purpose of the inner horizontal surface is to protect airspace for aerodrome pattern and visual manoeuvring prior to landing.*

[...]"

CS-ADR-DSN.H.430 — Transitional surface

"(a) Applicability: *The purpose of the transitional surface is to define the limit of the area available for buildings or other structures protect aircraft from deviations from the runway axis.*

[...]"

CS-ADR-DSN.H.450 — Inner approach surface

"(a) *Applicability:* The purpose of the inner approach surface is to protect final precision approaches.

Description: A rectangular portion of the approach surface immediately preceding the threshold. [...]"

CS-ADR-DSN.H.455 – Inner transitional surface

"(a) *Applicability:* The purpose of the inner transitional surface is to protect aeroplanes during precision approaches and balked landing from deviations from the runway axis.

Description: A surface similar to the transitional surface but closer to the runway. [...]"

CS-ADR-DSN.H.460 – Balked landing surface

"(a) *Applicability:* The purpose of the balked landing surface is to protect balked landing with all engines operating.

Description: An inclined plane located at a specified distance after the threshold, extending between the inner transitional surfaces. [...]"

response *Partially accepted*

The proposed text will be inserted at the beginning of paragraph (a) (omitting the text relating to all engines operating).

comment 1134

comment by: Flughafen Düsseldorf GmbH

Dimensionen / Neigungen gemäß ICAO (Table 4-1) ergänzen!

response *Noted*

Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be inserted in the NPA.

comment 1995

comment by: Aéroports De Lyon

Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.

Proposition: Déplacer en AR

response *Not accepted*

This CS does not assign responsibility for action.

comment 2317

comment by: HIA - Highlands and Islands Airports Limited

Noted

response *Noted*

CS-ADR – Book 1 – CS-ADR-DSN.J.465 – General

p. 45

comment 1996 comment by: *Aéroports De Lyon*

Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.

Proposition: Déplacer en AR

response *Not accepted*

This CS does not assign responsibility for action.

comment 2212 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 3093 comment by: *Fraport AG*

Chapter J

Editorial

Table for landing is missing.

Fraport
ICAO Annex 14

AG

response *Noted*

Chapter H describes the obstacle limitation surfaces. Dimensions are in Chapter J, Table J-1 (which is missing from the NPA but is in the corrigendum). Table J-1 will be added to the NPA.

CS-ADR – Book 1 – CS-ADR-DSN.J.470 Non-instrument runways

p. 45

comment	78	comment by: CAA-NL
	In subpart (f) the future development to extend a runway could also be a reason to establish a more stringent obstacle limitation surface. We propose to add the extension of a runway to this article.	
response	<i>Noted</i>	
	This is ICAO wording.	
comment	1997	comment by: Aéroports De Lyon
	Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.	
	<u>Proposition</u> : Déplacer en AR	
response	<i>Not accepted</i>	
	This CS does not assign responsibility for action.	
comment	2212 ❖	comment by: HIA - Highlands and Islands Airports Limited
	<i>Noted</i>	
response	<i>Noted</i>	
comment	2624	comment by: Airport Nuremberg - NUE/EDDN
	Many aerodromes are already struggling to fulfill the ICAO Annex 14 standards on obstacle limitation surfaces. By implementing the ICAO recommendation in to European legislation on that matter it denotes a lot more problems to aerodromes within the European Union, that aerodromes outside the European Union do not have. Having to comply with the higher inner European standards questions whether some aerodromes can still operate due to obstacles, on the same hand it means aerodromes have to invest a lot of effort and money in order to reach the higher standards, although on an international level it is just a recommendation! This often requires cutting into the at many aerodromes existing environmental protection zones!, which eventually leads to negative publicity and discussions and protests with the stakeholders of the aerodrome! Justifying that with an international recommendation should be revised! If it was so safety-critical at all, it would have been an ICAO standard as well, but isn't. All ICAO recommendations (d,e,f) on the matter of obstacle limitation surface should be moved to the guidance material.	
response	<i>Not accepted</i>	

comment	2935	comment by: AIRBUS
	(c) ... the new object or extension is would be shielded (d) ... when the object is would be shielded	
response	Accepted	

CS-ADR – Book 1 – CS-ADR-DSN.J.475 – Non-precision approach runways	p. 45-46
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comment	397	comment by: AIRBUS
	<p>PROPOSED TEXT / COMMENT: (f) Existing objects above any of the surfaces required by CS-ADR-DSN.J.465 General 475 Non precision approach runways, paragraph (a) should as far as practicable be removed except when the object is shielded by an existing immovable object, or after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.</p> <p>RATIONALE / REASON / JUSTIFICATION for the Comment: Consistency in references</p>	
response	Accepted	

comment	1343	comment by: UK CAA
	<p>Page No: 46</p> <p>Paragraph No: CS-ADR-DSN.J.475 – Non-precision approach runways (f),</p> <p>Comment: The term 'shielding' is referred to in all the noted sections; this should be defined in the definitions section and noted as being different from the term 'shadowing'.</p> <p>Justification: To clarify the use of 'shielding' and differentiate this from 'shadowing' to avoid confusion and mis-interpretation of use.</p>	
response	<p>Not accepted</p> <p>The term 'shielding' is used in Annex 14; 'shadowing' does not feature. Therefore, there should be no confusion. The application of shielding is described in the ICAO Airport Services Manual (Doc 9137), Part 6.</p>	

comment	1998	comment by: <i>Aéroports De Lyon</i>
	<p>Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.</p> <p><u>Proposition</u>: Déplacer en AR</p>	
response	<i>Not accepted</i>	
	This CS does not assign responsibility for action.	
comment	2212 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	
comment	2625	comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	<p>Many aerodromes are already struggling to fulfill the ICAO Annex 14 standards on obstacle limitation surfaces. By implementing the ICAO recommendation in to European legislation on that matter it denotes a lot more problems to aerodromes within the European Union, that aerodromes outside the European Union do not have. Having to comply with the higher inner European standards questions whether some aerodromes can still operate due to obstacles, on the same hand it means aerodromes have to invest a lot of effort and money in order to reach the higher standards, although on an international level it is just a recommendation! This often requires cutting into the at many aerodromes existing environmental protection zones!, which eventually leads to negative publicity and discussions and protests with the stakeholders of the aerodrome! Justifying that with an international recommendation should be revised! All ICAO recommendations (e,f) on the matter of obstacle limitation surface should be moved to the guidance material.</p>	
response	<i>Not accepted</i>	
	This is ICAO wording.	
comment	2936	comment by: <i>AIRBUS</i>
	(e) ... except when the object is would be shielded ...	
response	<i>Accepted</i>	

comment 398

comment by: AIRBUS

PROPOSED TEXT / COMMENT:

(a) The following obstacle limitation surfaces should be established for a precision approach runway category **I or II** or III:

- (1) conical surface;
- (2) inner horizontal surface;
- (3) approach surface and inner approach surface;
- (4) transitional surfaces and inner transitional surfaces; and
- (5) balked landing surface.

RATIONALE / REASON / JUSTIFICATION for the Comment:

Paragraphs (a), (b) and (c) could be merged as the listed obstacle limitation surfaces are the same for each precision approach category. The following numbering should be changed accordingly.

response *Noted*

ICAO does not yet stipulate that category I precision approach runways should have an OFZ (as required for Cat II/III). Therefore, Cat I requirements are separated from Cat I/III requirements.

comment 541

comment by: Union des Aéroports français - UAF

Attachment [#315](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.J.480

Référence: CS-ADR-DSN.J.480
Precision approach runways

Traduction de courtoisie

It is appropriate to modify in the following way : « The following obstacle limitation surfaces should **may** be established for a precision approach runway category I: »

For a precision approach runway category I, surfaces described in (b) are not compulsory. It is only a recommendation in the ICAO Annex 14.

response *Partially accepted*

Paragraph (b) will be moved to GM.

comment 748

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.J.480	Precision approach runways
Proposition/commentaire	(b) Il convient de modifier de la manière suivante : « The following obstacle limitation surfaces should may be established for a precision approach runway category I: »
Justification	Pour une piste avec approche de précision de catégorie I, les surfaces décrites au (b) ne sont pas obligatoires. Ce n'est qu'une recommandation dans l'annexe 14 de l'OACI.
Traduction de courtoisie	It is appropriate to modify in the following way : « The following obstacle limitation surfaces should may be established for a precision approach runway category I: » For a precision approach runway category I, surfaces described in (b) are not compulsory. It is only a recommendation in the ICAO Annex 14.

response *Partially accepted*

Paragraph (b) will be moved to GM.

comment 820

comment by: *Finavia*

(a) and (b) are not logical

response *Partially accepted*

Paragraph (b) will be moved to GM.

comment 829

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.J.480 – Precision approach runways (p46)
- CS-ADR - Book 2 – GM-ADR-DSN.J.480 – Precision approach runways (p244-245)

2. Justification and proposed text / comment

This specification is not binding in France and is only a recommendation in ICAO

Annex 14 Volume1. Removing all the obstacles concerned by this CS for precision approach runway category I would be impossible.
DGAC proposes to provide for the needed flexibility in using a "may" instead of a "should":

CS-ADR-DSN.J.480 – Precision approach runways

"[...]

(b) The following obstacle limitation surfaces ~~should~~ **may** be established for a precision approach runway category I:

- (1) inner approach surface;
- (2) inner transitional surfaces; and
- (3) balked landing surface.

[...]"

response *Partially accepted*

Paragraph (b) will be moved to GM.

comment 1035 comment by: *Federal Office of Civil Aviation FOCA*

Match para. (a) and (b) into one paragraph, as done in article (c). Both para. (a) and (b) describe the precision approach runway category I

response *Partially accepted*

Paragraph (b) will be moved to GM.

comment 1348 comment by: *UK CAA*

Page No: 47

Paragraph No: CS-ADR-DSN.J.480 – Precision approach runways (i),

Comment: The term 'shielding' is referred to in all the noted sections; this should be defined in the definitions section and noted as being different from the term 'shadowing'.

Justification: To clarify the use of 'shielding' and differentiate this from 'shadowing' to avoid confusion and mis-interpretation of use.

response *Not accepted*

The term 'shielding' is used in Annex 14; 'shadowing' does not feature. Therefore, there should be no confusion.
The application of shielding is described in the ICAO Airport Services Manual (Doc 9137), Part 6.

comment 1363 comment by: *ECA - European Cockpit Association*

Amend as follows:

The following obstacle limitation surfaces should be established for a precision approach runway category I **or MLS/GNSS/RNP**:

- (1) conical surface;
- (2) inner horizontal surface;
- (3) approach surface; **and**
- (4) transitional surfaces ;

(5) lateral offset or curved approach surface (MLS/GNSS/RNP)

Justification:

MLS procedures using the same criteria as for the Category I ILS are being developed by ICAO. The obstacle limitation surfaces will therefore be the same for both ILS and MLS/GNSS/RNP approaches. Later, the MLS/GNSS/RNP procedures will be further developed to cover the equivalent of ILS Category II and Category III approaches and a new obstacle limitation surface will be required to provide protection during the complex lateral offset or curved approaches that will eventually become possible with advances in MLS/GNSS/RNP technology.

Reference: IFALPA Annex 14, paragraph 4.2.14

response *Not accepted*

EASA follows development of navigation aids.

comment

1367

comment by: *ECA - European Cockpit Association*

Amend as follows:

(c) The following obstacle limitation surfaces should be established for a precision approach runway category II or III **or MLS/GNSS/RNP**:

- (1) conical surface;
- (2) inner horizontal surface;
- (3) approach surface and inner approach surface;

- (4) transitional surfaces and inner transitional surfaces; and
- (5) balked landing surface.

(6) lateral offset or curved approach surface (MLS/GNSS/RNP)

On runways equipped with MLS, the conical surfaces shall be extended to cover the procedural measures adopted to govern the inbound flights of aeroplanes from the Final Transition Point (FTP)

Justification:

Provision should be made in this paragraph for an MLS/GNSS/RNP category.

Reference: IFALPA Annex 14, paragraph 4.2.15

response *Not accepted*

comment

1369

comment by: *ECA - European Cockpit Association*

Add as follows:

(d) The heights and slopes of the surfaces should not be greater than, and their other dimensions not less than, those specified in Table ADR-DSN-J-1, except in the case of the horizontal section of the approach surface in paragraph (e) below **and in the case of MLS/GNSS/RNP procedures, the conical surface should be extended to cover the flight path.**

Justification:

Provision should be made for the LS/GNSS/RNP procedures by extension of the conical surface, which is a rational method of controlling objects under the flight path of complex MLS/GNSS/RNP approaches. The conical surface is presently used to protect circling approaches and, faced with the potential for multi-azimuth approaches with MLS, it is necessary to ensure adequate obstacle protection for those approaches in cases where existing objects cannot be removed.

Reference: IFALPA Annex 14, paragraph 4.2.16

response *Not accepted*

comment 1370 comment by: *ECA - European Cockpit Association*

Add the following paragraph:

(j) The dimensions of the inner approach surface shall not be less than those specified in table 4-1 (120m x 60m x 900m). These dimensions and slopes should apply to Category I, II and III runways.

Justification:

A new paragraph should be added specifying the dimensions of the inner approach surface, which have proven safe for Cat. II and III operations. Evidence of 98 accidents in low visibility, of which 68% were in Cat I, suggests that a review may indicate an increase in the size. However, we cannot accept a reduction in size or any increase in the slope angle.

Reference: IFALPA Annex 14, paragraph 4.2.16.x

response *Not accepted*

comment 1478 comment by: *Euroairport Bâle-Mulhouse*

Attachment [#316](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.J.480

Référence: CS-ADR-DSN.J.480

Precision approach runways

Traduction de courtoisie

	<p>It is appropriate to modify in the following way : « The following obstacle limitation surfaces should may be established for a precision approach runway category I: » For a precision approach runway category I, surfaces described in (b) are not compulsory. It is only a recommendation in the ICAO Annex 14.</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (b) will be moved to GM.</p>

comment	<p>1583 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>It is appropriate to modify in the following way : « The following obstacle limitation surfaces should may be established for a precision approach runway category I: » For a precision approach runway category I, surfaces described in (b) are not compulsory. It is only a recommendation in the ICAO Annex 14.</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (b) will be moved to GM.</p>

comment	<p>1785 comment by: <i>Tarbes-Lourdes-Pyrénées airport</i></p> <p>Attachment #317</p> <p>NPA 2011-20 (B.III) CS-ADR-DSN.J.480</p> <p>Référence: CS-ADR-DSN.J.480 Precision approach runways</p> <p>Traduction de courtoisie It is appropriate to modify in the following way : « The following obstacle limitation surfaces should may be established for a precision approach runway category I: » For a precision approach runway category I, surfaces described in (b) are not compulsory. It is only a recommendation in the ICAO Annex 1</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (b) will be moved to GM.</p>

comment	<p>1808 comment by: <i>Geneva International Airport (ROMIG)</i></p> <p>b) Move to GM This article is a recommendation in ICAO Annex 14 and should be kept as a recommendation as it is not applicable in all cases.</p>
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response	<i>Accepted</i>
comment	<p>1919 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #318</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.J.480</p> <p>Référence: CS-ADR-DSN.J.480 Precision approach runways</p> <p>Traduction de courtoisie It is appropriate to modify in the following way : « The following obstacle limitation surfaces should may be established for a precision approach runway category I: » For a precision approach runway category I, surfaces described in (b) are not compulsory. It is only a recommendation in the ICAO Annex 14.</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (b) will be moved to GM.</p>
comment	<p>1999 comment by: <i>Aéroports De Lyon</i></p> <p>Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.</p> <p><u>Proposition</u>: Déplacer en AR</p>
response	<p><i>Not accepted</i></p> <p>This CS does not assign responsibility for action.</p>
comment	<p>2033 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i></p> <p>It is appropriate to modify in the following way : « The following obstacle limitation surfaces should may be established for a precision approach runway category I: » For a precision approach runway category I, surfaces described in (b) are not compulsory. It is only a recommendation in the ICAO Annex 14.</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (b) will be moved to GM.</p>

comment	2139 comment by: <i>Aeroport Paris Vatry - XCR/LFOK</i>
	<p>Attachment #319</p> <p>NPA 2011-20 (B.III) CS-ADR-DSN.J.480</p> <p>Référence: CS-ADR-DSN.J.480 Precision approach runways</p> <p>Traduction de courtoisie It is appropriate to modify in the following way : « The following obstacle limitation surfaces should may be established for a precision approach runway category I: » For a precision approach runway category I, surfaces described in (b) are not compulsory. It is only a recommendation in the ICAO Annex 14.</p>
response	<i>Partially accepted</i>
	Paragraph (b) will be moved to GM.
comment	2212 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>
comment	2432 ❖ comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	Suggest moving the "CS" to "GM"
response	<i>Not accepted</i>
comment	2480 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	<p>This specification is not binding in Spain and is only a recommendation in ICAO Annex 14 Volume1. Removing all the obstacles concerned by this CS for precision approach runway category I would be impossible. It is proposed to provide for the needed flexibility in using a "may" instead of a "should":</p> <p>CS-ADR-DSN.J.480 – Precision approach runways "[...]"</p> <p><i>(b) The following obstacle limitation surfaces should may be established for a precision approach runway category I:</i></p> <p><i>(1) inner approach surface;</i> <i>(2) inner transitional surfaces; and</i> <i>(3) balked landing surface.</i></p>

response	<p><i>Partially accepted</i></p> <p>Paragraph (b) will be moved to GM.</p>
comment	<p>2626 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p> <p>Many aerodromes are already struggling to fulfill the ICAO Annex 14 standards on obstacle limitation surfaces. By implementing the ICAO recommendation in to European legislation on that matter it denotes a lot more problems to aerodromes within the European Union, that aerodromes outside the European Union do not have. Having to comply with the higher inner European standards questions whether some aerodromes can still operate due to obstacles, on the same hand it means aerodromes have to invest a lot of effort and money in order to reach the higher standards, although on an international level it is just a recommendation! This often requires cutting into the at many aerodromes existing environmental protection zones!, which eventually leads to negative publicity and discussions and protests with the stakeholders of the aerodrome! Justifying that with an international recommendation should be revised! If it was so safety-critical at all, it would have been an ICAO standard as well, but isn't. The ICAO recommendation (f) on the matter of obstacle limitation surface should be moved to the guidance material.</p>
response	<p><i>Not accepted</i></p> <p>This wording is from an ICAO standard and is recognised globally.</p>
comment	<p>2708 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #320</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.J.480</p> <p>Référence: CS-ADR-DSN.J.480 Precision approach runways</p> <p>Traduction de courtoisie It is appropriate to modify in the following way : « The following obstacle limitation surfaces should may be established for a precision approach runway category I: » For a precision approach runway category I, surfaces described in (b) are not compulsory. It is only a recommendation in the ICAO Annex 14.</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (b) will be moved to GM.</p>
comment	<p>2878 comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i></p>

Référence: CS-ADR-DSN.J.480	Precision approach runways
Proposition/commentaire	(b) Il convient de modifier de la manière suivante : « The following obstacle limitation surfaces should may be established for a precision approach runway category I: »
Justification	Pour une piste avec approche de précision de catégorie I, les surfaces décrites au (b) ne sont pas obligatoires. Ce n'est qu'une recommandation dans l'annexe 14 de l'OACI.
Traduction de courtoisie	It is appropriate to modify in the following way : « The following obstacle limitation surfaces should may be established for a precision approach runway category I: » For a precision approach runway category I, surfaces described in (b) are not compulsory. It is only a recommendation in the ICAO Annex 14.

response *Partially accepted*

Paragraph (b) will be moved to GM.

comment 2893 comment by: *SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard*

Attachment [#321](#)

SEARD NPA 2011-20 (B.III) CS-ADR-DSN.J.480

Référence: CS-ADR-DSN.J.480
Precision approach runways

Traduction de courtoisie

It is appropriate to modify in the following way : « The following obstacle limitation surfaces ~~should~~ **may** be established for a precision approach runway category I: »

For a precision approach runway category I, surfaces described in (b) are not compulsory. It is only a recommendation in the ICAO Annex 14.

response *Partially accepted*

Paragraph (b) will be moved to GM.

comment	2937	comment by: AIRBUS
	(g) ...when the new object or extension is would be shielded ... (h) ... when an object is would be shielded ...	
response	<i>Accepted</i>	

comment	3120	comment by: ATB Aéroport Toulouse-Blagnac - TLS/LFBO
	Attachment #322	
	ATB NPA 2011-20 (B.III) CS-ADR-DSN.J.480	
	Référence: CS-ADR-DSN.J.480 Precision approach runways	
	Traduction de courtoisie It is appropriate to modify in the following way : « The following obstacle limitation surfaces should may be established for a precision approach runway category I: » For a precision approach runway category I, surfaces described in (b) are not compulsory. It is only a recommendation in the ICAO Annex 14.	
response	<i>Partially accepted</i>	
	Paragraph (b) will be moved to GM.	

comment	542	comment by: Union des Aéroports français - UAF
	Attachment #323	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.J.485	
	Référence: CS-ADR-DSN.J.485 Runways meant for take-off	
	Traduction de courtoisie It is appropriate to delete the (e). However it is possible to indicate that take-off climb surfaces are correlated with operational characteristics of aircrafts that use the concerned runway and with local pressure and temperature conditions of it. There is a contradiction in the (e):	

	<ul style="list-style-type: none"> • either the obstacle free surface of 2% is sufficient and it is not necessary to establish another one; • or it is sufficient and it is appropriate not to indicate it. <p>We are inclined to favour the respect of the slope of 2% as indicated in ICAO Annex 14, Table J-2. Table J-2: some values do not correspond to ICAO Annex 14 and some references are mistaken. It is appropriate to modify in the following way:</p> <ul style="list-style-type: none"> • "280m" "380m" • "J.465" "J.485"
response	<p><i>Partially accepted</i></p> <p>Paragraph (e) will be moved to GM. Table J-2 will be amended.</p>

comment	615	comment by: Avinor
	CS.ADR.DSN.J.485. Table for landing missing.	
response	<i>Noted</i>	
	Table J-2 contains specifications for Runways Meant for Take-Off.	

comment	749	comment by: ADP : Aeroports de Paris						
	<table border="1"> <tr> <td>Référence: CS-ADR-DSN.J.485</td> <td>Runways meant for take-off</td> </tr> <tr> <td>Proposition/commentaire</td> <td> <p>(e) Il convient de supprimer cette disposition. En revanche, il est possible d'indiquer que les surfaces de décollage devraient être corrélées avec les caractéristiques opérationnelles des aéronefs qui utilisent la piste concernée ainsi qu'avec les conditions locales de pression et de température de celle-ci.</p> <p>Table J-2: Certaines valeurs ne correspondent pas à l'annexe 14 de l'OACI et certaines références sont erronées. Il convient donc de modifier de la manière suivante :</p> <ul style="list-style-type: none"> - "280m" par "380m" - "J.465" en "J.485" - </td> </tr> <tr> <td>Justification</td> <td> <p>Le (e) contient en tant que règlement une contradiction :</p> <ul style="list-style-type: none"> - soit la surface dégagée d'obstacle de 2% est suffisante et dans ce cas il n'est pas nécessaire </td> </tr> </table>		Référence: CS-ADR-DSN.J.485	Runways meant for take-off	Proposition/commentaire	<p>(e) Il convient de supprimer cette disposition. En revanche, il est possible d'indiquer que les surfaces de décollage devraient être corrélées avec les caractéristiques opérationnelles des aéronefs qui utilisent la piste concernée ainsi qu'avec les conditions locales de pression et de température de celle-ci.</p> <p>Table J-2: Certaines valeurs ne correspondent pas à l'annexe 14 de l'OACI et certaines références sont erronées. Il convient donc de modifier de la manière suivante :</p> <ul style="list-style-type: none"> - "280m" par "380m" - "J.465" en "J.485" - 	Justification	<p>Le (e) contient en tant que règlement une contradiction :</p> <ul style="list-style-type: none"> - soit la surface dégagée d'obstacle de 2% est suffisante et dans ce cas il n'est pas nécessaire
Référence: CS-ADR-DSN.J.485	Runways meant for take-off							
Proposition/commentaire	<p>(e) Il convient de supprimer cette disposition. En revanche, il est possible d'indiquer que les surfaces de décollage devraient être corrélées avec les caractéristiques opérationnelles des aéronefs qui utilisent la piste concernée ainsi qu'avec les conditions locales de pression et de température de celle-ci.</p> <p>Table J-2: Certaines valeurs ne correspondent pas à l'annexe 14 de l'OACI et certaines références sont erronées. Il convient donc de modifier de la manière suivante :</p> <ul style="list-style-type: none"> - "280m" par "380m" - "J.465" en "J.485" - 							
Justification	<p>Le (e) contient en tant que règlement une contradiction :</p> <ul style="list-style-type: none"> - soit la surface dégagée d'obstacle de 2% est suffisante et dans ce cas il n'est pas nécessaire 							

	<p>d'établir une autre surface libre d'obstacle, - soit elle n'est pas suffisante et dans ce cas il convient de ne pas l'indiquer. Nous penchons fortement pour le respect de la pente à 2% comme indiqué dans l'annexe 14 de l'OACI et dans le tableau J-2.</p>
Traduction de courtoisie	<p>It is appropriate to delete the (e). However it is possible to indicate that take-off climb surfaces are correlated with operational characteristics of aircrafts that use the concerned runway and with local pressure and temperature conditions of it. There is a contradiction in the (e): - either the obstacle free surface of 2% is sufficient and it is not necessary to establish another one; - or it is sufficient and it is appropriate not to indicate it. We are inclined to favour the respect of the slope of 2% as indicated in ICAO Annex 14, Table J-2.</p> <p>Table J-2: some values do not correspond to ICAO Annex 14 and some references are mistaken. It is appropriate to modify in the following way: - "280m" "380m" - "J.465" "J.485"</p>

response *Partially accepted*

Paragraph (e) will be moved to GM. Table J-2 will be amended.

comment 803

comment by: *Munich Airport International*

Table for landing missing

Justification: ICAO

response *Noted*

Table J-2 contains specifications for Runways Meant for Take-Off.

comment 830

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.J.485 — Runways meant for take-off (p47-48)
- CS-ADR - Book 2 - GM-ADR-DSN.J.485 — Runways meant for take-off (p245)

2. Justification and proposed text / comment

Paragraph (c) and (e) of CS-ADR-DSN.J.485, which are recommendations in ICAO Annex 14 Volume1, have no safety justification and are just possibilities for particular cases. These provisions are thus meant to be guidance materials. In particular, there is a contradiction in paragraph (e) of this CS: indeed, the obstacle free surface of 2% is sufficient, otherwise it would not be in Annex 14 volume 1; thus it is not necessary to establish another lower one of 1.6% that may not be complied with because of obstacles. The wording below in GM-ADR-DSN.J.485 is proposed.

Note: the duplication of figures and tables that are in the book I of the CS to book II - guidance materials brings too much confusion since one not knows if the figure or table is a guidance material or not. It is proposed to delete these duplications.

CS-ADR-DSN.J.485 — Runways meant for take-off

"[...]

~~(c) The operational characteristics of aeroplanes for which the runway is intended should be examined to see if it is desirable to reduce the slope specified in Table J-2 when critical operating conditions are to be catered to. If the specified slope is reduced, corresponding adjustment in the length of the take-off climb surface should be made so as to provide protection to a height of 300 m.~~

[...]

~~(e) If no object reaches the 2 % (1:50) take-off climb surface, an obstacle free surface of 1.6 % (1:62.5) should be established.~~

"[...]"

GM-ADR-DSN.J.485 — Runways meant for take-off

(a) The operational characteristics of aeroplanes for which the runway is intended may be examined to see if it is desirable to reduce the slope specified in Table J-2 when critical operating conditions are to be catered to. If the specified slope is reduced, corresponding adjustment in the length of the take-off climb surface may be made so as to provide protection to a height of 300 m.

(b) If no object reaches the 2 % (1:50) take-off climb surface, an obstacle free surface with a lower slope may be established.

(ac) When local conditions differ widely from sea level standard atmospheric conditions, it may be advisable for the slope specified in Book 1, Table J-2 (repeated below as Table GM-J-1) to be reduced. The degree of this reduction depends on the divergence between local conditions and sea level standard atmospheric conditions, and on the performance characteristics and operational requirements of the aeroplanes for which the runway is intended.

"[...]"

response Partially accepted

Paragraph (e) will be moved to GM. The table in the GM will be deleted.

comment	1036	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	CS-ADR-DSN.J.485 Table J-2: Please change final width for code number 1 to 380 m. Justification: 60 m plus 1600 m with a divergence of 10 % each side equals to 380 m.	
response	<i>Accepted</i>	

comment	1371	comment by: <i>ECA - European Cockpit Association</i>
	<p>Add new sub paragraph under (b): Where the criteria in CS-ADR-DSN.J.485 and Table J-2 cannot be complied with due to obstacles in the straight take-off flight path, the following shall apply: a) Curved Limitation Surface. The limits of the curved limitation surface shall comprise: an inner edge of 150m either side of the extended centre-line and expanding at 0,125D laterally where D is the horizontal distance the aeroplane has travelled from the inner edge. The other dimensions of the surface are as described for take-off runways in Table J-2; the inner edge of the surface shall commence where the aeroplane is required to commence turning; where the inner edge is beyond the distance from runway end as described in table J-2 then the 0.125D requirement shall commence at the width obtained by applying the appropriate splay for the runway. (b) When the curved limitation surface is implemented the entire take-off surface shall have an obstacle free surface with a slope of 1.6 percent (1:62.5). Note: The dimensions of the inner edge for different runway classifications are shown in Table J-2 and depicted in Table J-1.</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 4.2.23.x</p>	
response	<i>Not accepted</i>	
	ICAO text will be retained.	

comment	1372	comment by: <i>ECA - European Cockpit Association</i>
	<p>Amend (c) as follows:</p> <p>(c) The operational characteristics of aeroplanes for which the runway is intended should be examined to see if it is desirable to reduce the slope specified in Table J-2 when critical operating conditions are to be catered to. If the specified slope is reduced, corresponding adjustment in the length of the take-off climb surface should be made so as to provide protection to a height of 300 450 m (1500 ft).</p>	

response	<p>Justification: This is the acceleration altitude relevant for an aircraft taking off. Reference: IFALPA Annex 14, paragraph 4.2.24</p> <p><i>Not accepted</i></p> <p>ICAO text will be retained.</p>
comment	<p>1373 comment by: <i>ECA - European Cockpit Association</i></p> <p>Amend (e) as follows:</p> <p>(e) For existing runways, if no object reaches the 2 % (1:50) take- off climb surface, an obstacle free surface of 1.6 % (1:10062.5) should be established.</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 4.2.26</p>
response	<p><i>Not accepted</i></p> <p>Paragraph (e) will be moved to GM.</p>
comment	<p>1376 comment by: <i>UK CAA</i></p> <p>Page No: 47</p> <p>Paragraph No: CS-ADR-DSN.J.485 – Runways meant for take-off (d)</p> <p>Comment: The term 'shielding' is referred to in all the noted sections; this should be defined in the definitions section and noted as being different from the term 'shadowing'.</p> <p>Justification: To clarify the use of 'shielding' and differentiate this from 'shadowing' to avoid confusion and mis-interpretation of use.</p>
response	<p><i>Not accepted</i></p> <p>The term 'shielding' is used in Annex 14; 'shadowing' does not feature. Therefore, there should be no confusion. The application of shielding is described in the ICAO Airport Services Manual (<i>Doc 9137</i>), Part 6.</p>
comment	<p>1479 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #324</p>

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.J.485

Référence: CS-ADR-DSN.J.485
Runways meant for take-off

Traduction de courtoisie

It is appropriate to delete the (e).

However it is possible to indicate that take-off climb surfaces are correlated with operational characteristics of aircrafts that use the concerned runway and with local pressure and temperature conditions of it.

There is a contradiction in the (e):

- either the obstacle free surface of 2% is sufficient and it is not necessary to establish another one;
- or it is sufficient and it is appropriate not to indicate it.

We are inclined to favour the respect of the slope of 2% as indicated in ICAO Annex 14, Table J-2.

Table J-2: some values do not correspond to ICAO Annex 14 and some references are mistaken. It is appropriate to modify in the following way:

- "280m" "380m"
- "J.465" "J.485"

response *Partially accepted*

Paragraph (e) will be moved to GM. Table J-2 will be amended.

comment 1584

comment by: *Aéroport de Marseille - MRS/LFML*

It is appropriate to delete the (e).

However it is possible to indicate that take-off climb surfaces are correlated with operational characteristics of aircrafts that use the concerned runway and with local pressure and temperature conditions of it.

There is a contradiction in the (e):

- either the obstacle free surface of 2% is sufficient and it is not necessary to establish another one;
- or it is sufficient and it is appropriate not to indicate it.

We are inclined to favour the respect of the slope of 2% as indicated in ICAO Annex 14, Table J-2.

Table J-2: some values do not correspond to ICAO Annex 14 and some references are mistaken. It is appropriate to modify in the following way:

- "280m" "380m"
- "J.465" "J.485"

response *Partially accepted*

Paragraph (e) will be moved to GM. Table J-2 will be amended.

comment	1813	comment by: <i>Geneva International Airport (ROMIG)</i>
	The reference in point (d) is incorrect - change the reference to CS.ADR.DSN.J.485 Formating	
response	<i>Accepted</i>	

comment	1920	comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	Attachment #325	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.J.485	
	Référence: CS-ADR-DSN.J.485 Runways meant for take-off	
	Traduction de courtoisie It is appropriate to delete the (e). However it is possible to indicate that take-off climb surfaces are correlated with operational characteristics of aircrafts that use the concerned runway and with local pressure and temperature conditions of it. There is a contradiction in the (e):	
	<ul style="list-style-type: none"> • either the obstacle free surface of 2% is sufficient and it is not necessary to establish another one; • or it is sufficient and it is appropriate not to indicate it. 	
	We are inclined to favour the respect of the slope of 2% as indicated in ICAO Annex 14, Table J-2. Table J-2: some values do not correspond to ICAO Annex 14 and some references are mistaken. It is appropriate to modify in the following way:	
	<ul style="list-style-type: none"> • "280m" "380m" • "J.465" "J.485" 	
response	<i>Partially accepted</i>	
	Paragraph (e) will be moved to GM. Table J-2 will be amended.	

comment	2000	comment by: <i>Aéroports De Lyon</i>
	Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.	
	<u>Proposition</u> : Déplacer en AR	

response	<p><i>Not accepted</i></p> <p>This CS does not assign responsibility for action.</p>
comment	<p>2032 comment by: Pau Pyrénées Airport - PUF/LFBP</p> <p>It is appropriate to delete the (e). However it is possible to indicate that take-off climb surfaces are correlated with operational characteristics of aircrafts that use the concerned runway and with local pressure and temperature conditions of it. There is a contradiction in the (e):</p> <ul style="list-style-type: none"> - either the obstacle free surface of 2% is sufficient and it is not necessary to establish another one; - or it is sufficient and it is appropriate not to indicate it. <p>We are inclined to favour the respect of the slope of 2% as indicated in ICAO Annex 14, Table J-2.</p> <p>Table J-2: some values do not correspond to ICAO Annex 14 and some references are mistaken. It is appropriate to modify in the following way:</p> <ul style="list-style-type: none"> - "280m" "380m" - "J.465" "J.485"
response	<p><i>Partially accepted</i></p> <p>Paragraph (e) will be moved to GM. Table J-2 will be amended.</p>
comment	<p>2387 comment by: Airport St. Gallen-Altenrhein - ACH/LSZR</p> <p>a table for landing is missing</p>
response	<p><i>Noted</i></p> <p>Table J-2 contains specifications for Runways Meant for Take-Off.</p>
comment	<p>2481 comment by: AENA - Aeropuertos Españoles y Navegación Aérea</p> <p>Paragraph (c) and (e) of CS-ADR-DSN.J.485, which are recommendations in ICAO Annex 14 Volume1, have no safety justification and are just possibilities for particular cases. These provisions are thus meant to be guidance materials. In particular, there is a contradiction in paragraph (e) of this CS: indeed, the obstacle free surface of 2% is sufficient, otherwise it would not be in Annex 14 volume 1; thus it is not necessary to establish another lower one of 1.6% that may not be complied with because of obstacles. The wording below in GM-ADR-DSN.J.485 is proposed.</p> <p><i>Note: the duplication of figures and tables that are in the book I of the CS to book II - guidance materials brings too much confusion since one not knows if the figure or table is a guidance material or not. It is proposed to delete these</i></p>

duplications.

CS-ADR-DSN.J.485 – Runways meant for take-off

"[...]

~~(c) The operational characteristics of aeroplanes for which the runway is intended should be examined to see if it is desirable to reduce the slope specified in Table J-2 when critical operating conditions are to be catered to. If the specified slope is reduced, corresponding adjustment in the length of the take-off climb surface should be made so as to provide protection to a height of 300 m.~~

[...]

~~(e) If no object reaches the 2 % (1:50) take-off climb surface, an obstacle free surface of 1.6 % (1:62.5) should be established.~~

[...]"

GM-ADR-DSN.J.485 – Runways meant for take-off

"(a) The operational characteristics of aeroplanes for which the runway is intended may be examined to see if it is desirable to reduce the slope specified in Table J-2 when critical operating conditions are to be catered to. If the specified slope is reduced, corresponding adjustment in the length of the take-off climb surface may be made so as to provide protection to a height of 300 m.

(b) If no object reaches the 2 % (1:50) take-off climb surface, an obstacle free surface with a lower slope may be established.

(ac) When local conditions differ widely from sea level standard atmospheric conditions, it may be advisable for the slope specified in Book 1, Table J-2 (~~repeated below as Table GM-J-1~~) to be reduced. The degree of this reduction depends on the divergence between local conditions and sea level standard atmospheric conditions, and on the performance characteristics and operational requirements of the aeroplanes for which the runway is intended.

[...]"

response *Partially accepted*

Paragraph (e) will be moved to GM.

comment 2632

comment by: *Airport Nuremberg - NUE/EDDN*

(c) For existing aerodromes, fulfilling this recommendation is not practicable. It exceeds the ICAO standards and what aerodromes practically can achieve by far. This must be moved to guidance material to not discriminate the airports within the European Union. It is not clear who exactly could make such an examination and which authority would have the technical know-how to make a decision whether the examination / the calculated slope is correct.

response *Noted*

comment 2633

comment by: *Airport Nuremberg - NUE/EDDN*

(e) This must be moved to guidance material and remain a voluntarily

fulfillable recommandation! The aerodrome operator should be able to decide whether to reduce the obstacle free surface, since this could lead to further effort, cost and uncomfortable negotiations with stake holders / negative publicity when it comes to restricting environmental protection zones (trees etc.). Mainly making this ICAO recommendation a CS punishes the aerodromes reaching the needed 2%, rather than rewarding their effort!

response *Accepted*

comment 2713 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#326](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.J.485

Référence: CS-ADR-DSN.J.485
Runways meant for take-off

Traduction de courtoisie

It is appropriate to delete the (e).

However it is possible to indicate that take-off climb surfaces are correlated with operational characteristics of aircrafts that use the concerned runway and with local pressure and temperature conditions of it.

There is a contradiction in the (e):

- either the obstacle free surface of 2% is sufficient and it is not necessary to establish another one;
- or it is sufficient and it is appropriate not to indicate it.

We are inclined to favour the respect of the slope of 2% as indicated in ICAO Annex 14, Table J-2.

Table J-2: some values do not correspond to ICAO Annex 14 and some references are mistaken. It is appropriate to modify in the following way:

- "280m" "380m"
- "J.465" "J.485"

response *Partially accepted*

Paragraph (e) will be moved to GM. Table J-2 will be amended.

comment 2880 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

**Référence: CS-ADR-
DSN.J.485**

Runways meant for take-off

Proposition/commentaire

(e) Il convient de supprimer cette disposition.
En revanche, il est possible d'indiquer que les

	<p>surfaces de décollage devraient être corrélées avec les caractéristiques opérationnelles des aéronefs qui utilisent la piste concernée ainsi qu'avec les conditions locales de pression et de température de celle-ci.</p> <p>Table J-2: Certaines valeurs ne correspondent pas à l'annexe 14 de l'OACI et certaines références sont erronées. Il convient donc de modifier de la manière suivante :</p> <ul style="list-style-type: none"> - "280m" par "380m" - "J.465" en "J.485" -
Justification	<p>Le (e) contient en tant que règlement une contradiction :</p> <ul style="list-style-type: none"> - soit la surface dégagée d'obstacle de 2% est suffisante et dans ce cas il n'est pas nécessaire d'établir une autre surface libre d'obstacle, - soit elle n'est pas suffisante et dans ce cas il convient de ne pas l'indiquer. <p>Nous penchons fortement pour le respect de la pente à 2% comme indiqué dans l'annexe 14 de l'OACI et dans le tableau J-2.</p>
Traduction de courtoisie	<p>It is appropriate to delete the (e). However it is possible to indicate that take-off climb surfaces are correlated with operational characteristics of aircrafts that use the concerned runway and with local pressure and temperature conditions of it.</p> <p>There is a contradiction in the (e):</p> <ul style="list-style-type: none"> - either the obstacle free surface of 2% is sufficient and it is not necessary to establish another one; - or it is sufficient and it is appropriate not to indicate it. <p>We are inclined to favour the respect of the slope of 2% as indicated in ICAO Annex 14, Table J-2.</p> <p>Table J-2: some values do not correspond to ICAO Annex 14 and some references are mistaken. It is appropriate to modify in the following way:</p> <ul style="list-style-type: none"> - "280m" "380m" - "J.465" "J.485"
response	<i>Partially accepted</i>

Paragraph (e) will be moved to GM. Table J-2 will be amended.

comment 2938 comment by: AIRBUS

(d) ... when the new object or extension is **would be** shielded ...

response *Accepted*

comment 3025 comment by: ADV -German Airports Association

CS.ADR.DSN.J.485
Table for landing missing

Justification
ICAO

response *Noted*

Table J-2 contains specifications for Runways Meant for Take-Off.

comment 3060 comment by: MST / STR - Stuttgart Airport

CS.ADR.DSN.J.485
Table for landing missing

Justification
ICAO

response *Noted*

Table J-2 contains specifications for Runways Meant for Take-Off.

CS-ADR — Book 1 — Table J-2 Dimensions and slopes of obstacle limitation surfaces

p. 49

comment 29 comment by: ACI EUROPE - Airports Council International

Table for landing missing

	Justification: ICAO
response	<i>Noted</i>
	Table J-2 contains specifications for Runways Meant for Take-Off.

comment	230	comment by: <i>Danish Transport Authority</i>
	Final width of the take-off climb surface on code 1 runways shall be 380 meter according to ICAO Annex 14, Volume I	
response	<i>Accepted</i>	

comment	402	comment by: <i>Cologne/Bonn Airport</i>
	Change Final Width for Code 1 to 380 m According to ICAO	
response	<i>Accepted</i>	

comment	787	comment by: <i>Munich Airport International</i>
	Change Final Width for Code 1 to 380 m	
	Justification: According to ICAO	
response	<i>Accepted</i>	

comment	831	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> CS-ADR - Book 1 - Table J-2 Dimensions and slopes of obstacle limitation surfaces (p49) <p><u>2. Justification and proposed text / comment</u></p> <p>The final width for the take off climb surface for code 1 runway is erroneous: it should be 380m, as specified by Annex 14 volume1, instead of 280m. This is important because it decreases the protection of the take-off.</p> <p>Moreover, the reference the CS-ADR-DSN.J.465, which provide for the general presentation of OLS, is erroneous. It seems the good reference is CS-ADR-</p>	

DSN.J.485 which deals with runways meant for take-off.

RUNWAYS MEANT FOR TAKE-OFF			
Surface and dimensions ^a	Code number		
	1	2	3 or 4
[...]			
Final width	280 380 m	580 m	1200 m 1800 m
[...]			
[...]			

d. See CS-ADR-DSN.J.465 485 (c) and (e).

response *Accepted*

comment 1076

comment by: Euroairport Bâle-Mulhouse

Attachment [#327](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN Table J-1 Corrigendum

Référence: CS-ADR.DSN Corrigendum
Table J-1 Obstacle limitation requirements
Note (c) "distance to the end of strip"

Traduction de courtoisie

It is appropriate to modify the note (c) in the following way: distance: "distance to 60 m beyond the runway end."

The distance of 60 m corresponds to the minimal length of the runway strip beyond the runway end. It is frequent to have runway strips ending beyond this distance. For technical reasons, the obstacle limitation surfaces related to interrupted take-off

surface are related to this distance and not to the end of the runway strip which can be much longer.

response *Accepted*

comment 1374

comment by: ECA - European Cockpit Association

Add new CS-ADR-DSN.J.XXX on Other objects:

Insert ICAO Annex 14 paragraphs 4.4 in CS or GM:

4.4.1 Recommendation.— *Objects which do not project through the approach surface but which would nevertheless adversely affect the optimum siting or performance of visual or non-visual aids should, as far as practicable, be*

removed.

4.4.2 **Recommendation.**— Anything which may, in the opinion of the appropriate authority after aeronautical study, endanger aeroplanes on the movement area or in the air within the limits of the inner horizontal and conical surfaces should be regarded as an obstacle and should be removed in so far as practicable.

Note.— In certain circumstances, objects that do not project above any of the surfaces enumerated in 4.1 may constitute a hazard to aeroplanes as, for example, where there are one or more isolated objects in the vicinity of an aerodrome.

Justification:

ICAO Annex 14 paragraph 4.4. has been removed from CS and GM. There is not safety reason for such a deletion and ECA considers this is an important and useful paragraph.

response *Not accepted*

The proposal refers to operational consideration and contains no design specifications. this is partially addressed in CS-ADR-DSN.J.485, paragraph (f).

comment

1377

comment by: ECA - European Cockpit Association

General comment on Chapter J & Chapter Q:

ECA believes that the "see and be seen" concept for the avoidance of obstacles is not acceptable to pilots. The marking and lighting of obstacles as stipulated at present is not sufficient. This should only be a second choice. The first choice is to remove the obstacle.

This philosophy is especially applicable to chapter Q visual aids for denoting obstacles.

Reference: IFALPA Annex 14, paragraph "See and be seen" concept, page 14-I-4-9

response *Noted*

comment

1379

comment by: UK CAA

Page No: 49

Paragraph No: Table J-2 Dimensions and slopes of obstacle limitation surfaces

Comment: Final width (TOCS) for code number 1 runway should be **380m** not 280m

Justification: ICAO Annex 14 requires a final width of 380m.

Proposed Text: Final width – **380m**

response *Accepted*

comment *1380* comment by: *UK CAA*

Page No: 49

Paragraph No: Table J-2 Dimensions and slopes of obstacle limitation surfaces

Comment: The length of inner edge runway codes 1 or 2 needs to be widened to 150m if a clearway is provided.

Justification: Aircraft that would need to take advantage of a clearway are higher performance than would normally be operated from such a runway and additional protection is required.

Proposed Text: Length of Inner Edge code numbers 1 and 2 – **Add a footnote to each: "where clearway is provided the length of the inner edge should be 150m."**

response *Accepted*

comment *1811* comment by: *Geneva International Airport (ROMIG)*

Table for landing missing.
Exists in ICAO documentation

response *Noted*

Table J-2 contains specifications for Runways Meant for Take-Off.

comment *2002* comment by: *Aéroports De Lyon*

Tout ce qui concerne les OLS est géré, à ce jour par la DSAC et le SNA. Cela impliquerait de lourds changements opérationnels.

Proposition: Déplacer en AR

response *Not accepted*

This CS does not assign responsibility for action.

comment *2388* comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

	final width for code number 1 should read 380 m
response	<i>Accepted</i>

comment	2635 comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	<p>According to the ICAO Annex the final width of the runways meant for take-off at code number one should be 380m, not 280m. Therefore the table needs to be changed accordingly.</p> <p>Additionally Table 4-1 of the ICAO Annex 14 concerning Dimensions and slopes of obstacle limitation surfaces – Approach runways is completely missing in the EASA document - purposely?</p>

response	<i>Partially accepted</i>
	<p>Table J-2 will be amended. This chapter deals with runways meant for take-off. The missing approach runways table will be inserted in the appropriate chapter.</p>

comment	3009 comment by: <i>ADV -German Airports Association</i>
	<p>Table J-2 Change Final Width for Code 1 to 380 m</p> <p>Justification According to ICAO</p>

response	<i>Accepted</i>
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comment	3044 comment by: <i>MST / STR - Stuttgart Airport</i>
	<p>Table J-2 Change Final Width for Code 1 to 380 m</p> <p>Justification According to ICAO</p>

response	<i>Accepted</i>
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comment	129	comment by: <i>MWEBWV Ministerium für Wirtschaft, Energie, Bauen, Wohnen und Verkehr des Landes Nordrhein-Westfalen</i>
		According to which criteria is "a sufficient number" decided?
response		<i>Noted</i>
		This depends on the aerodrome design and infrastructure (as explained in CS paragraph (b)).
comment	595	comment by: <i>Cologne/Bonn Airport</i>
response		<i>Noted</i>
		No comment has been made.
comment	1065	comment by: <i>Bezirksregierung Düsseldorf / Luftverkehr</i>
		Die Festlegung "..ausreichende Anzahl an Windsäcken..." in CS-ADR-DSN-K.490(a) ist ohne jegliche Aussagekraft. Was bedeutet in diesem Fall "ausreichend"?
		<i>The requirement "...with a sufficient number of wind direction indicators..." offers no explanatory power. What is the meaning of the word "sufficient" in this context?</i>
response		<i>Noted</i>
		This depends on the aerodrome design and infrastructure (as explained in CS paragraph (b)).
comment	1112	comment by: <i>Belgian CAA</i>
		It would be better to mention that at least one wind direction indicator is needed.
response		<i>Noted</i>
comment	1382	comment by: <i>UK CAA</i>
		Page No: 50

	Paragraph No: CS.ADR.DSN.K.490(a) Wind Direction Indicator
	Comment: The UK supports the greater flexibility in provision.
response	<i>Noted</i>

comment	1500 comment by: <i>Flughafen Linz-Hörsching - LNZ/LOWL</i>
	(a) change "...a sufficient number of wind indicator..." to "...minimum one wind indicator..."
response	<i>Noted</i>

comment	2637 comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	(a), (b) and (d) could remain in the CS; Part (c) should be moved to the guidance material. This is far too much detail within this CS and additionally it does not always contain definite instructions (where practicable).
response	<i>Not accepted</i>
	This paragraph contains the specifications.

comment	2791 comment by: <i>ECA - European Cockpit Association</i>
	Delete (a) and replace with: (1) A wind direction indicator should be provided for each runway. (2) A wind direction indicator should be provided at runway/runway intersections. (3) Where local RT is not utilized for air traffic control or local RT control is not available during all hours landings and departures can be expected, a general purpose wind direction indicator shall be provided so that arrival aircraft aloft are able to determine aerodrome general wind information.
	Delete (b) and replace with: (1) Wind direction indicators serving runway ends shall be placed near and on the same runway side as the PAPI (or other VGSI) approximately 150 m upwind of the runway end so as to be clearly visible to aircraft on short final approach and to departing aircraft. (2) A wind direction indicator serving a runway/runway intersection should be placed in one quadrant of the intersection so as to be easily visible to aircraft utilizing either runway. (3) A general purpose wind direction indicator, when provided, should be placed

so as to be clearly visible and understandable to aircraft overhead the aerodrome.

(4) A general purpose wind direction indicator, when provided, should be placed so as to be free from the effects of air disturbances caused by nearby objects.

(5) A general purpose wind indicator, when provided, should be placed so as to be visible to aircraft operating on the movement area where possible.

Delete (c) and replace with:

(1) Wind direction indicators should be in the form of a truncated cone made of fabric and should have a length of not less than 3.6 m and a diameter, at the larger end, of .9 m. It should be constructed so that it gives a clear indication of the direction of the surface wind and a general indication of the wind speed.

(2) Wind direction indicators intended for use at night or during low ambient light conditions should be illuminated.

(3) A general purpose wind direction indicator should be clearly visible and understandable from a height of at least 300 m above aerodrome elevation.

(4) A general purpose wind direction indicator, when provided, should be marked by a circular band 15 m in diameter and 1.2 m wide. The band should be centred about the wind direction indicator support and should be in a colour chosen to provide adequate conspicuity, preferably white.

Wind direction indicator mountings should be frangible.

Justification:

There is a need to:

- Establish a Standard requiring an illuminated wind direction indicator (windsock) to serve each end of runways utilized by air carrier aircraft.
- Establish a Standard specifying the location of windsocks in the vicinity of the VGSI (PAPI).
- Establish a Recommendation that windsocks be provided in the vicinity of runway/runway intersections. Such placement will provide wind information to flight crews (i.e., unusual winds or wake vortex turbulence resulting from a landing or departure on the intersected runway) and alert flight crews to the location of the intersected runway.
- Establish somewhat revised criteria for the General Purpose Wind Direction Indicator. This is the only indicator to which the "...free from the effects of air disturbances caused by nearby objects..." criteria should apply. Each indicator serving a runway end should reflect the actual wind conditions as affected by nearby objects because that is the wind that arriving and departing aircraft will encounter.
- Establish a Standard specifying frangible mountings.

Reference: IFALPA Annex 14, paragraphs 5.1.1.1 to 5.1.1.14

response *Not accepted*

CS-ADR – Book 1 – CS-ADR-DSN.K.495 – Landing direction indicator

p. 50-51

comment 217 comment by: *CAA Austria - Ministry of Transport*

Should be made clear, that if at an ATC-controlled aerodrome there is no operational need for an Landing direction indicator, it wouldn't be provided.

response *Noted*

comment 291 comment by: *Icelandic Civil Aviation Administration*

Suggest to delete, landing direction indicators - not used at airports in scope.

response *Noted*

comment 343 comment by: *Vienna International Airport*

If an Aerodrome is ATC controlled there is no operational need for a Landing direction indicator.

response *Noted*

comment 992 comment by: *Salzburger Flughafen GmbH*

If an aerodrome is ATC controlled there is no operational need for a landing direction indicator

response *Noted*

comment 1099 comment by: *Flughafen Graz Betriebs GmbH*

If an Aerodrome is ATC controlled there is no operational need for a Landing direction indicator.

response *Noted*

comment	1166 comment by: <i>Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH</i>
	If an Aerodrome is ATC controlled there is no operational need for a Landing direction indicator.
response	<i>Noted</i>

comment	1386 comment by: <i>UK CAA</i>
	Page No: 50
	Paragraph No: CS-ADR-DSN.K.495
	Comment: Is it necessary to have this specification for an in-scope aerodrome?
	Justification: The rules are focussed on the requirements for a large aerodrome with instrument procedures, therefore, by design, the above specification is redundant. Therefore it should be deleted.
	Proposed Text: DELETE CS-ADR-DSN.K.495
response	<i>Not accepted</i>
	The rules cater for, <i>inter alia</i> , paved runways of 800 metres length upwards. It is feasible for some smaller aerodromes to have significant visual traffic in addition to the instrument traffic. Therefore, the landing direction indicator could be a useful adjunct.

comment	1502 comment by: <i>Flughafen Linz-Hörsching - LNZ/LOWL</i>
	if an aerodrome is ATC controlled there is no operational need for a landing direction indicator.
response	<i>Noted</i>

comment	2636 comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	(a) The term sufficient is too vague and needs to be clarified in greater detail.
response	<i>Noted</i>

comment	2722	comment by: <i>Flughafen Klagenfurt</i>
	If an Aerodrome is ATC controlled, there is no operational need for a landing direction indicator.	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.K.500 – Signalling lamp

p. 51

comment	146	comment by: <i>CAA Norway</i>
	CS-ADR-DSN.K.500 is empty. We suggest to elevate the GM referred to in the CS from GM to CS. Important safety critical use for aircraft without radio contact. Or make sure it is a requirement in ATM regulation.	
response	<i>Accepted</i>	

comment	292	comment by: <i>Icelandic Civil Aviation Administration</i>
	CS-ADR-DSN.K.500 is empty. We suggest to elevate the GM referred to in the CS from GM to CS. Important safety critical use for aircraft without radio contact. Or make sure it is a requirement in ATM regulation.	
response	<i>Accepted</i>	

comment	642	comment by: <i>Finnish Transport Safety Agency</i>
	CS-ADR-DSN.K.500 is empty. We suggest to elevate the GM referred to in the CS from GM to CS. Important safety critical use for aircraft without radio contact. Or make sure it is a requirement in ATM regulation.	
response	<i>Accepted</i>	

comment	1389	comment by: <i>UK CAA</i>
	<p>Page No: 51</p> <p>Paragraph No: CS-ADR-DSN.K.500</p> <p>Comment: Is it necessary to have this specification for an in-scope</p>	

	aerodrome?
	<p>Justification: The rules are focussed on the requirements for a large aerodrome with instrument procedures, therefore, by design, the above specification is redundant. Therefore it should be deleted.</p> <p>Proposed Text: DELETE CS-ADR-DSN.K.500</p>
response	<p><i>Not accepted</i></p> <p>The rules cater for, <i>inter alia</i>, paved runways of 800 metres length upwards. It is feasible for some smaller aerodromes to have significant visual traffic in addition to the instrument traffic. Therefore, the signalling lamp could be a useful adjunct for communicating with aircraft on the ground or in the air.</p>

comment	<p>1826 comment by: <i>ENAC Ente Nazionale per l'Aviazione Civile</i></p> <p>We propose to remove this GM.</p>
response	<p><i>Partially accepted</i></p> <p>This will be elevated to CS.</p>

CS-ADR – Book 1 – CS-ADR-DSN.K.505 – Signal panels and signal area

p. 51

comment	<p>293 comment by: <i>Icelandic Civil Aviation Administration</i></p> <p>Suggest to delete as signal areas are not used at airports in scope. Signal areas not used at modern aerodromes.</p>
response	<p><i>Accepted</i></p> <p>The CS will be used to update the GM.</p>

comment	<p>1391 comment by: <i>UK CAA</i></p> <p>Page No: 51</p> <p>Paragraph No: CS-ADR-DSN.K.505</p> <p>Comment: Is it necessary to have this specification for an in-scope aerodrome?</p> <p>Justification: The rules are focussed on the requirements for a large aerodrome with instrument procedures, therefore, by design, the above</p>
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specification is redundant. Therefore it should be deleted.

Proposed Text: DELETE CS-ADR-DSN.K.505

response *Accepted*

comment 2317 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – CS-ADR-DSN.K.510 – Location of signal area

p. 51

comment 294 comment by: *Icelandic Civil Aviation Administration*

Suggest to delete as signal areas are not used at airports in scope. Signal areas not used at modern aerodromes.

response *Accepted*

The CS will be used to update the GM.

comment 1835 comment by: *ENAC Ente Nazionale per l'Aviazione Civile*

We propose to change the title of the paragraph from
.. location of signal area To
... Condition for the installation of signal area.

response *Not accepted*

The title reflects ICAO wording.

comment 2317 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – CS-ADR-DSN.K.515 – Characteristics of signal area

p. 51

comment	295	comment by: <i>Icelandic Civil Aviation Administration</i>
	Suggest to delete as signal areas are not used at airports in scope. Signal areas not used at modern aerodromes.	
response	<i>Accepted</i>	
	The CS will be used to update the GM.	

comment	2317 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.L.520 – General – Colour and conspicuity

p. 52

comment	147	comment by: <i>CAA Norway</i>
	"Apron safety lines" is missing in CS-ADR-DSN.L.520 on page 52. We suggest to put in a text from Annex 14 5.2.1.6 for apron safety lines.	
response	<i>Accepted</i>	

comment	296	comment by: <i>Icelandic Civil Aviation Administration</i>
	"Apron safety lines" is missing in CS-ADR-DSN.L.520 on page 52. We suggest to put in a text from Annex 14 5.2.1.6 for apron safety lines.	
response	<i>Accepted</i>	

comment	358	comment by: <i>Estonian CAA</i>
	"Apron safety lines" is missing in CS-ADR-DSN.L.520 on page 52. We suggest to put in a text from Annex 14 5.2.1.6 for apron safety lines.	

response *Accepted*

comment 544 comment by: *Union des Aéroports français - UAF*

Attachment [#328](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.L.520

Référence: CS-ADR-DSN.L.520
General – Colour and conspicuity

Traduction de courtoisie

It is appropriate to delete the reference to the following GM: "Additional Guidance Material is set out in GM-AD-DSN-520. »

Referring to a GM inside a CS amounts to give the GM a CS value which is not recommended.

response *Accepted*

comment 643 comment by: *Finnish Transport Safety Agency*

"Apron safety lines" is missing in CS-ADR-DSN.L.520 on page 52. We suggest to put in a text from Annex 14 5.2.1.6 for apron safety lines.

response *Accepted*

comment 750 comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.L.520	General – Colour and conspicuity
Proposition/commentaire	Il convient de supprimer la référence au GM suivant: "Additional Guidance Material is set out in GM-AD-DSN-520. »
Justification	Faire référence à un GM à l'intérieur même d'un CS revient à lui donner une valeur de CS, ce qui n'est pas souhaitable.
Traduction de courtoisie	It is appropriate to delete the reference to the following GM: "Additional Guidance Material is set out in GM-AD-DSN-520. » Referring to a GM inside a CS amounts to give the GM a CS value which is not recommended.

response *Accepted*

comment *1160* comment by: *Swedish Transport Agency*

"Apron safety lines" is missing in CS-ADR-DSN.L.520 on page 52. We suggest to put in a text from Annex 14 5.2.1.6 for apron safety lines.

response *Accepted*

comment *1439* comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.L.520 — General - Colour and conspicuity (p52)

2. Justification and proposed text / comment

Making such a reference to a Guidance Material in this Certification Specification is strongly confusing. Indeed, **from a legal perspective**, such a reference may make the content of the GM become binding, through the introduction of the CS in the certification Basis, which is absolutely not the intent of a guidance material.

To avoid any misunderstanding, it is proposed to delete the last part of paragraph (c) of this CS:

CS-ADR-DSN.L.520 — General – Colour and conspicuity

"[...] (c) When it is operationally necessary to apply temporary runway or taxiway markings, those markings should comply with the relevant CS. Additional Guidance Material is set out in GM AD-DSN-520."

response *Accepted*

comment *1480* comment by: *Euroairport Bâle-Mulhouse*

Attachment [#329](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.L.520

Référence: CS-ADR-DSN.L.520
General – Colour and conspicuity

Traduction de courtoisie

It is appropriate to delete the reference to the following GM: "Additional

	Guidance Material is set out in GM-AD-DSN-520. » Referring to a GM inside a CS amounts to give the GM a CS value which is not recommended.
response	<i>Accepted</i>

comment	1585 comment by: <i>Aéroport de Marseille - MRS/LFML</i>
	It is appropriate to delete the reference to the following GM: "Additional Guidance Material is set out in GM-AD-DSN-520. » Referring to a GM inside a CS amounts to give the GM a CS value which is not recommended.
response	<i>Accepted</i>

comment	1921 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	Attachment #330
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.L.520
	Référence: CS-ADR-DSN.L.520 General – Colour and conspicuity
	Traduction de courtoisie It is appropriate to delete the reference to the following GM: "Additional Guidance Material is set out in GM-AD-DSN-520. » Referring to a GM inside a CS amounts to give the GM a CS value which is not recommended.
response	<i>Accepted</i>

comment	2015 comment by: <i>Aéroports De Lyon</i>
	OK pour une uniformisation du marquage mais attention à ne pas augmenter les surfaces glissantes
response	<i>Noted</i>

comment	2018 comment by: <i>Aéroports De Lyon</i>
	Le paragraphe CS-ADR-DSN.L585 - VOR aerodrome checkpoint marking n'apparait pas. Voici nos commentaires sur ce paragraphe:

	A ce jour, nous ne disposons pas de ce type de marquage. <u>Proposition</u> : Passer en GM
response	<i>Not accepted</i> The CS L.585 exists and is an ICAO specification.
comment	2031 comment by: Pau Pyrénées Airport - PUF/LFBP It is appropriate to delete the reference to the following GM: "Additional Guidance Material is set out in GM-AD-DSN-520. » Referring to a GM inside a CS amounts to give the GM a CS value which is not recommended.
response	<i>Accepted</i>
comment	2317 ❖ comment by: HIA - Highlands and Islands Airports Limited Noted
response	<i>Noted</i>
comment	2591 comment by: Danish Transport Authority "Apron safety lines" should be integrated in the paragraph according to ICAO Annex 14 5.2.1.6 for apron safety lines.
response	<i>Accepted</i>
comment	2617 comment by: Swedavia AB - Swedish airports (currently 11 airports) "Apron safety lines" is missing in CS-ADR-DSN.L.520 on page 52. We suggest to put in a text from Annex 14 5.2.1.6 for apron safety lines.
response	<i>Accepted</i>
comment	2714 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD Attachment #331

	<p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.L.520</p> <p>Référence: CS-ADR-DSN.L.520 General – Colour and conspicuity</p> <p>Traduction de courtoisie It is appropriate to delete the reference to the following GM: "Additional Guidance Material is set out in GM-AD-DSN-520. » Referring to a GM inside a CS amounts to give the GM a CS value which is not recommended.</p>
response	<i>Accepted</i>

comment	2881	comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i>								
	<table border="1"> <tr> <td>Référence: CS-ADR-DSN.L.520</td> <td>General – Colour and conspicuity</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de supprimer la référence au GM suivant: "Additional Guidance Material is set out in GM-AD-DSN-520. »</td> </tr> <tr> <td>Justification</td> <td>Faire référence à un GM à l'intérieur même d'un CS revient à lui donner une valeur de CS, ce qui n'est pas souhaitable.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>It is appropriate to delete the reference to the following GM: "Additional Guidance Material is set out in GM-AD-DSN-520. » Referring to a GM inside a CS amounts to give the GM a CS value which is not recommended.</td> </tr> </table>	Référence: CS-ADR-DSN.L.520	General – Colour and conspicuity	Proposition/commentaire	Il convient de supprimer la référence au GM suivant: "Additional Guidance Material is set out in GM-AD-DSN-520. »	Justification	Faire référence à un GM à l'intérieur même d'un CS revient à lui donner une valeur de CS, ce qui n'est pas souhaitable.	Traduction de courtoisie	It is appropriate to delete the reference to the following GM: "Additional Guidance Material is set out in GM-AD-DSN-520. » Referring to a GM inside a CS amounts to give the GM a CS value which is not recommended.	
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Proposition/commentaire	Il convient de supprimer la référence au GM suivant: "Additional Guidance Material is set out in GM-AD-DSN-520. »									
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response	<i>Accepted</i>									

comment	79	comment by: <i>CAA-NL</i>
	<p>Paragraph (3) does not address that larger dimensions should be used for the number where these are incorporated in the threshold marking in order to adequately fill the gap between the stripes of the threshold marking. The use of larger dimensions for the numbers where these are incorporated in the threshold marking is essential for the recognition of the marking for consistency and a standardised view. We Propose to add 'where the numbers are incorporated in the threshold marking, larger dimensions should be used in</p>	

	order to fill the gap between the stripes of the threshold marking'.	
response	<i>Accepted</i>	
comment	148	comment by: <i>CAA Norway</i>
	We suggest to make a GM to CS-ADR-DSN.L.525 on page 52 with information about not to use the combinations of 02/20 and 13/31 due to the possibility to be confused with each other.	
response	<i>Not accepted</i>	
comment	359	comment by: <i>Estonian CAA</i>
	We suggest to make a GM to CS-ADR-DSN.L.525 on page 52 with information about not to use the combinations of 02/20 and 13/31 due to the possibility to be confused with each other.	
response	<i>Not accepted</i>	
comment	644	comment by: <i>Finnish Transport Safety Agency</i>
	We suggest to make a GM to CS-ADR-DSN.L.525 on page 52 with information about not to use the combinations of 02/20 and 13/31 due to the possibility to be confused with each other.	
response	<i>Not accepted</i>	
comment	1163	comment by: <i>Swedish Transport Agency</i>
	We suggest to make a GM to CS-ADR-DSN.L.525 on page 52 with information about not to use the combinations of 02/20 and 13/31 due to the possibility to be confused with each other.	
response	<i>Not accepted</i>	
comment	2317 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	

response *Noted*

comment 2592 comment by: *Danish Transport Authority*

We suggest to make a GM to CS-ADR-DSN.L.525 with information about avoiding the use of combinations 02/20 and 13/31 due to the possibility to be confused with each other. Also the possibility of two aerodromes close th each other with the same runway designation may be a contributing safety factor that may be avoided.

response *Not accepted*

comment 2618 comment by: *Swedavia AB - Swedish airports (currently 11 airports)*

We suggest to make a GM to CS-ADR-DSN.L.525 on page 52 with information about not to use the combinations of 02/20 and 13/31 due to the possibility to be confused with each other.

response *Not accepted*

comment 2638 comment by: *Airport Nuremberg - NUE/EDDN*

(3) Comared to the respective ICAO Annex 14 standard, the EASA suggestion features a deleted phrase. This must be re-inserted in order to have the same wording in EASA and ICAO Annex 14! Not doing so means a lack of safety since in case the numbers and letters are incorporated in the threshold marking, the visibility of those is reduced due to the stripes of the threshold marking. Reducing the size of numbers and letters increases the visibility to pilots. Therefore this must be adapted as follows!

5.2.2.6 The numbers and letters shall be in the form and proportion shown in Figure L-2. The dimensions shall be not less than those shown in Figure L-2, **but where the numbers are incorporated in the threshold marking, larger dimensions shall be used in order to fill adequately the gap between the stripes of the threshold marking.**

response *Accepted*

comment 2805 comment by: *AENA - Aeropuertos Españoles y Navegación Aérea*

It is **critical** for Aena Airports.

It is a comment not only for that point, it is for all the marking of CS and GM points.

The dimensions of marking, usually, do not have any tolerance, and therefore a deviation of 30 cm, 0,5m, 1 meter, 5 meters..., will be a deviation form CS or GM with a big problem for the airport for the Certification of the Airport.

We think that it is not a safety issue.

This problem is causing a lot of problems in the Certification process in Spain, because allways there are differences and we have to make a safety study and the conclusion is that it does not any saffety effect, but we have to make the study and it is very expensive.

We propose to establish a tolerance for every measure or indicate in a general comment that the dimensions are orientative and they do not have effect on safety.

response *Not accepted*

comment 2948

comment by: *Isavia*

We suggest to make a GM to CS-ADR-DSN.L.525 on page 52 with information about not to use the combinations of 02/20 and 13/31 due to the possibility to be confused with each other.

response *Not accepted*

CS-ADR — Book 1 — Figure L-2 Form and proportions of numbers and letters for runway designation markings

p. 54

comment 2317 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR — Book 1 — CS-ADR-DSN.L.530 — Runway centre line marking

p. 55

comment 2317 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – CS-ADR-DSN.L.535 – Threshold marking

p. 55-57

comment 1037 comment by: *Federal Office of Civil Aviation FOCA*

CS.ADR.DSN.L.535 (d): Please adapt wording as the surface which is no more suitable for the movement of aircraft cannot be considered as being part of a runway.

response *Not accepted*

comment 1444 comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.L.535 – Threshold marking (p55-57)

2. Justification and proposed text / comment

In paragraph (b) of this CS, there is a reference to “this Regulation” but it is not clear which specification. It is proposed to indicate the reference of the CS as below:

CS-ADR-DSN.L.535 – Threshold marking

“[...] (d) When the runway before a threshold is unfit for the surface movement of aircraft, chevron markings, as described in ~~this Regulation~~ **CS-ADR-DSN.R.865 – Pre-threshold area**, should be provided.”

response *Accepted*

The reference is in paragraph (d) and will be deleted.

comment 2317 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2386 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

Ammend, a surface which is no more suitable for the movement of aircraft

	cannot be considered as part of a runway.
response	<i>Not accepted</i>

CS-ADR – Book 1 – Figure L-3 Displaced threshold markings

p. 56

comment	2317 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.L.540 – Aiming point marking

p. 57-58

comment	64	comment by: <i>Belfast International Airport - BFS/EGAA</i>
	Each point should start with the word where not the word here	
response	<i>Accepted</i>	

comment	80	comment by: <i>CAA-NL</i>
	In table L-1 the word 'here' should be changed in 'where'. This is a textual change.	
	Paragraph (c) (2) allows for an alternative aiming point marking and this is not recommended at one airport. We Propose to add the text 'that all aiming point marking at one airport should be of the same configuration'.	
response	<i>Partially accepted</i>	
	<i>Agreed: Table L-1</i> <i>Partially Agreed: Alternative aiming point marking will be deleted.</i>	

comment	149	comment by: <i>CAA Norway</i>
	We suggest to remove the option for an alternative aiming point in CS-ADR-	

response	<p>DSN.L.540 (c) (2) on page 58 and stick to the ICAO provisions for aiming point markings. Existing alternative aiming points could always have an ELOS for this.</p> <p><i>Accepted</i></p>
comment	<p>297 comment by: <i>Icelandic Civil Aviation Administration</i></p> <p>We suggest to remove the option for an alternative aiming point in CS-ADR-DSN.L.540 (c) (2) on page 58 and stick to the ICAO provisions for aiming point markings. Existing alternative aiming points could always have an ELOS for this.</p>
response	<p><i>Accepted</i></p>
comment	<p>360 comment by: <i>Estonian CAA</i></p> <p>CS-ADR-DSN.L.540 on page 57: The lateral spacing between inner sides of stripes for "1200 m up to but not including 2400 m runway" must be changed to 9 m - 22.5 m.</p>
response	<p><i>Partially accepted</i></p> <p>The table is the same as ICAO (with the addition of note <i>a</i> and promotion of former notes <i>a</i>, <i>b</i> and <i>c</i> to <i>b</i>, <i>c</i> and <i>d</i>). Note <i>d</i> is now the same as ICAO.</p>
comment	<p>361 comment by: <i>Estonian CAA</i></p> <p>We suggest to remove the option for an alternative aiming point in CS-ADR-DSN.L.540 (c) (2) on page 58 and stick to the ICAO provisions for aiming point markings. Existing alternative aiming points could always have an ELOS for this.</p>
response	<p><i>Accepted</i></p>
comment	<p>545 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #332</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.L.540</p> <p>Référence: CS-ADR-DSN.L.540 Aiming point marking</p>

Traduction de courtoisie
 (a) (2) It is appropriate to transfer this provision to GM.
 Such a provision is not necessary because the term "desirable" is a subjective term so it has no reason to be in the certification framework.
 Nevertheless, the aerodrome operator can add additional marks which will have to comply with the AESA regulation (CS).
 Here again we have an ICAO recommendation that shows the voluntary status of this provision.

response *Accepted*

comment 645 comment by: *Finnish Transport Safety Agency*

We suggest to remove the option for an alternative aiming point in CS-ADR-DSN.L.540 (c) (2) on page 58 and stick to the ICAO provisions for aiming point markings. Existing alternative aiming points could always have an ELOS for this.

response *Accepted*

comment 751 comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.L.540	Aiming point marking
Proposition/commentaire	(a) (2) Il convient de transférer cette disposition en Guidance Materials (GM).
Justification	Une telle disposition n'est pas nécessaire sachant que le côté "désirable" est subjectif et n'a donc pas de raison d'entrer dans le cadre de la certification. Cela n'empêche pas, si l'exploitant d'aérodrome le souhaite, de rajouter des marques additionnelles qui, de toute manière, devront respecter les dispositions de la réglementation AESA (CS). Ici encore nous n'avons qu'une recommandation OACI marquant le caractère facultatif de cette disposition.
Traduction de courtoisie	(a) (2) It is appropriate to transfer this provision to GM. Such a provision is not necessary because the term "desirable" is a subjective term so it has no reason to be in the certification framework. Nevertheless, the aerodrome operator can add additional marks which will have to comply with the AESA regulation (CS). Here again we have an ICAO recommendation

		that shows the voluntary status of this provision.
response	<i>Accepted</i>	
comment	1038	comment by: <i>Federal Office of Civil Aviation FOCA</i>
		<p>CS.ADR.DSN.L.540 (b):</p> <p>1) p. 57: Please change PAPI into VASIS, as it is in ICAO. Justification: The rule is applicable for all VASIS. PAPI is just one type of them.</p> <p>2) p. 58: Correct / adapt Table L-1 as it is poorly formulated.</p> <p>CS.ADR.DSN.L.540 (c) (2): Please remove this paragraph and the associated Figure L-4. There is no need to have UK CAA markings in the NPA. Otherwise, every Member State would be entiteled to put one of its specific requirements in the EASA regulations, which will be beyond the initial scope and rulemaking intentions of EASA.</p>
response	<i>Noted</i>	<p><i>Not Agreed:</i> (b) VASIs are no longer in use at civil aerodromes. PAPI is a different system.</p> <p><i>Agreed:</i> Table L-1</p> <p><i>Agreed:</i> (c)(2)</p>
comment	1167	comment by: <i>Swedish Transport Agency</i>
		<p>CS-ADR-DSN.L.540 on page 57: The lateral spacing between inner sides of stripes for "1200 m up to but not including 2400 m runway" must be changed to 9 m - 22.5 m . If you do not change it will work out on a runway narrower than 40 m.</p>
response	<i>Partially accepted</i>	<p>The table is the same as ICAO (with the addition of note <i>a</i> and promotion of former notes <i>a</i>, <i>b</i> and <i>c</i> to <i>b</i>, <i>c</i> and <i>d</i>). Note <i>d</i> is now the same as ICAO.</p>
comment	1168	comment by: <i>Swedish Transport Agency</i>
		<p>We suggest to remove the option for an alternative aiming point in CS-ADR-DSN.L.540 (c) (2) on page 58 and stick to the ICAO provisions for aiming point markings. Existing alternative aiming points could always have an ELOS for</p>

	this.
response	<i>Accepted</i>

comment	<p>1378 comment by: <i>ECA - European Cockpit Association</i></p> <p>Amend (b) as follows:</p> <p>The aiming point marking should commence no closer to the threshold than in accordance with the distance indicated in the appropriate column of Table L-1, except that, on a runway equipped with a PAPI system, the beginning of the marking should be coincident with the visual approach slope origin.</p> <p>Justification: We consider that the aiming point marking should be at a constant distance from the threshold, depending on the length of the runway. Reference: IFALPA Annex 14, paragraph 5.2.5.4</p>
response	<p><i>Not accepted</i></p> <p>This is ICAO (standard) wording.</p>

comment	<p>1586 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>(a) (2) It is appropriate to transfer this provision to GM.</p> <p>Such a provision is not necessary because the term "desirable" is a subjective term so it has no reason to be in the certification framework. Nevertheless, the aerodrome operator can add additional marks which will have to comply with the AESA regulation (CS). Here again we have an ICAO recommendation that shows the voluntary status of this provision.</p>
response	<i>Accepted</i>

comment	<p>1602 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #333</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.L.540</p> <p>Référence: CS-ADR-DSN.L.540 Aiming point marking</p> <p>Traduction de courtoisie (a) (2) It is appropriate to transfer this provision to GM. Such a provision is not necessary because the term "desirable" is a subjective</p>
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term so it has no reason to be in the certification framework.
Nevertheless, the aerodrome operator can add additional marks which will have to comply with the AESA regulation (CS).
Here again we have an ICAO recommendation that shows the voluntary status of this provision.

response *Accepted*

comment 1799 comment by: *Finnish Transport Safety Agency*

CS-ADR-DSN.L.540 on page 57: The lateral spacing between inner sides of stripes for "1200 m up to but not including 2400 m runway" must be changed to: "9 m - 22.5 m". If the first figure is not changed from 18 to 9 meter, you cannot use the rule for runways that have a width of less than 45 meters

response *Partially accepted*

The table is the same as ICAO (with the addition of note *a* and promotion of former notes *a*, *b* and *c* to *b*, *c* and *d*). Note *d* is now the same as ICAO.

comment 1922 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#334](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.L.540

Référence: CS-ADR-DSN.L.540

Aiming point marking

Traduction de courtoisie

(a) (2) It is appropriate to transfer this provision to GM.

Such a provision is not necessary because the term "desirable" is a subjective term so it has no reason to be in the certification framework.

Nevertheless, the aerodrome operator can add additional marks which will have to comply with the AESA regulation (CS).

Here again we have an ICAO recommendation that shows the voluntary status of this provision.

response *Accepted*

comment 2030 comment by: *Pau Pyrénées Airport - PUF/LFBP*

(a) (2) It is appropriate to transfer this provision to GM.

Such a provision is not necessary because the term "desirable" is a subjective term so it has no reason to be in the certification framework.

Nevertheless, the aerodrome operator can add additional marks which will have

	to comply with the AESA regulation (CS). Here again we have an ICAO recommendation that shows the voluntary status of this provision
response	<i>Accepted</i>
comment	2317 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>
comment	2383 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	Remove (c,2) and the associated Figure L-4. not ICAO
response	<i>Accepted</i>
comment	2385 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	use VASIS in L-1, PAPI too specific
response	<i>Noted</i>
	VASIS is no longer used at civil aerodromes.
comment	2593 comment by: <i>Danish Transport Authority</i>
	(c) (2) The paragraph regarding the alternative touchdown zone marking in implemented into the NPA without any explanation regarding to safety matters (NPA 2011-20 (C)). We suggest to keep the conversion of ICAO Annex 14 into the NPA clear of any alternatives. Alternatives should follow the proposed path/procedure as described in the NPA (ELOS).
response	<i>Accepted</i>
	The alternative touch down zone marking has been deleted from the CS.
comment	2716 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
	Attachment #335

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.L.540

Référence: CS-ADR-DSN.L.540
Aiming point marking

Traduction de courtoisie

(a) (2) It is appropriate to transfer this provision to GM.
Such a provision is not necessary because the term "desirable" is a subjective term so it has no reason to be in the certification framework.
Nevertheless, the aerodrome operator can add additional marks which will have to comply with the AESA regulation (CS).
Here again we have an ICAO recommendation that shows the voluntary status of this provision.

response *Accepted*

comment

2785

comment by: *Brussels Airport*

CS-ADR-DSN.L.540

To delete (c)(2)

There should not be an alternative aiming point marking. Markings and especially runway markings should be everywhere the same for safety reasons.

response *Accepted*

comment

2808

comment by: *CAA Norway*

We suggest to the lateral spacing between inner sides of stripes for "1200 m up to but not including 2400 m runway" to be changed to: "9 m - 22.5 m". If the first figure is not changed from 18 to 9 meter, you cannot use the rule for runways that have a width of less than 45 meters.

response *Partially accepted*

The table is the same as ICAO (with the addition of Note *a* and promotion of former notes *a*, *b* and *c* to *b*, *c* and *d*). Note *d* is now the same as ICAO.

comment

2882

comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.L.540

Aiming point marking

Proposition/commentaire

(a) (2) Il convient de transférer cette disposition en Guidance Materials (GM).

Justification	Une telle disposition n'est pas nécessaire sachant que le côté "désirable" est subjectif et n'a donc pas de raison d'entrer dans le cadre de la certification. Cela n'empêche pas, si l'exploitant d'aérodrome le souhaite, de rajouter des marques additionnelles qui, de toute manière, devront respecter les dispositions de la réglementation AESA (CS). Ici encore nous n'avons qu'une recommandation OACI marquant le caractère facultatif de cette disposition.
Traduction de courtoisie	(a) (2) It is appropriate to transfer this provision to GM. Such a provision is not necessary because the term "desirable" is a subjective term so it has no reason to be in the certification framework. Nevertheless, the aerodrome operator can add additional marks which will have to comply with the AESA regulation (CS). Here again we have an ICAO recommendation that shows the voluntary status of this provision.

response *Accepted*

comment 2949

comment by: *Isavia*

CS-ADR-DSN.L.540 on page 57: The lateral spacing between inner sides of stripes for "1200 m up to but not including 2400 m runway" must be changed to 9 m - 22.5 m.

response *Partially accepted*

The table is the same as ICAO (with the addition of Note *a* and promotion of former notes *a*, *b* and *c* to *b*, *c* and *d*). Note *d* is now the same as ICAO.

comment 2950

comment by: *Isavia*

We suggest removing the option for an alternative aiming point in CS-ADR-DSN.L.540 (c) (2) on page 58 and sticking to the ICAO provisions for aiming point markings. Existing alternative aiming points could always have an ELOS for this.

response *Accepted*

The alternative touch down zone marking has been deleted from the CS.

CS-ADR – Book 1 – Figure L-4 Alternative aiming point marking

p. 59

comment 2317 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – CS-ADR-DSN.L.545 – Touchdown zone marking

p. 59-60

comment 81 comment by: *CAA-NL*

We suggest to delete (d) (3), because an additional pair of touchdown zone marking stripes on a non-precision approach runway where the code number is 2 might result in a late landing which can result in a runway excursion. It is therefore not recommended to prescribe this marking on a runway where the code number is 2.

response *Not accepted*

This is from ICAO.

comment 1039 comment by: *Federal Office of Civil Aviation FOCA*

CS.ADR.DSN.L.545 (d) (4): Please remove this paragraph and the associated Figure L-6. There is no need to have UK CAA markings in the NPA. Otherwise every Member State would be entited to put one of its specific requirements in the EASA regulation, which will be beyond the initial scope and the rulemaking intentions of EASA.

response *Accepted*

comment 2317 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response	<i>Noted</i>
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comment	2382 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	Remove (d,4) and the associated Figure L-6. not ICAO
response	<i>Accepted</i>

comment	2787 comment by: <i>Brussels Airport</i>
	CS-ADR-DSN.L.545
	To delete(d)(4) and Figure L-6
	There should not be a special touch down zone marking for an alternative aiming point marking. Markings and especially runway markings should be everywhere the same for safety reasons.
response	<i>Accepted</i>

comment	2788 comment by: <i>Brussels Airport</i>
	CS-ADR-DSN.L.545 Figure L-5
	18m value together with 22,5mvalue on same location in both drawings is unclear
response	<i>Not accepted</i>
	This is from ICAO.

CS-ADR – Book 1 – Figure L-5 Aiming point and touchdown zone markings (illustrated for a runway with a length of 2 400 m or more)	p. 61
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comment	65 comment by: <i>Belfast International Airport - BFS/EGAA</i>
	Figure L-5 illustrates runway markings however no guidance is provided for when these should be used B-With distance coding
response	<i>Noted</i>

Guidance is given in GM-ADR-DSN.L.545.

comment	2317 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR — Book 1 — Figure L-6 Alternative aiming point and touchdown zone markings (illustrated for a runway with a length of 2 400 m or more)

p. 62

comment	2317 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR — Book 1 — CS-ADR-DSN.L.550 — Runway side stripe marking

p. 62-63

comment	150	comment by: <i>CAA Norway</i>
	We suggest to add after the word "on" in line 1 in CS-ADR-DSN.L.550(a)(2) on page 62: "... on a paved non-precision runway and a precision ..." We think it is important to have better contrast in the form of a side stripe marking also for a non-precision runway.	
response	<i>Not accepted</i>	

comment	298	comment by: <i>Icelandic Civil Aviation Administration</i>
	We suggest to add after the word "on" in line 1 in CS-ADR-DSN.L.550(a)(2) on page 62: "...on a paved non-precision runway and a precision ..." We think it is important to have better contrast in the form of a side stripe marking also for a non-precision runway.	
response	<i>Not accepted</i>	

comment	1169	comment by: <i>Swedish Transport Agency</i>
	Suggest to add after the word "on" in line 1 in (a)(2): "...on a paved non-precision runway and a precision ..." We think it is important to have better contrast in the form of a side stripe marking also for a non-precision runway.	
response	<i>Not accepted</i>	
comment	2317 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	
comment	2639	comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	a) Only the ICAO standard or the recommendation should be listed in order to prevent misunderstandings and misinterpretation. By having almost the same wording for (1) and (2) with a minimal difference the intention of the applicability is questionable and should therefore be adapted accordingly. Ideally would be (1) remaining in the CS and (2) within the guidance material in order to clarify the meaning.	
response	<i>Not accepted</i>	
comment	2797	comment by: <i>ECA - European Cockpit Association</i>
	Amend as follows: (a) Applicability: (1) A runway side stripe marking should be provided between the thresholds of a runway where there is a lack of contrast between the runway edges and the shoulders or the surrounding terrain. (2) A runway side stripe marking should be provided on a precision approach runway irrespective of the contrast between the runway edges and the shoulders or the surrounding terrain. <u>(2) Where there is a runway turn pad, the side stripe marking should be continued between the runway and the runway turn pad.</u>	
	Justification: The requirement for runway side stripe marking between the thresholds of a paved runway should be standardised. Reference: IFALPA ANnex 14, paragraphs 5.2.7 and 5.2.7.x	
response	<i>Not accepted</i>	

ICAO wording will be retained.

CS-ADR – Book 1 – CS-ADR-DSN.L.555 – Taxiway centre line marking

p. 63

comment 151 comment by: CAA Norway

We suggest to remove CS-ADR-DSN.L.555 (a)(2)(i) on p 63. Runway CL marking is required in CS-ADR-DSN.L.530 on all runways on the airports in scope.

response *Accepted*

comment 299 comment by: Icelandic Civil Aviation Administration

We suggest to remove CS-ADR-DSN.L.555 (a)(2)(i) on p 63. Runway CL marking is required in CS-ADR-DSN.L.530 on all runways on the airports in scope.

response *Accepted*

comment 300 comment by: Icelandic Civil Aviation Administration

Editorial.
The reference in Figure L-7 on p. 64 is an ICAO Annex 14 reference. Change the reference to a relevant paragraph in this regulation.

response *Accepted*

comment 362 comment by: Estonian CAA

We suggest to remove CS-ADR-DSN.L.555 (a)(2)(i) on p 63. Runway CL marking is required in CS-ADR-DSN.L.530 on all runways on the airports in scope.

response *Accepted*

comment 546 comment by: Union des Aéroports français - UAF

Attachment [#336](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.L.555

Référence: CS-ADR-DSN.L.555
Taxiway centre line marking

Traduction de courtoisie

This CS does not take into account the possibilities of double marking on an apron taxiway which is very penalizing for the aerodrome that receive several types of aircraft. It must be possible to keep this possibility. The way to realize this double marking could be in GM.

response *Not accepted*

If multiple taxiways are required for operational purposes, an ELOS or SC should be used.

comment 646 comment by: *Finnish Transport Safety Agency*

We suggest to remove CS-ADR-DSN.L.555 (a)(2)(i) on p 63. Runway CL marking is required in CS-ADR-DSN.L.530 on all runways on the airports in scope.

response *Accepted*comment 752 comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.L.555	Taxiway centre line marking
Proposition/commentaire	Cette CS ne prend pas en considération les possibilités de double marquage sur une voie de circulation sur l'aire de trafic ce qui est très pénalisant pour les aérodromes recevant plusieurs types d'avions. Cette possibilité doit pouvoir être conservée. La manière de faire ce double marquage pourrait se trouver en GM (par exemple : deux voies de circulation Code C pour une voie de circulation Code E).
Justification	
Traduction de courtoisie	This CS does not take into account the possibilities of double marking on an apron taxiway which is very penalizing for the aerodrome that receive several types of aircraft. It must be possible to keep this possibility. The way to realize this double marking could be in GM.

response *Not accepted*

If multiple taxiways are required for operational purposes, an ELOS or SC should be used.

comment 1040

comment by: *Federal Office of Civil Aviation FOCA*

CS.ADR.DSN.L.555 (b)(2): Please remove this paragraph as there are too many different cases. What matters is the distance between the landing gear and the taxiway edges, irrespective of the line of the markings.

CS.ADR.DSN.L.555 (b)(4): Unclear editing, therefore FOCA suggests reformulating this paragraph.

response *Partially accepted*

Paragraph (b)(2) is ICAO wording and remains. Paragraph (b)(4) is amended to reflect ICAO wording, but with NPA reference.

comment 1171

comment by: *Swedish Transport Agency*

We suggest to remove CS-ADR-DSN.L.555 (a)(2)(i) on p 63. Runway CL marking is required in CS-ADR-DSN.L.530 on all runways on the airports in scope.

response *Accepted*

comment 1172

comment by: *Swedish Transport Agency*

Editorial.
The reference in Figure L-7 on p. 64 is an ICAO Annex 14 reference. Change the reference to a relevant paragraph in this regulation.

response *Accepted*

comment 1587

comment by: *Aéroport de Marseille - MRS/LFML*

This CS does not take into account the possibilities of double marking on an

	apron taxiway which is very penalizing for the aerodrome that receive several types of aircraft. It must be possible to keep this possibility. The way to realize this double marking could be in GM.
response	<i>Not accepted</i>
	If multiple taxiways are required for operational purposes, an ELOS or SC should be used.

comment	1673	comment by: CAA CZ
	<p>Comment by Prague airport CS-ADR-DSN.R.855 — Closed runways and taxiways, or parts thereof Added to CS-ADR-DSN.R.855 or to GM-ADR-DSN.R.855: When an area is temporarily closed, frangible barriers or markings utilizing materials other than paint or other suitable means may be used to identify the closed area.</p>	
response	<i>Noted</i>	
	Comment misplaced from CS R.855.	

comment	1923	comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	<p>Attachment #338</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.L.555</p> <p>Référence: CS-ADR-DSN.L.555 Taxiway centre line marking</p> <p>Traduction de courtoisie</p> <p>This CS does not take into account the possibilities of double marking on an apron taxiway which is very penalizing for the aerodrome that receive several types of aircraft. It must be possible to keep this possibility. The way to realize this double marking could be in GM.</p>	
response	<i>Not accepted</i>	
	If multiple taxiways are required for operational purposes, an ELOS or SC should be used.	

comment	2028	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	This CS does not take into account the possibilities of double marking on an apron taxiway which is very penalizing for the aerodrome that receive several	

	types of aircraft. It must be possible to keep this possibility. The way to realize this double marking could be in GM.
response	<i>Not accepted</i>
	If multiple taxiways are required for operational purposes, an ELOS or SC should be used.
comment	2317 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>
comment	2380 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	re-write article, unclear editing.
response	<i>Partially accepted</i>
	Some amendments have been made for clarification.
comment	2381 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	remove (b,2); There are too many different cases, important is the distance between the landing gear and the taxiway edges, irrespective of the line of the markings
response	<i>Not accepted</i>
	This is ICAO wording.
comment	2594 comment by: <i>Danish Transport Authority</i>
	(a)(2)(i) We suggest to remove (a)(2)(i). Runway CL marking is required in CS-ADR-DSN.L.530 on all runways on the airports in scope.
response	<i>Accepted</i>
	Paragraph (a)(2)(i) has been deleted from the CS.
comment	2717 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>

Attachment [#339](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.L.555

Référence: CS-ADR-DSN.L.555

Taxiway centre line marking

Traduction de courtoisie

This CS does not take into account the possibilities of double marking on an apron taxiway which is very penalizing for the aerodrome that receive several types of aircraft. It must be possible to keep this possibility. The way to realize this double marking could be in GM.

response

Not accepted

If multiple taxiways are required for operational purposes, an ELOS or SC should be used.

comment

2798

comment by: *ECA - European Cockpit Association*

Add new CS-ADR-DSN.L.XXX on Taxiway Side Stripe Marking:

(1) Taxiway side stripe markings should be provided on a paved taxiway to delineate the lateral boundaries of the taxiway surface intended for the movement of aircraft.

(2) Location: A taxiway side stripe marking shall be placed along each taxiway lateral boundary with the outer edge of the marking approximately coincident with the lateral boundary.

(3) Characteristics: A taxiway side stripe marking shall consist of a pair of solid reflective yellow lines upon a fully contrasted background, each 15 cm wide and spaced 15 cm apart.

Justification:

Taxiway edges should also be easily Identifiable.

Reference: IFALPA Annex 14, paragraphs 5.2.x.1; 5.2.x.2; and 5.2.x.3.

response

Not accepted

This CS is for taxiway centre line marking.

comment

2799

comment by: *ECA - European Cockpit Association*

Add New CS-ADR-DSN.L.YYY on Taxi Lane Side Stripe Marking:

(1) Application: Taxi lane side stripe markings shall be provided along taxi lanes

to provide clearance from aircraft in adjacent taxi lanes of wide apron areas, aircraft within parking stand boundaries, ground service vehicles and equipment located on apron areas

(2) Location: Taxi lane side stripe markings shall be placed along each taxi lane lateral boundary with the outer edge of the marking approximately coincident with the lateral boundary

(3) Characteristics: Taxi lane side strip markings shall consist of a pair of broken reflective yellow lines upon a fully contrasted background, each 15 cm wide and spaced 15 cm apart.

Justification:
IFALPA Annex 14, paragraphs 5.2.Y

response *Not accepted*

This CS is for taxiway centre line marking.

comment

2883

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.L.555	Taxiway centre line marking
Proposition/commentaire	Cette CS ne prend pas en considération les possibilités de double marquage sur une voie de circulation sur l'aire de trafic ce qui est très pénalisant pour les aérodromes recevant plusieurs types d'avions. Cette possibilité doit pouvoir être conservée. La manière de faire ce double marquage pourrait se trouver en GM (par exemple : deux voies de circulation Code C pour une voie de circulation Code E).
Justification	
Traduction de courtoisie	This CS does not take into account the possibilities of double marking on an apron taxiway which is very penalizing for the aerodrome that receive several types of aircraft. It must be possible to keep this possibility. The way to realize this double marking could be in GM.

response *Not accepted*

If multiple taxiways are required for operational purposes, an ELOS or SC should be used.

comment	2951	comment by: <i>Isavia</i>
	We suggest to remove CS-ADR-DSN.L.555 (a)(2)(i) on p 63. Runway CL marking is required in CS-ADR-DSN.L.530 on all runways on the airports in scope.	
response	<i>Accepted</i>	

comment	2952	comment by: <i>Isavia</i>
	The reference in Figure L-7 on p. 64 is an ICAO Annex 14 reference. Change the reference to a relevant paragraph in this regulation.	
response	<i>Accepted</i>	

CS-ADR – Book 1 – Figure L-7 Taxiway markings (shown with basic runway markings)

p. 64

comment	153	comment by: <i>CAA Norway</i>
	Editorial. The reference in Figure L-7 on p. 64 is an ICAO Annex 14 reference. Change the reference to a relevant paragraph in this regulation.	
response	<i>Accepted</i>	

comment	363	comment by: <i>Estonian CAA</i>
	Editorial. The reference in Figure L-7 on p. 64 is an ICAO Annex 14 reference. Change the reference to a relevant paragraph in this regulation.	
response	<i>Accepted</i>	

comment	647	comment by: <i>Finnish Transport Safety Agency</i>
	Editorial. The reference in Figure L-7 on p. 64 is an ICAO Annex 14 reference. Change the reference to a relevant paragraph in this regulation.	

response	<i>Accepted</i>	
comment	2317 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.L.560 – Interruption of runway markings	p. 64-65
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comment	1113	comment by: <i>Belgian CAA</i>
	It is unclear what happened with the Annex 14 provision §5.2.8.7.	
response	<i>Noted</i>	
	The ICAO text is properly located in CS-ADR-DSN.L.555 (b)(3).	

comment	1843	comment by: <i>ENAC Ente Nazionale per l'Aviazione Civile</i>
	We propose to add the following GM: edge taxiway marking.	
	Edge marking can be used when it's necessary to clearly identify the contour from taxiway and other infrastructure (like shoulder, aprons, taxiway strip). The marking is defined with two lines parallel 15 centimeters width and with a distance of 15 centimeters.	
response	<i>Noted</i>	
	The title is 'runway' markings.	

comment	2317 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.L.565 – Runway turn pad marking	p. 65-66
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comment	154	comment by: CAA Norway
	<p>CS-ADR-DSN.L.565 (b)(1): Instead of "the aeroplanes" in the second last line: Suggest to put: "...of the most demanding aeroplane(s) for which ..." (Note: the most demanding aeroplane might be different from the critical aircraft for overall design).</p>	
response	<p><i>Not accepted</i></p> <p>This is ICAO design criteria wording.</p>	

comment	301	comment by: Icelandic Civil Aviation Administration
	<p>CS-ADR-DSN.L.565 (b)(1): Instead of "the aeroplanes" in the second last line: Suggest to put: "...of the most demanding aeroplane(s) for which ..." (Note: the most demanding aeroplane might be different from the critical aircraft for overall design).</p>	
response	<p><i>Not accepted</i></p> <p>This is ICAO design criteria wording.</p>	

comment	364	comment by: Estonian CAA
	<p>CS-ADR-DSN.L.565 (b)(1): Instead of "the aeroplanes" in the second last line: Suggest to put: "...of the most demanding aeroplane(s) for which ..." (Note: the most demanding aeroplane might be different from the critical aircraft for overall design).</p>	
response	<p><i>Not accepted</i></p> <p>This is ICAO design criteria wording.</p>	

comment	648	comment by: Finnish Transport Safety Agency
	<p>CS-ADR-DSN.L.565 (b)(1): Instead of "the aeroplanes" in the second last line: Suggest to put: "...of the most demanding aeroplane(s) for which ..." (Note: the most demanding aeroplane might be different from the critical aircraft for overall design).</p>	
response	<p><i>Not accepted</i></p> <p>This is ICAO design criteria wording.</p>	

comment	1175	comment by: <i>Swedish Transport Agency</i>
	CS-ADR-DSN.L.565 (b)(1): Instead of "the aeroplanes" in the second last line: Suggest to put: "...of the most demanding aeroplane(s) for which ..." (Note: the most demanding aeroplane might be different from the critical aircraft for overall design).	
response	<i>Not accepted</i>	
	This is ICAO design criteria wording.	
comment	1501	comment by: <i>Flughafen Linz-Hörsching - LNZ/LOWL</i>
	(b) (5) change "...turn should be based on a nose wheel steering angle not exceeding 45 degrees." in "...turn should be based on the maximum operational nose wheel steering angle from the aircraft using the turn pad."	
response	<i>Not accepted</i>	
	This is ICAO wording and the proposal is an operational consideration.	
comment	2346	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	
comment	2622	comment by: <i>Swedavia AB - Swedish airports (currently 11 airports)</i>
	CS-ADR-DSN.L.565 (b)(1): Instead of "the aeroplanes" in the second last line: Suggest to put: "...of the most demanding aeroplane(s) for which ..." (Note: the most demanding aeroplane might be different from the critical aircraft for overall design).	
response	<i>Not accepted</i>	
	This is ICAO design criteria wording.	

comment 82

comment by: CAA-NL

In (a) is not prescribed when an enhanced taxiway centre line marking needs to be applied. We Propose to add the text 'where it is necessary to denote the proximity of a runway-holding position, enhanced taxiway centre line marking should be provided', according to ICAO Annex 14, 5.2.8.4.

In (a) is not prescribed that when an enhanced taxiway centre line marking is applied at an aerodrome, it should be applied at all taxiway/runway intersections at that aerodrome. We Propose to add the text 'where provided, enhanced taxiway centre line marking should be installed at all taxiway/runway intersections at that aerodrome, according to ICAO Annex 14, 5.2.8.5.

response *Noted*

The CS is for design of the marking. Application is an operational consideration.

comment 547

comment by: Union des Aéroports français - UAF

Attachment [#342](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.L.570

Référence: CS-ADR-DSN.L.570
Enhanced taxiway centre line marking

Traduction de courtoisie

Like the other markings, it's important to know when it is necessary to apply such markings.

Besides, how do we deal with the case where it is necessary to keep runway ahead markings installed or established as a result of safety studies?

response *Noted*

The CS is for design of the marking; application is an operational consideration.

comment 753

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.L.570

Enhanced taxiway centre line marking

Proposition/commentaire

Comme pour les autres marques, il est important de savoir quand il est nécessaire d'appliquer de telles marques.

Par ailleurs, comment traiter le cas où il apparaît utile de conserver les marques d'entrée de piste ("runway ahead") installées ou mises en place suite à des études de sécurité?

Justification	
Traduction de courtoisie	Like the other markings, it's important to know when it is necessary to apply such markings. Besides, how do we deal with the case where it is necessary to keep runway ahead markings installed or established as a result of safety studies?

response *Noted*

The CS is for design of the marking. Application is an operational consideration.

comment *1041* comment by: *Federal Office of Civil Aviation FOCA*

Figure L-8, taken from ICAO, contains a mistake - the 45 m are incorrect. Please modify figure as ICAO is modifying the figure together with the new AMDT.

response *Accepted*

comment *1588* comment by: *Aéroport de Marseille - MRS/LFML*

Like the other markings, it's important to know when it is necessary to apply such markings.

Besides, how do we deal with the case where it is necessary to keep runway ahead markings installed or established as a result of safety studies?

response *Noted*

The CS is for design of the marking. Application is an operational consideration.

comment *1606* comment by: *Euroairport Bâle-Mulhouse*

Attachment [#343](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.L.570

Référence: CS-ADR-DSN.L.570

response	<p>Enhanced taxiway centre line marking</p> <p>Traduction de courtoisie Like the other markings, it's important to know when it is necessary to apply such markings. Besides, how do we deal with the case where it is necessary to keep runway ahead markings installed or established as a result of safety studies?</p> <p><i>Noted</i></p> <p>The CS is for design of the marking. Application is an operational consideration.</p>
comment	<p>1924 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #344</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.L.570</p> <p>Référence: CS-ADR-DSN.L.570 Enhanced taxiway centre line marking</p> <p>Traduction de courtoisie Like the other markings, it's important to know when it is necessary to apply such markings. Besides, how do we deal with the case where it is necessary to keep runway ahead markings installed or established as a result of safety studies?</p>
response	<p><i>Noted</i></p> <p>The CS is for design of the marking. Application is an operational consideration.</p>
comment	<p>2027 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i></p> <p>Like the other markings, it's important to know when it is necessary to apply such markings.</p> <p>Besides, how do we deal with the case where it is necessary to keep runway ahead markings installed or established as a result of safety studies?</p>
response	<p><i>Noted</i></p> <p>The CS is for design of the marking. Application is an operational consideration.</p>
comment	<p>2346 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p><i>Noted</i></p>

response *Noted*

comment 2718 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#345](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.L.570

Référence: CS-ADR-DSN.L.570
Enhanced taxiway centre line marking

Traduction de courtoisie

Like the other markings, it's important to know when it is necessary to apply such markings.

Besides, how do we deal with the case where it is necessary to keep runway ahead markings installed or established as a result of safety studies?

response *Noted*

The CS is for design of the marking. Application is an operational consideration.

comment 2884 comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.L.570

Enhanced taxiway centre line marking

Proposition/commentaire

Comme pour les autres marques, il est important de savoir quand il est nécessaire d'appliquer de telles marques.

Par ailleurs, comment traiter le cas où il apparaît utile de conserver les marques d'entrée de piste ("runway ahead") installées ou mises en place suite à des études de sécurité?

Justification

Traduction de courtoisie

Like the other markings, it's important to know when it is necessary to apply such markings.

Besides, how do we deal with the case where it is necessary to keep runway ahead markings installed or established as a result of safety studies?

response *Noted*

The CS is for design of the marking. Application is an operational consideration.

CS-ADR – Book 1 – Figure L-8 Enhanced taxiway centre line marking

p. 66

comment	2346 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

comment	2379	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	Figure L-8, needs to be corrected, consistency with ICAO ammendment	
response	<i>Accepted</i>	
	Figure L-8 has been amended to reflect the ICAO SL 41 amendment.	

CS-ADR – Book 1 – CS-ADR-DSN.L.575 – Runway-holding position marking p. 66-67

comment	83	comment by: <i>CAA-NL</i>
	In (a) (1), (a) (2), (a) (3) and (a) (4) there is a reference to figure L-9. We suggest to change the reference from figure L-9 into figure L-7.	
response	<i>Not accepted</i>	
	The reference is correct to show characteristics for Pattern A and B markings.	

comment	155	comment by: <i>CAA Norway</i>
	Editorial: CS-ADR-DSN.L.575 (a)(4): The reference to (b)(1) or (2): Where is this pointing to? The reference should be to CS-ADR-DSN.D.335, b (if the text from Annex 14 3.12.3 is added to CS-ADR-DSN.D.335(b) as suggested in our comment on CS-ADR-DSN.D.335).	

response	<i>Partially accepted</i>
	The missing reference is CS-ADR-DSN.L.605.
comment	156 comment by: <i>CAA Norway</i>
	Th reference in CS-ADR-DSN.L.575 (1), (2) and (3) on p. 67 should be to Figure L-7, not to L-9.
response	<i>Not accepted</i>
	The reference is correct to show characteristics for Pattern A and B markings.
comment	302 comment by: <i>Icelandic Civil Aviation Administration</i>
	Editorial: CS-ADR-DSN.L.575 (a)(4): The reference to (b)(1) or (2): Where is this pointing to? The reference should be to CS-ADR-DSN.D.335, b (if the text from Annex 14 3.12.3 is added to CS-ADR-DSN.D.335(b) as suggested in our comment on CS-ADR-DSN.D.335).
response	<i>Partially accepted</i>
	The missing reference is CS-ADR-DSN.L.605.
comment	303 comment by: <i>Icelandic Civil Aviation Administration</i>
	Th reference in CS-ADR-DSN.L.575 (1), (2) and (3) on p. 67 should be to Figure L-7, not to L-9.
response	<i>Not accepted</i>
	The reference is correct to show characteristics for Pattern A and B markings.
comment	365 comment by: <i>Estonian CAA</i>
	The reference in CS-ADR-DSN.L.575 (1), (2) and (3) on p. 67 should be to Figure L-7, not to L-9.
response	<i>Not accepted</i>
	The reference is correct to show characteristics for Pattern A and B markings.

comment	649	comment by: <i>Finnish Transport Safety Agency</i>
	<p>Editorial: CS-ADR-DSN.L.575 (a)(4): The reference to (b)(1) or (2): Where is this pointing to? The reference should be to CS-ADR-DSN.D.335, b (if the text from Annex 14 3.12.3 is added to CS-ADR-DSN.D.335(b) as suggested in our comment on CS-ADR-DSN.D.335).</p>	
response	<i>Partially accepted</i>	
	The missing reference is CS-ADR-DSN.L.605.	
comment	650	comment by: <i>Finnish Transport Safety Agency</i>
	The reference in CS-ADR-DSN.L.575 (1), (2) and (3) on p. 67 should be to Figure L-7, not to L-9.	
response	<i>Not accepted</i>	
	The reference is correct to show characteristics for Pattern A and B markings.	
comment	1176	comment by: <i>Swedish Transport Agency</i>
	<p>CS-ADR-DSN.L.575 (a)(4): The reference to (b)(1) or (2): Where is this pointing to? The reference should be to CS-ADR-DSN.D.335, b (if the text from Annex 14 3.12.3 is added to CS-ADR-DSN.D.335(b) as suggested in our comment on CS-ADR-DSN.D.335).</p>	
response	<i>Partially accepted</i>	
	The missing reference is CS-ADR-DSN.L.605.	
comment	1177	comment by: <i>Swedish Transport Agency</i>
	Th reference in CS-ADR-DSN.L.575 (1), (2) and (3) on p. 67 should be to Figure L-7, not to L-9.	
response	<i>Not accepted</i>	
	The reference is correct to show characteristics for Pattern A and B markings.	
comment	1396	comment by: <i>UK CAA</i>
	Page No: 67	

Paragraph No: CS-ADR-DSN.L.575 (a)(1)

Comment: The paragraph should refer to Figure L-7 not L-9

Justification: Figure L-9 refers to an increased conspicuity marking, not the normal marking. The normal marking is shown in Figure L-7.

Proposed Text: (a)(1) At an intersection of a taxiway and a non-instrument, non-precision approach or take-off runway, the runway-holding position marking should be as shown in Figure **L-7**, pattern A.

response *Not accepted*

Figure L-7 depicts the relative basic layout of the taxiway markings (runway holding position pattern A and B and intermediate holding position). Figure L-9 depicts runway holding position markings, pattern A and B, with specified marking dimensions. The enhanced taxiway centreline marking is shown in Figure L-8.

comment

1399

comment by: UK CAA

Page No: 67

Paragraph No: CS-ADR-DSN.L.575 (a)(2)

Comment: The paragraph should refer to Figure L-7 not L-9

Justification: Figure L-9 refers to an increased conspicuity marking, not the normal marking. The normal marking is shown in Figure L-7.

Proposed Text: (a)(2) Where a single runway-holding position is provided at an intersection of a taxiway and a precision approach category I, II or III runway, the runway-holding position marking should be as shown in Figure **L-7**, pattern A.

response *Not accepted*

Figure L-7 depicts the relative basic layout of the taxiway markings (runway holding position pattern A and B and intermediate holding position). Figure L-9 depicts runway holding position markings, pattern A and B, with specified marking dimensions. The enhanced taxiway centreline marking is shown in Figure L-8.

comment

1401

comment by: UK CAA

Page No: 67

Paragraph No: CS-ADR-DSN.L.575 (a)(4)

Comment: This is a repetition of paras (a)(1) & (a)(2)

	<p>Justification: Suggest delete para (a)(4)</p> <p>Proposed Text: DELETE (a)(4)</p>
response	<p><i>Not accepted</i></p> <p>Paragraph (a)(4) cross-refers to provision of mandatory instruction marking to be used in conjunction with a pattern A runway holding position marking (as depicted in Figure L-11).</p>

comment	<p>1403 comment by: UK CAA</p> <p>Page No: 67</p> <p>Paragraph No: CS-ADR-DSN.L.575 (a)(6)</p> <p>Comment: To reduce the runway incursion risk, the UK requires the aerodrome to limit the width of taxiways at holding points. We suggest therefore that, rather than displaying extra markings as warnings, it is better to reduce the width of the area concerned.</p> <p>The CAA is also concerned at the terminology used as we believe that the important message is to emphasise to aircrew that they are about to enter the runway. Therefore we use the term RUNWAY AHEAD at the Pattern B hold bar</p> <p>Justification: This promotes accurate taxiing by aircraft and ensures consistency and standardisation of runway access, as well as signifying that it is protecting the runway. It also removes the need to provide additional markings. This has been proven to be successful in the UK.</p> <p>Proposed Text: (a)(6) Where a pattern B runway-holding position marking is located on an area where it would exceed 60 m in length, measures should be taken to reduce the width of the area.</p> <p>However, if it is deemed that reduction in width is not feasible, a pattern B runway-holding position marking is located on an area where it would exceed 60 m in length, the term 'CAT II' or 'CAT III' or RUNWAY AHEAD as appropriate.....</p>
response	<p><i>Noted</i></p> <p>The proposed text is guidance, not CS. The CS wording is based on Annex 14.</p>

comment	<p>1846 comment by: ENAC Ente Nazionale per l'Aviazione Civile</p> <p>We propose to remove/delete the paragraph 6 of the C.S. and, therefore, don't define a runway holding position marking with term CAT II or CAT III.</p>
response	<p><i>Not accepted</i></p>

This is ICAO wording.

comment 2346 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2595 comment by: *Danish Transport Authority*

The reference in (1), (2) and (3) on should be to Figure L-7, not to L-9.

response *Not accepted*

The reference is correct to show characteristics for Pattern A and B markings.

comment 2623 comment by: *Swedavia AB - Swedish airports (currently 11 airports)*

The reference in CS-ADR-DSN.L.575 (1), (2) and (3) on p. 67 should be to Figure L-7, not to L-9.

response *Not accepted*

The reference is correct to show characteristics for Pattern A and B markings.

comment 2953 comment by: *Isavia*

CS-ADR-DSN.L.575 (a)(4): The reference to (b)(1) or (2): Where is this pointing to?
The reference should be to CS-ADR-DSN.D.335, b (if the text from Annex 14 3.12.3 is added to CS-ADR-DSN.D.335(b) as suggested in our comment on CS-ADR-DSN.D.335).

response *Partially accepted*

The missing reference is CS-ADR-DSN.L.605.

comment 2954 comment by: *Isavia*

Th reference in CS-ADR-DSN.L.575 (1), (2) and (3) on p. 67 should be to Figure L-7, not to L-9.

response *Not accepted*

The reference is correct to describe Pattern A and B marking characteristics.

CS-ADR – Book 1 – Figure L-9 Runway-holding position markings

p. 68

comment 2346 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – CS-ADR-DSN.L.580 – Intermediate holding position marking

p. 68-69

comment 1408 comment by: *UK CAA*

Page No: 68/69

Paragraph No: CS.ADR.DSN.L.580 (b)(2)

Comment: The distance between an intermediate holding position marking at the exit of a remote de-icing/anti-icing facility and the centreline of the adjoining taxiway for code letter F is shown as 57.5m. This does not coincide with Table D-1, column 11 (code letter F = 55m)

Justification: The text should be consistent.

Proposed Text: Change code letter F to read **55m**.

response *Accepted*

comment 2346 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment	2934	comment by: AIRBUS
	CS-ADR-DSN.L.580 (b) (2) contains distances for code letter A to F. These distances are the same as in Table D-1 Taxiway minimum separation distances except for code F. It is proposed to harmonise these distances and retain 55m for code F.	
response	Noted	

CS-ADR – Book 1 – CS-ADR-DSN.L.590 – Aircraft stand marking

p. 70

comment	66	comment by: Belfast International Airport - BFS/EGAA
	Diagram would be helpful to illustrate the apron markings	
response	Noted	

comment	548	comment by: Union des Aéroports français - UAF
	Attachment #346	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.L.590	
	Référence: CS-ADR-DSN.L.590 Aircraft stand marking	
	Traduction de courtoisie (d), (e) et (f) It is appropriate to transfer these provisions to GM. This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS.	
response	Not accepted	
	The wording is from ICAO.	

comment	754	comment by: ADP : Aeroports de Paris
	Référence: CS-ADR-DSN.L.590	Aircraft stand marking
	Proposition/commentaire	(d), (e) et (f) Il convient de transférer ces dispositions en GM.
	Justification	Ces dispositions n'étant que des règles de l'art

	et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.
Traduction de courtoisie	(d), (e) et (f) It is appropriate to transfer these provisions to GM. This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS.

response *Not accepted*

The wording is from ICAO.

comment 1589

comment by: *Aéroport de Marseille - MRS/LFML*

(d), (e) et (f) It is appropriate to transfer these provisions to GM.
This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS

response *Not accepted*

The wording is from ICAO.

comment 1607

comment by: *Euroairport Bâle-Mulhouse*

Attachment [#347](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.L.590

Référence: CS-ADR-DSN.L.590

Aircraft stand marking

Traduction de courtoisie

(d), (e) et (f) It is appropriate to transfer these provisions to GM.
This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS.

response *Not accepted*

The wording is from ICAO.

comment	<p>1925 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p>
	<p>Attachment #348</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.L.590</p> <p>Référence: CS-ADR-DSN.L.590 Aircraft stand marking</p> <p>Traduction de courtoisie (d), (e) et (f) It is appropriate to transfer these provisions to GM. This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS.</p>
response	<p><i>Not accepted</i></p>
	<p>The wording is from ICAO.</p>
comment	<p>2013 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i></p>
	<p>(d), (e) et (f) It is appropriate to transfer these provisions to GM. This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS.</p>
response	<p><i>Not accepted</i></p>
	<p>The wording is from ICAO.</p>
comment	<p>2346 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p>
	<p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2720 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p>
	<p>Attachment #349</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.L.590</p> <p>Référence: CS-ADR-DSN.L.590 Aircraft stand marking</p> <p>Traduction de courtoisie (d), (e) et (f) It is appropriate to transfer these provisions to GM. This provisions being only good practices and not normative references of the</p>

	Annex 14, they have to be put into GM and not CS.
response	<i>Not accepted</i>
	The wording is from ICAO.

comment	2885	comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i>
	<u>Référence: CS-ADR-DSN.L.590</u>	Aircraft stand marking
	Proposition/commentaire	(d), (e) et (f) Il convient de transférer ces dispositions en GM.
	Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.
	Traduction de courtoisie	(d), (e) et (f) It is appropriate to transfer these provisions to GM. This provisions being only good practices and not normative references of the Annex 14, they have to be put into GM and not CS.
response	<i>Not accepted</i>	
	The wording is from ICAO.	

CS-ADR – Book 1 – CS-ADR-DSN.L.595 – Apron safety lines

p. 70-71

comment	117	comment by: <i>Swedavia AB - Swedish airports (currently 11 airports)</i>
	Hard to fulfill on some aerodromes, can be misinterpreted by ground staff on some stands. (page 71 (c) (1) wing tip clearance).	
response	<i>Noted</i>	

comment	549	comment by: <i>Union des Aéroports français - UAF</i>
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Attachment [#350](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.L.595

Référence: CS-ADR-DSN.L.595
Apron safety lines

Traduction de courtoisie

(2) It is appropriate to modify in the following manner: « Apron safety lines should be **white or** of a conspicuous colour which should contrast with that used for aircraft stand markings ».

By its very nature, white might not be considered as a colour.

It would be appropriate to add it so that the existing white lines (broadly used in France) may be kept.

response *Not accepted*

Paragraph (c)(2) is from the general section on markings in ICAO Annex 14.

comment 755

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.L.595	Apron safety lines
Proposition/commentaire	(2) Il convient de modifier de la manière suivante: « Apron safety lines should be white or of a conspicuous colour which should contrast with that used for aircraft stand markings ».
Justification	De par sa nature, le blanc risque de ne pas être considéré comme une couleur. Il conviendrait donc de le rajouter afin que les lignes blanches existantes (largement utilisées en France) puissent être conservées.
Traduction de courtoisie	(2) It is appropriate to modify in the following manner: « Apron safety lines should be white or of a conspicuous colour which should contrast with that used for aircraft stand markings ». By its very nature, white might not be considered as a colour. It would be appropriate to add it so that the existing white lines (broadly used in France) may be kept.

response *Not accepted*

Paragraph (c)(2) is from the general section on markings in ICAO Annex 14.

comment	<p>1590 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>(2) It is appropriate to modify in the following manner: « Apron safety lines should be white or of a conspicuous colour which should contrast with that used for aircraft stand markings ».</p> <p>By its very nature, white might not be considered as a colour. It would be appropriate to add it so that the existing white lines (broadly used in France) may be kept.</p>
response	<p><i>Not accepted</i></p> <p>Paragraph (c)(2) is from the general section on markings in ICAO Annex 14.</p>

comment	<p>1608 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #351</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.L.595</p> <p>Référence: CS-ADR-DSN.L.595 Apron safety lines</p> <p>Traduction de courtoisie (2) It is appropriate to modify in the following manner: « Apron safety lines should be white or of a conspicuous colour which should contrast with that used for aircraft stand markings ».</p> <p>By its very nature, white might not be considered as a colour. It would be appropriate to add it so that the existing white lines (broadly used in France) may be kept.</p>
response	<p><i>Not accepted</i></p> <p>Paragraph (c)(2) is from the general section on markings in ICAO Annex 14.</p>

comment	<p>1926 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #352</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.L.595</p> <p>Référence: CS-ADR-DSN.L.595</p>
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	<p>Apron safety lines</p> <p>Traduction de courtoisie (2) It is appropriate to modify in the following manner: « Apron safety lines should be white or of a conspicuous colour which should contrast with that used for aircraft stand markings ».</p> <p>By its very nature, white might not be considered as a colour. It would be appropriate to add it so that the existing white lines (broadly used in France) may be kept.</p>
response	<p><i>Not accepted</i></p> <p>Paragraph (c)(2) is from the general section on markings in ICAO Annex 14.</p>

comment	<p>2012 comment by: Pau Pyrénées Airport - PUF/LFBP</p> <p>(2) It is appropriate to modify in the following manner: « Apron safety lines should be white or of a conspicuous colour which should contrast with that used for aircraft stand markings ».</p> <p>By its very nature, white might not be considered as a colour. It would be appropriate to add it so that the existing white lines (broadly used in France) may be kept.</p>
response	<p><i>Not accepted</i></p> <p>Paragraph (c)(2) is from the general section on markings in ICAO Annex 14.</p>

comment	<p>2346 ❖ comment by: HIA - Highlands and Islands Airports Limited</p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2640 comment by: Airport Nuremberg - NUE/EDDN</p> <p>The characteristics of apron safety lines listed under (c) should be moved to the guidance material, because they are recommendations and too definite within this section. There should be more room for aerodrome to adapt their own operation and the amount of traffic at the aerodrome accordingly. Since wingtip clearance lines and service road boundary lines are especially on smaller and medium sized aerodromes not always provided.</p>
response	<p><i>Not accepted</i></p> <p>Wording is from ICAO.</p>

comment	<p>2721 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #353</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.L.595</p> <p>Référence: CS-ADR-DSN.L.595 Apron safety lines</p> <p>Traduction de courtoisie (2) It is appropriate to modify in the following manner: « Apron safety lines should be white or of a conspicuous colour which should contrast with that used for aircraft stand markings ». By its very nature, white might not be considered as a colour. It would be appropriate to add it so that the existing white lines (broadly used in France) may be kept.</p>
response	<p><i>Not accepted</i></p> <p>Paragraph (c)(2) is from the general section on markings in ICAO Annex 14.</p>

comment	<p>2886 comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i></p> <table border="1"> <tr> <td>Référence: CS-ADR-DSN.L.595</td> <td>Apron safety lines</td> </tr> <tr> <td>Proposition/commentaire</td> <td>(2) Il convient de modifier de la manière suivante: « Apron safety lines should be white or of a conspicuous colour which should contrast with that used for aircraft stand markings ».</td> </tr> <tr> <td>Justification</td> <td>De par sa nature, le blanc risque de ne pas être considéré comme une couleur. Il conviendrait donc de le rajouter afin que les lignes blanches existantes (largement utilisées en France) puissent être conservées.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>(2) It is appropriate to modify in the following manner: « Apron safety lines should be white or of a conspicuous colour which should contrast with that used for aircraft stand markings ». By its very nature, white might not be considered as a colour. It would be appropriate to add it so that the existing white lines (broadly used in France) may be kept.</td> </tr> </table>	Référence: CS-ADR-DSN.L.595	Apron safety lines	Proposition/commentaire	(2) Il convient de modifier de la manière suivante: « Apron safety lines should be white or of a conspicuous colour which should contrast with that used for aircraft stand markings ».	Justification	De par sa nature, le blanc risque de ne pas être considéré comme une couleur. Il conviendrait donc de le rajouter afin que les lignes blanches existantes (largement utilisées en France) puissent être conservées.	Traduction de courtoisie	(2) It is appropriate to modify in the following manner: « Apron safety lines should be white or of a conspicuous colour which should contrast with that used for aircraft stand markings ». By its very nature, white might not be considered as a colour. It would be appropriate to add it so that the existing white lines (broadly used in France) may be kept.
Référence: CS-ADR-DSN.L.595	Apron safety lines								
Proposition/commentaire	(2) Il convient de modifier de la manière suivante: « Apron safety lines should be white or of a conspicuous colour which should contrast with that used for aircraft stand markings ».								
Justification	De par sa nature, le blanc risque de ne pas être considéré comme une couleur. Il conviendrait donc de le rajouter afin que les lignes blanches existantes (largement utilisées en France) puissent être conservées.								
Traduction de courtoisie	(2) It is appropriate to modify in the following manner: « Apron safety lines should be white or of a conspicuous colour which should contrast with that used for aircraft stand markings ». By its very nature, white might not be considered as a colour. It would be appropriate to add it so that the existing white lines (broadly used in France) may be kept.								

response *Not accepted*

Paragraph (c)(2) is from the general section on markings in ICAO Annex 14.

comment

2894 comment by: *SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard*

Attachment [#354](#)

SEARD NPA 2011-20 (B.III) CS-ADR-DSN.L.595

Référence: CS-ADR-DSN.L.595
Apron safety lines

Traduction de courtoisie

(2) It is appropriate to modify in the following manner: « Apron safety lines should be **white or** of a conspicuous colour which should contrast with that used for aircraft stand markings ».

By its very nature, white might not be considered as a colour.

It would be appropriate to add it so that the existing white lines (broadly used in France) may be kept.

response *Not accepted*

Paragraph (c)(2) is from the general section on markings in ICAO Annex 14.

comment

5

comment by: *Manchester Airport plc*

In accordance with the comment made on CS-ADR-DSN.D.335 (e), a road holding position marking where the road leads on to a runway would be better marked as a Patern A marking.

response *Not accepted*

comment	84	comment by: CAA-NL
	In (a) we suggest to delete the word 'service'. The road-holding position marking should be provided at all road entrances to a runway.	
response	<i>Accepted</i>	
comment	157	comment by: CAA Norway
	Instead of "a suitable" in line one of CS-ADR-DSN.L.600 (b)(2) on page 71: Suggest to use " road holding position marking " instead.	
response	<i>Accepted</i>	
comment	304	comment by: Icelandic Civil Aviation Administration
	Instead of "a suitable" in line one of CS-ADR-DSN.L.600 (b)(2) on page 71: Suggest to use "road holding position marking" instead.	
response	<i>Accepted</i>	
comment	366	comment by: Estonian CAA
	Instead of "a suitable" in line one of CS-ADR-DSN.L.600 (b)(2) on page 71: Suggest to use "road holding position marking" instead.	
response	<i>Accepted</i>	
comment	495	comment by: East Midlands Airport - EMA/EGNX
	In accordance with the comment made on CS-ADR-DSN.D.335 (e), a road holding position marking where the road leads on to a runway would be better marked as a Patern A marking.	
response	<i>Not accepted</i>	
comment	651	comment by: Finnish Transport Safety Agency
	Instead of "a suitable" in line one of CS-ADR-DSN.L.600 (b)(2) on page 71:	

	Suggest to use "road holding position marking" instead.
response	<i>Accepted</i>

comment	1179 comment by: <i>Swedish Transport Agency</i>
	Instead of "a suitable" in line one of CS-ADR-DSN.L.600 (b)(2) on page 71: Suggest to use "road holding position marking" instead.
response	<i>Accepted</i>

comment	1410 comment by: <i>UK CAA</i>
	<p>Page No: 71</p> <p>Paragraph No: CS.ADR.DSN.L.600</p> <p>Comment: The CSs for road-holding position marking should also include unpaved roads that access runways, information that is currently included only as guidance material. The GM. ADR.DSN.L.600 should be deleted and included in this CS.</p> <p>Justification: Consistent application of road access onto runways, which helps to minimise runway incursion risk.</p> <p>Proposed Text: (a) A road-holding position marking may be provided, as far as practicable, at all road entrances to a runway, whether paved or unpaved.</p> <p>New text: (b) (3) Where a road that accesses a runway is unpaved, it may not be possible to install markings. In such cases, a road-holding position signs and/or lights should be installed, combined with appropriate instructions on how the driver of a vehicle should proceed.</p> <p>All other text unchanged.</p>
response	<i>Noted</i>
	<p>Using the word 'all' implies paved and unpaved surfaces. Provision of road holding position signs is in CS-ADR-DSN.N.780, paragraph (a)(7):</p> <p><i>A road holding position sign should be provided at all road entrances to a runway and may also be provided at road entrances to taxiways.</i></p>

comment	2346 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

comment	2596	comment by: <i>Danish Transport Authority</i>
	(b)(2) Instead of "a suitable" in line one of CS-ADR-DSN.L.600 (b)(2) on page 71: Suggest to use "road holding position marking" instead.	
response	<i>Accepted</i>	

comment	2955	comment by: <i>Isavia</i>
	Instead of "a suitable" in line one of CS-ADR-DSN.L.600 (b)(2) on page 71: Suggest to use "road holding position marking" instead.	
response	<i>Accepted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.L.605 – Mandatory instruction marking	p. 71-72
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comment	85	comment by: <i>CAA-NL</i>
	<p>In (a) is prescribed where a mandatory instruction marking needs to be applied. There is however no reference to where it is impracticable to install a mandatory sign. We propose to add the text 'or where it is impracticable to install a mandatory instruction sign', according to ICAO Annex 14, 5.2.16.1.</p> <p>Paragraph CS-ADR-DSN.L.605 does not prescribe that a mandatory instruction marking should not be applied on a runway, except where operationally required. We propose to add the text 'except where operationally required, a mandatory instruction marking should not be located on a runway', according to ICAO Annex 14, 5.2.16.5.</p>	
response	<i>Partially accepted</i>	
	The operational reference is deleted.	

comment	305	comment by: <i>Icelandic Civil Aviation Administration</i>
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Suggest to install the standard 5.2.16.1 from Annex 14. Mandatory instruction marking may be necessary at points where signs cannot be installed.

response *Accepted*

comment 550 comment by: *Union des Aéroports français - UAF*

Attachment [#355](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.L.605

Référence: CS-ADR-DSN.L.605
Mandatory instruction marking

Traduction de courtoisie
(c) (4) It is appropriate to modify in the following way: "The character height should be 4 m for inscriptions where the code letter is C, D, E or F, and **at least** 2 m where the code letter is A or B. The inscription should be in the form and proportions shown in Figures L-12A to L-12E."
In France, it is estimated that 4 m are necessary. Adding "at least", existing markings stay compliant and reducing the size of markings is not necessary.

response *Accepted*

comment 652 comment by: *Finnish Transport Safety Agency*

We suggest to install the standard 5.2.16.1 from Annex 14 into CS-ADR-DSN.L.605 on page 71. Mandatory instruction marking may be necessary at points where signs cannot be installed.

response *Accepted*

comment 756 comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.L.605	Mandatory instruction marking
Proposition/commentaire	(c) (4) Il convient de modifier de la manière suivante: "The character height should be 4 m for inscriptions where the code letter is C, D, E or F, and at least 2 m where the code letter is A or B. The inscription should be in the form and proportions shown in Figures L-12A to L-12E."
Justification	En France, il est estimé que 4m sont nécessaires. En ajoutant "at least" les marques existantes restent conformes et il n'est pas

	nécessaire de réduire la taille des marques.
Traduction de courtoisie	(c) (4) It is appropriate to modify in the following way: "The character height should be 4 m for inscriptions where the code letter is C, D, E or F, and at least 2 m where the code letter is A or B. The inscription should be in the form and proportions shown in Figures L-12A to L-12E." In France, it is estimated that 4 m are necessary. Adding "at least", existing markings stay compliant and reducing the size of markings is not necessary.

response *Accepted*

comment *1182* comment by: *Swedish Transport Agency*

We suggest to install the standard 5.2.16.1 from Annex 14 into CS-ADR-DSN.L.605 on page 71.

response *Accepted*

comment *1250* comment by: *CAA Norway*

We suggest to install the standard 5.2.16.1 from Annex 14 into CS-ADR-DSN.L.605 on page 71. Mandatory instruction marking may be necessary at points where signs cannot be installed.

response *Accepted*

comment *1448* comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.L.605 — Mandatory instruction marking (p71-72)

2. Justification and proposed text / comment

In France, it was deemed necessary that the height of characters for mandatory instruction marking is 4 meters for all code letters.
This can be simply dealt with by adding "at least" before the 2 m. Thus existing markings remain compliant and have not to be changed:

CS-ADR-DSN.L.605 – Mandatory instruction marking

“(c) Characteristics:

[...] (4) The character height should be 4 m for inscriptions where the code letter is C, D, E or F, and **at least** 2 m where the code letter is A or B. The inscription should be in the form and proportions shown in Figures L-12A to L-12E.

[...]”

response *Accepted*

comment

1591

comment by: *Aéroport de Marseille - MRS/LFML*

(c) (4) It is appropriate to modify in the following way: “The character height should be 4 m for inscriptions where the code letter is C, D, E or F, and **at least** 2 m where the code letter is A or B. The inscription should be in the form and proportions shown in Figures L-12A to L-12E.”

In France, it is estimated that 4 m are necessary. Adding “at least”, existing markings stay compliant and reducing the size of markings is not necessary.

response *Accepted*

comment

1610

comment by: *Euroairport Bâle-Mulhouse*

Attachment [#356](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.L.605

Référence: CS-ADR-DSN.L.605
Mandatory instruction marking

Traduction de courtoisie

(c) (4) It is appropriate to modify in the following way: “The character height should be 4 m for inscriptions where the code letter is C, D, E or F, and **at least** 2 m where the code letter is A or B. The inscription should be in the form and proportions shown in Figures L-12A to L-12E.”

In France, it is estimated that 4 m are necessary. Adding “at least”, existing markings stay compliant and reducing the size of markings is not necessary.

response *Accepted*

comment

1849

comment by: *ENAC Ente Nazionale per l’Aviazione Civile*

(c)(4) We propose to modify the following paragraph FROM:
the character height should be 4 m for inscriptions where the code letter is C, D, E or F, and 2 m where the code letter is A or B.
TO:

	the character height should be 4 m for inscriptions where the code letter is C, D, E or F, and AT LEAST 2 m where the code letter is A or B.
response	<i>Accepted</i>

comment	1927 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	Attachment #357
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.L.605
	Référence: CS-ADR-DSN.L.605 Mandatory instruction marking
	Traduction de courtoisie
	(c) (4) It is appropriate to modify in the following way: "The character height should be 4 m for inscriptions where the code letter is C, D, E or F, and at least 2 m where the code letter is A or B. The inscription should be in the form and proportions shown in Figures L-12A to L-12E." In France, it is estimated that 4 m are necessary. Adding "at least", existing markings stay compliant and reducing the size of markings is not necessary.
response	<i>Accepted</i>

comment	2011 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	(c) (4) It is appropriate to modify in the following way: "The character height should be 4 m for inscriptions where the code letter is C, D, E or F, and at least 2 m where the code letter is A or B. The inscription should be in the form and proportions shown in Figures L-12A to L-12E." In France, it is estimated that 4 m are necessary. Adding "at least", existing markings stay compliant and reducing the size of markings is not necessary.
response	<i>Accepted</i>

comment	2346 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>

comment	2558 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
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In general the provision for height of mandatory instruction marking is correct. But in some areas as Apron this height is not possible (there is not enough space) and should be reduce.

CS-ADR-DSN.L.605 – Mandatory instruction marking

“(c) Characteristics:

[...] (4) The character height should be 4 m for inscriptions where the code letter is C, D, E or F, and at least 2 m where the code letter is A or B (that heights for all the codes could be reduce on apron). The inscription should be in the form and proportions shown in Figures L-12A to L-12E.

[...]”

response *Partially accepted*

At least 2 m for code letters A and B.

comment 2597 comment by: *Danish Transport Authority*

We suggest to install the standard 5.2.16.1 from Annex 14 into CS-ADR-DSN.L.605 on page 71. Mandatory instruction marking may be necessary at points where signs cannot be installed.

response *Accepted*

comment 2723 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#358](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.L.605

Référence: CS-ADR-DSN.L.605
Mandatory instruction marking

Traduction de courtoisie

(c) (4) It is appropriate to modify in the following way: “The character height should be 4 m for inscriptions where the code letter is C, D, E or F, and at least 2 m where the code letter is A or B. The inscription should be in the form and proportions shown in Figures L-12A to L-12E.”

In France, it is estimated that 4 m are necessary. Adding “at least”, existing markings stay compliant and reducing the size of markings is not necessary.

response *Accepted*

comment 2887 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.L.605	Mandatory instruction marking
Proposition/commentaire	(c) (4) Il convient de modifier de la manière suivante: "The character height should be 4 m for inscriptions where the code letter is C, D, E or F, and at least 2 m where the code letter is A or B. The inscription should be in the form and proportions shown in Figures L-12A to L-12E."
Justification	En France, il est estimé que 4m sont nécessaires. En ajoutant "at least" les marques existantes restent conformes et il n'est pas nécessaire de réduire la taille des marques.
Traduction de courtoisie	(c) (4) It is appropriate to modify in the following way: "The character height should be 4 m for inscriptions where the code letter is C, D, E or F, and at least 2 m where the code letter is A or B. The inscription should be in the form and proportions shown in Figures L-12A to L-12E." In France, it is estimated that 4 m are necessary. Adding "at least", existing markings stay compliant and reducing the size of markings is not necessary.

response *Accepted*

comment 2999

comment by: *IFATCA*

CS-ADR-DSN.L.605 – Mandatory instruction marking *MOVE to GM*

(c) Characteristics:

(1) A mandatory instruction marking should consist of an inscription in white on a red background. Except for a NO ENTRY marking, the inscription should provide information identical to that of the associated mandatory instruction sign.

(2) A NO ENTRY marking should consist of an inscription in white reading NO ENTRY on a red background.

(3) Where there is insufficient contrast between the marking and the pavement surface, the mandatory instruction marking should include an appropriate border, preferably white or black.

(4) The character height should be 4 m for inscriptions where the code letter is C, D, E or F, and 2 m where the code letter is A or B. The inscription should be in the form and proportions shown in Figures L-12A to L-12E.

(5) The background should be rectangular and extend a minimum of 0.5 m laterally and vertically beyond the extremities of the inscription.

In the other document (id_146), EASA emphasizes the importance of uniform markings (especially to prevent runway incursions). IFATCA does therefore not understand why this should be moved to GM. Proposal that it remains at the

	<i>same level as the other mentioning of it.</i>
response	<i>Not accepted</i>
	The superscript refers to only one line of text that has been moved to GM as it was an operational consideration.

CS-ADR – Book 1 – Figure L-11 Mandatory instruction marking	p. 72
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comment	2346 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure L-12A Mandatory instruction marking inscription form and proportions	p. 73
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comment	2346 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure L-12B Mandatory instruction marking inscription form and proportions	p. 74
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comment	2346 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure L-12C Mandatory instruction marking inscription form and proportions	p. 75
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comment	2346 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

**CS-ADR – Book 1 – Figure L-12D Mandatory instruction marking
inscription form and proportions**

p. 76

comment	2346 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

**CS-ADR – Book 1 – Figure L-12E Mandatory instruction marking
inscription form and proportions**

p. 77

comment	306	comment by: <i>Icelandic Civil Aviation Administration</i>
	<p>Comment refers to CS-ADR-DSN.L.610 below (a blocking possibility missing for this paragraph in the CRT) - We suggest to install the omitted standard 5.2.17.1 from Annex 14 into CS-ADR-DSN.L.610 on page 77. Editorial: We suggest to put Figure L12A to L12E after CS-ADR-DSN.L.610</p>	
response	<i>Accepted</i>	

comment	367	comment by: <i>Estonian CAA</i>
	<p>We suggest to install the omitted standard 5.2.17.1 from Annex 14 into CS-ADR-DSN.L.610 on page 77. Editorial: We suggest to put Figure L12A to L12E after CS-ADR-DSN.L.610.</p>	
response	<i>Accepted</i>	

comment	653	comment by: <i>Finnish Transport Safety Agency</i>
	We suggest to install the omitted standard 5.2.17.1 from Annex 14 into CS-ADR-DSN.L.610 on page 77. Editorial: We suggest to put Figure L12A to L12E after CS-ADR-DSN.L.610.	
response	<i>Accepted</i>	

comment	1184	comment by: <i>Swedish Transport Agency</i>
	We suggest to install the omitted standard 5.2.17.1 from Annex 14 into CS-ADR-DSN.L.610 on page 77. Editorial: We suggest to put Figure L12A to L12E after CS-ADR-DSN.L.610.	
response	<i>Accepted</i>	

comment	2346 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.L.610 – Information marking

p. 77

comment	86	comment by: <i>CAA-NL</i>
	This paragraph does not prescribe information markings, but for safety reasons these markings need also to be standardised. We propose to add the description of information markings.	
response	<i>Partially accepted</i>	
	Applicability is added to the CS. The descriptions are in GM.	

comment	158	comment by: <i>CAA Norway</i>
	We suggest to install the omitted standard 5.2.17.1 from Annex 14 into CS-ADR-DSN.L.610 on page 77. Editorial: We suggest to put Figure L12A to L12E after CS-ADR-DSN.L.610.	

response	Accepted	
comment	1416	comment by: UK CAA
	<p>Page No: 77</p> <p>Paragraph No: CS-ADR-DSN.L.610</p> <p>Comment: The description of the location of the information marking should be moved from the GM [GM-ADR-DSN.L.610 (b)(1)] to the CS.</p> <p>Justification: To be consistent with other CSs that describes the location of the markings and to enhance the safety perspective.</p> <p>Proposed Text: New text: An information (location/direction) marking should be displayed prior to and following complex taxiway intersections and where operational experience has indicated the addition of a taxiway location marking could assist flight crew ground navigation and on the pavement surface at regular intervals along taxiways of great length.</p>	
response	Noted	
	The characteristics in GM have been moved to the CS. Comments relating to operational considerations are in GM.	
comment	1852	comment by: ENAC Ente Nazionale per l'Aviazione Civile
	<p>Considering that an information marking has to be seen by a pilot and (at the same time) by a copilot, we guess that can be helpful to define the position of this marking in the centre of the taxiway. Therefore, we propose to add the following paragraph: an information marking must be located across the taxiway equally placed about the taxiway centre line.</p>	
response	Noted	
	This information is in GM.	
comment	2346 ❖	comment by: HIA - Highlands and Islands Airports Limited
	Noted	
response	Noted	

comment	<p>2559 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p> <p>The comment for that CS is the same that the previous one.</p> <p>But in that case it is more important because on Apron there are more information marking that mandatory.</p> <p>Thus it is proposed.</p> <p>In general the provision for height of mandatory instruction marking is correct. But in some areas as Apron this height is not possible (there is not enough space) and should be reduced.</p> <p>CS-ADR-DSN.L.605 – Information marking <i>"The character height should be as for mandatory instruction markings, but that height could be reduced in apron areas"</i></p>
response	<p><i>Noted</i></p> <p>This information is in .</p>

comment	<p>2598 comment by: <i>Danish Transport Authority</i></p> <p>We suggest to install the omitted standard 5.2.17.1 from Annex 14 into CS-ADR-DSN.L.610 on page 77. Editorial: We suggest to put Figure L12A to L12E after CS-ADR-DSN.L.610.</p>
response	<p><i>Accepted</i></p>

CS-ADR – Book 1 – CS-ADR-DSN.M.615 – General	p. 78-79
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comment	<p>1383 comment by: <i>ECA - European Cockpit Association</i></p> <p>Delete the whole paragraph (a) and replace with: (a) Elevated approach lights and their supporting structures within 1000 m from the threshold should be light-weight and have a frangible coupling at their bases</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 5.3.1.4</p>
response	<p><i>Not accepted</i></p> <p>Paragraph (a) is the same as ICAO standard.</p>

comment	1385	comment by: <i>ECA - European Cockpit Association</i>
	Amend (d) as follows:	
	(3) Where a high-intensity lighting system is provided, a suitable intensity control should be incorporated to allow for adjustment of the light intensity to meet the prevailing conditions. Separate intensity controls or other suitable methods should be provided to ensure that the following systems, when installed, can be operated at compatible intensities:	
	(i) approach lighting system;	
	(ii) runway edge lights;	
	(iii) runway threshold lights;	
	(iv) runway end lights;	
	(v) runway centre line lights;	
	(vi) runway touchdown zone lights; and	
	(vii) taxiway centre line lights; and	
	<u>(viii) runway turn pad guidance lights</u>	
	Justification: Reference: IFALPA Annex 14, paragraph 5.3.1.11	
response	<i>Not accepted</i>	

comment	2346 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.M.620 – Aeronautical beacons

p. 79-80

comment	87	comment by: <i>CAA-NL</i>
	In (b) (3) (i) we suggest to add the text 'or white flashes only', according to ICAO 5.3.3.6.	
response	<i>Accepted</i>	

comment	159	comment by: <i>CAA Norway</i>
	We suggest to remove "only" from CS-ADR-DSN.M.620 (a)(1) on page 79. It sounds like it is forbidden to have a beacon unless operationally necessary, which may be difficult to prove.	

response *Accepted*

comment *160* comment by: *CAA Norway*

We suggest to delete the word "either" from CS-ADR-DSN.M.620 (b)(3)(i) or to add the possibility for white flashes only. (Annex 14 p. 5.3.3.6). We suggest to use the word "green" instead of coloured in CS-ADR-DSN.M.620 (b)(3)(i). (see my other comments (iii) on the yellow).

response *Partially accepted*

ICAO stipulates 'coloured'.

comment *161* comment by: *CAA Norway*

We suggest to delete CS-ADR-DSN.M.620 (b)(3)(iii) on page 79, as airports in EASA scope will not be principally water aerodromes.

response *Accepted*

comment *162* comment by: *CAA Norway*

We suggest to delete CS-ADR-DSN.M.620 (c) on page 80. Identification beacon not used today, Morse codes not in pilot study material any longer and generally no need. Water aerodromes are not in our scope either.

response *Partially accepted*

Reference to water aerodrome will be deleted. The remainder is ICAO standard.

comment *307* comment by: *Icelandic Civil Aviation Administration*

Suggest to remove "only" from CS-ADR-DSN.M.620 (a)(1) on p 79. It sounds like it is forbidden to have a beacon unless operationally necessary, which may be difficult to prove.

response *Accepted*

comment *308* comment by: *Icelandic Civil Aviation Administration*

We suggest to delete the word "either" from CS-ADR-DSN.M.620 (b)(3)(i) or to

	add the possibility for white flashes only. (Annex 14 p. 5.3.3.6). We suggest to use the word "green" instead of coloured in CS-ADR-DSN.M.620 (b)(3)(i). (see our other comments (iii) on the yellow).
response	<i>Partially accepted</i> ICAO stipulates 'coloured'.
comment	309 comment by: <i>Icelandic Civil Aviation Administration</i> We suggest to delete CS-ADR-DSN.M.620 (b)(3)(iii) on page 79, as airports in EASA scope will not be principally water aerodromes.
response	<i>Accepted</i>
comment	310 comment by: <i>Icelandic Civil Aviation Administration</i> We suggest to delete CS-ADR-DSN.M.620 (c) on page 80. Identification beacon not used today, Morse codes not in pilot study material any longer and generally no need. Water aerodromes are not in our scope either.
response	<i>Partially accepted</i> Reference to water aerodrome will be deleted. The remainder is ICAO standard.
comment	368 comment by: <i>Estonian CAA</i> We suggest to remove "only" from CS-ADR-DSN.M.620 (a)(1) on page 79. It sounds like it is forbidden to have a beacon unless operationally necessary, which may be difficult to prove.
response	<i>Accepted</i>
comment	369 comment by: <i>Estonian CAA</i> We suggest to delete the word "either" from CS-ADR-DSN.M.620 (b)(3)(i) or to add the possibility for white flashes only. (Annex 14 p. 5.3.3.6). We suggest to use the word "green" instead of coloured in CS-ADR-DSN.M.620 (b)(3)(i). (see my other comments (iii) on the yellow).
response	<i>Partially accepted</i>

ICAO stipulates 'coloured'.

comment	370	comment by: <i>Estonian CAA</i>
	We suggest to delete CS-ADR-DSN.M.620 (b)(3)(iii) on page 79, as airports in EASA scope will not be principally water aerodromes.	
response	<i>Accepted</i>	

comment	371	comment by: <i>Estonian CAA</i>
	We suggest to delete CS-ADR-DSN.M.620 (c) on page 80. Identification beacon not used today, Morse codes not in pilot study material any longer and generally no need. Water aerodromes are not in our scope either.	
response	<i>Partially accepted</i>	
	Reference to water aerodrome will be deleted. The remainder is ICAO standard.	

comment	654	comment by: <i>Finnish Transport Safety Agency</i>
	We suggest to remove "only" from CS-ADR-DSN.M.620 (a)(1) on page 79. It sounds like it is forbidden to have a beacon unless operationally necessary, which may be difficult to prove.	
response	<i>Accepted</i>	

comment	655	comment by: <i>Finnish Transport Safety Agency</i>
	We suggest to delete the word "either" from CS-ADR-DSN.M.620 (b)(3)(i) or to add the possibility for white flashes only. (Annex 14 p. 5.3.3.6). We suggest to use the word "green" instead of coloured in CS-ADR-DSN.M.620 (b)(3)(i). (see my other comments (iii) on the yellow).	
response	<i>Partially accepted</i>	
	ICAO stipulates 'coloured'.	

comment	656	comment by: <i>Finnish Transport Safety Agency</i>
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response	<p>We suggest to delete CS-ADR-DSN.M.620 (b)(3)(iii) on page 79, as airports in EASA scope will not be principally water aerodromes.</p> <p><i>Accepted</i></p>
comment	<p>658 comment by: <i>Finnish Transport Safety Agency</i></p> <p>We suggest to delete CS-ADR-DSN.M.620 (c) on page 80. Identification beacon not used today, Morse codes not in pilot study material any longer and generally no need. Water aerodromes are not in our scope either.</p>
response	<p><i>Partially accepted</i></p> <p>Reference to water aerodrome will be deleted. The remainder is ICAO standard.</p>
comment	<p>1053 comment by: <i>Belgian CAA</i></p> <p>What is the rationale for deleting "or white flashes only" in (3)(i) in the text proposed by EASA (reference: ICAO Annex 14 §5.3.3.6)?</p>
response	<p><i>Accepted</i></p> <p>'Or white flashes only' will be reinserted.</p>
comment	<p>1186 comment by: <i>Swedish Transport Agency</i></p> <p>We suggest to remove "only" from CS-ADR-DSN.M.620 (a)(1) on page 79. It sounds like it is forbidden to have a beacon unless operationally necessary, which may be difficult to prove.</p>
response	<p><i>Accepted</i></p>
comment	<p>1187 comment by: <i>Swedish Transport Agency</i></p> <p>We suggest to delete the word "either" from CS-ADR-DSN.M.620 (b)(3)(i) or to add the possibility for white flashes only. (Annex 14 p. 5.3.3.6). We suggest to use the word "green" instead of coloured in CS-ADR-DSN.M.620 (b)(3)(i). (see my other comments (iii) on the yellow).</p>
response	<p><i>Partially accepted</i></p> <p>ICAO stipulates 'coloured'.</p>

comment	1189	comment by: <i>Swedish Transport Agency</i>
	We suggest to delete CS-ADR-DSN.M.620 (b)(3)(iii) on page 79, as airports in EASA scope will not be principally water aerodromes.	
response	<i>Accepted</i>	
comment	1190	comment by: <i>Swedish Transport Agency</i>
	We suggest to delete CS-ADR-DSN.M.620 (c) on page 80. Identification beacon not used today, Morse codes not in pilot study material any longer and generally no need. Water aerodromes are not in our scope either.	
response	<i>Partially accepted</i>	
	Reference to water aerodrome will be deleted. The remainder is ICAO standard.	
comment	1450	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> CS-ADR - Book 1 – CS-ADR-DSN. M.620 — Aeronautical beacons (p79-80) <p><u>2. Justification and proposed text / comment</u></p> <p>The words “as when non-precision and/or non-instrument operation are in use” shall be removed to be in compliance with ICAO standards and CS-ADR-DSN.M.620 (a)(2). Indeed, as written, paragraph (a)(1) would require that an aeronautical beacon has to be installed on all aerodromes with non-precision and non-instrument runways. But there is no identified operational need for that. Instead, these lights are provided only in conditions of paragraph (a)(2) of CS-ADR-DSN.M.620. Typical use is where aerodromes are embedded in very high vegetation. Very few aeronautical beacon are provided at aerodromes, as there are normally enough visual aids to correctly locate aerodromes.</p> <p>CS-ADR-DSN. M.620 — Aeronautical beacons “(a) General (1) Only if operationally necessary, as when non-precision and/or non-instrument operations are in use, an aerodrome beacon or identification beacon should be provided at each aerodrome intended for use at night. [...]”</p>	
response	<i>Noted</i>	
	This is ICAO standard.	

comment	1708	comment by: UK CAA
	<p>Page No: 79</p> <p>Paragraph No: CS.ADR.DSN.M.620(b)(3)(i)</p> <p>Comment: ICAO permits the aerodrome beacon to have either coloured flashes alternating with white flashes, or white flashes only.</p> <p>Justification: Consistency with ICAO Annex 14</p> <p>Proposed Text: The aerodrome beacon should show either coloured flashes alternating with white flashes, or white flashes only.</p>	
response	Accepted	
comment	1854	comment by: ENAC Ente Nazionale per l'Aviazione Civile
	<p>(c) Considering that in an airport where we do night VFR or where are applicable rules defined in the Aerodrome Beacon applicability it's necessary to install the Aerodrome Beacon, we propose to remove/delete the paragraph (c) and, therefore, don't define a identification beacon.</p>	
response	<p>Not accepted</p> <p>This is ICAO standard.</p>	
comment	2346 ❖	comment by: HIA - Highlands and Islands Airports Limited
	Noted	
response	Noted	
comment	2560	comment by: AENA - Aeropuertos Españoles y Navegación Aérea
	<p>The words "as when non-precision and/or non-instrument operation are in use" shall be removed to be in compliance with ICAO standards and CS-ADR-DSN.M.620 (a)(2).</p> <p>Indeed, as written, paragraph (a)(1) would require that an aeronautical beacon has to be installed on all aerodromes with non-precision and non-instrument runways. But there is no identified operational need for that. Instead, these lights are provided only in conditions of paragraph (a)(2) of CS-ADR-DSN.M.620. Typical use is where aerodromes are embedded in very high vegetation.</p> <p>Very few aeronautical beacon are provided at aerodromes, as there are normally enough visual aids to correctly locate aerodromes.</p>	

CS-ADR-DSN. M.620 — Aeronautical beacons

“(a) General

(1) Only if operationally necessary, ~~as when non-precision and/or non-instrument operations are in use,~~ an aerodrome beacon or identification beacon should be provided at each aerodrome intended for use at night.

[...].”

response *Not accepted*

CS allows flexibility.

comment

2599

comment by: *Danish Transport Authority*

(b)(3)(i) The paragraph should be adjusted to the ICAO Annex 14 and revised to "The aerodrome beacon should show either green flashes alternating with white flashes or white flashes only".

response *Accepted*

comment

2600

comment by: *Danish Transport Authority*

We suggest to delete paragraph (b)(3)(iii) , as aerodromes under the scope of basic regulation does not cover water aerodromes.

response *Accepted*

comment

2930

comment by: *Danish Transport Authority*

(c): The identification beacon will not be an issue under this regulation. The Paragraph should be removed.

response *Partially accepted*

Reference to water aerodrome will be deleted; remainder is ICAO standard.

comment

2956

comment by: *Isavia*

Suggest to remove "only" from CS-ADR-DSN.M.620 (a)(1) on p 79. It sounds like it is forbidden to have a beacon unless operationally necessary, which may be difficult to prove.

response *Accepted*

comment	2957	comment by: <i>Isavia</i>
	We suggest to delete the word "either" from CS-ADR-DSN.M.620 (b)(3)(i) or to add the possibility for white flashes only. (Annex 14 p. 5.3.3.6). We suggest to use the word "green" instead of colored in CS-ADR-DSN.M.620 (b)(3)(i). (See my other comments (iii) on the yellow).	
response	<i>Partially accepted</i>	
	ICAO stipulates 'coloured'.	

comment	2958	comment by: <i>Isavia</i>
	We suggest to delete CS-ADR-DSN.M.620 (b)(3)(iii) on page 79, as airports in EASA scope will not be principally water aerodromes.	
response	<i>Accepted</i>	

comment	2960	comment by: <i>Isavia</i>
	We suggest deleting CS-ADR-DSN.M.620 (c) on page 80. Identification beacon not used today, Morse codes not in pilot study material any longer and generally no need. Water aerodromes are not in our scope either.	
response	<i>Partially accepted</i>	
	Reference to water aerodrome will be deleted. The remainder is ICAO standard.	

CS-ADR – Book 1 – CS-ADR-DSN.M.625 – Approach lighting systems, general and applicability

p. 80-82

comment	6	comment by: <i>Manchester Airport plc</i>
	(f) (3) (i) Could a wire mesh boundary fence be exempt from this requirement when it is necessary for security reasons to have a higher type?	
response	<i>Noted</i>	
	ICAO standard does not allow this.	

comment	30	comment by: <i>ACI EUROPE - Airports Council International</i>
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	get letters right, there is twice the letter (e)
response	<i>Accepted</i>

comment	31 comment by: <i>ACI EUROPE - Airports Council International</i>
	(d) wrong reference, change to CS.ADR.DSN.M.635
response	<i>Accepted</i>

comment	88 comment by: <i>CAA-NL</i>
	The letter (e) is used twice. (k) is the same as (f) (3) (ii). The text is redundant and we suggest to delete it. In (d) please change the reference to CS.ADR.DSN.M.635 as reference for a precision approach category II and III lighting system.
response	<i>Accepted</i>

comment	163 comment by: <i>CAA Norway</i>
	Editorial: Numbering of CS-ADR-DSN.M.625 (e) to (k) on page 80-82 should be changed to give Simple Approach lighting system its own paragraph (CS) separate from CS-ADR-DSN.M.625. We suggest to rename (e) to (k) and make it a new CS-ADR-DSN.M.626 (a) to (g).
response	<i>Accepted</i>

comment	164 comment by: <i>CAA Norway</i>
	Editorial: CS-ADR-DSN.M.625 (a) (1) and (b) (1) on page 81 wrongly refers to (c). This reference should be to the existing (e) or preferably to the new CS as suggested in last comment to this paragraph.
response	<i>Accepted</i>

comment	311 comment by: <i>Icelandic Civil Aviation Administration</i>
	Editorial: Numbering of CS-ADR-DSN.M.625 (e) to (k) on page 80-82 should be

changed to give Simple Approach lighting system its own paragraph (CS) separate from CS-ADR-DSN.M.625. We suggest to rename (e) to (k) and make it a new CS-ADR-DSN.M.626 (a) to (g).

response *Accepted*

comment 312 comment by: *Icelandic Civil Aviation Administration*

Editorial: CS-ADR-DSN.M.625 (a) (1) and (b) (1) on page 81 wrongly refers to (c). This reference should be to the existing (e) or preferably to the new CS as suggested in our last comment (no. 163) to this paragraph.

response *Accepted*

comment 497 comment by: *East Midlands Airport - EMA/EGNX*

(f) (3) (i) Could a wire mesh boundary fence be exempt from this requirement when it is necessary for security reasons to have a higher type?

response *Noted*

ICAO standard does not allow this.

comment 551 comment by: *Union des Aéroports français - UAF*

Attachment [#359](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.625

Référence: CS-ADR-DSN.M.625
Approach lighting systems, general and applicability

Traduction de courtoisie

(a)(1)(2), (b)(1)(2) et (c) : it is appropriate to transfer these provisions to GM.

(c) It is appropriate to modify the reference in the following way: « CS-ADR-DSN.M.600 630 »

(d)) It is appropriate to modify the reference in the following way: « CS-ADR-DSN.M.605 635 »

These provisions are not normative references in ICAO Annex 14, they should be in GM and not in CS.

Trying to impose a unique configuration is unthinkable.

response *Partially accepted*

Incorrect references will be amended; paragraph (a)(2) and (b)(2) will be moved to GM.

comment	586	comment by: <i>Cologne/Bonn Airport</i>
	twice the letter f	
response	<i>Noted</i>	

comment	616	comment by: <i>Avinor</i>
	CS.ADR.DSN.M.625. Get letters right, there is twice the letter (f).	
response	<i>Accepted</i>	

comment	617	comment by: <i>Avinor</i>
	CS.ADR.DSN.M.625 (d). Wrong reference, change to CS.ADR.DSN.M.635.	
response	<i>Accepted</i>	

comment	659	comment by: <i>Finnish Transport Safety Agency</i>
	Editorial: Numbering of CS-ADR-DSN.M.625 (e) to (k) on page 80-82 should be changed to give Simple Approach lighting system its own paragraph (CS) separate from CS-ADR-DSN.M.625. We suggest to rename (e) to (k) and make it a new CS-ADR-DSN.M.626 (a) to (g).	
response	<i>Accepted</i>	

comment	660	comment by: <i>Finnish Transport Safety Agency</i>
	Editorial: CS-ADR-DSN.M.625 (a) (1) and (b) (1) on page 81 wrongly refers to (c). This reference should be to the existing (e) or preferably to the new CS as suggested in last comment to this paragraph.	
response	<i>Accepted</i>	

comment	757	comment by: <i>ADP : Aeroports de Paris</i>		
	<table border="1"> <tr> <td>Référence: CS-ADR-</td> <td>Approach lighting systems, general and</td> </tr> </table>		Référence: CS-ADR-	Approach lighting systems, general and
Référence: CS-ADR-	Approach lighting systems, general and			

DSN.M.625	applicability
Proposition/commentaire	<p>(a)(1)(2), (b)(1)(2) et (c) : Il convient de transférer ces dispositions en GM.</p> <p>(c) Il convient de modifier la référence suivante : « CS-ADR- DSN.M.600 630 »</p> <p>(d) Il convient de modifier la référence suivante : « CS-ADR- DSN.M.605 635 »</p>
Justification	<p>Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.</p> <p>De manière plus particulière pour les pistes avec approche de précision de catégorie I, la CS ne présente qu'une configuration possible comme dispositif lumineux d'approche en faisant référence à la CS-ADR- DSN.M.630 (et non 600 comme écrit). Cette configuration n'est pas toujours possible à mettre en place et pas toujours nécessaire.</p> <p>En France, outre cette configuration (dispositif lumineux d'approche de précision de catégorie I), il existe trois autres configurations possibles qui sont les suivantes :</p> <p>2^{ème} configuration : dispositif lumineux d'approche simplifié</p> <ul style="list-style-type: none"> > rangée de feux de ligne axiale d'approche dans le prolongement de l'axe de piste et s'étendant une distance minimale de 720 m à partir du seuil de piste : <ul style="list-style-type: none"> - espacement longitudinal entre feux : 60 m ; - rangées de 1 seul feu ; > barres de deux feux de barres transversales d'approche situées à 300 m et 60 m du seuil de piste. <p>3^{ème} configuration : dispositif lumineux d'approche simplifié</p> <ul style="list-style-type: none"> > rangée de feux de ligne axiale d'approche dans le prolongement de l'axe de piste et s'étendant une distance minimale de 420 m à partir du seuil de piste : <ul style="list-style-type: none"> - espacement longitudinal entre feux : 60 m ; - rangées de 1 seul feu ; > barres de deux feux de barres transversales d'approche situées à 300 m et 60 m du seuil de piste. <p>4^{ème} configuration : absence de dispositif lumineux de ligne d'approche</p> <p>Il est impensable de vouloir imposer une seule configuration.</p>
Traduction de courtoisie	(a)(1)(2), (b)(1)(2) et (c) : it is appropriate to transfer these provisions to GM.

	<p>(c) It is appropriate to modify the reference in the following way : « CS-ADR- DSN.M.600 630 »</p> <p>(d) It is appropriate to modify the reference in the following way: « CS-ADR- DSN.M.605 635 »</p> <p>These provisions are not normative references in ICAO Annex 14, they should be in GM and not in CS.</p> <p>Trying to impose a unique configuration is unthinkable.</p>
<p>response</p>	<p><i>Partially accepted</i></p> <p>Incorrect references will be amended. Paragraphs (a)(2) and (b)(2) will be moved to GM.</p>
<p>comment</p>	<p>804 comment by: <i>Munich Airport International</i></p> <p>get letters right, there is twice the letter (e)</p> <p><u>(d)</u>: wrong reference, change to CS.ADR.DSN.M.635</p>
<p>response</p>	<p><i>Accepted</i></p>
<p>comment</p>	<p>1042 comment by: <i>Federal Office of Civil Aviation FOCA</i></p> <p>CS.ADR.DSN.M.625 and following: Reconsider the whole structure of this provision and the following. The whole section "approach lighting systems" has a poor structure. There are requirements, which are repeated many times or which only are applicale for SALS, but are included in the "centre line lights" requirements.</p>
<p>response</p>	<p><i>Noted</i></p>
<p>comment</p>	<p>1054 comment by: <i>Belgian CAA</i></p>

	<p>The reference in (a)(1) is not (c) but (e) Simple approach lighting system.</p> <p>Title (e) Crossbar lights should be replaced by (f) Crossbar lights. Same remark for the following titles.</p>
response	<i>Accepted</i>

comment	<p>1055 comment by: <i>Belgian CAA</i></p> <p>The provisions (f)(3)(ii) and (k) contain a double negation that makes the sentence unclear. It would be better to write in the positive form: "extremities of a crossbar or of a centre line barette should never be screened from an approaching aircraft". We do not see the added value of the repetition of the sentence (f)(3)(ii) and (k).</p>
response	<p><i>Partially accepted</i></p> <p>ICAO standard does not allow this.</p>

comment	<p>1191 comment by: <i>Swedish Transport Agency</i></p> <p>Editorial: Numbering of CS-ADR-DSN.M.625 (e) to (k) on page 80-82 should be changed to give Simple Approach lighting system its own paragraph (CS) separate from CS-ADR-DSN.M.625. We suggest to rename (e) to (k) and make it a new CS-ADR-DSN.M.626 (a) to (g).</p>
response	<i>Accepted</i>

comment	<p>1193 comment by: <i>Swedish Transport Agency</i></p> <p>Editorial: CS-ADR-DSN.M.625 (a) (1) and (b) (1) on page 81 wrongly refers to (c). This reference should be to the existing (e) or preferably to the new CS as suggested in last comment to this paragraph.</p>
response	<i>Accepted</i>

comment	<p>1388 comment by: <i>ECA - European Cockpit Association</i></p> <p>Amend (e)(1)(i) as follows:</p> <p>(i) A simple approach lighting system should consist of a row of lights on the extended centre line of the runway extending, whenever possible, over a distance of not less than 420 m from the threshold with a row of lights forming a crossbar 18 m or 30 m in length at a distance of 300 m from the threshold.</p>
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Installation of the simple approach lighting system should be restricted to runways of Code 1.

Justification:

An amendment is required to this text which restricts the provision of a simple approach lighting system to runways of Code letter 1. For runways of Codes 2, 3 or 4 a full 3000 ft. approach lighting system is required.

Reference: IFALPA Annex 14, paragraph 5.3.4.2

response *Not accepted*

comment

1592

comment by: *Aéroport de Marseille - MRS/LFML*

a)(1)(2), (b)(1)(2) et (c) : it is appropriate to transfer these provisions to GM.

(c) It is appropriate to modify the reference in the following way : « CS-ADR-DSN.M.600 630 »

(d)) It is appropriate to modify the reference in the following way: « CS-ADR-DSN.M.605 635 »

These provisions are not normative references in ICAO Annex 14, they should be in GM and not in CS.

Trying to impose a unique configuration is unthinkable.

response *Partially accepted*

Incorrect references will be amended. Paragraphs (a)(2) and (b)(2) will be moved to GM.

comment

1611

comment by: *Euroairport Bâle-Mulhouse*

Attachment [#360](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.625

Référence: CS-ADR-DSN.M.625

Approach lighting systems, general and applicability

Traduction de courtoisie

(a)(1)(2), (b)(1)(2) et (c) : it is appropriate to transfer these provisions to GM.

(c) It is appropriate to modify the reference in the following way: « CS-ADR-DSN.M.600 630 »

(d)) It is appropriate to modify the reference in the following way: « CS-ADR-DSN.M.605 635 »

These provisions are not normative references in ICAO Annex 14, they should be in GM and not in CS.

Trying to impose a unique configuration is unthinkable.

response *Partially accepted*

Incorrect references will be amended. Paragraphs (a)(2) and (b)(2) will be moved to GM.

comment 1709

comment by: UK CAA

Page No: 82

Paragraph No: CS.ADR.DSN.M.625 (f) (1) & (2)

Comment: Distance between runway lights incorrect.

Justification: Annex 14 5.3.12.5 and CAP168 Ch 6 paragraph 5.7.1 states 30m spacing or 15m spacing

Proposed Text: Change 60m to 30m, and 30m to 15m.

response *Not accepted*

The Annex 14 reference quoted refers to runway centre line lights. The CS is for approach lighting systems and paragraphs (f)(1) and (2) for a 'Simple approach lighting system'. Spacing for the centre line lights of this system are as set out in the CS, derived from Annex 14, paragraphs 5.3.4.4 and 5.3.4.5.

comment 1771

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN. M.625 — Approach lighting systems, general and applicability (p80-82)
- CS-ADR - Book 1 - CS-ADR-DSN. M.630 — Precision approach category I lighting system (p84-85)
- CS-ADR - Book 1 - Figure M-2 Precision approach category I lighting systems (p85)
- CS-ADR - Book 1 - Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations (p86)
- CS-ADR - Book 1 - CS-ADR-DSN.M.635 — Precision approach category II and III lighting system (p87-88)
- CS-ADR - Book 2 - GM-ADR-DSN.M.625 — Approach lighting systems, general and applicability (p256-257)
- CS-ADR - Book 2 - Figure GM-M-2 Precision approach category I lighting systems (p262)
- CS-ADR - Book 2 - Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights (p263)
- CS-ADR - Book 2 - GM-ADR-DSN.M.630 — Precision approach category I lighting system (p265-267)

2. General comment

For precision approach category I runways, paragraph (c) of CS-ADR-DSN.M.625 allows for only one possible layout for its lighting system making reference to CS-ADR-DSN.M.600630.

But it is not always possible to implement the proposed layout and even not always necessary.

In France, there are three others precision approach category I lighting systems, as follows:

1. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 720m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
2. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 420m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
3. no approach lighting system:

Given these arguments, it is not appropriate to provide only one layout for precision approach category I lighting system in this CS.

2. Justification and proposed text / comment

This comment is critical.

This comment is linked to DGAC's comment on ICAO notes and attachments that shall be in GM rather than in CS.

The following specifications are not binding in France, are only in notes or in a attachment to ICAO Annex 14 Volume1 and are written as a guidance materials since there are just possibilities (e.g. use of "can" and "advisable"):

- Paragraphs (a)(2) and (b)(2) of CS-ADR-DSN.M.625 (ICAO notes)
- Paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 (ICAO Attachments)
- Paragraph (c)(3) of CS-ADR-DSN.M.630 (ICAO Attachments)
- paragraph (l) (6) of CS-ADR-DSN.M.635 (ICAO notes)
- Figure M-2, which is not referenced in the CS (ICAO Attachments)
- Figure M-3, which is just an explanation on how the lights characteristics have been determined in ICAO Annex 14 transcribed in chapter U of the CS (ICAO Attachments).

As confirmed by IACO, appendixes of an Annex have the same status as the corresponding provisions of the Annex, whereas attachments are only guidance materials.

Besides:

- paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 are respectively duplicated in paragraphs (a)(1) and (a)(2) of GM-ADR-DSN.M.625
- paragraph (c)(3) of CS-ADR-DSN.M.630 is already duplicated in GM-ADR-DSN.M.630
- paragraph (l) (6) of CS-ADR-DSN.M.635 is already duplicated in GM-

- ADR-DSN.M.635
- Figure M-2 and figure M-3 are already in GM respectively as Figure GM-M-2 and Figure GM-M-4.

DGAC proposes to **move these specifications to GM.**

Editorial improvements in CS-ADR-DSN.M.625

* In paragraphs (c) and (d), references are erroneous: they should respectively refer to CS-ADR-DSN.M.630 and CS-ADR-DSN.M.635.

* In CS-ADR-DSN.M.625, the numbering becomes erroneous from (e) crossbar lights (which should be (f)) to (k) (which should be (l)).

Editorial improvements in CS-ADR-DSN.M.630

* First sentence is a duplication of paragraph (c) of CS-ADR-DSN.M.625 without the "where physically practicable". It is essential to avoid any confusion to delete this sentence from CS-ADR-DSN.M.630.

* In paragraph (b)(2) the reference to "as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance" shall be replaced by "in CS-ADR-DSN.S.895" as maintenance objectives are not specified in Part OPS because the serviceability level results from design, manufacturing and maintenance.

* In paragraph (b)(2), the sentence "The barrettes should be at least 4 m in length" should be moved to paragraph (b)(3) in order to be consistent with the wording of ICAO Annex 14 volume1 Standards 5.3.4.15 and 16.

* Paragraph (c) should be consolidated with paragraph (b) for consistency. Thus CS-ADR-DSN.M.630 — (c) (1) and (2) should be renumbered as (b) (7) and (8).

* In paragraph (c) (1) "this Regulation" should be replaced by "(b)(1)(ii) or (b)(2)(ii)" for consistency with CS-ADR-DSN.M.630 — (b) (4) and Annex 14 Recommendation 5.3.4.17.

* In paragraph (c) (2) "this Regulation" should be replaced by (b)(7) (which corresponds to actual paragraph (c)(1) but the aforementioned re-numbering is taken into account).

Editorial improvements in CS-ADR-DSN.M.635

* In paragraph (a) references to Figure M-4, 10.4.7 and Figure M-4-A should respectively be replaced by Figure M-4A, CS-ADR-DSN.S.895 and Figure M-4B.

* In paragraph (h) "specified as maintenance objective" should be replaced by "specified in CS-ADR-DSN.S.895" as the serviceability level results from design, manufacturing and maintenance.

* In paragraph (j) "specified as maintenance objective" should be replaced by "specified in CS-ADR-DSN.S.895".

Book I

CS-ADR-DSN.M.625 — Approach lighting systems, general and applicability

"(a) Non-instrument runway

~~(1)~~ Where physically practicable, a simple approach lighting system as specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-instrument runway where the code number is 3 or 4 and intended for use at night, except when the runway is used only in conditions of good visibility, and sufficient guidance is provided by other visual aids.

~~(2) A simple approach lighting system can also provide visual guidance by day.~~

(b) Non-precision approach runway

~~(1)~~ Where physically practicable, a simple approach lighting system specified in paragraph (c) (Simple approach lighting system) below should be provided to

serve a non-precision approach runway, except when the runway is used only in conditions of good visibility or sufficient guidance is provided by other visual aids.

~~(2) It is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system.~~

(c) Precision approach runway category I

Where physically practicable, a precision approach category I lighting system as specified in CS-ADR-DSN.M.600 630 should be provided to serve a precision approach runway category I.

(d) Precision approach runway categories II and III

A precision approach category II and III lighting system as specified in CS-ADR-DSN. M.605 635 should be provided to serve a precision approach runway category II or III.

(e) Simple approach lighting system

[...]

~~(ii) The specifications in this document provide for the basic characteristics for simple approach lighting systems. For certain aspects of these systems, some latitude is permitted, for example, in the spacing between centre line lights and crossbars. The simple approach lighting patterns that have been generally adopted are shown in Figure M-1.~~

~~(iii) The approach lighting configuration is to be provided irrespective of the location of the threshold, i.e. whether the threshold is at the extremity of the runway or displaced from the runway extremity. In both cases, the approach lighting system should extend up to the threshold. However, in the case of a displaced threshold, inset lights are used from the runway extremity up to the threshold to obtain the specified configuration. These inset lights are designed to satisfy the structural requirements specified in this Regulation and the chromaticity and characteristics specified in CS-ADR-DSN.U.930 and CS-ADR-DSN. U.940.~~

~~(e) (f) Crossbar lights:~~

~~[...]"~~

CS-ADR-DSN. M.630 – Precision approach category I lighting system

~~"A precision approach category I lighting system as specified in this Regulation should be provided to serve a precision approach runway category I.~~

~~[...] (b) Characteristics:~~

~~[...] (2) Where the serviceability level of the approach lights specified as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance in CS-ADR-DSN.S.895 can be demonstrated, each centre line light position should consist of either:~~

~~[...]The barrettes should be at least 4 m in length.~~

~~(3)The barrettes should be at least 4 m in length. When barrettes are composed of lights approximating to point sources, the lights should be uniformly spaced at intervals of not more than 1.5 m.~~

~~[...](c) Characteristics:~~

~~(1) (7) If the centre line consists of barrettes as described in this Regulation paragraphs (b)(1)(ii) or (b)(2)(ii), each barrette [...]~~

~~(2) (8) Each capacitor discharge light as described in this Regulation paragraph (b)(7) should [...]~~

~~(3) The flight path envelopes used in the design of these lights are given in Figure M-3.~~

~~[...]"~~

Figure M-2 Precision approach category I lighting systems

Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations

CS-ADR-DSN.M.635 — Precision approach category II and III lighting system

"(a) [...] one at 150 m and one at 300 m from the threshold, all as shown in ~~Figure M-4~~ Figure M-4A. Where the serviceability level of the approach lights specified as maintenance objectives in ~~10.4.7 CS-ADR-DSN.S.895~~ can be demonstrated, the system may have two side rows of lights, extending 240 m from the threshold, and two crossbars, one at 150 m and one at 300 m from the threshold, all as shown in ~~Figure M-4A~~ Figure M-4B.

[...]

(h) The centre line of a precision approach category II and III lighting system for the first 300 m from the threshold should consist of barrettes showing variable white, except that, where the threshold is displaced 300 m or more, the centre line may consist of single light sources showing variable white. Where the serviceability level of the approach lights specified as ~~maintenance objectives~~ in CS-ADR-DSN.S.895 can be demonstrated, the centre line of a precision approach category II and III lighting system for the first 300 m from the threshold may consist of either:

[...]

(j) Where the serviceability level of the approach lights specified as ~~maintenance objectives~~ in CS-ADR-DSN.S.895 can be demonstrated, beyond 300 m from the threshold each centre line light position may consist of either:

[...]

(l) If the centre line beyond 300 m from the threshold consists of barrettes as described in (i)(1) and (j)(1) above, each barrette beyond 300 m should be supplemented by a capacitor discharge light, except where such lighting is considered unnecessary taking into account the characteristics of the system and the nature of the meteorological conditions.

[...]

~~(6) The flight path envelopes used in the design of these lights are given in Figure M-3.~~

[...]"

Book II**Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights****GM-ADR-DSN.M.625 — Approach lighting systems, general and applicability**

"(a) Non-instrument runway: a simple approach lighting system can also provide visual guidance by day.

(b) Non-precision approach runway: it is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system

(~~a~~ c) Types and characteristics

[...]"

GM-ADR-DSN.M.630 — Precision approach category I lighting system

"[...]

(~~a~~ c) Vertical tolerances:

[...]

(d) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

GM-ADR-DSN.M.635 — Precision approach category II and III lighting system

"[...]

comment	2009	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	<p>(a)(1)(2), (b)(1)(2) et (c) : it is appropriate to transfer these provisions to GM.</p> <p>(c) It is appropriate to modify the reference in the following way : « CS-ADR-DSN.M.600 630 »</p> <p>(d)) It is appropriate to modify the reference in the following way: « CS-ADR-DSN.M.605 635 »</p> <p>These provisions are not normative references in ICAO Annex 14, they should be in GM and not in CS.</p> <p>Trying to impose a unique configuration is unthinkable.</p>	
response	<i>Partially accepted</i>	
	<p>Incorrect references will be amended. Paragraphs (a)(2) and (b)(2) will be moved to GM.</p>	
comment	2126	comment by: <i>Irish Aviation Authority</i>
	<p>There is a cross reference error: The clauses numbered CS-ADR-DSN.M.600 and -605 should be corrected to CS-ADR-DSN.M.630 for Category 1 and CS-ADR-DSN.M.635 for categories II and III respectively.</p>	
response	<i>Accepted</i>	
	<p>The text has been amended to include the correct reference.</p>	
comment	2346 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<p>Noted</p>	
response	<i>Noted</i>	
comment	2378	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	<p>Rework the whole structure of this article and the following. Repetition, applicability poorly defined, unclear.</p>	
response	<i>Noted</i>	
comment	2483	comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>

For precision approach category I runways, paragraph (c) of CS-ADR-DSN.M.625 allows for only one possible layout for its lighting system making reference to CS-ADR-DSN.M.600630.

But it is not always possible to implement the proposed layout and even not always necessary.

In Spain, there are three others precision approach category I lighting systems, as follows:

1. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 720m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
2. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 420m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
3. no approach lighting system:

Given these arguments, it is not appropriate to provide only one layout for precision approach category I lighting system in this CS.

2. Justification and proposed text / comment

The following specifications are not binding in Spain, are only in notes or in a attachment to ICAO Annex 14 Volume1 and are written as a guidance materials since there are just possibilities (e.g. use of "can" and "advisable"):

Paragraphs (a)(2) and (b)(2) of CS-ADR-DSN.M.625 (ICAO notes)

Paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 (ICAO Attachments)

Paragraph (c)(3) of CS-ADR-DSN.M.630 (ICAO Attachments)

paragraph (l) (6) of CS-ADR-DSN.M.635 (ICAO notes)

Figure M-2, which is not referenced in the CS (ICAO Attachments)

Figure M-3, which is just an explanation on how the lights characteristics have been determined in ICAO Annex 14 transcribed in chapter U of the CS (ICAO Attachments).

As confirmed by IACO, appendixes of an Annex have the same status as the corresponding provisions of the Annex, whereas attachments are only guidance materials.

Besides:

- paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 are respectively duplicated in paragraphs (a)(1) and (a)(2) of GM-ADR-DSN.M.625

- paragraph (c)(3) of CS-ADR-DSN.M.630 is already duplicated in GM-ADR-DSN.M.630

- paragraph (l) (6) of CS-ADR-DSN.M.635 is already duplicated in GM-ADR-DSN.M.635

- Figure M-2 and figure M-3 are already in GM respectively as Figure GM-M-2 and Figure GM-M-4.

It is proposes to **move these specifications to GM.**

"(a) Non-instrument runway

(1) Where physically practicable, a simple approach lighting system as specified

in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-instrument runway where the code number is 3 or 4 and intended for use at night, except when the runway is used only in conditions of good visibility, and sufficient guidance is provided by other visual aids.

~~(2) A simple approach lighting system can also provide visual guidance by day.~~

~~(b) Non-precision approach runway~~

~~(1) Where physically practicable, a simple approach lighting system specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-precision approach runway, except when the runway is used only in conditions of good visibility or sufficient guidance is provided by other visual aids.~~

~~(2) It is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system.~~

~~(c) Precision approach runway category I~~

~~Where physically practicable, a precision approach category I lighting system as specified in CS-ADR-DSN.M.600 630 should be provided to serve a precision approach runway category I.~~

~~(d) Precision approach runway categories II and III~~

~~A precision approach category II and III lighting system as specified in CS-ADR-DSN. M.605 635 should be provided to serve a precision approach runway category II or III.~~

~~(e) Simple approach lighting system~~

~~[...]~~

~~(ii) The specifications in this document provide for the basic characteristics for simple approach lighting systems. For certain aspects of these systems, some latitude is permitted, for example, in the spacing between centre line lights and crossbars. The simple approach lighting patterns that have been generally adopted are shown in Figure M-1.~~

~~(iii) The approach lighting configuration is to be provided irrespective of the location of the threshold, i.e. whether the threshold is at the extremity of the runway or displaced from the runway extremity. In both cases, the approach lighting system should extend up to the threshold. However, in the case of a displaced threshold, inset lights are used from the runway extremity up to the threshold to obtain the specified configuration. These inset lights are designed to satisfy the structural requirements specified in this Regulation and the chromaticity and characteristics specified in CS ADR DSN.U.930 and CS-ADR-DSN. U.940.~~

~~(e) (f) Crossbar lights:~~

~~[...]"~~

response

Noted

Partially Agreed: Incorrect references will be amended. Paragraphs (a)(2) and (b)(2) will be moved to GM.

Not Agreed: Remaining proposals.

comment

2601

comment by: Danish Transport Authority

Editorial: Numbering of CS-ADR-DSN.M.625 (e) to (k) on page 80-82 should be changed to give Simple Approach lighting system its own paragraph (CS) separate from CS-ADR-DSN.M.625. We suggest to rename (e) to (k) and make it a new CS-ADR-DSN.M.626 (a) to (g).

response *Accepted*

comment 2725 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#362](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.M.625

Référence: CS-ADR-DSN.M.625

Approach lighting systems, general and applicability

Traduction de courtoisie

(a)(1)(2), (b)(1)(2) et (c) : it is appropriate to transfer these provisions to GM

(c) It is appropriate to modify the reference in the following way: « CS-ADR-DSN.M.600 **630** »

(d)) It is appropriate to modify the reference in the following way: « CS-ADR-DSN.M.605 **635** »

These provisions are not normative references in ICAO Annex 14, they should be in GM and not in CS.

Trying to impose a unique configuration is unthinkable.

response *Partially accepted*

Incorrect references will be amended. Paragraphs (a)(2) and (b)(2) will be moved to GM.

comment 2796 comment by: *Swedavia AB - Swedish airports (currently 11 airports)*

Get letters right, there is twice the letter (e).

(d). Wrong reference, change to CS.ADR.DSN.M.635.

response *Accepted*

comment 2895 comment by: *SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard*

Attachment [#363](#)

SEARD NPA 2011-20 (B.III) CS-ADR-DSN.M.625

Référence: CS-ADR-DSN.M.625

Approach lighting systems, general and applicability

Traduction de courtoisie

(a)(1)(2), (b)(1)(2) et (c) : it is appropriate to transfer these provisions to GM.
 (c) It is appropriate to modify the reference in the following way: « CS-ADR-DSN.M.600 630 »
 (d)) It is appropriate to modify the reference in the following way: « CS-ADR-DSN.M.605 635 »
 These provisions are not normative references in ICAO Annex 14, they should be in GM and not in CS.
 Trying to impose a unique configuration is unthinkable.

response *Partially accepted*

Incorrect references will be amended. Paragraphs (a)(2) and (b)(2) will be moved to GM.

comment 2903

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.M.625	Approach lighting systems, general and applicability
Proposition/commentaire	<p>(a)(1)(2), (b)(1)(2) et (c) : Il convient de transférer ces dispositions en GM.</p> <p>(c) Il convient de modifier la référence suivante : « CS-ADR- DSN.M.600 630 »</p> <p>(d) Il convient de modifier la référence suivante : « CS-ADR- DSN.M.605 635 »</p>
Justification	<p>Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.</p> <p>De manière plus particulière pour les pistes avec approche de précision de catégorie I, la CS ne présente qu'une configuration possible comme dispositif lumineux d'approche en faisant référence à la CS-ADR- DSN.M.630 (et non 600 comme écrit). Cette configuration n'est pas toujours possible à mettre en place et pas toujours nécessaire.</p> <p>En France, outre cette configuration (dispositif lumineux d'approche de précision de catégorie I), il existe trois autres configurations possibles qui sont les suivantes :</p> <p>2^{ème} configuration : dispositif lumineux d'approche simplifié</p> <p>> rangée de feux de ligne axiale d'approche dans le prolongement de l'axe de piste et s'étendant une distance minimale de 720 m à partir du seuil de piste :</p> <ul style="list-style-type: none"> - espacement longitudinal entre feux : 60 m ; - rangées de 1 seul feu ; <p>> barres de deux feux de barres transversales</p>

	<p>d'approche situées à 300 m et 60 m du seuil de piste.</p> <p>3^{ème} configuration : dispositif lumineux d'approche simplifié</p> <p>> rangée de feux de ligne axiale d'approche dans le prolongement de l'axe de piste et s'étendant une distance minimale de 420 m à partir du seuil de piste :</p> <ul style="list-style-type: none"> - espacement longitudinal entre feux : 60 m ; - rangées de 1 seul feu ; <p>> barres de deux feux de barres transversales d'approche situées à 300 m et 60 m du seuil de piste.</p> <p>4^{ème} configuration : absence de dispositif lumineux de ligne d'approche</p> <p>Il est impensable de vouloir imposer une seule configuration.</p>
Traduction de courtoisie	<p>(a)(1)(2), (b)(1)(2) et (c) : it is appropriate to transfer these provisions to GM.</p> <p>(c) It is appropriate to modify the reference in the following way : « CS-ADR- DSN.M.600 630 »</p> <p>(d)) It is appropriate to modify the reference in the following way: « CS-ADR- DSN.M.605 635 »</p> <p>These provisions are not normative references in ICAO Annex 14, they should be in GM and not in CS.</p> <p>Trying to impose a unique configuration is unthinkable.</p>

response *Partially accepted*

Incorrect references will be amended. Paragraphs (a)(2) and (b)(2) will be moved to GM.

comment 2961

comment by: *Isavia*

Numbering of CS-ADR-DSN.M.625 (e) to (k) on page 80-82 should be changed to give Simple Approach lighting system its own paragraph (CS) separate from CS-ADR-DSN.M.625. We suggest to rename (e) to (k) and make it a new CS-ADR-DSN.M.626 (a) to (g).

response	<i>Accepted</i>	
comment	2962	comment by: <i>Isavia</i>
	CS-ADR-DSN.M.625 (a) (1) and (b) (1) on page 81 wrongly refers to (c). This reference should be to the existing (e) or preferably to the new CS as suggested in our last comment (no. 163) to this paragraph.	
response	<i>Accepted</i>	
comment	2963	comment by: <i>Isavia</i>
	We suggest dividing paragraph CS-ADR-DSN.M.630 on page 84 in two parts for easier readings, one for "single light source (Calvert)" and one for "barrette centerline".	
response	<i>Noted</i>	
comment	3026	comment by: <i>ADV -German Airports Association</i>
	CS.ADR.DSN.M.625 get letters right, there is twice the letter (f)	
response	<i>Accepted</i>	
comment	3027	comment by: <i>ADV -German Airports Association</i>
	CS.ADR.DSN.M.625	(d)
	wrong reference, change to CS.ADR.DSN.M.635	
response	<i>Accepted</i>	
comment	3061	comment by: <i>MST / STR - Stuttgart Airport</i>
	CS.ADR.DSN.M.625 get letters right, there is twice the letter (f)	
response	<i>Accepted</i>	

comment	3062	comment by: <i>MST / STR - Stuttgart Airport</i>
	CS.ADR.DSN.M.625 (d) wrong reference, change to CS.ADR.DSN.M.635	
response	<i>Accepted</i>	

comment	3094	comment by: <i>Fraport AG</i>
	CS-ADR-DSN.M.625 — Approach lighting systems, general and applicability (d) Editorial CS-ADR.DSN.M.605 Correct cross reference to CS-ADR.DSN.M.635	
	Fraport	AG
	Mentioned cross reference does not exist.	
response	<i>Accepted</i>	

comment	3095	comment by: <i>Fraport AG</i>
	CS-ADR-DSN.M.625 — Approach lighting systems, general and applicability (e) Editorial Paragraph exist two times Correct numeration of paragraphs	
	Fraport	AG
	Wrong numeration.	
response	<i>Accepted</i>	

comment	2346 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	

response *Noted*

CS-ADR — Book 1 — CS-ADR-DSN.M.630 — Precision approach category I lighting system

p. 84-85

comment 67 comment by: *Belfast International Airport - BFS/EGAA*

Diagram would be useful to illustrate inner 300m approach and runway lighting for CAT 1

response *Noted*

comment 89 comment by: *CAA-NL*

We suggest to add the text 'the system shall lie as nearly as practicable in the horizontal plane passing through the threshold', according to ICAO Annex 14, 5.3.4.13.

response *Accepted*

comment 165 comment by: *CAA Norway*

Editorial: We suggest to divide paragraph CS-ADR-DSN.M.630 on page 84 in two parts for easier readings, one for "single light source (calvert)" and one for "barrette centerline".

response *Noted*

Text will be reviewed.

comment 313 comment by: *Icelandic Civil Aviation Administration*

Editorial: We suggest to divide paragraph CS-ADR-DSN.M.630 on page 84 in two parts for easier readings, one for "single light source (calvert)" and one for "barrette centerline".

response *Noted*

Text will be reviewed.

comment	661	comment by: <i>Finnish Transport Safety Agency</i>
	Editorial: We suggest to divide paragraph CS-ADR-DSN.M.630 on page 84 in two parts for easier readings, one for "single light source (calvert)" and one for "barrette centerline".	
response	<i>Noted</i>	
	Text will be reviewed.	
comment	1043	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	Precision Approach Runway CAT I lighting systems are dealt with in an own paragraph. SALS, non precision runway ALS missing resp. structured differently.	
response	<i>Noted</i>	
comment	1194	comment by: <i>Swedish Transport Agency</i>
	Editorial: We suggest to divide paragraph CS-ADR-DSN.M.630 on page 84 in two parts for easier readings, one for "single light source (calvert)" and one for "barrette centerline".	
response	<i>Noted</i>	
	Text will be reviewed.	
comment	1771 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 – CS-ADR-DSN. M.625 — Approach lighting systems, general and applicability (p80-82) • CS-ADR - Book 1 – CS-ADR-DSN. M.630 — Precision approach category I lighting system (p84-85) • CS-ADR - Book 1 - Figure M-2 Precision approach category I lighting systems (p85) • CS-ADR - Book 1 - Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations (p86) • CS-ADR - Book 1 - CS-ADR-DSN.M.635 — Precision approach category II and III lighting system (p87-88) • CS-ADR - Book 2 – GM-ADR-DSN.M.625 — Approach lighting systems, general and applicability (p256-257) • CS-ADR - Book 2 - Figure GM-M-2 Precision approach category I lighting systems (p262) • CS-ADR - Book 2 - Figure GM-M-4 Flight path envelopes to be used for 	

lighting design for category I, II and III operations - Centre line lights (p263)

- CS-ADR - Book 2 – GM-ADR-DSN.M.630 — Precision approach category I lighting system (p265-267)

2. General comment

For precision approach category I runways, paragraph (c) of CS-ADR-DSN.M.625 allows for only one possible layout for its lighting system making reference to CS-ADR-DSN.M.600~~630~~630.

But it is not always possible to implement the proposed layout and even not always necessary.

In France, there are three others precision approach category I lighting systems, as follows:

1. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 720m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
2. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 420m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
3. no approach lighting system:

Given these arguments, it is not appropriate to provide only one layout for precision approach category I lighting system in this CS.

2. Justification and proposed text / comment

This comment is critical.

This comment is linked to DGAC's comment on ICAO notes and attachments that shall be in GM rather than in CS.

The following specifications are not binding in France, are only in notes or in a attachment to ICAO Annex 14 Volume1 and are written as a guidance materials since there are just possibilities (e.g. use of "can" and "advisable"):

- Paragraphs (a)(2) and (b)(2) of CS-ADR-DSN.M.625 (ICAO notes)
- Paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 (ICAO Attachments)
- Paragraph (c)(3) of CS-ADR-DSN.M.630 (ICAO Attachments)
- paragraph (l) (6) of CS-ADR-DSN.M.635 (ICAO notes)
- Figure M-2, which is not referenced in the CS (ICAO Attachments)
- Figure M-3, which is just an explanation on how the lights characteristics have been determined in ICAO Annex 14 transcribed in chapter U of the CS (ICAO Attachments).

As confirmed by IACO, appendixes of an Annex have the same status as the corresponding provisions of the Annex, whereas attachments are only guidance materials.

Besides:

- paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 are respectively duplicated in paragraphs (a)(1) and (a)(2) of GM-ADR-DSN.M.625
- paragraph (c)(3) of CS-ADR-DSN.M.630 is already duplicated in GM-ADR-DSN.M.630
- paragraph (l) (6) of CS-ADR-DSN.M.635 is already duplicated in GM-ADR-DSN.M.635
- Figure M-2 and figure M-3 are already in GM respectively as Figure GM-M-2 and Figure GM-M-4.

DGAC proposes to **move these specifications to GM.**

Editorial improvements in CS-ADR-DSN.M.625

* In paragraphs (c) and (d), references are erroneous: they should respectively refer to CS-ADR-DSN.M.630 and CS-ADR-DSN.M.635.

* In CS-ADR-DSN.M.625, the numbering becomes erroneous from (e) crossbar lights (which should be (f)) to (k) (which should be (l)).

Editorial improvements in CS-ADR-DSN.M.630

* First sentence is a duplication of paragraph (c) of CS-ADR-DSN.M.625 without the "where physically practicable". It is essential to avoid any confusion to delete this sentence from CS-ADR-DSN.M.630.

* In paragraph (b)(2) the reference to "as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance" shall be replaced by "in CS-ADR-DSN.S.895" as maintenance objectives are not specified in Part OPS because the serviceability level results from design, manufacturing and maintenance.

* In paragraph (b)(2), the sentence "The barrettes should be at least 4 m in length" should be moved to paragraph (b)(3) in order to be consistent with the wording of ICAO Annex 14 volume1 Standards 5.3.4.15 and 16.

* Paragraph (c) should be consolidated with paragraph (b) for consistency. Thus CS-ADR-DSN.M.630 – (c) (1) and (2) should be renumbered as (b) (7) and (8).

* In paragraph (c) (1) "this Regulation" should be replaced by "(b)(1)(ii) or (b)(2)(ii)" for consistency with CS-ADR-DSN.M.630 – (b) (4) and Annex 14 Recommendation 5.3.4.17.

* In paragraph (c) (2) "this Regulation" should be replaced by (b)(7) (which corresponds to actual paragraph (c)(1) but the aforementioned re-numbering is taken into account).

Editorial improvements in CS-ADR-DSN.M.635

* In paragraph (a) references to Figure M-4, 10.4.7 and Figure M-4-A should respectively be replaced by Figure M-4A, CS-ADR-DSN.S.895 and Figure M-4B.

* In paragraph (h) "specified as maintenance objective" should be replaced by "specified in CS-ADR-DSN.S.895" as the serviceability level results from design, manufacturing and maintenance.

* In paragraph (j) "specified as maintenance objective" should be replaced by "specified in CS-ADR-DSN.S.895."

Book I

CS-ADR-DSN.M.625 – Approach lighting systems, general and applicability

"(a) Non-instrument runway

~~(1)~~ Where physically practicable, a simple approach lighting system as specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-instrument runway where the code number is 3 or 4 and intended

for use at night, except when the runway is used only in conditions of good visibility, and sufficient guidance is provided by other visual aids.

~~(2) A simple approach lighting system can also provide visual guidance by day.~~

(b) Non-precision approach runway

~~(1) Where physically practicable, a simple approach lighting system specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-precision approach runway, except when the runway is used only in conditions of good visibility or sufficient guidance is provided by other visual aids.~~

~~(2) It is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system.~~

(c) Precision approach runway category I

Where physically practicable, a precision approach category I lighting system as specified in CS-ADR-DSN.M.600 **630** should be provided to serve a precision approach runway category I.

(d) Precision approach runway categories II and III

A precision approach category II and III lighting system as specified in CS-ADR-DSN. M.605 **635** should be provided to serve a precision approach runway category II or III.

(e) Simple approach lighting system

[...]

~~(ii) The specifications in this document provide for the basic characteristics for simple approach lighting systems. For certain aspects of these systems, some latitude is permitted, for example, in the spacing between centre line lights and crossbars. The simple approach lighting patterns that have been generally adopted are shown in Figure M-1.~~

~~(iii) The approach lighting configuration is to be provided irrespective of the location of the threshold, i.e. whether the threshold is at the extremity of the runway or displaced from the runway extremity. In both cases, the approach lighting system should extend up to the threshold. However, in the case of a displaced threshold, inset lights are used from the runway extremity up to the threshold to obtain the specified configuration. These inset lights are designed to satisfy the structural requirements specified in this Regulation and the chromaticity and characteristics specified in CS-ADR-DSN.U.930 and CS-ADR-DSN. U.940.~~

~~(e) (f) Crossbar lights:~~

~~[...]"~~

CS-ADR-DSN. M.630 — Precision approach category I lighting system

~~"A precision approach category I lighting system as specified in this Regulation should be provided to serve a precision approach runway category I.~~

~~[...] (b) Characteristics:~~

~~[...] (2) Where the serviceability level of the approach lights specified as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance in CS-ADR-DSN.S.895 can be demonstrated, each centre line light position should consist of either:~~

~~[...]The barrettes should be at least 4 m in length.~~

~~(3)The barrettes should be at least 4 m in length. When barrettes are composed of lights approximating to point sources, the lights should be uniformly spaced at intervals of not more than 1.5 m.~~

~~[...](e) Characteristics:~~

~~(1) (7) If the centre line consists of barrettes as described in this Regulation paragraphs (b)(1)(ii) or (b)(2)(ii), each barrette [...]~~

~~(2) (8) Each capacitor discharge light as described in this Regulation paragraph (b)(7) should [...]~~

~~(3) The flight path envelopes used in the design of these lights are given in Figure M-3.~~

[...]"

Figure M-2 Precision approach category I lighting systems

Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations

CS-ADR-DSN.M.635 — Precision approach category II and III lighting system

"(a) [...] one at 150 m and one at 300 m from the threshold, all as shown in Figure M-4 Figure M-4A. Where the serviceability level of the approach lights specified as maintenance objectives in 10.4.7 CS-ADR-DSN.S.895 can be demonstrated, the system may have two side rows of lights, extending 240 m from the threshold, and two crossbars, one at 150 m and one at 300 m from the threshold, all as shown in Figure M-4A Figure M-4B.

[...]

(h) The centre line of a precision approach category II and III lighting system for the first 300 m from the threshold should consist of barrettes showing variable white, except that, where the threshold is displaced 300 m or more, the centre line may consist of single light sources showing variable white. Where the serviceability level of the approach lights specified as maintenance objectives in CS-ADR-DSN.S.895 can be demonstrated, the centre line of a precision approach category II and III lighting system for the first 300 m from the threshold may consist of either:

[...]

(j) Where the serviceability level of the approach lights specified as maintenance objectives in CS-ADR-DSN.S.895 can be demonstrated, beyond 300 m from the threshold each centre line light position may consist of either:

[...]

(l) If the centre line beyond 300 m from the threshold consists of barrettes as described in (i)(1) and (j)(1) above, each barrette beyond 300 m should be supplemented by a capacitor discharge light, except where such lighting is considered unnecessary taking into account the characteristics of the system and the nature of the meteorological conditions.

[...]

~~(6) The flight path envelopes used in the design of these lights are given in Figure M-3.~~

[...]"

Book II

Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights

GM-ADR-DSN.M.625 — Approach lighting systems, general and applicability

"(a) Non-instrument runway: a simple approach lighting system can also provide visual guidance by day.

(b) Non-precision approach runway: it is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system

(ac) Types and characteristics

[...]"

GM-ADR-DSN.M.630 — Precision approach category I lighting system

"[...]

(a c) Vertical tolerances:

[...]

(d) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

GM-ADR-DSN.M.635 — Precision approach category II and III lighting system

"[...]"

(h) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

response *Partially accepted*

CS-ADR-DSN.M.630

Agreed: First sentence will be deleted.

Partially Agreed: (b)(2) amended with ICAO text and referenced to CS S.895.

Agreed: Move the 4-metre barette length reference to (b)(3).

Not Agreed: Consolidation of paragraphs (b) and (c).

Partially Agreed: 'This Regulation' will be replaced with the appropriate NPA reference.

comment 2346 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2484 comment by: *AENA - Aeropuertos Españoles y Navegación Aérea*

For precision approach category I runways, paragraph (c) of CS-ADR-DSN.M.625 allows for only one possible layout for its lighting system making reference to CS-ADR-DSN.M.600630.

But it is not always possible to implement the proposed layout and even not always necessary.

In Spain, there are three others precision approach category I lighting systems, as follows:

1. simplified approach lighting system:

- *row of lights on the extended centre line of the runway over a distance of 720m from the runway threshold, longitudinally spaced of 60m, row of one light large;*
- *two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;*

2. simplified approach lighting system:

- *row of lights on the extended centre line of the runway over a distance of 420m from the runway threshold, longitudinally spaced of 60m, row of one light large;*
- *two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;*

3. no approach lighting system:

Given these arguments, it is not appropriate to provide only one layout for precision approach category I lighting system in this CS.

2. Justification and proposed text / comment

The following specifications are not binding in Spain, are only in notes or in a attachment to ICAO Annex 14 Volume1 and are written as a guidance materials since there are just possibilities (e.g. use of "can" and "advisable"):

Paragraphs (a)(2) and (b)(2) of CS-ADR-DSN.M.625 (ICAO notes)

Paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 (ICAO Attachments)

Paragraph (c)(3) of CS-ADR-DSN.M.630 (ICAO Attachments)

paragraph (l) (6) of CS-ADR-DSN.M.635 (ICAO notes)

Figure M-2, which is not referenced in the CS (ICAO Attachments)

Figure M-3, which is just an explanation on how the lights characteristics have been determined in ICAO Annex 14 transcribed in chapter U of the CS (ICAO Attachments).

As confirmed by IACO, appendixes of an Annex have the same status as the corresponding provisions of the Annex, whereas attachments are only guidance materials.

Besides:

- paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 are respectively duplicated in paragraphs (a)(1) and (a)(2) of GM-ADR-DSN.M.625

- paragraph (c)(3) of CS-ADR-DSN.M.630 is already duplicated in GM-ADR-DSN.M.630

- paragraph (l) (6) of CS-ADR-DSN.M.635 is already duplicated in GM-ADR-DSN.M.635

- Figure M-2 and figure M-3 are already in GM respectively as Figure GM-M-2 and Figure GM-M-4.

It is proposes to **move these specifications to GM.**

~~"A precision approach category I lighting system as specified in this Regulation should be provided to serve a precision approach runway category I.~~

~~[...] (b) Characteristics:~~

~~[...] (2) Where the serviceability level of the approach lights specified as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance in CS-ADR-DSN.S.895 can be demonstrated, each centre line light position should consist of either:~~

~~[...]The barrettes should be at least 4 m in length.~~

~~(3)The barrettes should be at least 4 m in length. When barrettes are composed of lights approximating to point sources, the lights should be uniformly spaced at intervals of not more than 1.5 m.~~

~~[...](c) Characteristics:~~

~~(1) (7) If the centre line consists of barrettes as described in this Regulation paragraphs (b)(1)(ii) or (b)(2)(ii), each barrette [...]~~

~~(2) (8) Each capacitor discharge light as described in this Regulation paragraph (b)(7) should [...]~~

~~(3) The flight path envelopes used in the design of these lights are given in Figure M-3.~~

~~[...]"~~

Figure M-2 Precision approach category I lighting systems

Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations

response	<i>Not accepted</i>	
	ELOS is available for alternative configurations.	
comment	3000	comment by: IFATCA
	<p>CS-ADR-DSN.M.630 – Precision approach category I lighting system ADD MOVE to GM</p> <p>A precision approach category I lighting system as specified in this Regulation should be provided to serve a precision approach runway category I.</p> <p><i>IFATCA proposes that this should be the same as with markings, it should be globally harmonized. Therefore IFATCA would like to have uniform specifications and characteristics mandated (and not GM) to ensure harmonization. We would welcome also a pilot point of view would be welcome here.</i></p>	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations

p. 86

comment	1822	comment by: Geneva International Airport (ROMIG)
	<p>Move figure M-3 to GM. This figure is presented in an Attachement of ICAO Annex 14 and is too detailed to be in a CS.</p>	
response	<i>Not accepted</i>	
	Retaining Figure M-3 in the CS is considered appropriate for design specification purposes.	
comment	2346 ❖	comment by: HIA - Highlands and Islands Airports Limited
	Noted	
response	<i>Noted</i>	
comment	2376	comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

	suggest Moving figure M-3 to GM.
response	<i>Noted</i>
	Retaining Figure M-3 in the CS is considered appropriate for design specification purposes.

CS-ADR – Book 1 – CS-ADR-DSN.M.635 – Precision approach category II and III lighting system	p. 87-88
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comment	1044	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	Precision Approach Runway CAT II/III lighting systems are dealt with in a separate requirement. SALS, non precision runway ALS missing resp. structured differently.	
response	<i>Noted</i>	

comment	1710	comment by: <i>UK CAA</i>
	Page No: 87	
	Paragraph No: CS.ADR.DSN.M.635 (f)	
	Comment: Wording permits crossbars all to be the same width so that the outer ends lie on two parallel lines.	
	Justification: The UK designed Calvert coded centreline system specifies a decrease in cross bar width to form lines converging at the centreline 300m from the threshold.	
	Proposed Text: delete "...either are parallel to the centreline or..."	
response	<i>Not accepted</i>	
	The CS text is derived from Annex 14 specifications in paragraphs 5.3.4.26 to 5.3.4.28. ICAO wording permits the UK Calvert system: <i>5.3.4.28 Where the additional crossbars described in 5.3.4.27 are incorporated in the system, the outer ends of these crossbars shall lie on two straight lines that either are parallel to the centre line or converge to meet the runway centre line 300 m from the threshold.</i>	

comment	1771 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<u>1. Affected paragraphs</u>	

- CS-ADR - Book 1 - CS-ADR-DSN. M.625 — Approach lighting systems, general and applicability (p80-82)
- CS-ADR - Book 1 - CS-ADR-DSN. M.630 — Precision approach category I lighting system (p84-85)
- CS-ADR - Book 1 - Figure M-2 Precision approach category I lighting systems (p85)
- CS-ADR - Book 1 - Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations (p86)
- CS-ADR - Book 1 - CS-ADR-DSN.M.635 — Precision approach category II and III lighting system (p87-88)
- CS-ADR - Book 2 - GM-ADR-DSN.M.625 — Approach lighting systems, general and applicability (p256-257)
- CS-ADR - Book 2 - Figure GM-M-2 Precision approach category I lighting systems (p262)
- CS-ADR - Book 2 - Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights (p263)
- CS-ADR - Book 2 - GM-ADR-DSN.M.630 — Precision approach category I lighting system (p265-267)

2. General comment

For precision approach category I runways, paragraph (c) of CS-ADR-DSN. M.625 allows for only one possible layout for its lighting system making reference to CS-ADR-DSN.M.600630.

But it is not always possible to implement the proposed layout and even not always necessary.

In France, there are three others precision approach category I lighting systems, as follows:

1. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 720m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
2. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 420m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
3. no approach lighting system:

Given these arguments, it is not appropriate to provide only one layout for precision approach category I lighting system in this CS.

2. Justification and proposed text / comment

This comment is critical.

This comment is linked to DGAC's comment on ICAO notes and attachments that shall be in GM rather than in CS.

The following specifications are not binding in France, are only in notes or in a attachment to ICAO Annex 14 Volume1 and are written as a guidance materials since there are just possibilities (e.g. use of "can" and "advisable"):

- Paragraphs (a)(2) and (b)(2) of CS-ADR-DSN.M.625 (ICAO notes)
- Paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 (ICAO Attachments)
- Paragraph (c)(3) of CS-ADR-DSN.M.630 (ICAO Attachments)
- paragraph (l) (6) of CS-ADR-DSN.M.635 (ICAO notes)
- Figure M-2, which is not referenced in the CS (ICAO Attachments)
- Figure M-3, which is just an explanation on how the lights characteristics have been determined in ICAO Annex 14 transcribed in chapter U of the CS (ICAO Attachments).

As confirmed by IACO, appendixes of an Annex have the same status as the corresponding provisions of the Annex, whereas attachments are only guidance materials.

Besides:

- paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 are respectively duplicated in paragraphs (a)(1) and (a)(2) of GM-ADR-DSN.M.625
- paragraph (c)(3) of CS-ADR-DSN.M.630 is already duplicated in GM-ADR-DSN.M.630
- paragraph (l) (6) of CS-ADR-DSN.M.635 is already duplicated in GM-ADR-DSN.M.635
- Figure M-2 and figure M-3 are already in GM respectively as Figure GM-M-2 and Figure GM-M-4.

DGAC proposes to **move these specifications to GM.**

Editorial improvements in CS-ADR-DSN.M.625

* In paragraphs (c) and (d), references are erroneous: they should respectively refer to CS-ADR-DSN.M.630 and CS-ADR-DSN.M.635.

* In CS-ADR-DSN.M.625, the numbering becomes erroneous from (e) crossbar lights (which should be (f)) to (k) (which should be (l)).

Editorial improvements in CS-ADR-DSN.M.630

* First sentence is a duplication of paragraph (c) of CS-ADR-DSN.M.625 without the "*where physically practicable*". It is essential to avoid any confusion to delete this sentence from CS-ADR-DSN.M.630.

* In paragraph (b)(2) the reference to "*as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance*" shall be replaced by "*in CS-ADR-DSN.S.895*" as maintenance objectives are not specified in Part OPS because the serviceability level results from design, manufacturing and maintenance.

* In paragraph (b)(2), the sentence "*The barrettes should be at least 4 m in length*" should be moved to paragraph (b)(3) in order to be consistent with the wording of ICAO Annex 14 volume1 Standards 5.3.4.15 and 16.

* Paragraph (c) should be consolidated with paragraph (b) for consistency. Thus CS-ADR-DSN.M.630 – (c) (1) and (2) should be renumbered as (b) (7) and (8).

* In paragraph (c) (1) "*this Regulation*" should be replaced by "*(b)(1)(ii) or (b)(2)(ii)*" for consistency with CS-ADR-DSN.M.630 – (b) (4) and Annex 14 Recommendation 5.3.4.17.

* In paragraph (c) (2) "*this Regulation*" should be replaced by **(b)(7)** (which corresponds to actual paragraph (c)(1) but the aforementioned re-numbering is taken into account).

Editorial improvements in CS-ADR-DSN.M.635

* In paragraph (a) references to Figure M-4, 10.4.7 and Figure M-4-A should respectively be replaced by Figure M-4A, CS-ADR-DSN.S.895 and Figure M-4B.

* In paragraph (h) "specified as maintenance objective" should be replaced by "specified in CS-ADR-DSN.S.895" as the serviceability level results from design, manufacturing and maintenance.

* In paragraph (j) "specified as maintenance objective" should be replaced by "specified in CS-ADR-DSN.S.895."

Book I**CS-ADR-DSN.M.625 – Approach lighting systems, general and applicability**

"(a) Non-instrument runway

~~(1) Where physically practicable, a simple approach lighting system as specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-instrument runway where the code number is 3 or 4 and intended for use at night, except when the runway is used only in conditions of good visibility, and sufficient guidance is provided by other visual aids.~~

~~(2) A simple approach lighting system can also provide visual guidance by day.~~

(b) Non-precision approach runway

~~(1) Where physically practicable, a simple approach lighting system specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-precision approach runway, except when the runway is used only in conditions of good visibility or sufficient guidance is provided by other visual aids.~~

~~(2) It is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system.~~

(c) Precision approach runway category I

Where physically practicable, a precision approach category I lighting system as specified in CS-ADR-DSN.M.600 **630** should be provided to serve a precision approach runway category I.

(d) Precision approach runway categories II and III

A precision approach category II and III lighting system as specified in CS-ADR-DSN. M.605 **635** should be provided to serve a precision approach runway category II or III.

(e) Simple approach lighting system

[...]

~~(ii) The specifications in this document provide for the basic characteristics for simple approach lighting systems. For certain aspects of these systems, some latitude is permitted, for example, in the spacing between centre line lights and crossbars. The simple approach lighting patterns that have been generally adopted are shown in Figure M-1.~~

~~(iii) The approach lighting configuration is to be provided irrespective of the location of the threshold, i.e. whether the threshold is at the extremity of the runway or displaced from the runway extremity. In both cases, the approach lighting system should extend up to the threshold. However, in the case of a displaced threshold, inset lights are used from the runway extremity up to the threshold to obtain the specified configuration. These inset lights are designed to satisfy the structural requirements specified in this Regulation and the chromaticity and characteristics specified in CS-ADR-DSN.U.930 and CS-ADR-DSN. U.940.~~

(e) **(f)** Crossbar lights:

[...]"

CS-ADR-DSN. M.630 – Precision approach category I lighting system

~~"A precision approach category I lighting system as specified in this Regulation should be provided to serve a precision approach runway category I.~~

~~[...] (b) Characteristics:~~

~~[...] (2) Where the serviceability level of the approach lights specified as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance in CS-ADR-DSN.S.895 can be demonstrated, each centre line light position should consist of either:~~

~~[...] The barrettes should be at least 4 m in length.~~

~~(3) The barrettes should be at least 4 m in length. When barrettes are composed of lights approximating to point sources, the lights should be uniformly spaced at intervals of not more than 1.5 m.~~

~~[...] (c) Characteristics:~~

~~(1) (7) If the centre line consists of barrettes as described in this Regulation paragraphs (b)(1)(ii) or (b)(2)(ii), each barrette [...]~~

~~(2) (8) Each capacitor discharge light as described in this Regulation paragraph (b)(7) should [...]~~

~~(3) The flight path envelopes used in the design of these lights are given in Figure M-3.~~

~~[...]"~~

~~**Figure M-2 Precision approach category I lighting systems**~~

~~**Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations**~~

CS-ADR-DSN.M.635 – Precision approach category II and III lighting system

"(a) [...] one at 150 m and one at 300 m from the threshold, all as shown in Figure M-4 ~~Figure M-4A~~. Where the serviceability level of the approach lights specified as maintenance objectives in ~~10.4.7~~ CS-ADR-DSN.S.895 can be demonstrated, the system may have two side rows of lights, extending 240 m from the threshold, and two crossbars, one at 150 m and one at 300 m from the threshold, all as shown in ~~Figure M-4A~~ ~~Figure M-4B~~.

[...]

(h) The centre line of a precision approach category II and III lighting system for the first 300 m from the threshold should consist of barrettes showing variable white, except that, where the threshold is displaced 300 m or more, the centre line may consist of single light sources showing variable white. Where the serviceability level of the approach lights specified as maintenance objectives in CS-ADR-DSN.S.895 can be demonstrated, the centre line of a precision approach category II and III lighting system for the first 300 m from the threshold may consist of either:

[...]

(j) Where the serviceability level of the approach lights specified as maintenance objectives in CS-ADR-DSN.S.895 can be demonstrated, beyond 300 m from the threshold each centre line light position may consist of either:

[...]

(l) If the centre line beyond 300 m from the threshold consists of barrettes as described in (i)(1) and (j)(1) above, each barrette beyond 300 m should be supplemented by a capacitor discharge light, except where such lighting is considered unnecessary taking into account the characteristics of the system and the nature of the meteorological conditions.

[...]

~~(6) The flight path envelopes used in the design of these lights are given in Figure M-3.~~

~~[...]"~~

Book II

Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights
GM-ADR-DSN.M.625 – Approach lighting systems, general and applicability

"(a) Non-instrument runway: a simple approach lighting system can also provide visual guidance by day.

(b) Non-precision approach runway: it is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system

(ac) Types and characteristics

[...]"

GM-ADR-DSN.M.630 – Precision approach category I lighting system

"[...]

(a c) Vertical tolerances:

[...]

(d) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

GM-ADR-DSN.M.635 – Precision approach category II and III lighting system

"[...]

(h) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

response Accepted

comment 1861 comment by: ENAC Ente Nazionale per l'Aviazione Civile

We propose to correct the name of the figures as following:
 pag. 89 it's figure M-4
 page 90 it's figure M-4A

response Partially Accepted

The renumbering of the figures in the Chapter M will be done

comment 2346 ❖ comment by: HIA - Highlands and Islands Airports Limited

Noted

response Noted

comment 2485 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

For precision approach category I runways, paragraph (c) of CS-ADR-DSN. M.625 allows for only one possible layout for its lighting system making

reference to CS-ADR-DSN.M.600630.

But it is not always possible to implement the proposed layout and even not always necessary.

In Spain, there are three others precision approach category I lighting systems, as follows:

1. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 720m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
2. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 420m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
3. no approach lighting system:

Given these arguments, it is not appropriate to provide only one layout for precision approach category I lighting system in this CS.

2. Justification and proposed text / comment

The following specifications are not binding in Spain, are only in notes or in a attachment to ICAO Annex 14 Volume1 and are written as a guidance materials since there are just possibilities (e.g. use of "can" and "advisable"):

Paragraphs (a)(2) and (b)(2) of CS-ADR-DSN.M.625 (ICAO notes)

Paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 (ICAO Attachments)

Paragraph (c)(3) of CS-ADR-DSN.M.630 (ICAO Attachments)

paragraph (l) (6) of CS-ADR-DSN.M.635 (ICAO notes)

Figure M-2, which is not referenced in the CS (ICAO Attachments)

Figure M-3, which is just an explanation on how the lights characteristics have been determined in ICAO Annex 14 transcribed in chapter U of the CS (ICAO Attachments).

As confirmed by IACO, appendixes of an Annex have the same status as the corresponding provisions of the Annex, whereas attachments are only guidance materials.

Besides:

- paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 are respectively duplicated in paragraphs (a)(1) and (a)(2) of GM-ADR-DSN.M.625
- paragraph (c)(3) of CS-ADR-DSN.M.630 is already duplicated in GM-ADR-DSN.M.630
- paragraph (l) (6) of CS-ADR-DSN.M.635 is already duplicated in GM-ADR-DSN.M.635
- Figure M-2 and figure M-3 are already in GM respectively as Figure GM-M-2 and Figure GM-M-4.

It is proposes to **move these specifications to GM.**

"(a) [...]one at 150 m and one at 300 m from the threshold, all as shown in ~~Figure M-4~~ Figure M-4A. Where the serviceability level of the approach lights specified as maintenance objectives in ~~10.4.7~~ CS-ADR-DSN.S.895 can be demonstrated, the system may have two side rows of lights, extending 240 m

from the threshold, and two crossbars, one at 150 m and one at 300 m from the threshold, all as shown in ~~Figure M-4A~~ Figure M-4B.

[...]

(h) The centre line of a precision approach category II and III lighting system for the first 300 m from the threshold should consist of barrettes showing variable white, except that, where the threshold is displaced 300 m or more, the centre line may consist of single light sources showing variable white. Where the serviceability level of the approach lights specified as ~~maintenance objectives~~ in CS-ADR-DSN.S.895 can be demonstrated, the centre line of a precision approach category II and III lighting system for the first 300 m from the threshold may consist of either:

[...]

response *Not accepted*

ELOS is available for alternative configurations.

comment

2690

comment by: *Airport Nuremberg - NUE/EDDN*

(a) still contains a reference to an ICAO chapter (10.4.7) and should therefore be replaced with the according EASA specification.

response

Accepted

Amended with NPA reference (CS S.895).

CS-ADR – Book 1 – Figure M-4A Inner 300 m approach and runway lighting for precision approach runways, categories II and III

p. 89

comment

2346 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response

Noted

CS-ADR – Book 1 – Figure M-4B Inner 300 m approach and runway lighting for precision approach runways, categories II and III, where the serviceability levels of the lights specified as maintenance objectives can be demonstrated

p. 91

comment

2346 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

	Noted
response	<i>Noted</i>

CS-ADR – Book 1 – CS-ADR-DSN.M.640 – Visual approach slope indicator systems: general

p. 91

comment	1045	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	Incorrect structure of section 2. PAPI and APAPI are VASIS, which is their generic term. There are other types of VASIS. If EASA does not consider them, then it must be indicated in the NPA.	
response	<i>Accepted</i>	
	Titles will be restructured.	

comment	1454	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN.M.640 — Visual approach slope indicator systems: general (p91) • CS-ADR - Book 2 - GM-ADR-DSN.M.640 — Visual approach slope indicator systems: general (p268-269) 	
	<p><u>2. Justification and proposed text / comment</u></p> <p>* Paragraph (a)(1)</p> <p>The safety issue of the requirement in paragraph (a)(1) is not known and no critical safety issue related to the absence of a visual approach slope indicator system on precision approach have been notified until now. Thus this is not binding in France and there is not systemically a visual approach slope indicator system on French precision approach runways. Implementing such systems on every precision approach runways would generate huge cost without any identified safety value. Moreover, as there is not identified safety issue, it is not possible to make an ELOS. Finally, paragraph (b) of the GM-ADR-DSN.M.640 supports completely that statement as it is written that "5.3.5.1 (b) to (e) of Chapter 5 may be used as a general guide". The ICAO reference should be updated to fit NPA: the corresponding paragraphs in the NPA are in paragraph (a) of CS-ADR-DSN.M.640. This shows well that it is guidance material and not a certification specification.</p> <p><u>It is essential</u> to remove paragraph (a)(1).</p> <p>* Paragraph (e)</p> <p>Paragraph (e) of this CS does not suit to a certification specification. Indeed, for changes and works, studies are systematically performed and mitigation measures undertaken. One of these measures may be to provide for a PAPI,</p>	

but it is not always needed. This specification is really meant to be in guidance material.

Thus the proposed modification:

CS-ADR-DSN.M.640 – Visual approach slope indicator systems: general

"(a) A visual approach slope indicator system should be provided to serve the approach to a runway whether or not the runway is served by other visual approach aids or by non-visual aids, where one or more of the following conditions exist:

~~(1) the runway is used by turbojet or other aeroplanes with similar approach guidance requirements;~~

~~(2) the pilot [...]~~

~~(e) Where a runway threshold is temporarily displaced from the normal position and one or more of the conditions specified in paragraph (a) above exist, a PAPI should be provided except that where the code number is 1 or 2 either an APAPI may be provided."~~

GM-ADR-DSN.M.640 – Visual approach slope indicator systems: general

"[...] (b) With respect to the seriousness of the hazard, the order given in the application specifications for a visual approach slope indicator system, ~~5.3.5.1 (b) to (e) of Chapter 5,~~ in paragraph (a) of CS-ADR-DSN.M.640 may be used as a general guide. These may be summarised as:

[...]

~~(d) Priority should~~ may be given to runways used by turbojet aeroplanes or other aeroplanes with similar approach guidance requirements.

~~(e) Where a runway threshold is temporarily displaced from the normal position and one or more of the conditions specified in paragraph (a) of CS-ADR-DSN.M.640 exist, a PAPI may be provided except that where the code number is 1 or 2 either an APAPI may be provided."~~

response Noted

Not Agreed: (a)(1) is part of an ICAO standard and remains in the CS.

Agreed: GM M.640 will be amended to reflect NPA reference.

Agreed: Paragraph (e) will be deleted as it is an operational consideration.

comment

1711

comment by: UK CAA

Page No: 91

Paragraph No: CS.ADR.DSN.M.640

Comment: The CS would be easier to understand if it included drawings.

Justification: UK CAP 168 Chapter 6 Appendix 6B includes useful drawings which help to explain the certification specification.

Proposed Text: Include text and drawings from UK CAP 168

response Not accepted

The CS focuses only on PAPI/APAPI visual approach slope indicators.

The text is supported by figures derived from Annex 14 and reproduced as Figures M-5, M-6 and M-7. The information in the figures is similar to that presented in CAP 168, Figure 6B.1, and is supported by additional specifications in Tables M-1 and M-2.

comment 1863 comment by: *ENAC Ente Nazionale per l'Aviazione Civile*

We propose to use always, in every phrase, the following definitions:

- 1) instrument approach runway;
- 2) non instrument approach runway;
- 3) precision approach runway;
- 4) non precision approach runway.

Otherwise we propose to introduce a general preface where it will be explained that instrument runway or non precision runway are definitions associated to operative procedures.

response *Not accepted*

The CS is for visual approaches, not instrument approaches.

comment 2346 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2375 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

use VASIS; PAPI and APAPI too specific

response *Partially accepted*

The CS titles have been reconfigured to include 'visual approach slope indicator'. Figure 3 remains in CS.

comment 2561 comment by: *AENA - Aeropuertos Españoles y Navegación Aérea*

* Paragraph (a)(1)

The safety issue of the requirement in paragraph (a)(1) is not known and no critical safety issue related to the absence of a visual approach slope indicator system on precision approach have been notified until now.

Moreover, as there is not identified safety issue, it is not possible to make an ELOS.

Finally, paragraph (b) of the GM-ADR-DSN.M.640 supports completely that statement as it is written that "5.3.5.1 (b) to (e) of Chapter 5 may be used as a

general guide". The ICAO reference should be updated to fit NPA: the corresponding paragraphs in the NPA are in paragraph (a) of CS-ADR-DSN.M.640. This shows well that it is guidance material and not a certification specification.

It is essential to remove paragraph (a)(1).

* Paragraph (e)

Paragraph (e) of this CS does not suit to a certification specification. Indeed, for changes and works, studies are systematically performed and mitigation measures undertaken. One of these measures may be to provide for a PAPI, but it is not always needed. This specification is really meant to be in guidance material.

Thus the proposed modification:

CS-ADR-DSN.M.640 – Visual approach slope indicator systems: general

"(a) A visual approach slope indicator system should be provided to serve the approach to a runway whether or not the runway is served by other visual approach aids or by non-visual aids, where one or more of the following conditions exist:

(1) the runway is used by turbojet or other aeroplanes with similar approach guidance requirements;

(2) the pilot [...]

(e) Where a runway threshold is temporarily displaced from the normal position and one or more of the conditions specified in paragraph (a) above exist, a PAPI should be provided except that where the code number is 1 or 2 either an APAPI may be provided."

response *Noted*

Not Agreed: (a)(1) is part of an ICAO standard and remains in the CS.

Agreed: GM M.640 will be amended to reflect NPA reference.

Agreed: Paragraph (e) will be deleted as it is an operational consideration.

CS-ADR – Book 1 – CS-ADR-DSN.M.645 PAPI and APAPI: general

p. 91-93

comment

1047

comment by: *Federal Office of Civil Aviation FOCA*

Figure M-5 contains ICAO references. Please update Figure in order to adapt it to the EASA structure, otherwise FOCA suggests to remove it.

response

Accepted

Correct NPA references will be added.

comment

1390

comment by: *ECA - European Cockpit Association*

Delete (c)(1) and replace with:

The standard visual approach slope indicator systems should be suitable for

both day and night operation. The contrast between the visual approach slope indicator system light units and the surrounding terrain should ensure that the system is usable in VMC day conditions at a distance of at least 3 nautical miles (5.58 kilometres).

Justification:

The area around the visual approach slope indicator system should be prepared so as to provide distinct contrast with the surrounding terrain when viewed down the normal glide slope.

Reference: IFALPA Annex 14, paragraph 5.3.5.x

response *Not accepted*

This is wording of the ICAO standard and will be retained in the CS.

comment 2346 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2374 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

Figure M-5; remove ICAO references.

response *Accepted*

CS-ADR – Book 1 – Figure M-5 Siting of PAPI and APAPI

p. 94

comment 2346 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2695 comment by: *Airport Nuremberg - NUE/EDDN*

Figure refers to Chapter numbers of ICAO Annex 14 (cross reference to 5.2.5 and Table 5-2) and should be adapted to the according Chapters in the EASA document.

response *Accepted*

The ICAO references have been replaced with EASA references.

CS-ADR – Book 1 – CS-ADR-DSN.M.650 – Approach slope and elevation setting of light units

p. 94-95

comment 2346 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Figure M-6 Light beams and angle of elevation setting of PAPI and APAPI

p. 96

comment 2346 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – CS-ADR-DSN.M.655 – Obstacle protection surface for PAPI and APAPI

p. 96-98

comment 399

comment by: *AIRBUS*

This paragraph could be part of chapter H and J as it introduces a further surface to protect runway from obstacles.

response *Noted*

comment 972

comment by: *Aéroport de Marseille - MRS/LFML*

response *Noted*

No comment has been made.

comment *1048* comment by: *Federal Office of Civil Aviation FOCA*

p. 98: Please update applicability of the note 2 of Table M-2. Note 2 of Table M-2 also applies for the APAPI.

p. 99: ICAO references in Figure M-7, please update.

response *Accepted*

Note 2 will be deleted from the table. Note 1 will be added to the APAPI line to reflect the ICAO table. The correct NPA reference will be inserted in Table M-7.

comment *2212* ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment *2372* comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

Update applicability of the note 2 of Table M-2.

response *Accepted*

comment *2702* comment by: *Airport Nuremberg - NUE/EDDN*

Concerning the obstacle protection surface, following ICAO Standards should be added:

5.3.5.44 Existing objects above an obstacle protection surface shall be removed except when, in the opinion of the appropriate authority, the object is shielded by an existing immovable object, or after aeronautical study it is determined that the object would not adversely affect the safety of operations of aeroplanes.

5.3.5.45 Where an aeronautical study indicates that an existing object extending above an obstacle protection surface could adversely affect the safety of operations of aeroplanes one or more of the following measures shall be taken:

a) suitably raise the approach slope of the system;

	<p>b) reduce the azimuth spread of the system so that the object is outside the confines of the beam; c) displace the axis of the system and its associated obstacle protection surface by no more than 5°; d) suitably displace the threshold; and e) where d) is found to be impracticable, suitably displace the system upwind of the threshold to provide an increase in threshold crossing height equal to the height of the object penetration.</p>
response	<p><i>Noted</i></p> <p>This text relates to operational considerations and will be reviewed for inclusion in the OPS section of the NPA.</p>
comment	<p>2707 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p> <p>It is not clear why following footnotes of the ICAO Annex 14 Table 5-47 have been neglected in the EASA document:</p> <p>a. This length is to be increased to 150 m for a T-VASIS or AT-VASIS. b. This length is to be increased to 15 000 m for a T-VASIS or AT-VASIS.</p>
response	<p><i>Noted</i></p> <p>The CS does not cover T-VASIS or AT-VASIS, only PAPI and APAPI.</p>
comment	<p>2931 comment by: <i>Danish Transport Authority</i></p> <p>The part regarding the aeronautical study when height is reduced regarding the eye to wheel height of aircraft in the approach configuration seems to be missing.</p>
response	<p><i>Accepted</i></p> <p>The relevant ICAO text will be added to the CS. The associated note (d) is already in Table M-1.</p>
comment	<p>2939 comment by: <i>AIRBUS</i></p> <p>(c) ... when the new object or extension is would be shielded ...</p>
response	<p><i>Accepted</i></p>

CS-ADR – Book 1 – Figure M-7 Obstacle protection surface for visual approach slope indicator systems

p. 99

comment	2348	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

comment	2371	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	needs updating, ICAO references in Figure M-7.	
response	<i>Accepted</i>	
	The ICAO references have been replaced with EASA references.	

comment	2719	comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	Figure refers to Chapter numbers of ICAO Annex 14 (cross reference to Section A-A and Table 5-3) and should be adapted to the according Chapters in the EASA document.	
response	<i>Accepted</i>	
	The ICAO references have been replaced with EASA references.	

CS-ADR – Book 1 – CS-ADR-DSN.M.660 – Circling guidance lights

p. 99-100

comment	2025	comment by: <i>Aéroports De Lyon</i>
	A ce jour, nous n'en avons pas.	
	<u>Proposition</u> : a déplacer en GM	
response	<i>Noted</i>	
	These lights are only required to meet certain circumstances.	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	Noted	

CS-ADR – Book 1 – CS-ADR-DSN.M.665 – Runway lead-in lighting systems	p. 100
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comment	552	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #366	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.665	
	Référence: CS-ADR-DSN.M.665 Runway lead-in lighting systems	
	Traduction de courtoisie(c) (2) It is appropriate to transfer this provision to GM. The words « where practicable » show that we have here a good practise and not a normative reference.	
response	Accepted	

comment	758	comment by: <i>ADP : Aeroports de Paris</i>								
	<table border="1"> <tr> <td>Référence: CS-ADR-DSN.M.665</td> <td>Runway lead-in lighting systems</td> </tr> <tr> <td>Proposition/commentaire</td> <td>(c) (2) Il convient de transférer cette disposition en Guidance Materials.</td> </tr> <tr> <td>Justification</td> <td>Le terme "where practicable" indique bien que nous avons affaire ici à une règle de l'art et non à une référence normative.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>(c) (2) It is appropriate to transfer this provision to GM. The words « where practicable » show that we have here a good practise and not a normative reference.</td> </tr> </table>	Référence: CS-ADR-DSN.M.665	Runway lead-in lighting systems	Proposition/commentaire	(c) (2) Il convient de transférer cette disposition en Guidance Materials.	Justification	Le terme "where practicable" indique bien que nous avons affaire ici à une règle de l'art et non à une référence normative.	Traduction de courtoisie	(c) (2) It is appropriate to transfer this provision to GM. The words « where practicable » show that we have here a good practise and not a normative reference.	
Référence: CS-ADR-DSN.M.665	Runway lead-in lighting systems									
Proposition/commentaire	(c) (2) Il convient de transférer cette disposition en Guidance Materials.									
Justification	Le terme "where practicable" indique bien que nous avons affaire ici à une règle de l'art et non à une référence normative.									
Traduction de courtoisie	(c) (2) It is appropriate to transfer this provision to GM. The words « where practicable » show that we have here a good practise and not a normative reference.									
response	Accepted									

comment	1593	comment by: <i>Aéroport de Marseille - MRS/LFML</i>
	(c) (2) It is appropriate to transfer this provision to GM. The words « where practicable » show that we have here a good practise and not a normative reference.	
response	<i>Accepted</i>	

comment	1613	comment by: <i>Euroairport Bâle-Mulhouse</i>
	Attachment #367 Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.665 Référence: CS-ADR-DSN.M.665 Runway lead-in lighting systems Traduction de courtoisie (c) (2) It is appropriate to transfer this provision to GM. The words « where practicable » show that we have here a good practise and not a normative reference.	
response	<i>Accepted</i>	

comment	2007	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	(c) (2) It is appropriate to transfer this provision to GM. The words « where practicable » show that we have here a good practise and not a normative reference.	
response	<i>Accepted</i>	

comment	2056	comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	(c) (2) Il convient de transférer cette disposition en Guidance Materials. Le terme "where practicable" indique bien que nous avons affaire ici à une règle de l'art et non à une référence normative. (c) (2) It is appropriate to transfer this provision to GM.	

The words « where practicable » show that we have here a good practise and not a normative reference.

response *Accepted*

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2726 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#368](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.M.665

Référence: CS-ADR-DSN.M.665
Runway lead-in lighting systems

Traduction de courtoisie

(c) (2) It is appropriate to transfer this provision to GM.

The words « where practicable » show that we have here a good practise and not a normative reference.

response *Accepted*

comment 2904 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.M.665

Obstacle protection surface for PAPI and APAPI

Proposition/commentaire

(c) (2) Il convient de transférer cette disposition en Guidance Materials.

Justification

Le terme "where practicable" indique bien que nous avons affaire ici à une règle de l'art et non à une référence normative.

Traduction de courtoisie

(c) (2) It is appropriate to transfer this provision to GM.

The words « where practicable » show that we

	have here a good practise and not a normative reference.
response	<i>Accepted</i>

CS-ADR – Book 1 – CS-ADR-DSN.M.670 – Runway threshold identification lights	p. 100-101
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comment	553	comment by: <i>Union des Aéroports français - UAF</i>
		Attachment #369
		UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.670
		Référence: CS-ADR-DSN.M.670 Runway threshold identification lights
		Traduction de courtoisie
		(a) It is appropriate to transfer this provision to GM. It is only a good practise and not a normative reference in the ICAO Annex 14.
		(b) It is appropriate to modify in the following way : "Location and positioning where provided:"
		The adding of « where provided » shows that the lights are not mandatory but if they are installed they must be compliant to the provisions of CS-ARD-DSN.M.670.
		(c) (1) It is appropriate to transfer the following provision to GM: "with a flash frequency between 60 and 120 per minute". It is only a good practise and not a normative reference in the ICAO Annex 14.
response		<i>Accepted</i>

comment	759	comment by: <i>ADP : Aeroports de Paris</i>						
		<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">Référence: CS-ADR-DSN.M.670</td> <td>Runway threshold identification lights</td> </tr> <tr> <td>Proposition/commentaire</td> <td>(a) Il convient de transférer cette disposition en Guidance Materials.</td> </tr> <tr> <td></td> <td>(b) Il convient d’apporter la modification suivante: "Location and positioning where provided:"</td> </tr> </table>	Référence: CS-ADR-DSN.M.670	Runway threshold identification lights	Proposition/commentaire	(a) Il convient de transférer cette disposition en Guidance Materials.		(b) Il convient d’apporter la modification suivante: "Location and positioning where provided:"
Référence: CS-ADR-DSN.M.670	Runway threshold identification lights							
Proposition/commentaire	(a) Il convient de transférer cette disposition en Guidance Materials.							
	(b) Il convient d’apporter la modification suivante: "Location and positioning where provided:"							

	(c) (1) Il convient de transférer la disposition suivante en Guidance Materials : "with a flash frequency between 60 and 120 per minute".
Justification	<p>La disposition (a) n'est qu'une règle de l'art et non une référence normative dans l'annexe 14 de l'OACI.</p> <p>Il en est de même pour la fréquence des flashes au point (c) (1).</p> <p>Le rajout de « where provided » indique bien que ces feux ne sont pas obligatoires mais que s'ils sont mis ils doivent être conformes aux dispositions du CS-ARD-DSN.M.670.</p>
Traduction de courtoisie	<p>(a) It is appropriate to transfer this provision to GM. It is only a good practise and not a normative reference in the ICAO Annex 14.</p> <p>(b) It is appropriate to modify in the following way : "Location and positioning where provided:" The adding of « where provided » shows that the lights are not mandatory but if they are installed they must be compliant to the provisions of CS-ARD-DSN.M.670.</p> <p>(c) (1) It is appropriate to transfer the following provision to GM: "with a flash frequency between 60 and 120 per minute". It is only a good practise and not a normative reference in the ICAO Annex 14.</p>
response	<i>Accepted</i>

comment

1594

comment by: *Aéroport de Marseille - MRS/LFML*

(a) It is appropriate to transfer this provision to GM.
It is only a good practise and not a normative reference in the ICAO Annex 14.

(b) It is appropriate to modify in the following way : "Location and positioning **where provided**:"
The adding of « where provided » shows that the lights are not mandatory but if they are installed they must be compliant to the provisions of CS-ARD-DSN.M.670.

(c) (1) It is appropriate to transfer the following provision to GM: "with a flash frequency between 60 and 120 per minute".
It is only a good practise and not a normative reference in the ICAO Annex 14.

response *Accepted*

comment 1614 comment by: Euroairport Bâle-Mulhouse

Attachment [#370](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.670

Référence: CS-ADR-DSN.M.670
Runway threshold identification lights

Traduction de courtoisie

(a) It is appropriate to transfer this provision to GM.

It is only a good practise and not a normative reference in the ICAO Annex 14.

(b) It is appropriate to modify in the following way : "Location and positioning where provided:"

The adding of « where provided » shows that the lights are not mandatory but if they are installed they must be compliant to the provisions of CS-ARD-DSN.M.670.

(c) (1) It is appropriate to transfer the following provision to GM: "with a flash frequency between 60 and 120 per minute".

It is only a good practise and not a normative reference in the ICAO Annex 14.

response *Accepted*

comment 1712 comment by: UK CAA

Page No: 101

Paragraph No: CS.ADR.DSN.M.670(a)(1) and (2)

Comment: This requirement should also apply to non-instrument runways.

Justification: Improved identification of runway threshold for all categories of runway.

Proposed Text: "Runway threshold identification lights should be installed:

(1) at the threshold of a non-precision approach runway when additional threshold conspicuity is necessary or where it is not practicable to provide other approach lighting aids;

(2) at the threshold of a non-instrument runway when additional threshold conspicuity is necessary or where it is not practicable to provide other approach lighting aids; and

	<p>(3) where a runway threshold is permanently displaced from the runway extremity or temporarily displaced from the normal position and additional threshold conspicuity is necessary.”</p>
response	<p><i>Noted</i></p> <p>The wording of the CS has been amended to start with ‘Where provided, Runway threshold identification lights...’ to provide the flexibility to install such lights on all categories of runway. The proposed text in paragraphs (1) (2) and (3) is in GM.</p>

comment	<p>1765 comment by: <i>DGAC Direction Générale de l'aviation civile</i></p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN.M.670 - Runway threshold identification lights (p100-101) <p><u>2. Information comment</u></p> <p>In France, runway threshold identification lights are provided for all precision approach runways and for non precision runways only if the runway threshold is permanently displaced. Indeed, non precision approach runways are used with better meteorological conditions and it has been deemed not necessary to provide for such expensive lights without any identified safety issue on that point.</p> <p><u>3. Justification and proposed text / comment</u></p> <p>In order to clarify the fact that the lights are not mandatory, but, if provided they have to be conformed to provisions of the CS, it is proposed to add “where provided” in paragraph (b).</p> <p>CS-ADR-DSN.M.670 - Runway threshold identification lights “[...]<i>(b) Location and positioning, where provided:</i> <i>Runway threshold identification lights should be located symmetrically about the runway centre line, in line with the threshold and approximately 10 m outside each line of runway edge lights.</i> [...]”</p>
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response	<p><i>Partially accepted</i></p> <p>Paragraphs (a) and (c)(1) are moved to GM. ‘Where provided’ is added to paragraph (b).</p>
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comment	<p>1865 comment by: <i>ENAC Ente Nazionale per l'Aviazione Civile</i></p> <p>(a) We propose to remove/delete the following part of the paragraph a): except on a non-instrument or non-precision approach runway where the threshold is displaced and wing bar lights are provided.</p>
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response	<p><i>Partially accepted</i></p>
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Paragraphs (a) and (c)(1) are moved to GM. 'Where provided' is added to paragraph (b).

comment	<p>1929 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #371</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.670</p> <p>Référence: CS-ADR-DSN.M.670 Runway threshold identification lights</p> <p>Traduction de courtoisie (a) It is appropriate to transfer this provision to GM. It is only a good practise and not a normative reference in the ICAO Annex 14. (b) It is appropriate to modify in the following way : "Location and positioning where provided:" The adding of « where provided » shows that the lights are not mandatory but if they are installed they must be compliant to the provisions of CS-ARD-DSN.M.670. (c) (1) It is appropriate to transfer the following provision to GM: "with a flash frequency between 60 and 120 per minute". It is only a good practise and not a normative reference in the ICAO Annex 14.</p>
response	<p><i>Accepted</i></p>

comment	<p>2006 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i></p> <p>(a) It is appropriate to transfer this provision to GM. It is only a good practise and not a normative reference in the ICAO Annex 14.</p> <p>(b) It is appropriate to modify in the following way : "Location and positioning where provided:" The adding of « where provided » shows that the lights are not mandatory but if they are installed they must be compliant to the provisions of CS-ARD-DSN.M.670.</p> <p>(c) (1) It is appropriate to transfer the following provision to GM: "with a flash frequency between 60 and 120 per minute". It is only a good practise and not a normative reference in the ICAO Annex 14.</p>
response	<p><i>Accepted</i></p>

comment	<p>2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
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response *Noted*

comment 2727 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#372](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.M.670

Référence: CS-ADR-DSN.M.670
Runway threshold identification lights

Traduction de courtoisie

(a) It is appropriate to transfer this provision to GM.

It is only a good practise and not a normative reference in the ICAO Annex 14.

(b) It is appropriate to modify in the following way : "Location and positioning where provided:"

The adding of « where provided » shows that the lights are not mandatory but if they are installed they must be compliant to the provisions of CS-ARD-DSN.M.670.

(c) (1) It is appropriate to transfer the following provision to GM: "with a flash frequency between 60 and 120 per minute".

It is only a good practise and not a normative reference in the ICAO Annex 14.

response *Accepted*

comment 2905 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.M.670

Runway threshold identification lights

Proposition/commentaire

(a) Il convient de transférer cette disposition en Guidance Materials.

(b) Il convient d'apporter la modification suivante: "Location and positioning where provided:"

(c) (1) Il convient de transférer la disposition suivante en Guidance Materials : "with a flash frequency between 60 and 120 per minute".

Justification

La disposition (a) n'est qu'une règle de l'art et non une référence normative dans l'annexe 14 de l'OACI.

Il en est de même pour la fréquence des flashes au point (c) (1).

Le rajout de « where provided » indique bien que ces feux ne sont pas obligatoires mais que

	s'ils sont mis ils doivent être conformes aux dispositions du CS-ARD-DSN.M.670.
Traduction de courtoisie	<p>(a) It is appropriate to transfer this provision to GM. It is only a good practise and not a normative reference in the ICAO Annex 14.</p> <p>(b) It is appropriate to modify in the following way : "Location and positioning where provided:" The adding of « where provided » shows that the lights are not mandatory but if they are installed they must be compliant to the provisions of CS-ARD-DSN.M.670.</p> <p>(c) (1) It is appropriate to transfer the following provision to GM: "with a flash frequency between 60 and 120 per minute". It is only a good practise and not a normative reference in the ICAO Annex 14.</p>
response	<i>Accepted</i>

comment 1392

comment by: ECA - European Cockpit Association

Amend (b)(4) as follows:

(4) The lights should be uniformly spaced in rows at intervals of not more than 60 m ~~for an instrument runway, and at intervals of not more than 100 m for a non instrument runway~~. The lights on opposite sides of the runway axis should be on lines at right angles to that axis. ~~At intersections of runways, lights may be spaced irregularly or omitted, provided that adequate guidance remains available to the pilot. Where a runway is intersected by other runways or taxiways, a semi-flush light should be installed to maintain the uniform spacing for runway edge lights.~~

Justification:

The spacing of runway edge lights should be standardised at 60m irrespective of whether they are instrument or non-instrument runways.

ECA further believes that runway edge lights are one of the references pilots have for taxiing guidance and this is supported by the NTSB which, in its analysis of the Detroit accident on 3 December 1990, stated "that the absence of runway edge lights on the runway/taxiway intersection probably contributed

to the flight crews actions". If the lights had been embedded in the pavement at intervals of 200 ft, the pilots would probably have noticed them before the runway incursion and stopped taxiing.

Reference: IFALPA Annex 14, paragraph 5.3.9.6

response *Not accepted*

Wording is mostly from the ICAO standards.

comment 1393 comment by: ECA - European Cockpit Association

Add as follows:

(e) Runway edge lights on a precision approach runway should be in accordance with the specifications in CS-ADR-DSN.U.940 Aeronautical ground light characteristics. **Runway edge lights on a non-precision approach runway should be in accordance with the Category 1 specifications in CS-ADR-DSN.U.940 Aeronautical ground light characteristics.**

Justification:

Reference: IFALPA Annex 14, paragraph 5.3.9.10

response *Not accepted*

Wording is mostly from the ICAO standards.

comment 1394 comment by: ECA - European Cockpit Association

Add new paragraph (f):

(f) The lights should be raised to a height not greater than 10 inches above the surface of the runway.

Justification:

Reference: IFALPA Annex 14, paragraph 5.3.9.x

response *Not accepted*

comment 1713 comment by: UK CAA

Page No: 101

Paragraph No: CS.ADR.DSN.M.675(b)(2)

Comment: There should not be a tolerance of 3m (which allows runway edge lights to be placed up to 3m from the edge of the runway. The lights should be located along the edges of the area declared for use as the runway.

off. The runway lighting had a non-standard layout. In darkness, the crew was unaware that they had lined up with the runway edge lights instead of the centre ones. Take-off roll begun and the aircraft struck 20 runway lights on take-off resulting in significant damage to the landing."

response *Not accepted*

Wording is mostly from the ICAO standards.

CS-ADR – Book 1 – CS-ADR-DSN.M.680 – Runway threshold and wing bar lights

p. 102-103

comment

1395

comment by: ECA - European Cockpit Association

Add under (e)(2) as follows:

(2) Runway threshold lights on a precision approach runway should be in accordance with the specifications in CS-ADR-DSN.U.940 Aeronautical ground light characteristics. **Runway threshold lights on a non-precision approach runway should be in accordance with the Category 1 specifications in CS-ADR-DSN.U.940 Aeronautical ground light characteristics.**

Justification:

Reference: IFALPA Annex 14, paragraph 5.3.10.10

response

Not accepted

The wording is from the ICAO standards.

comment

1397

comment by: ECA - European Cockpit Association

Add under (e)(3) as follows:

(3) Threshold wing bar lights on a precision approach runway should be in accordance with the specifications in CS-ADR-DSN.U.940 Aeronautical ground light characteristics. **Threshold wing bar lights on a non-precision approach runway should be in accordance with the Category 1 specifications in CS-ADR-DSN.U.940 Aeronautical ground light characteristics.**

Justification:

Reference: IFALPA Annex 14, paragraph 5.3.10.11

response

Not accepted

The wording is from the ICAO standards.

comment	1715	comment by: UK CAA
	<p>Page No: 102</p> <p>Paragraph No: CS.ADR.DSN.M680 (b) (1)</p> <p>Comment: UK does not permit 3m tolerance.</p> <p>Justification: At night or in low visibility, crews might think there was more pavement available for turning than there actually is.</p> <p>Proposed Text: Delete "...and in any case, not more than 3m outside the extremity."</p>	
response	<p><i>Not accepted</i></p> <p>The text in the CS is taken verbatim from Annex 14. Where there are differences, the ELOS or DAAD should be used.</p>	

comment	1866	comment by: ENAC Ente Nazionale per l'Aviazione Civile
	<p>We propose to remove/delete the following part of the phrase at paragraph C (2): and runway threshold lights are required, but not provided.</p>	
response	<p><i>Not accepted</i></p> <p>The wording is from the ICAO standards.</p>	

comment	2348 ❖	comment by: HIA - Highlands and Islands Airports Limited
	<p>Noted</p>	
response	<p><i>Noted</i></p>	

comment	314	comment by: Icelandic Civil Aviation Administration
	<p>Editorial: The reference in Figure M-8 on page 105 is an ICAO Annex 14 reference. Change the reference to a relevant paragraph in this regulation.</p>	

response *Accepted*

Correct NPA references will be inserted.

comment 1716 comment by: UK CAA

Page No: 103

Paragraph No: CS.ADR.DSN. M.685(b)(i)

Comment: There should not be a tolerance of 3m (which allows runway end lights to be placed up to 3m beyond the end of the runway. The lights should be located along the end of the area declared for use as the runway.

Justification: Lights should be located at the edge of the area declared for use as this does not promote the use of a non-load bearing or unsuitable surface.

Proposed Text: "Runway end lights should be placed on a line at right angles to the runway axis as near **as possible to the runway end.**"

DELETE " and, in any case, not more than 3 m outside the end."

response *Not accepted*

The text in the CS is taken verbatim from Annex 14.

comment 2348 ❖ comment by: HIA - Highlands and Islands Airports Limited

Noted

response *Noted*

CS-ADR – Book 1 – Figure M-8 Arrangement of runway threshold and runway end lights

p. 105

comment 167 comment by: CAA Norway

Editorial: The reference in Figure M-8 on page 105 is an ICAO Annex 14 reference. Change the reference to a relevant paragraph in this regulation.

response *Partially accepted*

Paragraph (a) will be moved to GM.

comment	662	comment by: <i>Finnish Transport Safety Agency</i>
	Editorial: The reference in Figure M-8 on page 105 is an ICAO Annex 14 reference. Change the reference to a relevant paragraph in this regulation.	
response	<i>Partially accepted</i>	
	Paragraph (a) will be moved to GM.	

comment	1196	comment by: <i>Swedish Transport Agency</i>
	Editorial: The reference in Figure M-8 on page 105 is an ICAO Annex 14 reference. Change the reference to a relevant paragraph in this regulation.	
response	<i>Partially accepted</i>	
	Paragraph (a) will be moved to GM.	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

comment	2964	comment by: <i>Isavia</i>
	The reference in Figure M-8 on page 105 is an ICAO Annex 14 reference. Change the reference to a relevant paragraph in this regulation	
response	<i>Partially accepted</i>	
	Paragraph (a) will be moved to GM.	

CS-ADR – Book 1 – Figure M-9 Example of approach and runway lighting for runway with displaced threshold

p. 106

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	

response *Noted*

CS-ADR – CS-ADR-DSN.M.690 – Runway centre line lights

p. 107

comment 7

comment by: *Manchester Airport plc*

(b) (1), The text states that runway centreline lights should be located 'from the **threshold** to the end'. In cases where there is a displaced threshold this can mean there being no runway centreline lighting between the start of TORA and the threshold when the runway is being used as a departure-only, and no approach lighting is displayed. EGCC RWY 05L is an example, with a threshold displaced by 427m. There are potential dangers here in the form of inadequate guidance to pilots entering a runway in low visibility and not being able to identify the centreline correctly. See also the text at GM-ADR-DSN.B.030 (e) (6) which refers to the possibility of differing RVR values when a threshold is displaced.

(d) the text allows three options for lighting the pre-threshold runway centreline but is vague about how to treat cases where approach lighting is not always displayed. The only suitable solution in these cases is (d) (2), but the text needs to make this clear.

response *Noted*

The text provided is identical to the ICAO. The operational use is the responsibility of aerodrome operators.

comment 68

comment by: *Belfast International Airport - BFS/EGAA*

Clarification required regarding the term "high landing speeds"

response *Noted*

Although the term is commonly used, there is no definition in ICAO or EASA documents indicating what 'high landing speed' is.

comment 69

comment by: *Belfast International Airport - BFS/EGAA*

C Characteristics space between 1 800 m could be confusing.

response *Noted*

This is the text used by ICAO.

comment	90	comment by: CAA-NL
	We suggest to add the spacing of 30 m between runway centre line lights as specified in ICAO Annex 14, 5.3.12.5.	
response	<i>Accepted</i>	
	The relevant text has been added to the CS.	

comment	168	comment by: CAA Norway
	CS-ADR-DSN.M.690 (b)(1) is more demanding than Annex 14 where from the following has been deleted: "Where the serviceability level of the runway center line lights specified as maintenance objectives in 10.4.7 or 10.4.11, as appropriate, can be demonstrated and the runway is intended for use in runway visual range condition of 350 m or greater, the longitudinal spacing may be approximately 30 m." We suggest this to be revisited and either installed here or a rationale published for the deletion. (Also look into the OPS part with regard to preventive maintenance etc.)	
response	<i>Accepted</i>	

comment	169	comment by: CAA Norway
	The reference to the Figure 20 in subparagraph CS-ADR-DSN.M.690 (d)(3) on page 107 is wrong because figure 20 does not exist in this regulation.	
response	<i>Accepted</i>	
	The correct figure (M-9) will be inserted.	

comment	170	comment by: CAA Norway
	What is the definition of "high landing speeds" in CS-ADR-DSN.M.690 (a)(2) on page 107? What is the definition of "very high take-off speed" in CS-ADR-DSN.M.690 (a)(4) on page 107?	
response	<i>Noted</i>	
	ICAO does not define these terms.	

comment	254	comment by: <i>Brussels Airport - BRU/EBBR</i>
	CS-ADR-DSN.M.690(d)(3)	
	Incorrect reference to figure.	
	CS-ADR-DSN.M.690(d)(3) refers to fig. 20. It should refer to fig. M-9.	
response	<i>Accepted</i>	

comment	315	comment by: <i>Icelandic Civil Aviation Administration</i>
	CS-ADR-DSN.M.690 (b)(1) is more demanding than Annex 14 where from the following has been deleted: "Where the serviceability level of the runway center line lights specified as maintenance objectives in 10.4.7 or 10.4.11, as appropriate, can be demonstrated and the runway is intended for use in runway visual range condition of 350 m or greater, the longitudinal spacing may be approximately 30 m."	
	We suggest this to be revisited and either installed here or a rationale published for the deletion. (Also look into the OPS part with regard to preventive maintenance etc.)	
response	<i>Accepted</i>	

comment	316	comment by: <i>Icelandic Civil Aviation Administration</i>
	The reference to the Figure 20 in subparagraph CS-ADR-DSN.M.690 (d)(3) on page 107 is wrong because figure 20 does not exist in this regulation.	
response	<i>Accepted</i>	
	The correct figure (M-9) will be inserted.	

comment	317	comment by: <i>Icelandic Civil Aviation Administration</i>
	What is the definition of "high landing speeds" in CS-ADR-DSN.M.690 (a)(2) on page 107?	
	What is the definition of "very high take-off speed" in CS-ADR-DSN.M.690 (a)(4) on page 107?	
response	<i>Noted</i>	
	ICAO does not define these terms.	

comment	<p>372 comment by: <i>Estonian CAA</i></p>
	<p>CS-ADR-DSN.M.690 (b)(1) is more demanding than Annex 14 where from the following has been deleted: "Where the serviceability level of the runway center line lights specified as maintenance objectives in 10.4.7 or 10.4.11, as appropriate, can be demonstrated and the runway is intended for use in runway visual range condition of 350 m or greater, the longitudinal spacing may be approximately 30 m." We suggest this to be revisited and either installed here or a rationale published for the deletion. (Also look into the OPS part with regard to preventive maintenance etc.)</p>
response	<p><i>Accepted</i></p>
comment	<p>373 comment by: <i>Estonian CAA</i></p>
	<p>The reference to the Figure 20 in subparagraph CS-ADR-DSN.M.690 (d)(3) on page 107 is wrong because figure 20 does not exist in this regulation.</p>
response	<p><i>Accepted</i></p> <p>The correct figure will be inserted.</p>
comment	<p>374 comment by: <i>Estonian CAA</i></p>
	<p>What is the definition of "high landing speeds" in CS-ADR-DSN.M.690 (a)(2) on page 107? What is the definition of "very high take-off speed" in CS-ADR-DSN.M.690 (a)(4) on page 107?</p>
response	<p><i>Noted</i></p> <p>ICAO does not define these terms.</p>
comment	<p>506 comment by: <i>East Midlands Airport - EMA/EGNX</i></p>
	<p>(b) (1), The text states that runway centreline lights should be located 'from the threshold to the end'. In cases where there is a displaced threshold this can mean there being no runway centreline lighting between the start of TORA and the threshold when the runway is being used as a departure-only, and no approach lighting is displayed. EGNX RWY 09 is an example, with a threshold displaced by 210m. There are potential dangers here in the form of inadequate guidance to pilots entering a runway in low visibility and not being able to</p>

identify the centreline correctly. See also the text at GM-ADR-DSN.B.030 (e) (6) which refers to the possibility of differing RVR values when a threshold is displaced.

(d) the text allows three options for lighting the pre-threshold runway centreline but is vague about how to treat cases where approach lighting is not always displayed. The only suitable solution in these cases is (d) (2), but the text needs to make this clear.

response *Noted*

The text provided is identical to the ICAO. The operational use is the responsibility of aerodrome operators.

comment

554

comment by: *Union des Aéroports français - UAF*

Attachment [#373](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.690

Référence: CS-ADR-DSN.M.690
Runway centre line lights

Traduction de courtoisie

(a) (2) It is appropriate to transfer this provision (a) (2) to GM and to modify in the following way : « Runway centre line lights ~~should~~ **could** be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. »

Precision approach runways category I are less demanding than those of category II and III because of their using conditions of the runway and it is not necessary to have runway center line lights for this category. Nevertheless, it is still possible following the rules of CS-ADR-DSN.M.690.

(a) (4) What does the EASA consider as a high take-off speed?

response *Noted*

ICAO does not define these terms.

comment

663

comment by: *Finnish Transport Safety Agency*

CS-ADR-DSN.M.690 (b)(1) is more demanding than Annex 14 where from the following has been deleted: "Where the serviceability level of the runway center line lights specified as maintenance objectives in 10.4.7 or 10.4.11, as appropriate, can be demonstrated and the runway is intended for use in runway visual range condition of 350 m or greater, the longitudinal spacing may be approximately 30 m."

We suggest this to be revisited and either installed here or a rationale published for the deletion. (Also look into the OPS part with regard to preventive maintenance etc.)

response *Accepted*

comment 664 *comment by: Finnish Transport Safety Agency*

The reference to the Figure 20 in subparagraph CS-ADR-DSN.M.690 (d)(3) on page 107 is wrong because figure 20 does not exist in this regulation.

response *Accepted*

The correct figure (M-9) will be inserted.

comment 665 *comment by: Finnish Transport Safety Agency*

What is the definition of "high landing speeds" in CS-ADR-DSN.M.690 (a)(2) on page 107?
What is the definition of "very high take-off speed" in CS-ADR-DSN.M.690 (a)(4) on page 107?

response *Noted*

ICAO does not define these terms.

comment 760 *comment by: ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.M.690	Runway centre line lights
Proposition/commentaire	(a) (2) Il convient de transférer la disposition (a) (2) en Guidance Materials et de modifier de la manière suivante : « Runway centre line lights should could be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. » (a) (4) Que considère l'AESA comme « vitesse élevée »? ("high take-off speed")
Justification	Les pistes avec approche de précision de catégorie I sont moins exigeantes que les pistes avec approche de précision de catégorie II ou III de part les conditions d'utilisation de la piste et il n'est pas nécessaire d'avoir des feux axiaux de piste pour cette catégorie. En revanche cela reste possible et dans les règles fixées par la CS-ADR-DSN.M.690.
Traduction de courtoisie	(a) (2) It is appropriate to transfer this

	<p>provision (a) (2) to GM and to modify in the following way : « Runway centre line lights should could be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. »</p> <p>Precision approach runways category I are less demanding than those of category II and III because of their using conditions of the runway and it is not necessary to have runway center line lights for this category. Nevertheless, it is still possible following the rules of CS-ADR-DSN.M.690.</p> <p>(a) (4) What does the EASA consider as a high take-off speed?</p>
response	<p><i>Noted</i></p> <p>ICAO does not define these terms.</p>
comment	<p>1049 comment by: <i>Federal Office of Civil Aviation FOCA</i></p> <p>CS.ADR.DSN.M.690 (d) (3): A non-existing "Figure 20" is mentioned, please correct.</p>
response	<p><i>Accepted</i></p> <p>The correct figure will be inserted.</p>
comment	<p>1056 comment by: <i>Belgian CAA</i></p> <p>What is the rationale for deleting the second part of Annex 14 §5.3.12.5 relating to serviceability?</p>
response	<p><i>Accepted</i></p> <p>The relevant ICAO text has been added to the CS.</p>

comment	1057	comment by: <i>Belgian CAA</i>
	The 350m in the text are probably linked to the Cat II operations. The minimum RVR value for Cat II operations changed from 350 to 300m. So, 350m should be replaced by 300m.	
response	<i>Not accepted</i>	
	This is the value currently used by ICAO. The Agency monitors potential changes and makes amendments when mature ICAO text is published.	
comment	1109	comment by: <i>Belgian CAA</i>
	The reference to the figure 20 is not correct.	
response	<i>Accepted</i>	
	The correct figure will be inserted.	
comment	1199	comment by: <i>Swedish Transport Agency</i>
	CS-ADR-DSN.M.690 (b)(1) is more demanding than Annex 14 where from the following has been deleted: "Where the serviceability level of the runway center line lights specified as maintenance objectives in 10.4.7 or 10.4.11, as appropriate, can be demonstrated and the runway is intended for use in runway visual range condition of 350 m or greater, the longitudinal spacing may be approximately 30 m." We suggest this to be revisited and either installed here or a rationale published for the deletion. (Also look into the OPS part with regard to preventive maintenance etc.)	
response	<i>Accepted</i>	
comment	1201	comment by: <i>Swedish Transport Agency</i>
	The reference to the Figure 20 in subparagraph CS-ADR-DSN.M.690 (d)(3) on page 107 is wrong because figure 20 does not exist in this regulation.	
response	<i>Accepted</i>	
	The correct figure will be inserted.	
comment	1202	comment by: <i>Swedish Transport Agency</i>

response	<p>What is the definition of "high landing speeds" in CS-ADR-DSN.M.690 (a)(2) on page 107? What is the definition of "very high take-off speed" in CS-ADR-DSN.M.690 (a)(4) on page 107?</p> <p><i>Noted</i></p> <p>ICAO does not define these terms.</p>
comment	<p>1464 comment by: <i>DGAC Direction Générale de l'aviation civile</i></p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> CS-ADR - Book 1 - CS-ADR-DSN.M.690 - Runway centre line lights (p107) <p><u>2. Justification and proposed text / comment</u></p> <p>Paragraph (a)(2) and (a)(4) of this CS are not binding in France because their relevance for safety is not known and there has been no safety issue until now on this point: indeed, precision approach category I runways are used by better weather conditions than category II or III runways and thus are less demanding. It has been deemed that such lights for these runways are absolutely not necessary.</p> <p>Moreover, for Paragraph (a)(4), it is not clear what means "very high take-off speed".</p> <p>Besides, they are only ICAO recommendation in Annex 14 volume 1.</p> <p>Thus it is proposed to move them to GM:</p> <p>CS-ADR-DSN.M.690 – Runway centre line lights</p> <p><i>"(a) Applicability:</i> [...](2) Runway centre line lights should be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. [...](4) Runway centre line lights should be provided on a runway intended to be used for take-off with an operating minimum of an RVR of the order of 400 m or higher when used by aeroplanes with a very high take-off speed, where the width between the runway edge lights is greater than 50 m. [...]"</p> <p>GM-ADR-DSN.M.690 – Runway centre line lights</p> <p><i>"(1) Runway centre line lights may be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m.</i> <i>(2) Runway centre line lights may be provided on a runway intended to be used for take-off with an operating minimum of an RVR of the order of 400 m or higher when used by aeroplanes with a very high take-off speed, where the width between the runway edge lights is greater than 50 m.</i> <i>(3) Where it is not practicable to locate them along the centre line, the lights may be uniformly offset to the same side of the runway centre line by not more than 60 cm."</i></p> <p><i>Accepted</i></p>
response	

Paragraphs (a)(2) and (a)(4) have been moved to GM.

comment	<p>1595 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>(a) (2) It is appropriate to transfer this provision (a) (2) to GM and to modify in the following way : « Runway centre line lights should could be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. »</p> <p>Precision approach runways category I are less demanding than those of category II and III because of their using conditions of the runway and it is not necessary to have runway center line lights for this category. Nevertheless, it is still possible following the rules of CS-ADR-DSN.M.690.</p> <p>(a) (4) What does the EASA consider as a high take-off speed?</p>
response	<p><i>Noted</i></p> <p>ICAO does not define these terms.</p>

comment	<p>1615 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #374</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.690</p> <p>Référence: CS-ADR-DSN.M.690 Runway centre line lights</p> <p>Traduction de courtoisie</p> <p>(a) (2) It is appropriate to transfer this provision (a) (2) to GM and to modify in the following way : « Runway centre line lights should could be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. »</p> <p>Precision approach runways category I are less demanding than those of category II and III because of their using conditions of the runway and it is not necessary to have runway center line lights for this category. Nevertheless, it is still possible following the rules of CS-ADR-DSN.M.690.</p> <p>(a) (4) What does the EASA consider as a high take-off speed?</p>
response	<p><i>Noted</i></p> <p>ICAO does not define these terms.</p>

comment	<p>1717 comment by: <i>UK CAA</i></p>
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Page No: 107

Paragraph No: CS.ADR.DSN.M690 (b) (1)

Comment: There is some ambiguity with the word "threshold" in the last sentence.

Justification: Where there is a displaced threshold and the runway in front of this is available for takeoff (whether above or below 400m) centreline lighting if provided should commence at the start of the runway as per (Annex 14 5.3.12.6.), therefore the two should cross-refer to each other.

Proposed Text: The lights should be located from the **beginning of a runway available for the manoeuvring of aircraft** to the end at a spacing of approximately 15m.

response *Not accepted*

The text in the CS is taken verbatim from Annex 14. Where a threshold is displaced and the runway before threshold is available for take-off, the specifications in paragraph (d) of the CS (verbatim from Annex 14) apply.

comment

1721

comment by: UK CAA

Page No: 107

Paragraph No: CS.ADR.DSN.M.690 (c) (1) and Figure M-9 (page 106)

Comment: The NPA specifies that Red/White colour coded runway centre line lights are provided 900m from runway end.

Justification: Text is required to identify what to do if the end of the declared distances does not coincide with runway end. UK CAP168, Ch6, Para 5.7.1 provides such guidance.

Proposed Text: Additional sentence: **"Where the end of TORA/LDA does not coincide with the runway end the section of red lights should be extended to the runway."**

response *Not accepted*

The text in the CS is taken verbatim from Annex 14. Where there are differences, the ELOS or DAAD should be used.

comment

1724

comment by: UK CAA

Page No: 107

Paragraph No: CS.ADR.DSN.M690 (c) (2)

Comment: The wording "chromaticity and characteristics" is not needed in

	<p>this case.</p> <p>Justification: The extra words add nothing and impose artificial limitations.</p> <p>Proposed Text: Delete "...chromaticity and characteristics..."</p>
response	<i>Accepted</i>

comment	<p>1725 comment by: UK CAA</p> <p>Page No: 107</p> <p>Paragraph No: CS.ADR.DSN.M690 (d) (2)</p> <p>Comment: (a) (4) refers to takeoffs with an RVR in the order of 400m requiring centreline lights to support CAT II/III operations but a spacing of only 30m is indicated. Furthermore, at (b) (1) 15m spacing is required beyond the threshold. Additional text is required to cover the gap between the start of the runway and a displaced threshold</p> <p>Justification: Low visibility takeoffs from the start of runway where the threshold is displaced using 30m spacing would be non compliant.</p> <p>Proposed Text: (d)(2)(i) runway centreline lights; (d)(2)(ii) Where the threshold of a runway does not coincide with the start of runway available for takeoff, arrangements for the provision of inset centreline lights at 15m spacing should be agreed in advance with the competent authority.</p>
response	<p><i>Not accepted</i></p> <p>The text in the CS is taken verbatim from Annex 14. Where there are differences, the ELOS or DAAD should be used.</p>

comment	<p>1786 comment by: Tarbes-Lourdes-Pyrénées airport</p> <p>Attachment #375</p> <p>NPA 2011-20 (B.III) CS-ADR-DSN.M.690</p> <p>Référence: CS-ADR-DSN.M.690 Runway centre line lights</p> <p>Traduction de courtoisie (a) (2) It is appropriate to transfer this provision (a) (2) to GM and to modify in the following way : « Runway centre line lights should could be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. » Precision approach runways category I are less demanding than those of</p>
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	<p>category II and III because of their using conditions of the runway and it is not necessary to have runway center line lights for this category. Nevertheless, it is still possible following the rules of CS-ADR-DSN.M.690. (a) (4) What does the EASA consider as a high take-off speed?</p>
response	<p><i>Noted</i></p> <p>ICAO does not define these terms.</p>
comment	<p>1930 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #376</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.690</p> <p>Référence: CS-ADR-DSN.M.690 Runway centre line lights</p> <p>Traduction de courtoisie (a) (2) It is appropriate to transfer this provision (a) (2) to GM and to modify in the following way : « Runway centre line lights should could be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. » Precision approach runways category I are less demanding than those of category II and III because of their using conditions of the runway and it is not necessary to have runway center line lights for this category. Nevertheless, it is still possible following the rules of CS-ADR-DSN.M.690. (a) (4) What does the EASA consider as a high take-off speed?</p>
response	<p><i>Noted</i></p> <p>ICAO does not define these terms.</p>
comment	<p>2005 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i></p> <p>(a) (2) It is appropriate to transfer this provision (a) (2) to GM and to modify in the following way : « Runway centre line lights should could be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. » Precision approach runways category I are less demanding than those of category II and III because of their using conditions of the runway and it is not necessary to have runway center line lights for this category. Nevertheless, it is still possible following the rules of CS-ADR-DSN.M.690. (a) (4) What does the EASA consider as a high take-off speed?</p>

response	<p><i>Noted</i></p> <p>ICAO does not define these terms.</p>	
comment	2137	comment by: <i>Aéroport Paris Vatry - XCR/LFOK</i>
	<p>Attachment #377</p> <p>NPA 2011-20 (B.III) CS-ADR-DSN.M.690</p> <p>Référence: CS-ADR-DSN.M.690 Runway centre line lights</p> <p>Traduction de courtoisie (a) (2) It is appropriate to transfer this provision (a) (2) to GM and to modify in the following way : « Runway centre line lights should could be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. » Precision approach runways category I are less demanding than those of category II and III because of their using conditions of the runway and it is not necessary to have runway center line lights for this category. Nevertheless, it is still possible following the rules of CS-ADR-DSN.M.690. (a) (4) What does the EASA consider as a high take-off speed?</p>	
response	<p><i>Noted</i></p> <p>ICAO does not define these terms.</p>	
comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<p><i>Noted</i></p>	
response	<p><i>Noted</i></p>	
comment	2370	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	<p>"Figure 20" is mentioned by does not exist</p>	
response	<p><i>Accepted</i></p> <p>The correct figure will be inserted.</p>	
comment	2564	comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>

Paragraph (a)(2) and (a)(4) of this CS their relevance for safety is not known and there has been no safety issue until now on this point: indeed, precision approach category I runways are used by better weather conditions than category II or III runways and thus are less demanding. It has been deemed that such lights for these runways are absolutely not necessary.

Moreover, for Paragraph (a)(4), it is not clear what means "very high take-off speed".

Besides, they are only ICAO recommendation in Annex 14 volume 1.

Thus it is proposed to move them to GM:

CS-ADR-DSN.M.690 – Runway centre line lights

"(a) Applicability:

~~[...](2) Runway centre line lights should be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m.~~

~~[...](4) Runway centre line lights should be provided on a runway intended to be used for take-off with an operating minimum of an RVR of the order of 400 m or higher when used by aeroplanes with a very high take-off speed, where the width between the runway edge lights is greater than 50 m.~~

[...]"

response *Accepted*

Paragraphs (a)(2) and (a)(4) have been moved to GM.

comment 2602

comment by: *Danish Transport Authority*

CS-ADR-DSN.M.690 (b)(1) is more demanding than Annex 14 where from the following has been deleted: "Where the serviceability level of the runway center line lights specified as maintenance objectives in 10.4.7 or 10.4.11, as appropriate, can be demonstrated and the runway is intended for use in runway visual range condition of 350 m or greater, the longitudinal spacing may be approximately 30 m."

We suggest this to be revisited and either installed here or a rationale published for the deletion. (Also look into the OPS part with regard to preventive maintenance etc.)

response *Accepted*

comment 2603

comment by: *Danish Transport Authority*

EDITORIAL: The reference to the Figure 20 in subparagraph CS-ADR-DSN.M.690 (d)(3) on page 107 is wrong because figure 20 does not exist in this regulation.

response *Accepted*

The correct figure will be inserted.

comment	<p>2604 comment by: <i>Danish Transport Authority</i></p> <p>What is the definition of "high landing speeds" in CS-ADR-DSN.M.690 (a)(2) on page 107? What is the definition of "very high take-off speed" in CS-ADR-DSN.M.690 (a)(4) on page 107?</p>
response	<p><i>Noted</i></p> <p>ICAO does not define these terms.</p>
comment	<p>2627 comment by: <i>Swedavia AB - Swedish airports (currently 11 airports)</i></p> <p>CS-ADR-DSN.M.690 (b)(1) is more demanding than Annex 14 where from the following has been deleted: "Where the serviceability level of the runway center line lights specified as maintenance objectives in 10.4.7 or 10.4.11, as appropriate, can be demonstrated and the runway is intended for use in runway visual range condition of 350 m or greater, the longitudinal spacing may be approximately 30 m." We suggest this to be revised or published for deletion.</p> <p>The reference to the Figure 20 in subparagraph CS-ADR-DSN.M.690 (d)(3) on page 107 is wrong because figure 20 does not exist.</p>
response	<p><i>Accepted</i></p>
comment	<p>2728 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #378</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.M.690</p> <p>Référence: CS-ADR-DSN.M.690 Runway centre line lights</p> <p>Traduction de courtoisie (a) (2) It is appropriate to transfer this provision (a) (2) to GM and to modify in the following way : « Runway centre line lights should could be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. » Precision approach runways category I are less demanding than those of category II and III because of their using conditions of the runway and it is not necessary to have runway center line lights for this category. Nevertheless, it is still possible following the rules of CS-ADR-DSN.M.690. (a) (4) What does the EASA consider as a high take-off speed?</p>

response	<p><i>Noted</i></p> <p>ICAO does not define these terms.</p>
comment	<p>2741 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p> <p>(2) and (d) should be moved to the guidance material since this are recommendations and therefor be left in the decision of the aerodrome operator. Concerning (b) the wording should be adapted to the ICAO Annex 14 and</p> <p>Where the serviceability level of the runway centre line lights specified as maintenance objectives in 10.4.7 or 10.4.11, as appropriate, can be demonstrated and the runway is intended for use in runway visual range conditions of 350 m or greater, the longitudinal spacing may be approximately 30 m.</p> <p>should be added after "spacing approximately 15m".</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (a)(2) has been moved to GM.</p> <p>Paragraph (d) contains design specifications. Therefore, it will remain in the CS.</p> <p>The proposed additional text has been added to the CS.</p>
comment	<p>2896 comment by: <i>SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard</i></p> <p>Attachment #379</p> <p>SEARD NPA 2011-20 (B.III) CS-ADR-DSN.M.690</p> <p>Référence: CS-ADR-DSN.M.690 Runway centre line lights</p> <p>Traduction de courtoisie</p> <p>(a) (2) It is appropriate to transfer this provision (a) (2) to GM and to modify in the following way : « Runway centre line lights should could be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. »</p> <p>Precision approach runways category I are less demanding than those of category II and III because of their using conditions of the runway and it is not necessary to have runway center line lights for this category. Nevertheless, it is still possible following the rules of CS-ADR-DSN.M.690.</p> <p>(a) (4) What does the EASA consider as a high take-off speed?</p>

response *Noted*

ICAO does not define these terms.

comment 2906

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.M.690	Runway centre line lights
Proposition/commentaire	<p>(a) (2) Il convient de transférer la disposition (a) (2) en Guidance Materials et de modifier de la manière suivante : « Runway centre line lights should could be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. »</p> <p>(a) (4) Que considère l'AESA comme « vitesse élevée »? ("high take-off speed")</p>
Justification	<p>Les pistes avec approche de précision de catégorie I sont moins exigeantes que les pistes avec approche de précision de catégorie II ou III de part les conditions d'utilisation de la piste et il n'est pas nécessaire d'avoir des feux axiaux de piste pour cette catégorie. En revanche cela reste possible et dans les règles fixées par la CS-ADR-DSN.M.690.</p>
Traduction de courtoisie	<p>(a) (2) It is appropriate to transfer this provision (a) (2) to GM and to modify in the following way : « Runway centre line lights should could be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. »</p> <p>Precision approach runways category I are less demanding than those of category II and III because of their using conditions of the runway and it is not necessary to have runway center line lights for this category. Nevertheless, it is still possible following the rules of CS-ADR-DSN.M.690.</p> <p>(a) (4) What does the EASA consider as a high take-off speed?</p>

response *Noted*

ICAO does not define these terms.

comment 2965 comment by: *Isavia*

CS-ADR-DSN.M.690 (b)(1) is more demanding than Annex 14 where from the following has been deleted: "Where the serviceability level of the runway center line lights specified as maintenance objectives in 10.4.7 or 10.4.11, as appropriate, can be demonstrated and the runway is intended for use in runway visual range condition of 350 m or greater, the longitudinal spacing may be approximately 30 m."

We suggest this to be revisited and either installed here or a rationale published for the deletion. (Also look into the OPS part with regard to preventive maintenance etc.)

response *Accepted*

comment 2966 comment by: *Isavia*

The reference to the Figure 20 in subparagraph CS-ADR-DSN.M.690 (d)(3) on page 107 is wrong because figure 20 does not exist in this regulation.

response *Accepted*

The correct figure will be inserted.

comment 2967 comment by: *Isavia*

What is the definition of "high landing speeds" in CS-ADR-DSN.M.690 (a)(2) on page 107?

What is the definition of "very high take-off speed" in CS-ADR-DSN.M.690 (a)(4) on page 107?

response *Noted*

ICAO does not define these terms.

comment 3121 comment by: *ATB Aéroport Toulouse-Blagnac - TLS/LFBO*

Attachment [#380](#)

ATB NPA 2011-20 (B.III) CS-ADR-DSN.M.690

Référence: CS-ADR-DSN.M.690
Runway centre line lights

Traduction de courtoisie

(a) (2) It is appropriate to transfer this provision (a) (2) to GM and to modify in the following way : « Runway centre line lights ~~should~~ **could** be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m. »

Precision approach runways category I are less demanding than those of category II and III because of their using conditions of the runway and it is not necessary to have runway center line lights for this category. Nevertheless, it is still possible following the rules of CS-ADR-DSN.M.690.

(a) (4) What does the EASA consider as a high take-off speed?

response *Noted*

ICAO does not define these terms.

CS-ADR – CS-ADR-DSN.M.695 – Runway touchdown zone lights

p. 108

comment

1398

comment by: *ECA - European Cockpit Association*

Amend as follows:

(a) Applicability:

Touchdown zone lights should be provided in the touchdown zone of ~~a precision approach runway category II or III~~ **all instrument runways**.

Justification:

The present ICAO/EASA wording calls for touchdown zone lights for Category II and III operations only, whilst ECA believes that they should be provided for Category I also.

Reference: IFALPA Annex 14, paragraph 5.3.13

response

Not accepted

EASA has used the current ICAO specifications.

comment

2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response

Noted

CS-ADR — Book 1 — CS-ADR-DSN.M.700 — Rapid exit taxiway indicator lights

p. 108-109

comment

1384

comment by: *DGAC Direction Générale de l'aviation civile***1. Affected paragraphs**

- CS-ADR-DSN.M.700-Rapid exit taxiway indicator lights (Book III, page 108-109)
- GM-ADR-DSN.M.710 — Taxiway centre line lights (p270)

2. Justification and proposed text / comment

Annex 14 Volume 1 Recommendation 5.3.14.1, which is transposed in the first sentence of CS-ADR-DSN.M.700, and which specifies under which conditions implementation of Rapid Exit Taxiway Indicator Lights (RETILs) should be considered, duplicates the specification contained in Annex 14 Volume 1 Standard 5.3.16.1 reminded hereafter:

"5.3.16.1 Taxiway centre line lights shall be provided on an exit taxiway, taxiway, de-icing/anti-icing facility and apron intended for use in runway visual range conditions less than a value of 350 m in such a manner as to provide continuous guidance between the runway centre line and aircraft stands, except that these lights need not be provided where the traffic density is light and taxiway edge lights and centre line marking provide adequate guidance."

Need for additional information on the distance to go to the nearest rapid exit taxiway may be considered to increase the efficiency of the runway and aircraft operations where traffic density is heavy as indicated in Annex 14-Volume 1 - Note to 5.3.14, reminded hereafter:

"5.3.14 Rapid exit taxiway indicator lights

Note.— The purpose of rapid exit taxiway indicator lights (RETILs) is to provide pilots with distance-to-go information to the nearest rapid exit taxiway on the runway, to enhance situational awareness in low visibility conditions and enable pilots to apply braking action for more efficient roll-out and runway exit speeds. [...]"

This information may be provided by other means such as on-board moving maps or the Brake-to-Vacate devices used on modern aeroplanes.

Indeed it is not a safety requirement as sufficient guidance for a safe exit is provided by CS-ADR-DSN.M.710 (which transposes Annex 14 Volume 1 - Standard 5.3.16 on Taxiway Centre Line Lights).

Therefore **DGAC proposes to move CS-ADR-DSN.M.700 as complementary guidance in GM-ADR-DSN.M.710 in a new paragraph (c).**

response

Noted

The rapid exit taxiway indicator lights serve a different purpose to taxiway centre line lights. The fact that the RVR parameters are the same is not relevant to the wording of the CS. Since each CS will stand alone, the RETIL CS wording is retained.

comment	<p>1400 comment by: <i>ECA - European Cockpit Association</i></p>
	<p>New CS-ADR-DSN.M.XXX on Runway Status Lights: Runway Status Lights are warning systems and shall require minimal recognition and reaction times from flight crews and shall function in the same way and provide identical displays. These safety critical systems shall be designed to provide consistent, universally recognized displays.</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 5.3.x</p>
response	<p><i>Not accepted</i></p> <p>The term 'runway status lights' is not used by ICAO.</p>
comment	<p>2026 comment by: <i>Aéroports De Lyon</i></p>
	<p>Ce qui était une recommandation (conseillée) devient un CS (obligatoire), pourquoi?</p> <p><u>Proposition</u>: à déplacer en GN</p>
response	<p><i>Not accepted</i></p> <p>These lights are only required to meet certain circumstances. CSs are not obligatory until they are agreed into the CB.</p>
comment	<p>2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p>
	<p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2575 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p>
	<p>Annex 14 Volume 1 Recommendation 5.3.14.1, which is transposed in the first sentence of CS-ADR-DSN.M.700, and which specifies under which conditions implementation of Rapid Exit Taxiway Indicator Lights (RETILs) should be considered, duplicates the specification contained in Annex 14 Volume 1 Standard 5.3.16.1 reminded hereafter: "5.3.16.1 Taxiway centre line lights shall be provided on an exit taxiway, taxiway, de-icing/anti-icing facility and apron intended for use in runway visual range conditions less than a value of 350 m in such a manner as to provide continuous guidance between the runway centre line and aircraft stands, except that these lights need not be provided where the traffic density is light and taxiway edge lights and centre line marking provide adequate guidance." Need for additional information on the distance to go to the nearest rapid exit</p>

taxiway may be considered to increase the efficiency of the runway and aircraft operations where traffic density is heavy as indicated in Annex 14-Volume 1 - Note to 5.3.14, reminded hereafter:

"5.3.14 Rapid exit taxiway indicator lights

Note.— The purpose of rapid exit taxiway indicator lights (RETILs) is to provide pilots with distance-to-go information to the nearest rapid exit taxiway on the runway, to enhance situational awareness in low visibility conditions and enable pilots to apply braking action for more efficient roll-out and runway exit speeds. [...]"

This information may be provided by other means such as on-board moving maps or the Brake-to-Vacate devices used on modern aeroplanes.

Indeed it is not a safety requirement as sufficient guidance for a safe exit is provided by CS-ADR-DSN.M.710 (which transposes Annex 14 Volume 1 - Standard 5.3.16 on Taxiway Centre Line Lights).

Therefore **It is proposed to move CS-ADR-DSN.M.700 as complementary guidance in GM-ADR-DSN.M.710 in a new paragraph (c).**

response *Noted*

The rapid exit taxiway indicator lights serve a different purpose to taxiway centre line lights. The fact that the RVR parameters are the same is not relevant to the wording of the CS. Since each CS will stand alone, the RETIL CS wording is retained.

comment

1727

comment by: *UK CAA*

Page No: 109

Paragraph No: CS.ADR.DSN. M.705(b)

Comment: There should not be a tolerance of 3m (which allows stopway lights to be placed up to 3m beyond the end of the stopway. The lights should be located along the end of the area declared for use as the stopway.

Justification: Lights should be located at the edge of the area declared for use as this does not promote the use of non-load bearing or unsuitable surface.

Proposed Text: DELETE text "... and, in any case, not more than 3 m outside the end."

response

Not accepted

The text in the CS is taken verbatim from Annex 14.

comment

2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

	Noted
response	<i>Noted</i>

CS-ADR – Book 1 – CS-ADR-DSN.M.710 – Taxiway centre line lights

p. 110-111

comment	8	comment by: <i>Manchester Airport plc</i>
	(b) (2) (i) These should always be alternate amber/green. Why is there an option to show green only?	
response	<i>Noted</i>	
	This is the text used by ICAO.	
comment	32	comment by: <i>ACI EUROPE - Airports Council International</i>
	(a) (1) change "350m" into "300m"	
	Justification: mistake by ICAO, ICAO will also change this!	
response	<i>Not accepted</i>	
	This is the current ICAO value. The Agency monitors any proposed changes and adopts mature amendments when they are published.	
comment	91	comment by: <i>CAA-NL</i>
	In (a) we suggest to add the text 'Taxiway centre line lights should be provided on a runway forming part of a standard taxi-route and intended for taxiing in runway visual range conditions less than a value of 350 m, except that these lights need not be provided where the traffic density is light and taxiway edge lights and centre line marking provide adequate guidance', according to ICAO Annex 14, 5.3.16.4. The provision of taxiway centre line lights on a runway forming part of a standard taxi route might be essential for safety	
	In (b) (2) is stated that 'on a runway served by ILS/MLS, taxiway centre line lights on an exit taxiway should be fixed lights'. The actual wording implies that only a runway exit of a runway served by an ILS/MLS should be equipped by taxiway centre line lights. This is incorrect. We suggest to change the text into 'taxiway centre line lights on an exit taxiway should be fixed lights. Alternate taxiway centre line lights should show green and yellow from their beginning near the runway centre line to the perimeter of the ILS/MLS critical/sensitive area or the lower edge...' , according to ICAO Annex 14, 5.3.16.7.	

response	<p><i>Accepted</i></p> <p>The ICAO text has been added to the CS.</p>
comment	<p>260 comment by: <i>Flughafen Düsseldorf GmbH</i></p> <p>b)2) Es ist davon auszugehen, dass die EASA in diesem Punkt nur für zukünftige Maßnahmen gilt und vorhandene Anlagen diesbezüglich Bestandsschutz besitzen.</p>
response	<p><i>Noted</i></p> <p>'Grandfathering' will not be accepted. ELOS or DAAD are available for deviations on existing aerodromes.</p> <p>The ICAO text has been added to CS (b)(2).</p>
comment	<p>555 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #381</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.710</p> <p>Référence: CS-ADR-DSN.M.710 Taxiway centre line lights Traduction de courtoisie</p> <p>(a) (2) (3) et (4) It is appropriate to transfer these provisions to GM because they are only good practices and not normative references so they should be in GM and not in CS.</p> <p>(a) (4) It is also appropriate to modify in the following way : « Taxiway centre line lights should may be provided in all visibility conditions on a runway forming part of a standard taxiroute where specified as components of an advanced surface movement guidance and control system. »</p> <p>(b) (4) We understand that the cross-reference is not about the figure U-11 but about the figure U-16 (taxiway centre line) because the narrow beam runway centre line lights is not suitable for rapid exit taxiway, because it would lead to a loss of vision of the track by the pilot.</p>
response	<p><i>Partially accepted</i></p> <p>The proposed text changes in paragraph (a) will be retained because they contain design parameters.</p> <p>Paragraph (b)(4) has been amended to show the correct reference.</p>

comment	587	comment by: Cologne/Bonn Airport
	RVR 300 m not 350m, ICAO will also change the figur	
response	<i>Not accepted</i>	
	350 m is the current ICAO value. The Agency monitors any proposed changes and adopts mature amendments when they are published.	

comment	618	comment by: Avinor
	CS.ADR.DSN.M.710 (a) (1). Change "350m" into "300m".	
response	<i>Not accepted</i>	
	350 m is the current ICAO value. The Agency monitors any proposed changes and adopts mature amendments when they are published.	

comment	806	comment by: Munich Airport International
	(a)	
	(1): change "350m" into "300m"	
	Justification: mistake by ICAO, ICAO will also change this figure	
response	<i>Not accepted</i>	
	350 m is the current ICAO value. The Agency monitors any proposed changes and adopts mature amendments when they are published.	

comment	1020	comment by: ADP : Aeroports de Paris
	Référence: CS-ADR-DSN.M.710	Taxiway centre line lights
	Proposition/commentaire	(a) (2) (3) et (4) Il convient de transférer ces dispositions en Guidance Materials. (a) (4) Il convient d'apporter également la modification suivante: « Taxiway centre line lights should may be provided in all visibility conditions on a runway forming part of a standard taxi-route where specified as components of an advanced surface movement guidance and control system. »

	(b) (4) Nous comprenons qu'il ne s'agit pas du renvoi à la figure U-11 mais plutôt à la figure U-16 (taxiway center line) car les feux d'axe de piste à faisceau étroit ne peuvent pas convenir pour la partie courbe de voie de sortie rapide.(risque de perte de continuité du guidage)
Justification	Les dispositions (a) (2) (3) et (4) n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.
Traduction de courtoisie	<p>(a) (2) (3) et (4) It is appropriate to transfer these provisions to GM because they are only good practices and not normative references so they should be in GM and not in CS.</p> <p>(a) (4) It is also appropriate to modify in the following way : « Taxiway centre line lights should may be provided in all visibility conditions on a runway forming part of a standard taxi-route where specified as components of an advanced surface movement guidance and control system. »</p> <p>(b) (4) We understand that the cross-reference is not about the figure U-11 but about the figure U-16 (taxiway center line) because the narrow beam runway centre line lights cannot be used on the curved part of rapid exit taxiway.(because of the risk of loss of guidance for the pilots)</p>

response *Partially accepted*

The proposed text changes in paragraph (a) will be retained because they contain design parameters.

Paragraph (b)(4) has been amended to show the correct reference.

comment *1058*

comment by: *Belgian CAA*

(a)(1) The 350m in the text are probably linked to the Cat II operations. The minimum RVR value for Cat II operations changed from 350 to 300m. So, 350m should be replaced by 300m.

response *Not accepted*

350 m is the current ICAO value. The Agency monitors any proposed changes and adopts mature amendments when they are published.

comment 1402 comment by: *ECA - European Cockpit Association*

Delete (a)(1) and replace with:

Taxiway centre line lights shall be provided on an exit taxiway, taxiway, de/anti-icing facility and apron intended for use in runway visual conditions less than a value of the order of 350m in such a manner as to provide continuous guidance between the runway centre line and the aircraft stands.

Justification:
Reference: IFALPA Annex 14, paragraph 5.3.16.1

response *Not accepted*

ICAO text will be used in the CS.

comment 1404 comment by: *ECA - European Cockpit Association*

Delete (a)(2) and replace with:

Taxiway centre line lights should be provided on a taxiway intended for use at night in visual range conditions of 350m or greater, and particularly on complex taxiway intersections and exit taxiways.

Justification:
Reference: IFALPA Annex 14, paragraph 5.3.16.2

response *Not accepted*

ICAO text will be used in the CS.

comment 1467 comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.M.710 - Taxiway centre line lights (p110)
- CS-ADR - Book 2 - GM-ADR-DSN.M.710 - Taxiway centre line lights (p270)

2. Justification and proposed text / comment

Paragraph (a)(2) of this CS is not binding in France because its relevance for safety is not known, there has been no safety issue until now on this point and

implementing it generates huge costs without any added safety value. Besides, it is only an ICAO recommendation in Annex 14 volume 1 and it is not detailed enough.

Note: In the CS, paragraph (b)(4), we understand that the cross-reference is not about the figure U-11, but about the figure U-16 which deals with taxi lane centre line, because the narrow beam runway centre line lights cannot be on the exit taxiway.

CS-ADR-DSN.M.710 – Taxiway centre line lights

"(a) Applicability:

~~[...] (2) Taxiway centre line lights should be provided on a taxiway intended for use at night in runway visual range conditions of 350 m or greater, and particularly on complex taxiway intersections and exit taxiways, except that these lights need not be provided where the traffic density is light and taxiway edge lights and centre line marking provide adequate guidance.~~

[...]"

GM-ADR-DSN.M.710 – Taxiway centre line lights

"(a) Taxiway centre line lights may be provided on a taxiway intended for use at night in runway visual range conditions of 350 m or greater, and particularly on complex taxiway intersections and exit taxiways, except that these lights need not be provided where the traffic density is light and taxiway edge lights and centre line marking provide adequate guidance.

~~(a)~~ (b) In the case where taxiway centre line lights are provided and where there may be a need to delineate the edges of a taxiway, e.g. on a rapid exit taxiway, narrow taxiway or in snow conditions, this may be done with taxiway edge lights or markers. Care is necessary to limit the light distribution of green lights on or near a runway so as to avoid possible confusion with threshold lights.

~~(b)~~ (c) The term 'continuous guidance' is not intended to require that taxiway centre line lighting is provided onto aircraft stands. Instead, it is intended that centre line lighting be provided on taxiways leading to aircraft stands or other apron areas, from which visual cues or other means exist to enable aircrew to manoeuvre the aircraft onto a stand or other parking area."

response Partially accepted

The proposed text changes in paragraph (a) will be retained because they contain design parameters.

Paragraph (b)(4) has been amended to show the correct reference.

comment 1596

comment by: Aéroport de Marseille - MRS/LFML

(a) (2) (3) et (4) It is appropriate to transfer these provisions to GM because they are only good practices and not normative references so they should be in GM and not in CS.

(a) (4) It is also appropriate to modify in the following way : « Taxiway centre line lights ~~should~~ **may** be provided in all visibility conditions on a runway forming part of a standard taxi-route where specified as components of an advanced surface movement guidance and control system. »

	(b) (4) We understand that the cross-reference is not about the figure U-11 but about the figure U-16 (taxiway centre line) because the narrow beam runway centre line lights is not suitable for rapid exit taxiway, because it would lead to a loss of vision of the track by the pilot.
response	<p><i>Partially accepted</i></p> <p>The proposed text changes in paragraph (a) will be retained because they contain design parameters.</p> <p>Paragraph (b)(4) has been amended to show the correct reference.</p>

comment	<p>1617 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #382</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.710</p> <p>Référence: CS-ADR-DSN.M.710 Taxiway centre line lights</p> <p>Traduction de courtoisie (a) (2) (3) et (4) It is appropriate to transfer these provisions to GM because they are only good practices and not normative references so they should be in GM and not in CS. (a) (4) It is also appropriate to modify in the following way : « Taxiway centre line lights should may be provided in all visibility conditions on a runway forming part of a standard taxiroute where specified as components of an advanced surface movement guidance and control system. » (b) (4) We understand that the cross-reference is not about the figure U-11 but about the figure U-16 (taxiway centre line) because the narrow beam runway centre line lights is not suitable for rapid exit taxiway, because it would lead to a loss of vision of the track by the pilot.</p>
response	<p><i>Partially accepted</i></p> <p>The proposed text changes in paragraph (a) will be retained because they contain design parameters.</p> <p>Paragraph (b)(4) has been amended to show the correct reference.</p>

comment	<p>1728 comment by: UK CAA</p> <p>Page No: 110</p> <p>Paragraph No: CS.ADR.DSN. M.710(a)(4)</p> <p>Comment: If aircraft taxi routes utilise part of a runway, guidance is supplied by the runway marking and lighting. Taxiway lighting should only be provided if the runway centreline lighting is not considered adequate.</p>
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	<p>Justification: Additional cost is not outweighed by a safety benefit.</p> <p>Proposed Text: Where the runway centreline lighting is not provided or is not considered adequate, taxiway centreline lights should be provided in all visibility conditions on a runway forming part of a standard taxi-route where specified as components of an advanced surface movement guidance and control system.</p>
response	<p><i>Partially accepted</i></p> <p>ICAO text has been added to the CS paragraph (a)(4), taken verbatim from Annex 14.</p>
comment	<p>1795 comment by: <i>Tarbes-Lourdes-Pyrénées airport</i></p> <p>Attachment #383</p> <p>NPA 2011-20 (B.III) CS-ADR-DSN.M.710</p> <p>Référence: CS-ADR-DSN.M.710 Taxiway centre line lights</p> <p>Traduction de courtoisie (a) (2) (3) et (4) It is appropriate to transfer these provisions to GM because they are only good practices and not normative references so they should be in GM and not in CS. (a) (4) It is also appropriate to modify in the following way : « Taxiway centre line lights should may be provided in all visibility conditions on a runway forming part of a standard taxiroute where specified as components of an advanced surface movement guidance and control system. » (b) (4) We understand that the cross-reference is not about the figure U-11 but about the figure U-16 (taxiway centre line) because the narrow beam runway centre line lights is not suitable for rapid exit taxiway, because it would lead to a loss of vision of the track by the pilot.</p>
response	<p><i>Partially accepted</i></p> <p>The proposed text changes in paragraph (a) will be retained because they contain design parameters.</p> <p>Paragraph (b)(4) has been amended to show the correct reference.</p>
comment	<p>1824 comment by: <i>Geneva International Airport (ROMIG)</i></p> <p>a)1) Change "350m" into "300m" Mistake made also by ICAO. ICAO will change this figure with the publication of Ammendment 10.</p>

response *Not accepted*

350 m is the current ICAO value. The Agency monitors any proposed changes and adopts mature amendments when they are published.

comment

1931

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#384](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.710

Référence: CS-ADR-DSN.M.710

Taxiway centre line lights

Traduction de courtoisie

(a) (2) (3) et (4) It is appropriate to transfer these provisions to GM because they are only good practices and not normative references so they should be in GM and not in CS.

(a) (4) It is also appropriate to modify in the following way : « Taxiway centre line lights ~~should~~ **may** be provided in all visibility conditions on a runway forming part of a standard taxiroute where specified as components of an advanced surface movement guidance and control system. »

(b) (4) We understand that the cross-reference is not about the figure U-11 but about the figure U-16 (taxiway centre line) because the narrow beam runway centre line lights is not suitable for rapid exit taxiway, because it would lead to a loss of vision of the track by the pilot.

response *Partially accepted*

The proposed text changes in paragraph (a) will be retained because they contain design parameters.

Paragraph (b)(4) has been amended to show the correct reference.

comment

2003

comment by: *Pau Pyrénées Airport - PUF/LFBP*

(a) (2) (3) et (4) It is appropriate to transfer these provisions to GM because they are only good practices and not normative references so they should be in GM and not in CS.

(a) (4) It is also appropriate to modify in the following way : « Taxiway centre line lights ~~should~~ **may** be provided in all visibility conditions on a runway forming part of a standard taxi-route where specified as components of an advanced surface movement guidance and control system. »

(b) (4) We understand that the cross-reference is not about the figure U-11 but about the figure U-16 (taxiway centre line) because the narrow beam runway centre line lights is not suitable for rapid exit taxiway, because it would lead to a loss of vision of the track by the pilot.

response	<p><i>Partially accepted</i></p> <p>The proposed text changes in paragraph (a) will be retained because they contain design parameters.</p> <p>Paragraph (b)(4) has been amended to show the correct reference.</p>	
comment	2138	comment by: <i>Aéroport Paris Vatry - XCR/LFOK</i>
	<p>Attachment #385</p> <p>NPA 2011-20 (B.III) CS-ADR-DSN.M.710</p> <p>Référence: CS-ADR-DSN.M.710 Taxiway centre line lights</p> <p>Traduction de courtoisie (a) (2) (3) et (4) It is appropriate to transfer these provisions to GM because they are only good practices and not normative references so they should be in GM and not in CS. (a) (4) It is also appropriate to modify in the following way : « Taxiway centre line lights should may be provided in all visibility conditions on a runway forming part of a standard taxiroute where specified as components of an advanced surface movement guidance and control system. » (b) (4) We understand that the cross-reference is not about the figure U-11 but about the figure U-16 (taxiway centre line) because the narrow beam runway centre line lights is not suitable for rapid exit taxiway.</p>	
response	<p><i>Partially accepted</i></p> <p>The proposed text changes in paragraph (a) will be retained because they contain design parameters.</p> <p>Paragraph (b)(4) has been amended to show the correct reference.</p>	
comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
response	<p><i>Noted</i></p>	
comment	2369	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
response	<p><i>Not accepted</i></p> <p>ammend "350m" to "300m"; consistent with ICAO change</p>	

350 m is the current ICAO value. The Agency monitors any proposed changes and adopts mature amendments when they are published.

comment 2565 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

Paragraph (a)(2) of this CS its relevance for safety is not known, there has been no safety issue until now on this point and implementing it generates huge costs without any added safety value.
Besides, it is only an ICAO recommendation in Annex 14 volume 1 and it is not detailed enough.

Note: In the CS, paragraph (b)(4), we understand that the cross-reference is not about the figure U-11, but about the figure U-16 which deals with taxi lane centre line, because the narrow beam runway centre line lights cannot be on the exit taxiway.

CS-ADR-DSN.M.710 – Taxiway centre line lights

“(a) Applicability:

~~[...] (2) Taxiway centre line lights should be provided on a taxiway intended for use at night in runway visual range conditions of 350 m or greater, and particularly on complex taxiway intersections and exit taxiways, except that these lights need not be provided where the traffic density is light and taxiway edge lights and centre line marking provide adequate guidance.~~

[...]”

response Partially accepted

The proposed text changes in paragraph (a) will be retained because they contain design parameters.

Paragraph (b)(4) has been amended to show the correct reference.

comment 2730 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#386](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.M.710

Référence: CS-ADR-DSN.M.710
Taxiway centre line lights

Traduction de courtoisie

(a) (2) (3) et (4) It is appropriate to transfer these provisions to GM because they are only good practices and not normative references so they should be in GM and not in CS.

(a) (4) It is also appropriate to modify in the following way : « Taxiway centre line lights ~~should~~ **may** be provided in all visibility conditions on a runway forming part of a standard taxiroute where specified as components of an advanced surface movement guidance and control system. »

	<p>(b) (4) We understand that the cross-reference is not about the figure U-11 but about the figure U-16 (taxiway centre line) because the narrow beam runway centre line lights is not suitable for rapid exit taxiway, because it would lead to a loss of vision of the track by the pilot.</p>
response	<p><i>Partially accepted</i></p> <p>The proposed text changes in paragraph (a) will be retained because they contain design parameters.</p> <p>Paragraph (b)(4) has been amended to show the correct reference.</p>
comment	<p>2800 comment by: ECA - European Cockpit Association</p> <p>Add new CS-ADR-DSN.M.71x on RUNWAY CLEARANCE AID</p> <p>(1) The extent of the ILS sensitive area and obstacle limitation surface should be indicated by the provision of alternate green and yellow taxiway centre line lights. These should commence at the runway centre line and should extend to that point on the taxiway where, when the pilot of the most critical aircraft can no longer see these lights because of the cockpit cut-off angle, the aircraft should be clear of the ILS sensitive area or obstacle limitation surface, whichever is the greater.</p> <p>(2)The alternating yellow taxiway centre line lights should be bi-directional between the runway centre line and the stop bars on the taxiway and unidirectional, showing yellow only in the direction of exit from the runway, between the stop bars and the point where they terminate in accordance with CS-ADR-DSN.M.715 (b)(1).</p> <p>Justification: The following observations apply to this new text:</p> <ol style="list-style-type: none"> 1. A colour-coded taxiway centre line lighting system is preferred to other methods (such as sign- boards, etc.) to denote the extremities of the critical areas after leaving the runway in low visibility. Green/grey and green/yellow centre line light combinations have contamination. Yellow also has the connotation of "caution" whilst the aircraft remains within the sensitive area. Yellow is considered to provide the best contrast with green, particularly under conditions of surface. 2. In order to provide a continuous indication to the pilot of these areas after leaving the runway centre line it is considered essential to ensure that the colour-coded taxiway centre line lights commence at the point of intersection with the runway centre line. 3. The recommendation for changing the beam direction of the yellow lights at the point where they reach the stop bars arises from the desirability of providing the pilot of an aircraft approaching the runway with an additional indication of penetration of the critical area. <p>Reference: IFALPA Annex 14, paragraph 5.3.16.x and 5.3.16.y</p>
response	<p><i>Not accepted</i></p> <p>ICAO text will be used in the CS.</p>

comment	<p>2897 comment by: <i>SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard</i></p> <p>Attachment #387</p> <p>SEARD NPA 2011-20 (B.III) CS-ADR-DSN.M.710</p> <p>Référence: CS-ADR-DSN.M.710 Taxiway centre line lights</p> <p>Traduction de courtoisie (a) (2) (3) et (4) It is appropriate to transfer these provisions to GM because they are only good practices and not normative references so they should be in GM and not in CS. (a) (4) It is also appropriate to modify in the following way : « Taxiway centre line lights should may be provided in all visibility conditions on a runway forming part of a standard taxi-route where specified as components of an advanced surface movement guidance and control system. » (b) (4) We understand that the cross-reference is not about the figure U-11 but about the figure U-16 (taxiway centre line) because the narrow beam runway centre line lights is not suitable for rapid exit taxiway.</p>
response	<p><i>Partially accepted</i></p> <p>The proposed text changes in paragraph (a) will be retained because they contain design parameters.</p> <p>Paragraph (b)(4) has been amended to show the correct reference.</p>

comment	<p>2907 comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i></p>						
	<table border="1"> <tr> <td>Référence: CS-ADR-DSN.M.710</td> <td>Taxiway centre line lights</td> </tr> <tr> <td>Proposition/commentaire</td> <td> <p>(a) (2) (3) et (4) Il convient de transférer ces dispositions en Guidance Materials.</p> <p>(a) (4) Il convient d'apporter également la modification suivante: « Taxiway centre line lights should may be provided in all visibility conditions on a runway forming part of a standard taxi-route where specified as components of an advanced surface movement guidance and control system. »</p> <p>(b) (4) Nous comprenons qu'il ne s'agit pas du renvoi à la figure U-11 mais plutôt à la figure U-16 (taxi lane center line) car les feux d'axe de piste à faisceau étroit ne peuvent pas se trouver sur une sortie de taxiway.</p> </td> </tr> <tr> <td>Justification</td> <td>Les dispositions (a) (2) (3) et (4) n'étant que des règles de l'art et non des références</td> </tr> </table>	Référence: CS-ADR-DSN.M.710	Taxiway centre line lights	Proposition/commentaire	<p>(a) (2) (3) et (4) Il convient de transférer ces dispositions en Guidance Materials.</p> <p>(a) (4) Il convient d'apporter également la modification suivante: « Taxiway centre line lights should may be provided in all visibility conditions on a runway forming part of a standard taxi-route where specified as components of an advanced surface movement guidance and control system. »</p> <p>(b) (4) Nous comprenons qu'il ne s'agit pas du renvoi à la figure U-11 mais plutôt à la figure U-16 (taxi lane center line) car les feux d'axe de piste à faisceau étroit ne peuvent pas se trouver sur une sortie de taxiway.</p>	Justification	Les dispositions (a) (2) (3) et (4) n'étant que des règles de l'art et non des références
Référence: CS-ADR-DSN.M.710	Taxiway centre line lights						
Proposition/commentaire	<p>(a) (2) (3) et (4) Il convient de transférer ces dispositions en Guidance Materials.</p> <p>(a) (4) Il convient d'apporter également la modification suivante: « Taxiway centre line lights should may be provided in all visibility conditions on a runway forming part of a standard taxi-route where specified as components of an advanced surface movement guidance and control system. »</p> <p>(b) (4) Nous comprenons qu'il ne s'agit pas du renvoi à la figure U-11 mais plutôt à la figure U-16 (taxi lane center line) car les feux d'axe de piste à faisceau étroit ne peuvent pas se trouver sur une sortie de taxiway.</p>						
Justification	Les dispositions (a) (2) (3) et (4) n'étant que des règles de l'art et non des références						

	normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.
Traduction de courtoisie	<p>(a) (2) (3) et (4) It is appropriate to transfer these provisions to GM because they are only good practices and not normative references so they should be in GM and not in CS.</p> <p>(a) (4) It is also appropriate to modify in the following way : « Taxiway centre line lights should may be provided in all visibility conditions on a runway forming part of a standard taxi-route where specified as components of an advanced surface movement guidance and control system. »</p> <p>(b) (4) We understand that the cross-reference is not about the figure U-11 but about the figure U-16 (taxi lane center line) because the narrow beam runway centre line lights cannot be on the exit taxiway.</p>

response *Partially accepted*

The proposed text changes in paragraph (a) will be retained because they contain design parameters.

Paragraph (b)(4) has been amended to show the correct reference.

comment 3028

comment by: *ADV -German Airports Association*

CS.ADR.DSN.M.710 (a) (1)
change "350m" into "300m"

Justification
mistake by ICAO, ICAO will also change this figure

response *Not accepted*

350 m is the current ICAO value. The Agency monitors any proposed changes and adopts mature amendments when they are published.

comment 3063

comment by: *MST / STR - Stuttgart Airport*

	<p>CS.ADR.DSN.M.710 (a) (1) change "350m" into "300m"</p> <p>Justification mistake by ICAO, ICAO will also change this figure</p>
response	<p><i>Not accepted</i></p> <p>350 m is the current ICAO value. The Agency monitors any proposed changes and adopts mature amendments when they are published.</p>

comment	<p>3096 comment by: <i>Fraport AG</i></p> <p>CS-ADR-DSN.M.710 — Taxiway centre line lights (a) (1)</p> <p>Editorial</p> <p>... runway visual range conditions less than a value of 350 m in such a manner ...</p> <p>Proposed Text ... runway visual range conditions less than a value of 300 m in such a manner ...</p> <p>Fraport AG mistake by ICAO, ICAO will also change this!</p>
response	<p><i>Not accepted</i></p> <p>350 m is the current ICAO value. The Agency monitors any proposed changes and adopts mature amendments when they are published.</p>

comment	<p>3122 comment by: <i>ATB Aéroport Toulouse-Blagnac - TLS/LFBO</i></p> <p>Attachment #388</p> <p>ATB NPA 2011-20 (B.III) CS-ADR-DSN.M.710</p> <p>Référence: CS-ADR-DSN.M.710 Taxiway centre line lights</p> <p>Traduction de courtoisie (a) (2) (3) et (4) It is appropriate to transfer these provisions to GM because they are only good practices and not normative references so they should be in GM and not in CS. (a) (4) It is also appropriate to modify in the following way : « Taxiway centre line lights should may be provided in all visibility conditions on a runway forming part of a standard taxiroute where specified as components of an advanced surface movement guidance and control system. » (b) (4) We understand that the cross-reference is not about the figure U-11 but</p>
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about the figure U-16 (taxiway centre line) because the narrow beam runway centre line lights is not suitable for rapid exit taxiway, because it would lead to a loss of vision of the track by the pilot.

response *Partially accepted*

The proposed text changes in paragraph (a) will be retained because they contain design parameters.

Paragraph (b)(4) has been amended to show the correct reference.

CS-ADR – Book 1 – CS-ADR-DSN.M.715 – Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

p. 111-113

comment 92

comment by: *CAA-NL*

In (c) (1) please change the reference to figure M-8 into M-11, because this is the correct figure.

(f) and (g) are confusing. It is not clear that they are related to the spacing of taxiway centre line lights as in CS-ADR-DSN.M.715 (a).

response *Accepted*

Reference to the Figure M-8 to the Figure M-11 will be changed, and the CS text in (g) has been deleted.

comment 404

comment by: *Cologne/Bonn Airport*

Add (g) to (b)	Two Paragraphs with the same topic are misleading; According to ICAO
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response *Accepted*

The CS text in (g) has been deleted.

comment 556

comment by: *Union des Aéroports français - UAF*

Attachment [#389](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.715

Référence: CS-ADR-DSN.M.715

Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

Traduction de courtoisie

It is appropriate that only the following provision is indicated in CS: "The lights should be spaced at intervals such that a clear indication of the route is provided."

All the rest is GM.

It is appropriate to mention the function of taxiway centre line lights that is to show clearly the route to be followed by the aircraft instead of having strict specification. However the space between the lights must not be too precise so that it can vary according the complexity of the route, the type of traffic, configuration of taxiway...

It seems useless to change the position of existing lights as long as the aim of the clear indication of the route is reached. The other provisions are only good practises and not normative references in the ICAO Annex 14 so they must be in GM and not in CS.

response *Partially accepted*

Objectives on some CSs will be added among applicability and characteristics. The proposed text in comment has explanatory meaning and is not a CS requirement. The spacing will remain in the CS as this is dimension and relevant to visibility conditions. CSs M.710 and M.715 allow adequate level of flexibility. The lights composition at existing taxiways could remain without change with ELOS, SC or DAAD. Defining the taxi route is an operational issue.

comment 788

comment by: *Munich Airport International*

Add (g) to (b)

Justification: Two Paragraphs with the same topic are misleading; According to ICAO

response *Accepted*

The CS text in (g) has been deleted.

comment 1023

comment by: *ADP : Aeroports de Paris***Référence: CS-ADR-DSN.M.715**

Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

Proposition/commentaire

Il convient que seule la disposition suivante soit

	<p>indiquée en CS: "The lights should be spaced at intervals such that a clear indication of the <u>route</u> is provided." Tout le reste est du domaine du GM.</p>
<p>Justification</p>	<p>Il convient de mentionner la fonction des feux axiaux de voie de circulation qui est d'indiquer clairement la route que doit suivre l'aéronef plutôt que d'avoir des spécifications strictes. Cependant il ne faut pas être trop précis sur l'espacement de ceux-ci qui doit pouvoir rester variable selon la complexité du cheminement, le type de trafic, la configuration des voies de circulation...</p> <p>Il semble inutile de changer la position des feux existants dès lors que l'objectif de la claire indication des routes est atteint.</p> <p>Les autres dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.</p> <p>De plus, il devrait être précisé la tolérance de 10% qui est nécessaire dans les espacements longitudinaux pour éviter les implantations en bordures de dallage, ou bien conflictuelles avec d'autres feux.</p> <p>La tolérance de 10% est appliquée depuis plus de 20ans et est notamment mentionnée dans les derniers documents techniques comme la FAA (standard de 2005)</p>
<p>Traduction de courtoisie</p>	<p>It is appropriate that only the following provision is indicated in CS: "The lights should be spaced at intervals such that a clear indication of the <u>route</u> is provided." All the rest is GM.</p> <p>It is appropriate to mention the function of taxiway centre line lights that is to show clearly the route to be followed by the aircraft instead of having strict specification. However the space between the lights must not be too precise so that it can vary according the complexity of the route, the type of traffic, configuration of taxiway...</p> <p>It seems useless to change the position of existing lights as long as the aim of the clear indication of the route is reached. The other provisions are only good practice and not normative references in the ICAO Annex 14 so they must be in GM and not in CS.</p> <p>In addition a 10% tolerance on longitudinal spacings should be mentioned in order to avoid location problems near pavement joint and also for any other coordination issue. This tolerance has been used for more than 20 years on</p>

	airports and is mentioned as standard in FAA latest revised documents.(see AC 150/5340-30)
response	<p><i>Partially accepted</i></p> <p>Objectives on some CSs will be added among applicability and characteristics. The proposed text in comment has explanatory meaning and is not a CS requirement. The spacing will remain in the CS as this is dimension and relevant to visibility conditions. CSs M.710 and M.715 allow adequate level of flexibility. The lights composition at existing taxiways could remain without change with ELOS, SC or DAAD. Defining the taxi route is an operational issue.</p>

comment	<p>1597 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p>
	<p>It is appropriate that only the following provision is indicated in CS: "The lights should be spaced at intervals such that a clear indication of the <u>route</u> is provided." All the rest is GM.</p> <p>It is appropriate to mention the function of taxiway centre line lights that is to show clearly the route to be followed by the aircraft instead of having strict specification. However the space between the lights must not be too precise so that it can vary according to the complexity of the route, the type of traffic, configuration of taxiway...</p> <p>It seems useless to change the position of existing lights as long as the aim of the clear indication of the route is reached. The other provisions are only good practises and not normative references in the ICAO Annex 14 so they must be in GM and not in CS.</p>

response	<p><i>Partially accepted</i></p>
	<p>Objectives on some CSs will be added among applicability and characteristics. The proposed text in comment has explanatory meaning and is not a CS requirement. The spacing will remain in the CS as this is dimension and relevant to visibility conditions. CSs M.710 and M.715 allow adequate level of flexibility. The lights composition at existing taxiways could remain without change with ELOS, SC or DAAD. Defining the taxi route is an operational issue.</p>

comment	<p>1618 comment by: <i>Euroairport Bâle-Mulhouse</i></p>
	<p>Attachment #390</p>

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.715

Référence: CS-ADR-DSN.M.715

Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

Traduction de courtoisie

It is appropriate that only the following provision is indicated in CS: "The lights should be spaced at intervals such that a clear indication of the route is provided."

All the rest is GM.

It is appropriate to mention the function of taxiway centre line lights that is to show clearly the route to be followed by the aircraft instead of having strict specification. However the space between the lights must not be too precise so that it can vary according the complexity of the route, the type of traffic, configuration of taxiway...

It seems useless to change the position of existing lights as long as the aim of the clear indication of the route is reached. The other provisions are only good practises and not normative references in the ICAO Annex 14 so they must be in GM and not in CS.

response *Partially accepted*

Objectives on some CSs will be added among applicability and characteristics. The proposed text in comment has explanatory meaning and is not a CS requirement. The spacing will remain in the CS as this is dimension and relevant to visibility conditions. CSs M.710 and M.715 allow adequate level of flexibility. The lights composition at existing taxiways could remain without change with ELOS, SC or DAAD. Defining the taxi route is an operational issue.

comment

1729

comment by: UK CAA

Page No: 111

Paragraph No: CS.ADR.DSN.M715 (c) (1)

Comment: The CS apportions differing lengths of taxiway lights on runways etc. depending on whether the runway is code 1&2 or 3&4.

Justification: To provide lengths of lead-in taxiway lights compatible with the use of the taxiway –rapid exit taxiways 60m; other taxiways (slower speed) 30m.

Proposed Text: c(1) Taxiway centreline lights on taxiways other than rapid exit taxiways should commence **30m before the point**.....

response *Not accepted*

The text in the CS is taken verbatim from Annex 14, paragraph 5.3.16.17.

comment 1773

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.M.715 - Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways (p111-113)
- CS-ADR - Book 2 – GM-ADR-DSN.M.715 - Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways (p271)

2. Justification and proposed text / comment

It is proposed to keep in the CS the purpose of the specification which is to provide a clear indication of the route and to move the remaining to GM. Indeed, this specification comes from an ICAO recommendation in Annex 14 volume 1. This recommendation has most likely been taken into account during the design and the construction of currently existing aerodromes, but:

- in France, it is not binding and is considered as guidance material,
- for this reason, it has not been verified since the design of these aerodromes,
- systematically verifying that it is effective on aerodromes, as required in order to deliver a certificate, would generate huge costs without any added safety value, since no safety issue related to it has been observed until now.

Thus the purpose is kept in the CS and the rest of the content is move to GM using "may" instead of "should", as follows:

CS-ADR-DSN.M.715 - Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

~~"(a) Taxiway centre line lights on taxiways:~~

~~(1) Taxiway centre line lights on a straight section of a taxiway should be spaced at longitudinal intervals such that a clear indication of the route is provided of not more than 30 m, except that:~~

~~(i) intervals less than 30 m should be provided on short straight sections;~~

~~(ii) on a taxiway intended for use in RVR conditions of less than a value of 350 m, the longitudinal spacing should not exceed 15 m.~~

~~(2) Taxiway centre line lights on a taxiway curve should continue from the straight portion of the taxiway at a constant distance from the outside edge of the taxiway curve. The lights should be spaced at intervals such that a clear indication of the curve is provided.~~

~~(3) On a taxiway intended for use in RVR conditions of less than a value of 350 m, the lights on a curve should not exceed spacing of 15 m and on a curve of less than 400 m radius the lights should be spaced at intervals of not greater than 7.5 m. This spacing should extend for 60 m before and after the curve.~~

~~(b) Taxiway centre line lights on rapid exit taxiways:~~

~~(1) Taxiway centre line lights on a rapid exit taxiway should commence at a point at least 60 m before the beginning of the taxiway centre line curve and continue beyond the end of the curve to a point on the centre line of the taxiway where an aeroplane can be expected to reach normal taxiing speed, as shown in Figure M-10. The lights on that portion parallel to the runway centre line should always be at least 60 cm from any row of runway centre line lights, as shown in Figure M-10.~~

~~(2) The lights should be spaced at longitudinal intervals of not more than 15 m.~~

~~(c) Taxiway centre line lights on other exit taxiways:~~

~~(1) Taxiway centre line lights on exit taxiways other than rapid exit taxiways should commence at the point where the taxiway centre line marking begins to curve from the runway centre line, and follow the curved taxiway centre line marking at least to the point where the marking leaves the runway. The first light should be at least 60 cm from any row of runway centre line lights, as shown in Figure M-8, Arrangement of runway threshold and runway end lights.~~

~~(2) The lights should be spaced at longitudinal intervals of not more than 7.5 m.~~

~~(d) Taxiway centre line lights on runways:~~

~~Taxiway centre line lights on a runway forming part of a standard taxi-route and intended for taxiing in runway visual range conditions less than a value of 350 m should be spaced at longitudinal intervals not exceeding 15 m.~~

~~Figure M-11~~

~~(e) Positioning of Taxiway centre line lights on taxiway:~~

~~(1) The spacing on a particular section of taxiway centre line lighting, (straight or curved section), should be such that a clear indication of the taxiway centre line is provided, particularly on a curved section.~~

~~(2) Where a taxiway is only intended for use in RVR conditions of 350 m or greater, the spacing of taxiway centre line lights on curves should not exceed the table below:~~

~~Curve radius Light spacing~~

~~up to 400 m 7.5 m~~

~~401 m to 899 m 15 m~~

~~900 m or greater 30 m~~

~~(f) Taxiway centre line lights on straight sections of taxiways:~~

~~Larger intervals not exceeding 60 m may be used where, because of the prevailing meteorological conditions, adequate guidance is provided by such spacing.~~

~~(g) Taxiway centre line lights on rapid exit taxiways:~~

~~Where runway centre line lights are not provided, a greater interval not exceeding 30 m may be used."~~

GM-ADR-DSN.M.715 - Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

"(a) Taxiway centre line lights on taxiways:

(1) Taxiway centre line lights on a straight section of a taxiway may be spaced at longitudinal intervals of not more than 30 m, except that:

(i) intervals less than 30 m may be provided on short straight sections;

(ii) on a taxiway intended for use in RVR conditions of less than a value of 350 m, the longitudinal spacing may not exceed 15 m.

(2) Taxiway centre line lights on a taxiway curve may continue from the straight portion of the taxiway at a constant distance from the outside edge of the taxiway curve. The lights may be spaced at intervals such that a clear indication of the curve is provided.

(3) On a taxiway intended for use in RVR conditions of less than a value of 350 m, the lights on a curve may not exceed spacing of 15 m and on a curve of less than 400 m radius the lights may be spaced at intervals of not greater than 7.5 m. This spacing may extend for 60 m before and after the curve.

(b) Taxiway centre line lights on rapid exit taxiways:

(1) Taxiway centre line lights on a rapid exit taxiway may commence at a point at least 60 m before the beginning of the taxiway centre line curve and continue beyond the end of the curve to a point on the centre line of the taxiway where an aeroplane can be expected to reach normal taxiing speed, as shown in Figure M-10. The lights on that portion parallel to the runway centre line may always be at least 60 cm from any row of runway centre line lights, as shown in Figure M-10.

(2) The lights may be spaced at longitudinal intervals of not more than 15 m.

(c) Taxiway centre line lights on other exit taxiways:

(1) Taxiway centre line lights on exit taxiways other than rapid exit taxiways may commence at the point where the taxiway centre line marking begins to curve from the runway centre line, and follow the curved taxiway centre line marking at least to the point where the marking leaves the runway. The first light may be at least 60 cm from any row of runway centre line lights, as shown in Figure M-8, Arrangement of runway threshold and runway end lights.

(2) The lights may be spaced at longitudinal intervals of not more than 7.5 m.

(d) Taxiway centre line lights on runways:
Taxiway centre line lights on a runway forming part of a standard taxi-route and intended for taxiing in runway visual range conditions less than a value of 350 m may be spaced at longitudinal intervals not exceeding 15 m.
Figure M-11

(e) Positioning of Taxiway centre line lights on taxiway:

(1) The spacing on a particular section of taxiway centre line lighting, (straight or curved section), may be such that a clear indication of the taxiway centre line is provided, particularly on a curved section.

(2) Where a taxiway is only intended for use in RVR conditions of 350 m or greater, the spacing of taxiway centre line lights on curves may not exceed the table below:

Curve radius	Light spacing
up to 400 m	7.5 m
401 m to 899 m	15 m
900 m or greater	30 m

(f) Taxiway centre line lights on straight sections of taxiways:
Larger intervals not exceeding 60 m may be used where, because of the prevailing meteorological conditions, adequate guidance is provided by such spacing.

(g) Taxiway centre line lights on rapid exit taxiways:
Where runway centre line lights are not provided, a greater interval not exceeding 30 m may be used."

response *Partially accepted*

Objectives on some CSs will be added among applicability and characteristics. The proposed text in comment has explanatory meaning and is not a CS requirement. The spacing will remain in the CS as this is dimension and relevant to visibility conditions. CSs M.710 and M.715 allow adequate level of flexibility. The lights composition at existing taxiways could remain without change with ELOS, SC or DAAD. Defining the taxi route is an operational issue.

comment 1932

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#391](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.715

Référence: CS-ADR-DSN.M.715

Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

Traduction de courtoisie

It is appropriate that only the following provision is indicated in CS: "The lights should be spaced at intervals such that a clear indication of the route is provided."

All the rest is GM.

It is appropriate to mention the function of taxiway centre line lights that is to show clearly the route to be followed by the aircraft instead of having strict specification. However the space between the lights must not be too precise so that it can vary according the complexity of the route, the type of traffic, configuration of taxiway...

It seems useless to change the position of existing lights as long as the aim of the clear indication of the route is reached. The other provisions are only good practises and not normative references in the ICAO Annex 14 so they must be in GM and not in CS.

response *Partially accepted*

Objectives on some CSs will be added among applicability and characteristics. The proposed text in comment has explanatory meaning and is not a CS requirement. The spacing will remain in the CS as this is dimension and relevant to visibility conditions. CSs M.710 and M.715 allow adequate level of flexibility. The lights composition at existing taxiways could remain without change with ELOS, SC or DAAD. Defining the taxi route is an operational issue.

comment 2001

comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate that only the following provision is indicated in CS: "The lights should be spaced at intervals such that a clear indication of the route is provided."

All the rest is GM.

It is appropriate to mention the function of taxiway centre line lights that is to show clearly the route to be followed by the aircraft instead of having strict specification. However the space between the lights must not be too precise so that it can vary according the complexity of the route, the type of traffic, configuration of taxiway...

It seems useless to change the position of existing lights as long as the aim of the clear indication of the route is reached. The other provisions are only good practises and not normative references in the ICAO Annex 14 so they must be in GM and not in CS.

response *Partially accepted*

Objectives on some CSs will be added among applicability and characteristics. The proposed text in comment has explanatory meaning and is not a CS requirement. The spacing will remain in the CS as this is dimension and relevant to visibility conditions. CSs M.710 and M.715 allow adequate level of flexibility. The lights composition at existing taxiways could remain without change with ELOS, SC or DAAD. Defining the taxi route is an operational issue.

comment	2348 ❖	comment by: HIA - Highlands and Islands Airports Limited
	Noted	
response	Noted	

comment	2490	comment by: AENA - Aeropuertos Españoles y Navegación Aérea
	<p>It is proposed to keep in the CS the purpose of the specification which is to provide a clear indication of the route and to move the remaining to GM. Indeed, this specification comes from an ICAO recommendation in Annex 14 volume 1. This recommendation has most likely been taken into account during <u>the design and the construction</u> of currently existing aerodromes, but:</p> <ul style="list-style-type: none"> - in Spain, it is not binding and is considered as guidance material, - for this reason, it has not been verified since the design of these aerodromes, - systematically verifying that it is effective on aerodromes, as required in order to deliver a certificate, would generate huge costs without any added safety value, since no safety issue related to it has been observed until now. <p>Thus the purpose is kept in the CS and the rest of the content is move to GM using "may" instead of "should", as follows:</p> <p>CS-ADR-DSN.M.715 - Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways</p> <p>"(a) Taxiway centre line lights on taxiways:</p> <p>(1) Taxiway centre line lights on a straight section of a taxiway should be spaced at longitudinal intervals such that a clear indication of the route is provided of not more than 30 m, except that:</p> <p>(i) intervals less than 30 m should be provided on short straight sections;</p> <p>(ii) on a taxiway intended for use in RVR conditions of less than a value of 350 m, the longitudinal spacing should not exceed 15 m.</p> <p>(2) Taxiway centre line lights on a taxiway curve should continue from the straight portion of the taxiway at a constant distance from the outside edge of the taxiway curve. The lights should be spaced at intervals such that a clear indication of the curve is provided.</p> <p>(3) On a taxiway intended for use in RVR conditions of less than a value of 350 m, the lights on a curve should not exceed spacing of 15 m and on a curve of less than 400 m radius the lights should be spaced at intervals of not greater than 7.5 m. This spacing should extend for 60 m before and after the curve.</p> <p>(b) Taxiway centre line lights on rapid exit taxiways:</p> <p>(1) Taxiway centre line lights on a rapid exit taxiway should commence at a point at least 60 m before the beginning of the taxiway centre line curve and continue beyond the end of the curve to a point on the centre line of the taxiway where an aeroplane can be expected to reach normal taxiing speed, as shown in Figure M-10. The lights on that portion parallel to the runway centre line should always be at least 60 cm from any row of runway centre line lights, as shown in Figure M-10.</p> <p>(2) The lights should be spaced at longitudinal intervals of not more than 15 m.</p> <p>(c) Taxiway centre line lights on other exit taxiways:</p> <p>(1) Taxiway centre line lights on exit taxiways other than rapid exit taxiways should commence at the point where the taxiway centre line marking begins to curve from the runway centre line, and follow the curved taxiway centre line marking at least to the point where the marking leaves the runway. The first</p>	

~~light should be at least 60 cm from any row of runway centre line lights, as shown in Figure M-8, Arrangement of runway threshold and runway end lights.~~

~~(2) The lights should be spaced at longitudinal intervals of not more than 7.5 m.~~

~~(d) Taxiway centre line lights on runways:~~

~~Taxiway centre line lights on a runway forming part of a standard taxi route and intended for taxiing in runway visual range conditions less than a value of 350 m should be spaced at longitudinal intervals not exceeding 15 m.~~

~~Figure M-11~~

~~(e) Positioning of Taxiway centre line lights on taxiway:~~

~~(1) The spacing on a particular section of taxiway centre line lighting, (straight or curved section), should be such that a clear indication of the taxiway centre line is provided, particularly on a curved section.~~

~~(2) Where a taxiway is only intended for use in RVR conditions of 350 m or greater, the spacing of taxiway centre line lights on curves should not exceed the table below:~~

~~Curve radius Light spacing~~

~~up to 400 m 7.5 m~~

~~401 m to 899 m 15 m~~

~~900 m or greater 30 m~~

~~(f) Taxiway centre line lights on straight sections of taxiways:~~

~~Larger intervals not exceeding 60 m may be used where, because of the prevailing meteorological conditions, adequate guidance is provided by such spacing.~~

~~(g) Taxiway centre line lights on rapid exit taxiways:~~

~~Where runway centre line lights are not provided, a greater interval not exceeding 30 m may be used."~~

response Partially accepted

Objectives on some CSs will be added among applicability and characteristics. The proposed text in comment has explanatory meaning and is not a CS requirement. The spacing will remain in the CS as this is dimension and relevant to visibility conditions. CSs M.710 and M.715 allow adequate level of flexibility. The lights composition at existing taxiways could remain without change with ELOS, SC or DAAD. Defining the taxi route is an operational issue.

comment 2732 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#392](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.M.715

Référence: CS-ADR-DSN.M.715

Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

Traduction de courtoisie

It is appropriate that only the following provision is indicated in CS: "The lights should be spaced at intervals such that a clear indication of the route is provided."

All the rest is GM.

It is appropriate to mention the function of taxiway centre line lights that is to

show clearly the route to be followed by the aircraft instead of having strict specification. However the space between the lights must not be too precise so that it can vary according to the complexity of the route, the type of traffic, configuration of taxiway...

It seems useless to change the position of existing lights as long as the aim of the clear indication of the route is reached. The other provisions are only good practises and not normative references in the ICAO Annex 14 so they must be in GM and not in CS.

response *Partially accepted*

Objectives on some CSs will be added among applicability and characteristics. The proposed text in comment has explanatory meaning and is not a CS requirement. The spacing will remain in the CS as this is dimension and relevant to visibility conditions. CSs M.710 and M.715 allow adequate level of flexibility. The lights composition at existing taxiways could remain without change with ELOS, SC or DAAD. Defining the taxi route is an operational issue.

comment 2767

comment by: *Airport Nuremberg - NUE/EDDN*

ICAO recommendation 5.3.16.16 was accidentally splitted when taking over in the EASA document (the first part is listed under (b)2 and the second part under (g). This should be joint according to the Annex 14 as following:

The lights should be spaced at longitudinal intervals of not more than 15 m, except that, where runway centre line lights are not provided, a greater interval not exceeding 30 m may be used.

response *Accepted*

comment

2898

comment by: *SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard*

Attachment [#393](#)

SEARD NPA 2011-20 (B.III) CS-ADR-DSN.M.715

Référence: CS-ADR-DSN.M.715

Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

Traduction de courtoisie

It is appropriate that only the following provision is indicated in CS: "The lights should be spaced at intervals such that a clear indication of the route is provided."

All the rest is GM.

It is appropriate to mention the function of taxiway centre line lights that is to show clearly the route to be followed by the aircraft instead of having strict specification. However the space between the lights must not be too precise so that it can vary according the complexity of the route, the type of traffic, configuration of taxiway...

It seems useless to change the position of existing lights as long as the aim of the clear indication of the route is reached. The other provisions are only good practises and not normative references in the ICAO Annex 14 so they must be in GM and not in CS.

response *Partially accepted*

Objectives on some CSs will be added among applicability and characteristics. The proposed text in comment has explanatory meaning and is not a CS requirement. The spacing will remain in the CS as this is dimension and relevant to visibility conditions. CSs M.710 and M.715 allow adequate level of flexibility. The lights composition at existing taxiways could remain without change with ELOS, SC or DAAD. Defining the taxi route is an operational issue.

comment 2908

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

<u>Référence: CS-ADR-DSN.M.715</u>	Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways
Proposition/commentaire	Il convient que seule la disposition suivante soit indiquée en CS: "The lights should be spaced at intervals such that a clear indication of the <u>route</u> is provided." Tout le reste est du domaine du GM.
Justification	Il convient de mentionner la fonction des feux axiaux de voie de circulation qui est d'indiquer clairement la route que doit suivre l'aéronef plutôt que d'avoir des spécifications strictes. Cependant il ne faut pas être trop précis sur l'espacement de ceux-ci qui doit pouvoir rester variable selon la complexité du cheminement, le type de trafic, la configuration des voies de circulation... Il semble inutile de changer la position des feux existants dès lors que l'objectif de la claire indication des routes est atteint. Les autres dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.
Traduction de courtoisie	It is appropriate that only the following provision is indicated in CS: "The lights should be spaced at intervals such that a clear indication of the <u>route</u> is provided." All the rest is GM.

	<p>It is appropriate to mention the function of taxiway centre line lights that is to show clearly the route to be followed by the aircraft instead of having strict specification. However the space between the lights must not be too precise so that it can vary according the complexity of the route, the type of traffic, configuration of taxiway...</p> <p>It seems useless to change the position of existing lights as long as the aim of the clear indication of the route is reached. The other provisions are only good practises and not normative references in the ICAO Annex 14 so they must be in GM and not in CS.</p>
response	<p><i>Partially accepted</i></p> <p>Objectives on some CSs will be added among applicability and characteristics. The proposed text in comment has explanatory meaning and is not a CS requirement. The spacing will remain in the CS as this is dimension and relevant to visibility conditions. CSs M.710 and M.715 allow adequate level of flexibility. The lights composition at existing taxiways could remain without change with ELOS, SC or DAAD. Defining the taxi route is an operational issue.</p>
comment	<p>3010 comment by: <i>ADV -German Airports Association</i></p> <p>CS-ADR-DSN.M.715 Add (g) to (b)</p> <p>Justification Two Paragraphs with the same topic are misleading; According to ICAO</p>
response	<p><i>Accepted</i></p> <p>The CS text in (g) has been deleted.</p>
comment	<p>3045 comment by: <i>MST / STR - Stuttgart Airport</i></p> <p>CS-ADR-DSN.M.715 Add (g) to (b)</p> <p>Justification Two Paragraphs with the same topic are misleading; According to ICAO</p>

response *Accepted*

The CS text in (g) has been deleted.

CS-ADR – Book 1 – Figure M-12 Taxiway lighting

p. 114

comment

556 ❖

comment by: *Union des Aéroports français - UAF*

UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.715

Référence: CS-ADR-DSN.M.715

Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

Traduction de courtoisie

It is appropriate that only the following provision is indicated in CS: "The lights should be spaced at intervals such that a clear indication of the route is provided."

All the rest is GM.

It is appropriate to mention the function of taxiway centre line lights that is to show clearly the route to be followed by the aircraft instead of having strict specification. However the space between the lights must not be too precise so that it can vary according the complexity of the route, the type of traffic, configuration of taxiway...

It seems useless to change the position of existing lights as long as the aim of the clear indication of the route is reached. The other provisions are only good practises and not normative references in the ICAO Annex 14 so they must be in GM and not in CS.

response

Partially accepted

Objectives on some CSs will be added among applicability and characteristics. The proposed text in comment has explanatory meaning and is not a CS requirement. The spacing will remain in the CS as this is dimension and relevant to visibility conditions. CSs M.710 and M.715 allow adequate level of flexibility. The lights composition at existing taxiways could remain without change with ELOS, SC or DAAD. Defining the taxi route is an operational issue.

comment

2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response

Noted

comment 1406

comment by: ECA - European Cockpit Association

Amend as follows:

(1) Taxiway edge lights should be provided at the edges of a runway turn pad on a holding bay, apron, etc. intended for use at night **and during reduced visibility operations** and on a taxiway not provided with taxiway centre line lights and intended for use at night, except that taxiway edge lights need not be provided where, considering the nature of the operations, **the same or improved adequate** guidance ~~can be~~ **is** achieved by surface illumination or other means. **Taxiways equipped with centre line lights in accordance with CS-ADR-DSN.M.715 should be provided with edge lights in the following conditions:**

1) When the aerodrome is located in an area where centre line lights could be obscured by snow and/or ice accumulation; and

2) When a need exists at a specific location to identify the physical edge of the pavement such as at critical curves or intersections."

Justification:

This text requires extension and amplification in order to meet the operational requirement

Reference: IFALPA Annex 14, paragraph 5.3.17.1

response *Not accepted*

ICAO wording used is appropriate for aerodrome design criteria. The other proposed provisions are operational considerations.

comment 1409

comment by: ECA - European Cockpit Association

Attachment [#394](#)

Add new CS-ADR-DSN.M.72x on Runway Turn Pad Guidance lights (figure mentioned in the text is enclosed):

(a) Applicability

Runway turn pad guidance lights should be provided on the runway turn pad intended for use at night and under conditions of poor visibility in such a manner as to provide continuous guidance from the runway centre line through the runway turn pad to the point where a full turn is to be made.

(b) Characteristics:

(1) Runway turn pad guidance lights within the runway turn pad should be fixed lights showing green with beam dimensions such that the light is visible only from aeroplanes on or in the vicinity of the runway turn pad.

(2) Runway turn pad guidance lights at the portion leading off from the runway centre line should be fixed lights showing green.

Note: See figure below for an illustration of the runway turn pad guidance lights.

(a) Location:

(1) Runway turn pad guidance lights shall commence at a point at least 60 m before the beginning of the turn pad guidance line curve, continue beyond the curve into the runway turn pad following the runway turn pad guidance line. The lights on that portion parallel to the runway centre line should always be at least 60 cm from any row of runway centre line lights, as shown in figure 5-20.

Note : Figure 5-20 referred to is in ICAO Annex 14, Chapter 5, page 76.

(2) Recommendation. The lights should be spaced at longitudinal intervals of not more than 7.5 m.

Note : Research carried out to formulate these requirements are based on existing aircraft types. Further research in the future is necessary to include new aircraft types.

Justification:

Reference: IFALPA Annex 14, paragraphs 5.3.y

response *Noted*

Runway turn pad light specifications are in CS-ADR-DSN.M.725.

comment

1730

comment by: UK CAA

Page No: 115

Paragraph No: CS.ADR.DSN. M.720(b)(4)

Comment: There should not be a tolerance of 3m (which allows taxiway edge lights to be placed up to 3m from the edge of the taxiway).

Justification: Lights should be located along the edge of the area declared for use as the taxiway, as this does not promote the use of non-load bearing or unsuitable surface.

Proposed Text: The lights should be located as near as practicable to the edges of the taxiway, runway turn pad, holding bay, de-icing/anti-icing facility, apron or runway.

DELETE text "... etc. or outside the edges at a distance of not more than 3 m."

response *Not accepted*

The text in the CS is taken verbatim from Annex 14.

comment

2348 ❖

comment by: HIA - Highlands and Islands Airports Limited

	Noted
response	<i>Noted</i>

comment	2768 comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	Since subpart (b) is an ICAO recommendation and very detailed it should be moved to the guidance material in order to leave this at the decision of the aerodrome operator
response	<i>Noted</i>
	Flexibility for provision of taxiway edge lights is given in paragraph (a)(1) of the CS. Paragraph (b) contains design criteria and is therefore retained in the CS.

CS-ADR – Book 1 – CS-ADR-DSN.M.725 – Runway turn pad lights

p. 115-116

comment	558 comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #395
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.725
	Référence: CS-ADR-DSN.M.725 Runway turn pad lights
	Traduction de courtoisie It is appropriate to transfer the (b) to GM and to replace it by: « The lights should be spaced at intervals such that a clear indication of the route is provided ».
	The space between lights must be such as the pilot clearly sees the route to be followed by the aircraft. The references about this space must respect this principle but they do not need to be more precise.
response	<i>Not accepted</i>
	The ICAO design specifications in the CS will be retained.

comment	763 comment by: <i>ADP : Aeroports de Paris</i>		
	<table border="1"> <tr> <td>Référence: CS-ADR-DSN.M.725</td> <td>Runway turn pad lights</td> </tr> </table>	Référence: CS-ADR-DSN.M.725	Runway turn pad lights
Référence: CS-ADR-DSN.M.725	Runway turn pad lights		

Proposition/commentaire	(b) Il convient de transférer le (b) en GM et de le remplacer par: « The lights should be spaced at intervals such that a clear indication of the route is provided ».
Justification	L'espacement des feux doit être tel que le cheminement que doit suivre l'aéronef est clairement perçu par le pilote. Les dispositions relatives à cet espacement doivent respecter ce principe mais n'ont pas besoin d'être plus précises.
Traduction de courtoisie	It is appropriate to transfer the (b) to GM and to replace it by: « The lights should be spaced at intervals such that a clear indication of the route is provided ». The space between lights must be such as the pilot clearly sees the route to be followed by the aircraft. The references about this space must respect this principle but they do not need to be more precise.

response *Not accepted*

The ICAO design specifications in the CS will be retained.

comment 1598

comment by: *Aéroport de Marseille - MRS/LFML*

It is appropriate to transfer the (b) to GM and to replace it by: « The lights should be spaced at intervals such that a clear indication of the route is provided ».

The space between lights must be such as the pilot clearly sees the route to be followed by the aircraft. The references about this space must respect this principle but they do not need to be more precise.

response *Not accepted*

The ICAO design specifications in the CS will be retained.

comment 1619

comment by: *Euroairport Bâle-Mulhouse*

Attachment [#396](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.725

Référence: CS-ADR-DSN.M.725
Runway turn pad lights

Traduction de courtoisie

It is appropriate to transfer the (b) to GM and to replace it by: « The lights should be spaced at intervals such that a clear indication of the route is provided ».

The space between lights must be such as the pilot clearly sees the route to be followed by the aircraft. The references about this space must respect this principle but they do not need to be more precise.

response *Not accepted*

The ICAO design specifications in the CS will be retained.

comment

1644

comment by: *ECA - European Cockpit Association*

Add a new CS-ADR-DSN.M.72x on Runway turn pad edge lights, as follows:

Add new CS on Runway Turn Pad Edge Lights :

(a) Application

Runway turn pad edge lights shall be provided on a runway turn pad intended for use at night.

(b) Location

(1) Runway turn pad edge lights on a straight section of the runway turn pad should be spaced at uniform longitudinal intervals of not more than 30m. The lights on a curve should be spaced at intervals less than 30m so that a clear indication of the curve is provided.

(2) The lights should be located as near as practicable to the edges of the runway turn pad or outside the edges at a distance of not more than 3m .

(c) Characteristics

Runway turn pad edge lights shall be fixed lights showing blue. The lights shall show up to at least 30° above the horizontal and at all angles in azimuth necessary to provide guidance to a pilot taxiing. The segment of the runway turn pad edge lights adjacent to the runway extremity shall be unidirectional.

Justification:

Reference: IFALPA Annex 14, paragraphs 5.3.z

response *Not accepted*

The ICAO design specifications in the CS will be retained.

comment

1994

comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate to transfer the (b) to GM and to replace it by: « The lights should be spaced at intervals such that a clear indication of the route is

	<p>provided ».</p> <p>The space between lights must be such as the pilot clearly sees the route to be followed by the aircraft. The references about this space must respect this principle but they do not need to be more precise.</p>
response	<p><i>Not accepted</i></p> <p>The ICAO design specifications in the CS will be retained.</p>

comment	<p>2208 comment by: <i>DGAC Direction Générale de l'aviation civile</i></p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS ADR DSN – Book 1 — CS-ADR-DSN.M.725 — Runway turn pad lights (p115-116) <p><u>2. Justification and proposed text / comment</u></p> <p>Paragraph (b) needs not be so much detailed, since the proposed figures are only guidance to achieve the objective of the lights which is to provide a clear indication of the route to the pilot.</p> <p>Sometimes, the spacing can differ to fulfil the aforementioned objective.</p> <p>Thus, the minimum is to provide the objective in the CS, as proposed below, and it would be appropriate to move the figures in (c)(1), (c)(2) and (c)(3) to GM.</p> <p>CS-ADR-DSN.M.725 — Runway turn pad lights</p> <p>"[...]</p> <p>(b) Location: the runway turn pad lights should be so spaced as to provide a clear indication of the route.</p> <p>(1) [...].</p> <p>[...]"</p>
response	<p><i>Not accepted</i></p> <p>The ICAO design specifications in the CS will be retained.</p>

comment	<p>2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2733 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #397</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.M.725</p>
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Référence: CS-ADR-DSN.M.725
Runway turn pad lights

Traduction de courtoisie
It is appropriate to transfer the (b) to GM and to replace it by: « The lights should be spaced at intervals such that a clear indication of the route is provided ». The space between lights must be such as the pilot clearly sees the route to be followed by the aircraft. The references about this space must respect this principle but they do not need to be more precise.

response *Not accepted*

The ICAO design specifications in the CS will be retained.

comment

2909

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.M.725	Runway turn pad lights
Proposition/commentaire	(b) Il convient de transférer le (b) en GM et de le remplacer par: « The lights should be spaced at intervals such that a clear indication of the route is provided ».
Justification	L'espacement des feux doit être tel que le cheminement que doit suivre l'aéronef est clairement perçu par le pilote. Les dispositions relatives à cet espacement doivent respecter ce principe mais n'ont pas besoin d'être plus précises.
Traduction de courtoisie	It is appropriate to transfer the (b) to GM and to replace it by: « The lights should be spaced at intervals such that a clear indication of the route is provided ». The space between lights must be such as the pilot clearly sees the route to be followed by the aircraft. The references about this space must respect this principle but they do not need to be more precise.

response *Not accepted*

The ICAO design specifications in the CS will be retained.

comment 559 comment by: *Union des Aéroports français - UAF*

Attachment [#398](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.730

Référence: CS-ADR-DSN.M.730
Stop bar lights

Traduction de courtoisie

(a) (1) this article must be review so that the distinction between RVR lower than 350 m and RVR between 350 m and 550 m is clearer.

(c) (8) It is appropriate to transfer this provision to GM.

Experience showed that there is a high risk of pilots dazzling. However it is possible to set several additional identical lights (instead of setting high intensity lights).

response *Partially accepted*

The CS has been amended so that paragraph (a)(1) now stipulates an RVR value of 550m to cover the 350m to 550m case and the below 350m case. The ICAO standards in 5.3.19.1 and 5.3.19.2 are identical apart from the stated RVR values.

Paragraph (c)(8) will be retained. If operational conditions require a different configuration, ELOS can be used.

comment 1026 comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.M.730	Stop bar lights
Proposition/commentaire	(a) (1) Cet article nécessite d'être revu afin que la distinction entre RVR inférieure à 350 m et RVR entre 350 et 550 m soit plus claire. (c) (8) Il convient de transférer la disposition suivante en GM.et d'éviter les feux haute intensité.en dédoublant les feux des barres d'arrêt avec des photométries type U18 et U18
Justification	Pour le (c) (8), l'expérience a montré qu'avec des photométries à haute intensité, il y a un grand risque d'éblouissement des pilotes. En revanche il est possible d'installer plusieurs feux supplémentaires normaux type U18 /U19 orientés (au lieu d'installer des feux à grande intensité).

	Cette solution est notamment appliquée dans le cas d'une barre d'arrêt disposée à proximité du taxiway parallèle à la piste. Dans cette configuration, il est en effet nécessaire d'orienter les feux dans les deux sens de circulation et donc de doubler les feux.
Traduction de courtoisie	(a) (1) this article must be review so that the distinction between RVR lower than 350 m and RVR between 350 m and 550 m is clearer. (c) (8) It is appropriate to transfer this provision to GM. and avoid the use of high intensity lights as U21 or U23. Experience showed that there is a high risk of pilots dazzling with such lights. More convenient solution is to set several normal (type U18/U19) lights with appropriate orientations to enlarge light emitted beams. This solution has been already used for the case of stopbars located near the taxiway parallel to the runway. In this configuration, it was needed to double the stop bar lights to provide light beam for each direction on the taxiway.

response *Partially accepted*

The CS has been amended so that paragraph (a)(1) now stipulates an RVR value of 550 m to cover the 350 m to 550 m case and the below 350 m case. Apart from the stated RVR values, the ICAO standards in 5.3.19.1 and 5.3.19.2 are identical.

Paragraph (c)(8) will be retained. If operational conditions require a different configuration, ELOS can be used.

comment *1059*

comment by: *Belgian CAA*

To reflect the full ICAO range of §5.3.19.1 and 5.3.19.2 (combined value less than 350m and between 350 and 550m), only the value of 550m should remain: "... used in RVR conditions less than a value of 550m, except...".

response *Accepted*

The CS has been amended so that paragraph (a)(1) now stipulates an RVR value of 550 m to cover the 350 m to 550 m case and the below 350 m case. Apart from the stated RVR values, the ICAO standards in 5.3.19.1 and 5.3.19.2 are identical.

comment	<p>1599 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p>
	<p>(a) (1) this article must be review so that the distinction between RVR lower than 350 m and RVR between 350 m and 550 m is clearer.</p> <p>(c) (8) It is appropriate to transfer this provision to GM. Experience showed that there is a high risk of pilots dazzling. However it is possible to set several additional identical lights (instead of setting high intensity lights).</p>
response	<p><i>Partially accepted</i></p>
	<p>The CS has been amended so that paragraph (a)(1) now stipulates an RVR value of 550 m to cover the 350 m to 550 m case and the below 350 m case. Apart from the stated RVR values, the ICAO standards in 5.3.19.1 and 5.3.19.2 are identical.</p> <p>Paragraph (c)(8) will be retained. If operational conditions require a different configuration, ELOS can be used.</p>
comment	<p>1620 comment by: <i>Euroairport Bâle-Mulhouse</i></p>
	<p>Attachment #399</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.730</p> <p>Référence: CS-ADR-DSN.M.730 Stop bar lights</p> <p>Traduction de courtoisie (a) (1) this article must be review so that the distinction between RVR lower than 350 m and RVR between 350 m and 550 m is clearer. (c) (8) It is appropriate to transfer this provision to GM. Experience showed that there is a high risk of pilots dazzling. However it is possible to set several additional identical lights (instead of setting high intensity lights).</p>
response	<p><i>Partially accepted</i></p>
	<p>The CS has been amended so that paragraph (a)(1) now stipulates an RVR value of 550 m to cover the 350 m to 550 m case and the below 350 m case. Apart from the stated RVR values, the ICAO standards in 5.3.19.1 and 5.3.19.2 are identical.</p> <p>Paragraph (c)(8) will be retained. If operational conditions require a different configuration, ELOS can be used.</p>

comment	<p>1645 comment by: ECA - European Cockpit Association</p>
	<p>Delete (a)(1); (2) and (3) and replace with: Stop bars should be used 24 hrs per day irrespective of the weather conditions. Stop bars should be selectively switchable by the appropriate aerodrome controller. Stop bars should be installed at all aerodromes where a runway crossing is possible, and provided at every runway-holding position serving a runway, including non active runways. Aircraft should not cross red stop bars unless contingency measures are in force. Contingency measures should cover all cases where the stop bars or controls are unserviceable.</p> <p>Justification: Runway incursions may take place in all visibility or weather conditions. The provision of stop bars at runway holding positions and their use during the day or night form part of effective runway incursion prevention measures. Reference: IFALPA Annex 14, paragraph 5.3.19.1</p>
response	<p><i>Not accepted</i></p> <p>The ICAO text will be retained in the CS. The mode of use is an operational decision.</p>

comment	<p>1731 comment by: UK CAA</p>
	<p>Page No: 116</p> <p>Paragraph No: CS-ADR-DSN.M.730</p> <p>Comment: Para. (a) (1) is difficult to understand.</p> <p>Justification: Stop bar operation is very important to the safety of runway operations. The CS should clearly describe those conditions that warrant their use as well as the conditions that may lead to exceptions.</p> <p>Proposed Text:</p> <p>a) Applicability: (1) A stop bar should be provided at every runway-holding position serving a runway when it is intended that the runway will be used in runway visual range conditions less than a value of 350 m. [DELETE text "... and values between 350 m and 550 m except where:" and MOVE text in (i) and (ii) to item (2) below]</p> <p>ADD NEW TEXT: (2) A stop bar should be provided at every runway-holding position serving a runway when it is intended that the runway will be used in runway visual range conditions between values of 350 m and 550 m except where: (i) appropriate aids and procedures are available to assist in preventing inadvertent incursions of aircraft and vehicles onto the runway; or (ii) operational procedures exist to limit, in runway visual range conditions less than a value of 550 m, the number of:</p>

	(A) aircraft on the manoeuvring area to one at a time; and (B) vehicles on the manoeuvring area to the essential minimum.
response	<i>Partially accepted</i> The CS has been amended so that paragraph (a)(1) now stipulates an RVR value of 550 m to cover the 350 m to 550 m case and the below 350 m case. Apart from the stated RVR values, the ICAO standards in 5.3.19.1 and 5.3.19.2 are identical.

comment	1732 comment by: UK CAA Page No: 116 Paragraph No: CS-ADR-DSN.M.730 (c) (1) Comment: ICAO has agreed to spacing of stop bar lights up to 3m, so the EASA text should read the same as ICAO. Justification: Paragraph needs altering to reflect latest ICAO requirements. Also, at runway-taxi holding positions where there is an increased risk of runway incursion placing the lights closer together increases conspicuity. This has been proved in service in the UK and has been adopted by ICAO. Proposed Text: (1) "Stop bars should consist of lights spaced at intervals of no greater than 3m across the taxiway, showing red in the intended direction(s) of approach to the intersection or runway holding position."
response	<i>Noted</i> The text in the CS is taken verbatim from the current Annex 14. The Agency monitors proposed ICAO changes, and when the relevant text is mature, it is incorporated into the CS.

comment	1766 comment by: DGAC Direction Générale de l'aviation civile <u>1. Affected paragraphs</u> <ul style="list-style-type: none"> • CS-ADR - Book 1 – CS-ADR-DSN.M.730 - Stop bar lights (p116-117) • CS-ADR - Book 2 - GM-ADR-DSN.M.730 – Stop bar lights (p271) <u>2. Justification and proposed text / comment</u> It is appropriate to transfer this provision to GM. Indeed, experience has proven that there is a high risk of dazzling the pilots by the use of such lights. However, it is possible to provide several additional "normal" lights (instead of providing high intensity lights). CS-ADR-DSN.M.730 – Stop bar lights
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~~"[...] (8) Where a wide beam fixture is required, the intensity in red light and beam spreads of stop bar lights should be in accordance with the specifications in CS-ADR/DSN.U.940, Figure U-21 or U-23. [...]"~~

GM-ADR-DSN.M.730 – Stop bar lights

~~"Where a wide beam fixture is required, the intensity in red light and beam spreads of stop bar lights should be in accordance with the specifications in CS-ADR/DSN.U.940, Figure U-21 or U-23."~~

response *Not accepted*

Paragraph (c)(8) will be retained. If operational conditions require a different configuration, ELOS can be used.

comment **1933** comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#400](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.730

Référence: CS-ADR-DSN.M.730
Stop bar lights

Traduction de courtoisie

(a) (1) this article must be review so that the distinction between RVR lower than 350 m and RVR between 350 m and 550 m is clearer.

(c) (8) It is appropriate to transfer this provision to GM.

Experience showed that there is a high risk of pilots dazzling. However it is possible to set several additional identical lights (instead of setting high intensity lights).

response *Partially accepted*

The CS has been amended so that paragraph (a)(1) now stipulates an RVR value of 550 m to cover the 350 m to 550 m case and the below 350 m case. Apart from the stated RVR values, the ICAO standards in 5.3.19.1 and 5.3.19.2 are identical.

Paragraph (c)(8) will be retained. If operational conditions require a different configuration, ELOS can be used.

comment **1988** comment by: *Pau Pyrénées Airport - PUF/LFBP*

(a) (1) this article must be review so that the distinction between RVR lower than 350 m and RVR between 350 m and 550 m is clearer.

(c) (8) It is appropriate to transfer this provision to GM.

Experience showed that there is a high risk of pilots dazzling. However it is

	possible to set several additional identical lights (instead of setting high intensity lights).
response	<p><i>Partially accepted</i></p> <p>The CS has been amended so that paragraph (a)(1) now stipulates an RVR value of 550 m to cover the 350 m to 550 m case and the below 350 m case. Apart from the stated RVR values, the ICAO standards in 5.3.19.1 and 5.3.19.2 are identical.</p> <p>Paragraph (c)(8) will be retained. If operational conditions require a different configuration, ELOS can be used.</p>

comment	<p>2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2735 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #401</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.M.730</p> <p>Référence: CS-ADR-DSN.M.730 Stop bar lights</p> <p>Traduction de courtoisie (a) (1) this article must be review so that the distinction between RVR lower than 350 m and RVR between 350 m and 550 m is clearer. (c) (8) It is appropriate to transfer this provision to GM. Experience showed that there is a high risk of pilots dazzling. However it is possible to set several additional identical lights (instead of setting high intensity lights).</p>
response	<p><i>Partially accepted</i></p> <p>The CS has been amended so that paragraph (a)(1) now stipulates an RVR value of 550 m to cover the 350 m to 550 m case and the below 350 m case. Apart from the stated RVR values, the ICAO standards in 5.3.19.1 and 5.3.19.2 are identical.</p> <p>Paragraph (c)(8) will be retained. If operational conditions require a different configuration, ELOS can be used.</p>

comment	<p>2910 comment by: <i>ACA - Aéroports de la Côte d'Azur - NCE/LFMN</i></p>
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Référence: CS-ADR-DSN.M.730	Stop bar lights
Proposition/commentaire	(a) (1) Cet article nécessite d'être revu afin que la distinction entre RVR inférieure à 350 m et RVR entre 350 et 550 m soit plus claire. (c) (8) Il convient de transférer la disposition suivante en GM.
Justification	Pour le (c) (8), l'expérience a montré qu'avec une telle disposition, il y a un grand risque d'éblouissement des pilotes. En revanche il est possible d'installer plusieurs feux supplémentaires identiques (au lieu d'installer des feux à grande intensité).
Traduction de courtoisie	(a) (1) this article must be review so that the distinction between RVR lower than 350 m and RVR between 350 m and 550 m is clearer. (c) (8) It is appropriate to transfer this provision to GM. Experience showed that there is a high risk of pilots dazzling. However it is possible to set several additional identical lights (instead of setting high intensity lights).

response *Partially accepted*

The CS has been amended so that paragraph (a)(1) now stipulates an RVR value of 550 m to cover the 350 m to 550 m case and the below 350 m case. Apart from the stated RVR values, the ICAO standards in 5.3.19.1 and 5.3.19.2 are identical.

Paragraph (c)(8) will be retained. If operational conditions require a different configuration, ELOS can be used.

CS-ADR – Book 1 – CS-ADR-DSN.M.735 – Intermediate holding position lights

p. 117-118

comment 560

comment by: *Union des Aéroports français - UAF*

Attachment [#402](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.735

Référence: CS-ADR-DSN.M.735
Intermediate holding position lights

Traduction de courtoisie

(a) (2) It is appropriate to transfer these provisions to GM.
They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

The remaining text is ICAO standards. Paragraph (a)(2) is thus retained for completeness of the CS.

comment 768

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.M.735	Intermediate holding position lights
Proposition/commentaire	(a)(2) Il convient de transférer ces dispositions en Guidance Materials.
Justification	Cette disposition n'étant qu'une règle de l'art et non une référence normative dans l'Annexe 14 de l'OACI, elle a sa place en GM et non en CS.
Traduction de courtoisie	(a) (2) It is appropriate to transfer these provisions to GM. They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

The remaining text is ICAO standards. Paragraph (a)(2) is thus retained for completeness of the CS.

comment 1601

comment by: *Aéroport de Marseille - MRS/LFML*

(a) (2) It is appropriate to transfer these provisions to GM.
They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response	<p><i>Not accepted</i></p> <p>The remaining text is ICAO standards. Paragraph (a)(2) is thus retained for completeness of the CS.</p>
comment	<p>1622 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #403</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.735</p> <p>Référence: CS-ADR-DSN.M.735 Intermediate holding position lights</p> <p>Traduction de courtoisie (a) (2) It is appropriate to transfer these provisions to GM. They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p>
response	<p><i>Not accepted</i></p> <p>The remaining text is ICAO standards. Paragraph (a)(2) is thus retained for completeness of the CS.</p>
comment	<p>1934 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #404</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.735</p> <p>Référence: CS-ADR-DSN.M.735 Intermediate holding position lights</p> <p>Traduction de courtoisie (a) (2) It is appropriate to transfer these provisions to GM. They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p>
response	<p><i>Not accepted</i></p> <p>The remaining text is ICAO standards. Paragraph (a)(2) is thus retained for completeness of the CS.</p>
comment	<p>1979 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i></p> <p>(a) (2) It is appropriate to transfer these provisions to GM.</p>

They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

The remaining text is ICAO standards. Paragraph (a)(2) is thus retained for completeness of the CS.

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2736 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#405](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.M.735

Référence: CS-ADR-DSN.M.735
Intermediate holding position lights

Traduction de courtoisie
(a) (2) It is appropriate to transfer these provisions to GM. They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

The remaining text is ICAO standards. Paragraph (a)(2) is thus retained for completeness of the CS.

comment 2911 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.M.735	Stop bar lights
Proposition/commentaire	(a)(2) Il convient de transférer ces dispositions en Guidance Materials.
Justification	Cette disposition n'étant qu'une règle de l'art et non une référence normative dans l'Annexe 14 de l'OACI, elle a sa place en GM et non en CS.
Traduction de courtoisie	(a) (2) It is appropriate to transfer these

	provisions to GM. They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.
response	<p><i>Not accepted</i></p> <p>The remaining text is ICAO standards. Paragraph (a)(2) is thus retained for completeness of the CS.</p> <p>This CS is for intermediate holding position lights, not stop bar lights.</p>

CS-ADR – Book 1 – CS-ADR-DSN.M.740 – De-icing/anti-icing facility exit lights

p. 118

comment	<p>561 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #406</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.740</p> <p>Référence: CS-ADR-DSN.M.740 De-icing/anti-icing facility exit lights</p> <p>Traduction de courtoisie</p> <p>(a) It is appropriate to modify in the following way : « The purpose of the de-icing/anti-icing facility exit lights should be provided at is to indicate the exit boundary of a remote de-icing/anti-icing facility adjoining a taxiway. » Such a modification ensure a clarification of the purpose of these lights.</p> <p>b) It is appropriate to modify in the following way : « Where provided de-icing/anti-icing facility exit lights should be located 0.3 m inward of the intermediate holding position marking displayed at the exit boundary of a remote de-icing/ anti-icing facility.</p> <p>(c) It is appropriate to modify in the following way : « Where provided de-icing/anti-icing facility exit lights should consist of in-pavement fixed unidirectional lights spaced at intervals of 6 m showing yellow in the direction of the approach to the exit boundary with a light distribution similar to taxiway centre line lights (see Figure M-13). Adding "where provided" allows to clearly indicate that these lights are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.740.</p>
response	<p><i>Accepted</i></p>

comment 771

comment by: ADP : Aeroports de Paris

Référence: CS-ADR-DSN.M.740	De-icing/anti-icing facility exit lights
Proposition/commentaire	<p>(a) Nous proposons la modification suivante: « The purpose of the de-icing/anti-icing facility exit lights should be provided at is to indicate the exit boundary of a remote de-icing/anti-icing facility adjoining a taxiway. »</p> <p>(b) Nous proposons la modification suivante: « Where provided de-icing/anti-icing facility exit lights should be located 0.3 m inward of the intermediate holding position marking displayed at the exit boundary of a remote de-icing/ anti-icing facility.</p> <p>(c) Nous proposons la modification suivante : « Where provided de-icing/anti-icing facility exit lights should consist of in-pavement fixed unidirectional lights spaced at intervals of 6 m showing yellow in the direction of the approach to the exit boundary with a light distribution similar to taxiway centre line lights (see Figure M-13).</p>
Justification	<p>Une telle modification au (a) permet une clarification du but de ces feux.</p> <p>L'ajout de « where provided » permet de clairement indiquer que ces feux ne sont pas obligatoires mais que s'ils sont installés ils doivent respecter le CS-ADR-DSN.M.740.</p>
Traduction de courtoisie	<p>(a) It is appropriate to modify in the following way : « The purpose of the de-icing/anti-icing facility exit lights should be provided at is to indicate the exit boundary of a remote de-icing/anti-icing facility adjoining a taxiway. » Such a modification ensure a clarification of the purpose of these lights.</p> <p>b) It is appropriate to modify in the following way : « Where provided de-icing/anti-icing facility exit lights should be located 0.3 m inward of the intermediate holding position marking displayed at the exit boundary of a remote de-icing/ anti-icing facility.</p> <p>(c) It is appropriate to modify in the following way : « Where provided de-icing/anti-icing facility exit lights should consist of in-pavement fixed unidirectional lights spaced at intervals of 6 m showing yellow in the direction of the</p>

approach to the exit boundary with a light distribution similar to taxiway centre line lights (see Figure M-13).
Adding "where provided" allows to clearly indicate that these lights are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.740.

response *Accepted*

comment 1600

comment by: *Aéroport de Marseille - MRS/LFML*

(a) It is appropriate to modify in the following way : « **The purpose of the de-icing/anti-icing facility exit lights should be provided at** is to indicate the exit boundary of a remote de-icing/anti-icing facility adjoining a taxiway. »
Such a modification ensure a clarification of the purpose of these lights.

b) It is appropriate to modify in the following way : « **Where provided** de-icing/anti-icing facility exit lights should be located 0.3 m inward of the intermediate holding position marking displayed at the exit boundary of a remote de-icing/ anti-icing facility.

(c) It is appropriate to modify in the following way : « **Where provided** de-icing/anti-icing facility exit lights should consist of in-pavement fixed unidirectional lights spaced at intervals of 6 m showing yellow in the direction of the approach to the exit boundary with a light distribution similar to taxiway centre line lights (see Figure M-13).
Adding "where provided" allows to clearly indicate that these lights are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.740.

response *Accepted*

comment 1623

comment by: *Euroairport Bâle-Mulhouse*

Attachment [#407](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.740

Référence: CS-ADR-DSN.M.740
De-icing/anti-icing facility exit lights

Traduction de courtoisie (a) It is appropriate to modify in the following way : « **The purpose of the de-icing/anti-icing facility exit lights should be provided at** is to indicate the exit boundary of a remote de-icing/anti-icing facility adjoining a taxiway. »
Such a modification ensure a clarification of the purpose of these lights.

b) It is appropriate to modify in the following way : « **Where provided** de-icing/anti-icing facility exit lights should be located 0.3 m inward of the intermediate holding position marking displayed at the exit boundary of a remote de-icing/ anti-icing facility.

(c) It is appropriate to modify in the following way : « **Where provided** de-icing/anti-icing facility exit lights should consist of in-pavement fixed unidirectional lights spaced at intervals of 6 m showing yellow in the direction of the approach to the exit boundary with a light distribution similar to taxiway centre line lights (see Figure M-13).

Adding "where provided" allows to clearly indicate that these lights are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.740.

response *Accepted*

comment

1935

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#408](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.740

Référence: CS-ADR-DSN.M.740

De-icing/anti-icing facility exit lights

Traduction de courtoisie

(a) It is appropriate to modify in the following way : « **The purpose of the** de-icing/anti-icing facility exit lights ~~should be provided at~~ **is to indicate** the exit boundary of a remote de-icing/anti-icing facility adjoining a taxiway. »

Such a modification ensure a clarification of the purpose of these lights.

b) It is appropriate to modify in the following way : « **Where provided** de-icing/anti-icing facility exit lights should be located 0.3 m inward of the intermediate holding position marking displayed at the exit boundary of a remote de-icing/ anti-icing facility.

(c) It is appropriate to modify in the following way : « **Where provided** de-icing/anti-icing facility exit lights should consist of in-pavement fixed unidirectional lights spaced at intervals of 6 m showing yellow in the direction of the approach to the exit boundary with a light distribution similar to taxiway centre line lights (see Figure M-13).

Adding "where provided" allows to clearly indicate that these lights are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.740.

response *Accepted*

comment

1977

comment by: *Pau Pyrénées Airport - PUF/LFBP*

(a) It is appropriate to modify in the following way : « **The purpose of the** de-icing/anti-icing facility exit lights ~~should be provided at~~ **is to indicate** the exit boundary of a remote de-icing/anti-icing facility adjoining a taxiway. »

Such a modification ensure a clarification of the purpose of these lights.

b) It is appropriate to modify in the following way : « **Where provided** de-icing/anti-icing facility exit lights should be located 0.3 m inward of the intermediate holding position marking displayed at the exit boundary of a remote de-icing/ anti-icing facility.

(c) It is appropriate to modify in the following way : « **Where provided** de-icing/anti-icing facility exit lights should consist of in-pavement fixed unidirectional lights spaced at intervals of 6 m showing yellow in the direction of the approach to the exit boundary with a light distribution similar to taxiway centre line lights (see Figure M-13).

Adding "where provided" allows to clearly indicate that these lights are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.740.

response *Accepted*

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2912 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.M.740

De-icing/anti-icing facility exit lights

Proposition/commentaire

(a) Nous proposons la modification suivante:
« **The purpose of the de-icing/anti-icing facility exit lights should be provided at is to indicate** the exit boundary of a remote de-icing/anti-icing facility adjoining a taxiway. »

(b) Nous proposons la modification suivante:
« **Where provided** de-icing/anti-icing facility exit lights should be located 0.3 m inward of the intermediate holding position marking displayed at the exit boundary of a remote de-icing/ anti-icing facility.

(c) Nous proposons la modification suivante :
« **Where provided** de-icing/anti-icing facility exit lights should consist of in-pavement fixed unidirectional lights spaced at intervals of 6 m showing yellow in the direction of the approach to the exit boundary with a light distribution similar to taxiway centre line lights (see Figure M-13).

Justification

Une telle modification au (a) permet une clarification du but de ces feux.

	L'ajout de « where provided » permet de clairement indiquer que ces feux ne sont pas obligatoires mais que s'ils sont installés ils doivent respecter le CS-ADR-DSN.M.740.
Traduction de courtoisie	<p>(a) It is appropriate to modify in the following way : « The purpose of the de-icing/anti-icing facility exit lights should be provided at is to indicate the exit boundary of a remote de-icing/anti-icing facility adjoining a taxiway. » Such a modification ensure a clarification of the purpose of these lights.</p> <p>b) It is appropriate to modify in the following way : « Where provided de-icing/anti-icing facility exit lights should be located 0.3 m inward of the intermediate holding position marking displayed at the exit boundary of a remote de-icing/ anti-icing facility.</p> <p>(c) It is appropriate to modify in the following way : « Where provided de-icing/anti-icing facility exit lights should consist of in-pavement fixed unidirectional lights spaced at intervals of 6 m showing yellow in the direction of the approach to the exit boundary with a light distribution similar to taxiway centre line lights (see Figure M-13). Adding "where provided" allows to clearly indicate that these lights are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.740.</p>
response	<i>Accepted</i>

CS-ADR - Book 1 -- Book 1 — Figure M-13 Typical remote de-icing/anti-icing facility

p. 118

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	Noted	

comment	2769	comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	Figure refers to Chapter numbers of ICAO Annex 14 (cross reference to Section 3.15.10 and Table 3-1) and should be adapted to the according Chapters in the EASA document. Additionally this figure is already listed within this document (page 118 CS-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad) and should be cross-referenced accordingly.	
response	<i>Accepted</i>	
	Text references will be rectified; . Figure M-13 is slightly different to Figure G-1 in that it shows facility exit lights location.	

CS-ADR - Book 1 -- Book 1 — CS-ADR-DSN.M.745 — Runway guard lights p. 118-120
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comment	70	comment by: <i>Belfast International Airport - BFS/EGAA</i>
	(2) word collocated misspelt	
response	<i>Not accepted</i>	
	Spelling is correct;. According to definition from the <i>Oxford English Dictionary</i> and other reference sources, it is defined as means "placed next to or close to".	

comment	93	comment by: <i>CAA-NL</i>
	We suggest to add the text 'medium or light' to (1) (ii), according to ICAO Annex 14, 5.3.22.2.b.	
response	<i>Noted</i>	
	The use of guard lights in medium or light traffic conditions can be covered by an ELOS.	

comment	216	comment by: <i>CAA Austria - Ministry of Transport</i>
	In Austria Runway guard lights are not in use. At all Airports with CAT II-III approaches, only CAT II-III runway holding positions are marked and fitted with stop bars. This stop bars are always - druning the operational hours - active and have to be deactivated by ATC.	
	We would suggest to extend this chapter similar as stated in CAA-UK CAP 168	

- Appendix 2D - Point 2.15 (b)
 "The use of stop-bars 24 hours a day in all lighting conditions should be considered as runway incursions are not limited to low visibility conditions"

response *Noted*

The comments regarding stop bars are in the wrong segment — - this segment is for guard light comments. In any event, the the proposed use of stop bars is an operational consideration.

comment 226

comment by: *Flughafen Düsseldorf GmbH*

c)1) Fehlerhaft: Konfiguration B stellt die Anordnung der Feuer **nur** auf der Rollbahn dar. Eine Anordnung der Start-/Landebahnbeleuchtung beidseitig der Rollbahn ist in Konfiguration B nicht vorgesehen; die beidseitige Anordnung ist **nur** in Konfiguration A vorgesehen.

response *Accepted*

comment 405

comment by: *Cologne/Bonn Airport*

(c) Location:
 (1) Runway guard lights, Configuration A, Configuration B, or both, should be located at each side of the taxiway and at the same distance as the runway holding position marking.

delete
 „Configuration B, or both“

Configuration B is never located on the side of Taxiways; According to ICAO

response *Accepted*

comment 562

comment by: *Union des Aéroports français - UAF*

Attachment [#409](#)

UAF

NPA

2011-20

(B.III)

CS-ADR-DSN.M.745

Référence:	CS-ADR-DSN.M.745
Runway	guard lights
Traduction	de courtoisie
(b) (2), (d) (2) and (d) (5) to (10): it is appropriate to transfer these provisions to GM.	
They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.	
Moreover the demonstration of need in (d) (2) is not obvious. The choice to opt for this configuration must remain a possibility but it must not be a reference.	
response	<i>Partially accepted</i>
Paragraph (d)(2) has been moved to GM; the . The remaining paragraphs are retained in the CS as they contain design specifications.	

comment

772

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.M.745	Runway guard lights
Proposition/commentaire	(b) (2) Il convient de transférer ces dispositions en Guidance Materials. (d) (2) Il convient de transférer ces dispositions en Guidance Materials. (d) (5) à (10) Il convient de transférer ces dispositions en Guidance Materials.
Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS. De plus, la démonstration du besoin pour le (d) (2) n'est pas évidente. Le choix de prendre cette configuration doit demeurer une possibilité mais ne doit pas être une référence.
Traduction de courtoisie	(b) (2), (d) (2) and (d) (5) to (10): it is appropriate to transfer these provisions to GM. They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS. Moreover the demonstration of need in (d) (2) is not obvious. The choice to opt for this

	configuration must remain a possibility but it must not be a reference.
response	<p><i>Partially accepted</i></p> <p>Paragraph (d)(2) has been moved to GM; the . The remaining paragraphs are retained in the CS as they contain design specifications.</p>
comment	<p>789 comment by: <i>Munich Airport International</i></p> <p><u>(c) Location</u></p> <p>delete: „Configuration B, or both“</p> <p>Justification: Configuration B is never located on the side of Taxiways; According to ICAO</p>
response	<i>Accepted</i>
comment	<p>1603 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>(b) (2), (d) (2) and (d) (5) to (10): it is appropriate to transfer these provisions to GM.</p> <p>They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS. Moreover the demonstration of need in (d) (2) is not obvious. The choice to opt for this configuration must remain a possibility but it must not be a reference.</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (d)(2) has been moved to GM; the . The remaining paragraphs are retained in the CS as they contain design specifications.</p>
comment	<p>1624 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #410</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.745</p>

	<p>Référence: CS-ADR-DSN.M.745</p> <p>Runway guard lights</p> <p>Traduction de courtoisie</p> <p>(b) (2), (d) (2) and (d) (5) to (10): it is appropriate to transfer these provisions to GM.</p> <p>They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p> <p>Moreover the demonstration of need in (d) (2) is not obvious. The choice to opt for this configuration must remain a possibility but it must not be a reference.</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (d)(2) has been moved to GM; the . The remaining paragraphs are retained in the CS as they contain design specifications.</p>
comment	<p>1646 comment by: ECA - European Cockpit Association</p> <p>Amend as follows: (c) Location: (1) Runway guard lights, Configuration A, Configuration B, or both, should be located at each side of the taxiway, and at the same distance as the co- <u>located in alignment with the marking of the corresponding</u> runway holding position marking. (2) Runway guard lights, Configuration B, should be located across the taxiway, and at the same distance as parallel to and not more than 1m from the <u>taxiway side of</u> the runway holding position marking.</p> <p>Justification: It is not clear whether in (1) Configuration B lights can be located at each side of the taxiway as by their design they have to be located across the taxiway. Reference: IFALPA Annex 14, paragraph 5.3.22.4 and 5.3.22.5</p>
response	<p><i>Noted</i></p> <p>Comment on (c) (1): <i>Agreed</i> Comment on (c) (2): <i>Not Agreed:</i> (CS text will remain ICAO wording.)</p>
comment	<p>1650 comment by: ECA - European Cockpit Association</p> <p>Amend (d)(4) as follows: (4) The light beam should be unidirectional and aligned so as to be visible to the pilot of an aeroplane taxiing to the holding position and operator of a <u>vehicle approaching the holding position marking. Runway guard lights should remain visible to pilots or drivers of approaching aircraft or</u></p>

response	<p><u>vehicles.</u></p> <p>Justification:</p> <p>Reference: IFALPA Annex 14, paragraph 5.3.22.9</p> <p><i>Noted</i></p> <p>ICAO does not mention vehicles; . This is an operational consideration.</p>
comment	<p>1652 comment by: <i>ECA - European Cockpit Association</i></p> <p>Add new paragraph: If installed, runway guard lights should be in use day and night at active holding position markings. Note- When there is more than one holding position marking at the same taxiway/runway intersection, runway guard lights and stopbars at non-active holding position markings shall be switched off.</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 5.3.22.4 and 5.3.22.x</p>
response	<p><i>Not accepted</i></p> <p>This is an operational consideration.</p>
comment	<p>1735 comment by: <i>UK CAA</i></p> <p>Page No: 119</p> <p>Paragraph No: CS-ADR-DSN.M.745 (b) (1)</p> <p>Comment: This requirement links the operation of the runway guard lights with visibility. It should be linked to the runway being active. Text should be reworded and items (i) & (ii) deleted.</p> <p>Justification: To demonstrate to drivers and pilots that the runway is active, runway guard lights should be operational throughout the active period of the runway being in use.</p> <p>Proposed Text: Runway guard lights, Configuration A, should be provided at each taxiway/runway intersection associated with a runway and illuminated when the runway is active.</p> <p>DELETE items (i) & (ii).</p>
response	<p><i>Noted</i></p> <p>Paragraphs (i) and (ii) are retained, but will be reviewed when the outcome of ICAO SL 41 is mature.</p>

comment	<p>1736 comment by: UK CAA</p> <p>Page No: 119</p> <p>Paragraph No: CS-ADR-DSN.M.745 (b) (2)</p> <p>Comment: Text is unclear whether the runway guard lights Configuration A & B should be co-located.</p> <p>Justification: Configuration B is operational during the day but extinguished in hours of darkness or during low visibility operations when the stop bars are in use. In these circumstances, protection for the taxiway/runway intersection is left to Configuration A. Therefore, it would be prudent to supplement Configuration A with Configuration B, when applicable, rather than replace Configuration A.</p> <p>Proposed Text: Runway guard lights, Configuration B, should be provided at each taxiway/runway intersection in conjunction with CS-ADR-DSN.M.745 (b) (1) where enhanced conspicuity of the taxiway/runway intersection is needed, such as on a wide-throat taxiway, except that Configuration B should not be co-located with a stop bar.</p>
response	<p><i>Noted</i></p> <p>The text is verbatim from Annex 14.</p>

comment	<p>1738 comment by: UK CAA</p> <p>Page No: 119</p> <p>Paragraph No: CS-ADR-DSN.M.745 (c) (1)</p> <p>Comment: Configuration B should not be included in the para. Suggest delete Configuration B.</p> <p>Justification: The paragraph relates to the location of Configuration A not Configuration B (which runs across the taxiway and is not at the sides).</p> <p>Proposed Text: Runway guard lights, Configuration A, should be located at each side of the taxiway and at the same distance as the runway holding position marking.</p>
response	<p><i>Accepted</i></p>

comment	<p>1936 comment by: Aéroport Nantes Atlantique - NTE/LFRS</p> <p>Attachment #411</p>
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	UAF	NPA	2011-20	(B.III)	CS-ADR-DSN.M.745
	Référence:				CS-ADR-DSN.M.745
	Runway			guard	lights
	Traduction			de	courtoisie
	(b) (2), (d) (2) and (d) (5) to (10): it is appropriate to transfer these provisions to GM.				
	They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.				
	Moreover the demonstration of need in (d) (2) is not obvious. The choice to opt for this configuration must remain a possibility but it must not be a reference.				
response	<i>Partially accepted</i>				
	Paragraph (d)(2) has been moved to GM. The remaining paragraphs are retained in the CS as they contain design specifications.				
comment	1975			comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>	
	(b) (2), (d) (2) and (d) (5) to (10): it is appropriate to transfer these provisions to GM.				
	They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.				
	Moreover the demonstration of need in (d) (2) is not obvious. The choice to opt for this configuration must remain a possibility but it must not be a reference.				
response	<i>Partially accepted</i>				
	Paragraph (d)(2) has been moved to GM. The remaining paragraphs are retained in the CS as they contain design specifications.				
comment	2348 ❖			comment by: <i>HIA - Highlands and Islands Airports Limited</i>	
	Noted				
response	<i>Noted</i>				
comment	2738			comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>	

Attachment [#412](#)

ADB M NPA 2011-20 (B.III) CS-ADR-DSN.M.745

Référence: CS-ADR-DSN.M.745

Runway guard lights

Traduction de courtoisie

(b) (2), (d) (2) and (d) (5) to (10): it is appropriate to transfer these provisions to GM.

They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

Moreover the demonstration of need in (d) (2) is not obvious. The choice to opt for this configuration must remain a possibility but it must not be a reference.

response *Partially accepted*

Paragraph (d)(2) has been moved to GM. The remaining paragraphs are retained in the CS as they contain design specifications.

comment

2770

comment by: *Airport Nuremberg - NUE/EDDN*

In order to be correct and compliant with the Annex 14 standard, c-1 must be changed to:

5.3.22.4 Runway guard lights, Configuration A, shall be located at each side of the taxiway at a distance from the runway centre line not less than that specified for a take-off runway.

response *Accepted*

comment

2913

comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.M.745

Runway guard lights

Proposition/commentaire

(b) (2) Il convient de transférer ces dispositions en Guidance Materials.

(d) (2) Il convient de transférer ces dispositions en Guidance Materials.

(d) (5) à (10) Il convient de transférer ces dispositions en Guidance Materials.

Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS. De plus, la démonstration du besoin pour le (d) (2) n'est pas évidente. Le choix de prendre cette configuration doit demeurer une possibilité mais ne doit pas être une référence.
Traduction de courtoisie	(b) (2), (d) (2) and (d) (5) to (10): it is appropriate to transfer these provisions to GM. They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS. Moreover the demonstration of need in (d) (2) is not obvious. The choice to opt for this configuration must remain a possibility but it must not be a reference.

response *Partially accepted*

Paragraph (d)(2) has been moved to GM. The remaining paragraphs are retained in the CS as they contain design specifications.

comment

3011

comment by: *ADV -German Airports Association*

CS-ADR-DSN.M.745

(c)

Location:

(1) Runway guard lights, Configuration A, Configuration B, or both, should be located at each side of the taxiway and at the same distance as the runway holding position marking.

delete

„Configuration B, or both“

Justification

Configuration B is never located on the side of Taxiways; According to ICAO

response	<i>Accepted</i>	
comment	3046	comment by: <i>MST / STR - Stuttgart Airport</i>
	CS-ADR-DSN.M.745 (c)	Location:
	(1) Runway guard lights, Configuration A, Configuration B, or both, should be located at each side of the taxiway and at the same distance as the runway holding position marking.	
	delete	
	Justificaiton „Configuration B, or both“ Configuration B is never located on the side of Taxiways; According to ICAO	
response	<i>Accepted</i>	

CS-ADR - Book 1 -- Book 1 – Figure M-14 Runway guard lights
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p. 120

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR - Book 1 -- Book 1 – CS-ADR-DSN.M.750 – Apron floodlighting

p. 120-121

comment	563	comment by: <i>Union des Aéroports français - UAF</i>		
	Attachment #413			
	UAF	NPA	2011-20	(B.III) CS-ADR-DSN.M.750
	Référence:	CS-ADR-DSN.M.750		
	Apron	floodlighting		

Traduction de courtoisie

(a) It is appropriate to add in (a): « the purpose of apron lighting is to help the pilot to find his way on this area to its stand. »

It is important to know the purpose of apron lighting so that there is no confusion with other functions that other lighting sources have to carry out notably around the aircraft on its stand during fuelling.

(b) It is appropriate to transfer this provision to GM.

(c) (2) It is appropriate to transfer this provision to GM because it is too precise.

(b) and (c) (2) are just good practices and not normative references so they must be in GM and not in CS.

response *Partially accepted*

Objectives on some CSs will be added among applicability and characteristics. The text in (b) will be reviewed. The text in (b) (2) is design requirement; therefore, it will remain as CS.

comment 773

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.M.750	Apron floodlighting
Proposition/commentaire	<p>Il convient d'ajouter au (a): "L'objectif de l'éclairage de l'aire de stationnement est de permettre au pilote de mieux se repérer sur cette aire afin de trouver son chemin vers son poste de stationnement ".</p> <p>(b) Il convient de transférer cette disposition en Guidance Materials.</p> <p>(c) (2) Il convient de transférer cette disposition en Guidance Materials car elle est trop précise.</p>
Justification	<p>Les dispositions (b) et (c) (2) n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.</p> <p>Il est important au (a) de connaître l'objectif de cet éclairage des aires de stationnement pour qu'il n'y ait pas de confusion avec d'autres fonctions que doivent remplir d'autres sources d'éclairage notamment autour de l'avion lors de l'avitaillement.</p> <p>De manière générale, les niveaux d'éclairage doivent rester des recommandations car les</p>

	performances d'éclairage en extérieur sont toujours complexes à mesurer..
Traduction de courtoisie	<p>(a) It is appropriate to add in (a): « the purpose of apron lighting is to help the pilot finding his way on this area to the aircraft parking position. »</p> <p>It is important to know the purpose of apron lighting so that there is no confusion with other functions that other lighting sources have to carry out notably around the aircraft during fuelling.</p> <p>(b) It is appropriate to transfer this provision to GM.</p> <p>(c) (2) It is appropriate to transfer this provision to GM because it is too precise.</p> <p>(b) and (c) (2) are just good practices and not normative references so they must be in GM and not in CS.</p> <p>As a general point, outdoor lighting performances are always difficult to measure and lighting levels in industry and public building applications and requirements stay as recommendations.</p>

response *Partially accepted*

Objectives on some CSs will be added among applicability and characteristics. The text in (b) will be reviewed. The text in (b) (2) is design requirement; therefore, it will remain as CS.

comment *1605*

comment by: *Aéroport de Marseille - MRS/LFML*

(a) It is appropriate to add in (a): « the purpose of apron lighting is to help the pilot to find his way on this area to its stand. »

It is important to know the purpose of apron lighting so that there is no confusion with other functions that other lighting sources have to carry out notably around the aircraft on its stand during fuelling.

(b) It is appropriate to transfer this provision to GM.

	<p>(c) (2) It is appropriate to transfer this provision to GM because it is too precise.</p> <p>(b) and (c) (2) are just good practices and not normative references so they must be in GM and not in CS.</p>
response	<p><i>Partially accepted</i></p> <p>Objectives on some CSs will be added among applicability and characteristics. The text in (b) will be reviewed. The text in (b) (2) is design requirement; therefore, it will remain as CS.</p>

comment	<p>1625 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #414</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.750</p> <p>Référence: CS-ADR-DSN.M.750</p> <p>Apron floodlighting</p> <p>Traduction de courtoisie</p> <p>(a) It is appropriate to add in (a): « the purpose of apron lighting is to help the pilot to find his way on this area to its stand. »</p> <p>It is important to know the purpose of apron lighting so that there is no confusion with other functions that other lighting sources have to carry out notably around the aircraft on its stand during fuelling.</p> <p>(b) It is appropriate to transfer this provision to GM.</p> <p>(c) (2) It is appropriate to transfer this provision to GM because it is too precise.</p> <p>(b) and (c) (2) are just good practices and not normative references so they must be in GM and not in CS.</p>
response	<p><i>Partially accepted</i></p> <p>Objectives on some CSs will be added among applicability and characteristics. The text in (b) will be reviewed. The text in (b) (2) is design requirement; therefore, it will remain as CS.</p>

comment	<p>1739 comment by: UK CAA</p> <p>Page No: 120</p> <p>Paragraph No: CS.ADR.DSN.M750 (c) (1) & (2)</p>
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Comment: There could be other ways to ensure an apron is lit to a satisfactory standard.

Justification: If placed in an AMC it would allow for states to innovate.

Proposed Text: Nil – suggest inclusion as an AMC.

response *Noted*

The text will be retained as CS.

comment

1833

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.M.750 – Apron floodlighting (p120-121)
- CS-ADR - Book 2 – GM-ADR-DSN.M.750 – Apron floodlighting (p271)

2. Justification and proposed text / comment

This CS, and in particular its paragraphs (b) and (c)(2), is not in the French national regulation because this point has to be dealt with on a case by case basis because solutions differ depending on the situation. Besides, it is in recommendations in ICAO Annex 14 volume 1.

When delivering the certificate, justifying for each case the difference, even if there have been safety studies performed, will generate huge cost without any added safety value.

But most of all, it is essential to indicate the objective of such apron floodlighting, in order to be able to perform the given case by case studies, which is to help the pilot to find his way on this area to the aircraft parking position.

It is proposed to add the objective in the CS and to move paragraphs (b) and (c)(2) to GM.

CS-ADR-DSN.M.750 – Apron floodlighting

"(a) Applicability:

Apron floodlighting should be provided on an apron, on a de-icing/anti-icing facility and on a designated isolated aircraft parking position intended to be used at night in order to help the pilot to find his way on this area to the aircraft parking position.

(b) Location:

Apron floodlights should be located so as to provide adequate illumination on all apron service areas, with a minimum of glare to pilots of aircraft in flight and on the ground, aerodrome and apron controllers, and personnel on the apron. The arrangement and aiming of floodlights should be such that an aircraft stand receives light from two or more directions to minimise shadows.

(c) Characteristics:

(1) The spectral distribution of apron floodlights should be such that the colours used for aircraft marking connected with routine servicing, and for surface and obstacle marking, can be correctly identified.

(2) The average illuminance should be at least the following:

(i) Aircraft stand:

(A) horizontal illuminance — 20 lux with a uniformity ratio (average to

	<p>(b) It is appropriate to transfer this provision to GM.</p> <p>(c) (2) It is appropriate to transfer this provision to GM because it is too precise.</p> <p>(b) and (c) (2) are just good practices and not normative references so they must be in GM and not in CS.</p>
response	<p><i>Partially accepted</i></p> <p>Objectives on some CSs will be added among applicability and characteristics. The text in (b) will be reviewed. The text in (b) (2) is design requirement; therefore, it will remain as CS.</p>

comment	<p>1974 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i></p> <p>(a) It is appropriate to add in (a): « the purpose of apron lighting is to help the pilot to find his way on this area to its stand. » It is important to know the purpose of apron lighting so that there is no confusion with other functions that other lighting sources have to carry out notably around the aircraft on its stand during fuelling.</p> <p>(b) It is appropriate to transfer this provision to GM.</p> <p>(c) (2) It is appropriate to transfer this provision to GM because it is too precise.</p> <p>(b) and (c) (2) are just good practices and not normative references so they must be in GM and not in CS.</p>
response	<p><i>Partially accepted</i></p> <p>Objectives on some CSs will be added among applicability and characteristics. The text in (b) will be reviewed. The text in (b) (2) is design requirement; therefore, it will remain as CS.</p>

comment	<p>2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2670 comment by: <i>Infratil Airports Europe Ltd</i></p> <p>Page No: 120/121</p> <p>Paragraph No: CS-ADR-DSN.M.750</p>
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Comment : The text detailing the luminary requirements (both vertical and horizontal) of stand luminance is difficult to interpret and would benefit from a detailed example via the use of a typical stand layout diagram detailing how many measurements to take and how to take the measurements, accompanied by a table detailing the calculations necessary to determine the luminary performance of the stand

response *Noted*

The Ttext in CS M.750 is the same as in ICAO, Annex 14, and will remain as requiremen,. It is up to designer to calculate necessary illuminance.

comment 2740 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#416](#)

ADBMNPA 2011-20 (B.III) CS-ADR-DSN.M.750

Référence: CS-ADR-DSN.M.750

Apron floodlighting

Traduction de courtoisie

(a) It is appropriate to add in (a): « the purpose of apron lighting is to help the pilot to find his way on this area to its stand. »

It is important to know the purpose of apron lighting so that there is no confusion with other functions that other lighting sources have to carry out notably around the aircraft on its stand during fuelling.

(b) It is appropriate to transfer this provision to GM.

(c) (2) It is appropriate to transfer this provision to GM because it is too precise.

(b) and (c) (2) are just good practices and not normative references so they must be in GM and not in CS.

response *Partially accepted*

Objectives on some CSs will be added among applicability and characteristics. The text in (b) will be reviewed. The text in (b) (2) is design requirement; therefore, it will remain as CS.

comment 2914 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.M.750	Apron floodlighting
Proposition/commentaire	Il convient d'ajouter au (a): "L'objectif de

	<p>l'éclairage de l'aire de stationnement est de permettre au pilote de mieux se repérer sur cette aire afin de trouver son chemin vers son poste de stationnement ".</p> <p>(b) Il convient de transférer cette disposition en Guidance Materials.</p> <p>(c) (2) Il convient de transférer cette disposition en Guidance Materials car elle est trop précise.</p>
Justification	<p>Les dispositions (b) et (c) (2) n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.</p> <p>Il est important au (a) de connaître l'objectif de cet éclairage des aires de stationnement pour qu'il n'y ait pas de confusion avec d'autres fonctions que doivent remplir d'autres sources d'éclairage notamment autour de l'avion lors de l'avitaillement.</p>
Traduction de courtoisie	<p>(a) It is appropriate to add in (a): « the purpose of apron lighting is to help the pilot finding his way on this area to the aircraft parking position. »</p> <p>It is important to know the purpose of apron lighting so that there is no confusion with other functions that other lighting sources have to carry out notably around the aircraft during fuelling.</p> <p>(b) It is appropriate to transfer this provision to GM.</p> <p>(c) (2) It is appropriate to transfer this provision to GM because it is too precise.</p> <p>(b) and (c) (2) are just good practices and not normative references so they must be in GM and not in CS.</p>

response *Partially accepted*

Objectives on some CSs will be added among applicability and characteristics. The text in (b) will be reviewed. The text in (b) (2) is design requirement;

therefore, it will remain as CS.

CS-ADR - Book 1 -- Book 1 – CS-ADR-DSN.M.755 – Visual docking guidance system

p. 121

comment

94

comment by: CAA-NL

Subpart (c) does not contain all the elements as specified in ICAO Annex 14, 5.3.24.10 – 5.3.14.20 and we suggest to add these elements.

response

Accepted

The missing text has been added.

comment

215

comment by: CAA Austria - Ministry of Transport

Concerning to the SARPs explanation in ICAO Annex 14 5th. 5.3.24.10 to 5.3.24.20 important details have not been considered

We suggest to assume the relevant chapters from ICAO Annex 14 5th. to NPA

response

Accepted

The missing text has been added.

comment

255

comment by: Brussels Airport - BRU/EBBR

CS-ADR-DSN.M.755 (c)(2)

Missing text ?

Under (c) **Location** (2) it states : "The azimuth guidance unit and the stopping position indicator should be positioned as prescribed below." But nothing is mentioned below, and on the next page it starts with CS-ADR-DSN.M.760 Advanced VDGS. So there is a reference to something that is not there. Unless it was meant to refer to the text mentioned in the next CS : CS-ADR-DSN.M.760 (b) **Location**.

If so, the reference was not quite clear.

Or, maybe some part of Annex 14 (5.3.24.10 up to and including 5.3.24.20) was lost during the transposition.

	pilot or for both?
response	<p><i>Accepted</i></p> <p>The missing text has been added.</p>

comment	<p>1609 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>(c) (2) This article is incomplete because it refers to a provision that is supposed to be « below » but that does not exist.</p> <p>Besides, does the described system have to be calibrated for the pilot position or for the co-pilot or for both?</p>
response	<p><i>Accepted</i></p> <p>The missing text has been added.</p>

comment	<p>1626 comment by: <i>Euroairport Bâle-Mulhouse</i></p> <p>Attachment #418</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.755</p> <p>Référence: CS-ADR-DSN.M.755</p> <p>Visual docking guidance system</p> <p>Traduction de courtoisie</p> <p>(c) (2) This article is incomplete because it refers to a provision that is supposed to be « below » but that does not exist.</p> <p>Besides, does the described system have to be calibrated for the pilot position or for the co-pilot or for both?</p>
response	<p><i>Accepted</i></p> <p>The missing text has been added.</p>

comment	<p>1655 comment by: <i>ECA - European Cockpit Association</i></p> <p>Delete (b)(4)</p> <p>Justification: This paragraph is duplicated in both (b) Characteristics and (c) Location</p>
response	<p><i>Accepted</i></p>

comment	<p>1740 comment by: <i>UK CAA</i></p> <p>Page No: 121</p> <p>Paragraph No: CS.ADR.DSN.M.755 (c)</p> <p>Comment: Text is not complete. Paragraph (c) needs to be completed and additional requirements in Annex 14 relating to the azimuth guidance unit and stopping position indicator have been omitted.</p> <p>Justification: Text is not complete. Also, needs to be consistent with ICAO Annex 14.</p> <p>Proposed Text: Additional text to replace existing (c) with:</p> <p>(c) Azimuth guidance unit</p> <p>(1) Location</p> <p>The azimuth guidance unit should be located on or close to the extension of the stand centre line ahead of the aircraft so that its signals are visible from the cockpit of an aircraft throughout the docking manoeuvre and aligned for use at least by the pilot occupying the left seat, although it is preferable for it to be aligned for use by the pilots occupying both the left and right seats.</p> <p>(2) Characteristics</p> <p>(i) The azimuth guidance unit should provide unambiguous left/right guidance which enables the pilot to acquire and maintain the lead-in line without over-controlling.</p> <p>(ii) When azimuth guidance is indicated by colour change, green should be used to identify the centre line and red for deviations from the centre line.</p> <p>(d) Stopping position indicator</p> <p>(1) Location</p> <p>(i) The stopping position indicator should be located in conjunction with, or sufficiently close to, the azimuth guidance unit so that a pilot can observe both the azimuth and stop signals without turning the head.</p> <p>(ii) The stopping position indicator should be usable at least by the pilot</p>
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occupying the left seat, although it is preferable for it to be usable by the pilots occupying both the left and right seats.

(2) Characteristics

(i) The stopping position information provided by the indicator for a particular aircraft type should account for the anticipated range of variations in pilot eye height and/or viewing angle.

(ii) The stopping position indicator should show the stopping position for the aircraft for which guidance is being provided and should provide closing rate information to enable the pilot to gradually decelerate the aircraft to a full stop at the intended stopping position.

(iii) The stopping position indicator should provide closing rate information over a distance of at least 10 m.

(iv) When stopping guidance is indicated by colour change, green should be used to show that the aircraft can proceed and red to show that the stop point has been reached, except that for a short distance prior to the stop point a third colour may be used to warn that the stopping point is close.

response *Accepted*

comment 1851 comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.M.755 — Visual docking guidance system (p121)

2. Justification and proposed text / comment

Paragraph (c)(2) of this CS seems to be uncompleted because there is a reference to "as prescribe below", and that "below" doesn't exist. Besides, does the described system have to be calibrated for the pilot position or for the co-pilot or for both?

response *Accepted*

The missing text has been added.

comment 1939 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#419](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.755

Référence: CS-ADR-DSN.M.755

	<p>Visual docking guidance system</p> <p>Traduction de courtoisie</p> <p>(c) (2) This article is incomplete because it refers to a provision that is supposed to be « below » but that does not exist.</p> <p>Besides, does the described system have to be calibrated for the pilot position or for the co-pilot or for both?</p>
response	<p><i>Accepted</i></p> <p>The missing text has been added.</p>

comment	<p>1973 comment by: Pau Pyrénées Airport - PUF/LFBP</p> <p>(c) (2) This article is incomplete because it refers to a provision that is supposed to be « below » but that does not exist.</p> <p>Besides, does the described system have to be calibrated for the pilot position or for the co-pilot or for both?</p>
response	<p><i>Accepted</i></p> <p>The missing text has been added.</p>

comment	<p>2348 ❖ comment by: HIA - Highlands and Islands Airports Limited</p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	<p>2683 comment by: Infratil Airports Europe Ltd</p> <p>Page No: 121/122</p> <p>Paragraph No: CS-ADR-DSN.M.755</p> <p>Comment IAEL agree that CS-ADR-DSN.M.755 — Visual docking guidance system is an acceptable means of compliance for the precise positioning of an aircraft on an aircraft stand, without the need for marshalls’.</p> <p>The scope of the CS should be clarified, ie. Under what criteria is an aerodrome required to provide A-VDGS rather than VDGS. For example, where airbridges are utilised and in any case, where an aerodrome replaces existing VDGS equipment, they should be replaced with A-VDGS.</p>
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response *Partially accepted*

The CS M.755 text will be reviewed. CS may be accompanied only with GM. The type of VDGS provided is an operational decision.

comment 2745 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#420](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.M.755

Référence: CS-ADR-DSN.M.755

Visual docking guidance system

Traduction de courtoisie

(c) (2) This article is incomplete because it refers to a provision that is supposed to be « below » but that does not exist.

Besides, does the described system have to be calibrated for the pilot position or for the co-pilot or for both?

response *Accepted*

The missing text has been added.

comment 2915 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.M.755

Visual docking guidance system

Proposition/commentaire

(c) (2) Cet article est visiblement incomplet puisqu'il fait référence à une disposition devant se trouver « ci-dessous » (« as prescribed below ») mais qui n'existe pas.

Par ailleurs, le système décrit doit-il être calibré pour la position du pilote ou du copilote ou pour les deux?

Justification

Traduction de courtoisie

(c) (2) This article is incomplete because it refers to a provision that is supposed to be « below » but that does not exist.

Besides, does the described system have to be calibrated for the pilot position or for the co-pilot or for both?

response *Accepted*

The missing text has been added.

CS-ADR – Book 1 – CS-ADR-DSN.M.760 – Advanced visual docking guidance system

p. 122-124

comment

9

comment by: *Manchester Airport plc*

(b) (2) Should not the AVDGS be usable from either seat in the cockpit?

response

Noted

This is not an ICAO requirement. Therefore, it has not been included in the CS.

comment

95

comment by: *CAA-NL*

Item (4) (i - viii) and (5 - 10) are redundant. We suggest to delete one of those.

In table M-3 please change 50mm into 500 mm, because this is the correct number.

response

Accepted

Table M-3 will be amended, and the distance will read: +/- 500 mm.

comment

130

comment by: *MWEBWV Ministerium für Wirtschaft, Energie, Bauen, Wohnen und Verkehr des Landes Nordrhein-Westfalen*

Mistake in the table M-3; it would be correct:

With guidance information <distance> maximum deviation at 25m stop position: + - 500 mm. (delete +- 50mm)

response

Accepted

Table M-3 will be amended, and the distance will read: +/- 500 mm.

comment	189	comment by: <i>Flughafen Düsseldorf GmbH</i>
	Fehler in der Tabelle M-3! Korrekt wäre: Bei Führungsinformation <Entfernung> beträgt die maximal zulässige Abweichung der Halteposition +/- 500 mm und bei Führungsinformation <Azimuth> beträgt die maximal zulässige Abweichung 25 m vor der Halteposition ebenfalls +/- 500 mm.	
response	<i>Accepted</i>	
	Table M-3 will be amended, and the distance will read: +/- 500 mm.	

comment	214	comment by: <i>CAA Austria - Ministry of Transport</i>
	The declaration of the value for the distance of the maximum deviation at stop position (stop area) in table M-3 is incorrect We suggest to correct the value for the distance of the maximum deviation at stop position (stop area) to +/-500mm	
response	<i>Noted</i>	
	Table M-3 will be amended, and the distance will read: +/- 500 mm.	

comment	231	comment by: <i>Danish Transport Authority</i>
	Table M-3 EDITORIAL: The max deviation at 25 m from stop position (azimuth) and max deviation at stop position (distance) must be corrected from 50 mm to 500 mm. Reference ICAO Annex 14, Volume I.	
response	<i>Accepted</i>	
	Table M-3 will be amended, and the distance will read: +/- 500 mm.	

comment	256	comment by: <i>Brussels Airport - BRU/EBBR</i>
	CS-ADR-DSN.M.760 Text mentioned twice. Some items from the Advanced Visual Docking Guidance System have been written twice under CS-ADR-DSN.M.760 (c) Characteristics. (c)(4)(ii) = (c)(6) (c)(4) 2 ^{de} zin = (c)(5) (c)(4)(iv) & (v) = (c)(7)	

	(c)(4)(vi) = (c)(8) (c)(4)(vii) = (c)(9) (c)(4)(viii) = (c)(10) Once should be enough.
response	<i>Accepted</i>

comment	565 comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #421
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.760
	Référence: CS-ADR-DSN.M.760 Advanced visual docking guidance system
	Traduction de courtoisie a) (2) (3) (6) (7) et (b) (2) It is appropriate to transfer these provisions to GM. These provisions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS. (b) (1) It is appropriate to modify in the following way: « Where provided , the Advanced visual docking guidance system should be located such that unobstructed and unambiguous guidance is provided to the person responsible for, and persons assisting, the docking of the aircraft throughout the docking manoeuvre. » The adding of "where provided" allows to clearly indicate that these systems are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.760.
response	<i>Not accepted</i>
	The CS is composed mainly of ICAO standards. ICAO recommendations are kept in CS for the complete consistency and information purposes. The CS text relates to 'where provided'.

comment	775 comment by: <i>ADP : Aeroports de Paris</i>				
	<table border="1" style="width: 100%;"> <tr> <td style="width: 30%;">Référence: CS-ADR-DSN.M.760</td> <td>Advanced visual docking guidance system</td> </tr> <tr> <td>Proposition/commentaire</td> <td> <p>(a) (2) (3) (6) (7) et (b) (2) Il convient de transférer ces dispositions en Guidance Materials.</p> <p>(b)(1) Il convient d'apporter la modification suivante: « Where provided, the Advanced visual docking guidance system should be located such that unobstructed and unambiguous guidance is provided to the</p> </td> </tr> </table>	Référence: CS-ADR-DSN.M.760	Advanced visual docking guidance system	Proposition/commentaire	<p>(a) (2) (3) (6) (7) et (b) (2) Il convient de transférer ces dispositions en Guidance Materials.</p> <p>(b)(1) Il convient d'apporter la modification suivante: « Where provided, the Advanced visual docking guidance system should be located such that unobstructed and unambiguous guidance is provided to the</p>
Référence: CS-ADR-DSN.M.760	Advanced visual docking guidance system				
Proposition/commentaire	<p>(a) (2) (3) (6) (7) et (b) (2) Il convient de transférer ces dispositions en Guidance Materials.</p> <p>(b)(1) Il convient d'apporter la modification suivante: « Where provided, the Advanced visual docking guidance system should be located such that unobstructed and unambiguous guidance is provided to the</p>				

	person responsible for, and persons assisting, the docking of the aircraft throughout the docking manoeuvre. »
Justification	<p>Ces dispositions (a) (2) (3) (6) (7) et (b) (2) ne sont que des règles de l'art ou des explications complémentaires et non des références normatives dans l'Annexe 14 de l'OACI (notes et recommandations). Elles ont donc leur place en GM et non en CS.</p> <p>L'ajout de « where provided » permet de clairement indiquer que ces systèmes ne sont pas obligatoires mais que s'ils sont installés ils doivent respecter le CS-ADR-DSN.M.760.</p>
Traduction de courtoisie	<p>a) (2) (3) (6) (7) et (b) (2) It is appropriate to transfer these provisions to GM. These provisions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p> <p>(b) (1) It is appropriate to modify in the following way: « Where provided, the Advanced visual docking guidance system should be located such that unobstructed and unambiguous guidance is provided to the person responsible for, and persons assisting, the docking of the aircraft throughout the docking manoeuvre. » The adding of "where provided" allows to clearly indicate that these systems are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.760.</p>

response *Not accepted*

The CS is composed mainly of ICAO standards. ICAO recommendations are kept in CS for the complete consistency and information purposes. The CS text relates to 'where provided'.

comment 1141

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.M.760 - Advanced visual docking guidance system (p122-124)
- CS-ADR - Book 2 - GM-ADR-DSN.M.760 - Advanced visual docking

guidance system (p272)

2. Justification and proposed text / comment

Paragraphs (a)(2), (a)(6), (a)(7), (b)(2), (c)(4)(i), (c)(4)(iii): these specifications are only notes in section 5.3.25 of Annex14 Volume 1 and provide for guidance only on advanced visual docking guidance systems. They are not binding in France. It is essential to move them to guidance material GM-ADR-DSN.M.760.

Moreover, there are erroneous figures in columns 1 and 5 of table M-3, and in paragraph (c)(4) there is some duplication:

- the end is already in (c)(5),
- (ii) is already in (c)(6),
- (iv) and (v) are already in (c)(7),
- (vi) is already in (c)(8),
- (vii) is already in (c)(9),
- (viii) is already in (c)(10).

Thus the following modifications:

CS-ADR-DSN.M.760 — Advanced visual docking guidance system

"(a) Application:

~~[...](2) Advanced visual docking guidance systems should provide docking guidance information in three stages: the acquisition of the aircraft by the system, the azimuth alignment of the aircraft, and the stopping position information.~~

~~[...](6) The use of the Advanced visual docking guidance systems in conditions such as weather, visibility, and background lighting both by day and night would need to be specified.~~

~~(7) Care is required in both the design and on-site installation of the system to ensure that glare, reflection of sunlight, or other light in the vicinity, does not degrade the clarity and conspicuity of the visual cues provided by the system.~~

~~[...]~~

(b) Location:

~~[...](2) Usually the pilot in command is responsible for the docking of the aircraft. However, in some circumstances, another person could be responsible and this person may be the driver of a vehicle that is towing the aircraft.~~

~~[...]~~

(c) Characteristics:

~~[...](4) The information on displacement of the aircraft relative to the stand centre line and distance to the stopping position, when displayed, should be provided with the accuracy specified in Table M-3 Symbols and graphics used to depict guidance information should be intuitively representative of the type of information provided.~~

~~(i) The use of colour needs to be appropriate and should follow signal convention, i.e. red, yellow and green mean hazard, caution and normal/correct conditions, respectively. The effects of colour contrasts also needs to be considered.~~

~~(ii) Information on the lateral displacement of the aircraft relative to the stand centre line should be provided at least 25 m prior to the stop position.~~

~~(iii) The indication of the distance of the aircraft from the stop position may be colour coded and presented at a rate and distance proportional to the actual closure rate and distance of the aircraft approaching the stop point.~~

~~(iv) Continuous closure distance and closure rate shall be provided from at least 15 m prior to the stop position.~~

~~(v) Where provided, closure distance displayed in numerals should be provided in metre integers to the stop position and displayed to 1 decimal place at least 3 m prior to the stop position.~~

~~(vi) Throughout the docking manoeuvre, an appropriate means should be provided on the Advanced visual docking guidance system to indicate the need to bring the aircraft to an immediate halt. In such an event, which includes a failure of the system, no other information shall be displayed.~~

~~(vii) Provision to initiate an immediate halt to the docking procedure should be made available to personnel responsible for the operational safety of the stand.~~

~~(viii) The word 'STOP' in red characters should be displayed when an immediate cessation of the docking manoeuvre is required.~~

(5) Symbols and graphics used to depict guidance information should be intuitively representative of the type of information provided.

(6) Information on the lateral displacement of the aircraft relative to the stand centre line should be provided at least 25 m prior to the stop position.

(7) Continuous closure distance and closure rate should be provided from at least 15 m prior to the stop position. Where provided, closure distance displayed in numerals should be provided in metre integers to the stop position and displayed to 1 decimal place at least 3 m prior to the stop position.

(8) Throughout the docking manoeuvre, an appropriate means should be provided on the A-VDGS to indicate the need to bring the aircraft to an immediate halt. In such an event, which includes a failure of the A-VDGS, no other information should be displayed.

(9) Provision to initiate an immediate halt to the docking procedure should be made available to personnel responsible for the operational safety of the stand.

(10) The word 'stop' in red characters should be displayed when an immediate cessation of the docking manoeuvre is required.

Guidance information	Maximum deviation at stop position (stop area)	Maximum deviation at 9 m from stop position	Maximum deviation at 15 m from stop position	Maximum deviation at 25 m from stop position
Azimuth		[...]		±500 mm
Distance	±500 mm		[...]	

Table M-3 [...]

"

GM-ADR-DSN.M.760 — Advanced visual docking guidance system

(a) Application:

(1) Advanced visual docking guidance systems may provide docking guidance information in three stages: the acquisition of the aircraft by the system, the azimuth alignment of the aircraft, and the stopping position information.

(2) The use of the Advanced visual docking guidance systems in conditions such as weather, visibility, and background lighting both by day and night would need to be specified.

(3) Care is required in both the design and on-site installation of the system to ensure that glare, reflection of sunlight, or other light in the vicinity, does not degrade the clarity and conspicuity of the visual cues provided by the system.

(b) Location: Usually the pilot-in-command is responsible for the docking of the aircraft. However, in some circumstances, another person could be responsible and this person may be the driver of a vehicle that is towing the aircraft.

(c) Characteristics:

(1) The use of colour needs to be appropriate and should follow signal convention, i.e. red, yellow and green mean hazard, caution and normal/correct conditions, respectively. The effect of colour contrasts also needs to be considered.

(2) The indication of the distance of the aircraft from the stop position may be colour-coded and presented at a rate and distance proportional to the actual closure rate and distance of the aircraft approaching the stop point."

response *Partially accepted*

The CS is composed mainly of ICAO standards. ICAO recommendations are kept in CS for the complete consistency and information purposes.
The redundant text will be deleted and the CS text will be reviewed.
Table M-3 will be reviewed, and the distance will read: +/- 500 mm.

comment 1612

comment by: *Aéroport de Marseille - MRS/LFML*

a) (2) (3) (6) (7) et (b) (2) It is appropriate to transfer these provisions to GM. These provisions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

(b) (1) It is appropriate to modify in the following way: « **Where provided**, the Advanced visual docking guidance system should be located such that unobstructed and unambiguous guidance is provided to the person responsible for, and persons assisting, the docking of the aircraft throughout the docking manoeuvre. »

The adding of "where provided" allows to clearly indicate that these systems are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.760.

response *Not accepted*

The CS is composed mainly of ICAO standards. ICAO recommendations are kept in CS for the complete consistency and information purposes.
The CS text relates to 'where provided'.

comment 1628

comment by: *Euroairport Bâle-Mulhouse*

Attachment [#422](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.760

Référence: CS-ADR-DSN.M.760
Advanced visual docking guidance system

Traduction de courtoisie

a) (2) (3) (6) (7) et (b) (2) It is appropriate to transfer these provisions to GM. These provisions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

(b) (1) It is appropriate to modify in the following way: « **Where provided**, the Advanced visual docking guidance system should be located such that

	<p>unobstructed and unambiguous guidance is provided to the person responsible for, and persons assisting, the docking of the aircraft throughout the docking manoeuvre. »</p> <p>The adding of "where provided" allows to clearly indicate that these systems are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.760.</p>
response	<p><i>Not accepted</i></p> <p>The CS is composed mainly of ICAO standards. ICAO recommendations are kept in CS for the complete consistency and information purposes. The CS text relates to 'where provided'.</p>
comment	<p>1657 comment by: <i>ECA - European Cockpit Association</i></p> <p>Add new CS CS-ADR-DSN.M.76x — Aircraft stand manoeuvring guidance lights EMERGENCY STOP COMPONENTS (a) Applicability: Manual Emergency Stop – An emergency STOP button shall be installed to provide the stand operator, marshaller or safety officer/monitor the ability to signal the aircraft to stop immediately. The display shall enunciate STOP in flashing, red letters when the button is pushed. (b) Location The emergency stop button shall be located to provide the person(s) monitoring docking a clear view of the aircraft and stand. This location should provide a clear view of the system display or a remote duplication of the display.</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 5.3.26.x</p>
response	<p><i>Not accepted</i></p> <p>The CS is composed mainly of ICAO standards. ICAO recommendations are kept in CS for the complete consistency and information purposes. CS offers the text equal to the ICAO Annex 14 text for A-VDGS.</p>
comment	<p>1940 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #423</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.760</p> <p>Référence: CS-ADR-DSN.M.760 Advanced visual docking guidance system</p> <p>Traduction de courtoisie a) (2) (3) (6) (7) et (b) (2) It is appropriate to transfer these provisions to GM. These provisions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p>

	<p>(b) (1) It is appropriate to modify in the following way: « Where provided, the Advanced visual docking guidance system should be located such that unobstructed and unambiguous guidance is provided to the person responsible for, and persons assisting, the docking of the aircraft throughout the docking manoeuvre. »</p> <p>The adding of "where provided" allows to clearly indicate that these systems are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.760.</p>
response	<p><i>Not accepted</i></p> <p>The CS is composed mainly of ICAO standards. ICAO recommendations are kept in CS for the complete consistency and information purposes. The CS text relates to 'where provided'.</p>
comment	<p>1972 comment by: Pau Pyrénées Airport - PUF/LFBP</p> <p>a) (2) (3) (6) (7) et (b) (2) It is appropriate to transfer these provisions to GM. These provisions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p> <p>(b) (1) It is appropriate to modify in the following way: « Where provided, the Advanced visual docking guidance system should be located such that unobstructed and unambiguous guidance is provided to the person responsible for, and persons assisting, the docking of the aircraft throughout the docking manoeuvre. »</p> <p>The adding of "where provided" allows to clearly indicate that these systems are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.760.</p>
response	<p><i>Not accepted</i></p> <p>The CS is composed mainly of ICAO standards. ICAO recommendations are kept in CS for the complete consistency and information purposes. The CS text relates to 'where provided'.</p>
comment	<p>2348 ❖ comment by: HIA - Highlands and Islands Airports Limited</p> <p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2545 comment by: AENA - Aeropuertos Españoles y Navegación Aérea</p> <p>Paragraphs (a)(2), (a)(6), (a)(7), (b)(2), (c)(4)(i), (c)(4)(iii): these specifications are only <u>notes</u> in section 5.3.25 of Annex14 Volume 1 and provide for <u>guidance</u> only on advanced visual docking guidance systems. It is essential to move them to guidance material GM-ADR-DSN.M.760.</p>

Moreover, there are erroneous figures in columns 1 and 5 of table M-3, and in paragraph (c)(4) there is some duplication:

- the end is already in (c)(5),
- (ii) is already in (c)(6),
- (iv) and (v) are already in (c)(7),
- (vi) is already in (c)(8),
- (vii) is already in (c)(9),
- (viii) is already in (c)(10).

Thus the following modifications:

CS-ADR-DSN.M.760 – Advanced visual docking guidance system

"(a) Application:

~~[...](2) Advanced visual docking guidance systems should provide docking guidance information in three stages: the acquisition of the aircraft by the system, the azimuth alignment of the aircraft, and the stopping position information.~~

~~[...](6) The use of the Advanced visual docking guidance systems in conditions such as weather, visibility, and background lighting both by day and night would need to be specified.~~

~~(7) Care is required in both the design and on-site installation of the system to ensure that glare, reflection of sunlight, or other light in the vicinity, does not degrade the clarity and conspicuity of the visual cues provided by the system.~~

~~[...]~~

(b) Location:

~~[...](2) Usually the pilot in command is responsible for the docking of the aircraft. However, in some circumstances, another person could be responsible and this person may be the driver of a vehicle that is towing the aircraft.~~

~~[...]~~

(c) Characteristics:

~~[...](4) The information on displacement of the aircraft relative to the stand centre line and distance to the stopping position, when displayed, should be provided with the accuracy specified in Table M-3 Symbols and graphics used to depict guidance information should be intuitively representative of the type of information provided.~~

~~(i) The use of colour needs to be appropriate and should follow signal convention, i.e. red, yellow and green mean hazard, caution and normal/correct conditions, respectively. The effects of colour contrasts also needs to be considered.~~

~~(ii) Information on the lateral displacement of the aircraft relative to the stand centre line should be provided at least 25 m prior to the stop position.~~

~~(iii) The indication of the distance of the aircraft from the stop position may be colour coded and presented at a rate and distance proportional to the actual closure rate and distance of the aircraft approaching the stop point.~~

~~(iv) Continuous closure distance and closure rate shall be provided from at least 15 m prior to the stop position.~~

~~(v) Where provided, closure distance displayed in numerals should be provided in metre integers to the stop position and displayed to 1 decimal place at least 3 m prior to the stop position.~~

~~(vi) Throughout the docking manoeuvre, an appropriate means should be provided on the Advanced visual docking guidance system to indicate the need to bring the aircraft to an immediate halt. In such an event, which includes a failure of the system, no other information shall be displayed.~~

~~(vii) Provision to initiate an immediate halt to the docking procedure should be made available to personnel responsible for the operational safety of the stand.~~

~~(viii) The word 'STOP' in red characters should be displayed when an immediate cessation of the docking manoeuvre is required.~~

- (5) Symbols and graphics used to depict guidance information should be intuitively representative of the type of information provided.
- (6) Information on the lateral displacement of the aircraft relative to the stand centre line should be provided at least 25 m prior to the stop position.
- (7) Continuous closure distance and closure rate should be provided from at least 15 m prior to the stop position. Where provided, closure distance displayed in numerals should be provided in metre integers to the stop position and displayed to 1 decimal place at least 3 m prior to the stop position.
- (8) Throughout the docking manoeuvre, an appropriate means should be provided on the A-VDGS to indicate the need to bring the aircraft to an immediate halt. In such an event, which includes a failure of the A-VDGS, no other information should be displayed.
- (9) Provision to initiate an immediate halt to the docking procedure should be made available to personnel responsible for the operational safety of the stand.
- (10) The word 'stop' in red characters should be displayed when an immediate cessation of the docking manoeuvre is required.

Guidance information	Maximum deviation at stop position (stop area)	Maximum deviation at 9 m from stop position	Maximum deviation at 15 m from stop position	Maximum deviation at 25 m from stop position
Azimuth		[...]		±500 mm
Distance	±500 mm		[...]	
Table M-3 [...]				

"

response *Partially accepted*

The CS is composed mainly of ICAO standards. ICAO recommendations are kept in CS for the complete consistency and information purposes. The CS text offers the text equal to the ICAO Annex 14 requirement No 5.3.25. The redundant text in the CS will be deleted, and the text will be reviewed. Table M-3 will be amended, and the distance will read: +/- 500 mm.

comment

2747

comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#424](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.M.760

Référence: CS-ADR-DSN.M.760

Advanced visual docking guidance system

Traduction de courtoisie

a) (2) (3) (6) (7) et (b) (2) It is appropriate to transfer these provisions to GM.

These provisions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.
 (b) (1) It is appropriate to modify in the following way: « **Where provided**, the Advanced visual docking guidance system should be located such that unobstructed and unambiguous guidance is provided to the person responsible for, and persons assisting, the docking of the aircraft throughout the docking manoeuvre. »
 The adding of "where provided" allows to clearly indicate that these systems are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.760.

response *Not accepted*

The CS is composed mainly of ICAO standards; ICAO recommendations are kept in CS for the complete consistency and information purposes.
 The CS text relating to "where provided".

comment 2771 comment by: *Airport Nuremberg - NUE/EDDN*

The following text passages were accidentally mentioned twice and should be limited to one in order to make it understandable:

- (4) (Sentence stating after "M-3") is exactly the same as (5)
- (4) (ii) is exactly the same as (6)
- (4) (iv) is exactly the same as (7)
- (4) (vi) is exactly the same as (8)
- (4) (vii) is exactly the same as (9)
- (4) (viii) is exactly the same as (10)

response *Accepted*

The redundant CS text has been deleted.

comment 2916 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

<u>Référence: CS-ADR-DSN.M.760</u>	Advanced visual docking guidance system
<u>Proposition/commentaire</u>	<p>(a) (2) (3) (6) (7) et (b) (2) Il convient de transférer ces dispositions en Guidance Materials.</p> <p>(b)(1) Il convient d'apporter la modification suivante: « Where provided, the Advanced visual docking guidance system should be located such that unobstructed and unambiguous guidance is provided to the person responsible for, and persons assisting, the docking of the aircraft throughout the docking manoeuvre. »</p>

Justification	<p>Ces dispositions (a) (2) (3) (6) (7) et (b) (2) ne sont que des règles de l'art ou des explications complémentaires et non des références normatives dans l'Annexe 14 de l'OACI (notes et recommandations). Elles ont donc leur place en GM et non en CS.</p> <p>L'ajout de « where provided » permet de clairement indiquer que ces systèmes ne sont pas obligatoires mais que s'ils sont installés ils doivent respecter le CS-ADR-DSN.M.760.</p>
Traduction de courtoisie	<p>a) (2) (3) (6) (7) et (b) (2) It is appropriate to transfer these provisions to GM. These provisions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p> <p>(b) (1) It is appropriate to modify in the following way: « Where provided, the Advanced visual docking guidance system should be located such that unobstructed and unambiguous guidance is provided to the person responsible for, and persons assisting, the docking of the aircraft throughout the docking manoeuvre. » The adding of "where provided" allows to clearly indicate that these systems are not compulsory but if they are set, they have to respect CS-ADR-DSN.M.760.</p>

response *Not accepted*

The CS is composed mainly of ICAO standards; ICAO recommendations are kept in CS for the complete consistency and information purposes.
The CS text relating to "where provided".

comment 3097

comment by: *Fraport AG*

CS-ADR-DSN.M.760 — Advanced visual docking guidance system (c) (4), (6) and (7)

Editorial

(4) The information on displacement of the aircraft relative to the stand centre

line and distance to the stopping position, when displayed, should be provided with the accuracy specified in Table M-3 Symbols and graphics used to depict guidance information should be intuitively representative of the type of information provided.

(i) The use of colour needs to be appropriate and should follow signal convention, i.e. red, yellow and green mean hazard, caution and normal/correct conditions, respectively. The effects of colour contrasts also needs to be considered.

(ii) Information on the lateral displacement of the aircraft relative to the stand centre line should be provided at least 25 m prior to the stop position.

(iii) The indication of the distance of the aircraft from the stop position may be colour-coded and presented at a rate and distance proportional to the actual closure rate and distance of the aircraft approaching the stop point.

(iv) Continuous closure distance and closure rate shall be provided from at least 15 m prior to the stop position.

(v) Where provided, closure distance displayed in numerals should be provided in metre integers to the stop position and displayed to 1 decimal place at least 3 m prior to the stop position.

(vi) Throughout the docking manoeuvre, an appropriate means should be provided on the Advanced visual docking guidance system to indicate the need to bring the aircraft to an immediate halt. In such an event, which includes a failure of the system, no other information shall be displayed.

(vii) Provision to initiate an immediate halt to the docking procedure should be made available to personnel responsible for the operational safety of the stand.

(viii) The word 'STOP' in red characters should be displayed when an immediate cessation of the docking manoeuvre is required.

(6) Information on the lateral displacement of the aircraft relative to the stand centre line should be provided at least 25 m prior to the stop position.

(7) Continuous closure distance and closure rate should be provided from at least 15 m prior to the stop position. Where provided, closure distance ed in numerals should be provided in metre integers to the stop position and displayed to 1 decimal place at least 3 m prior to the stop position.

Proposed Text

(4) The information on displacement of the aircraft relative to the stand centre line and distance to the stopping position, when displayed, should be provided with the accuracy specified in Table M-3 Symbols and graphics used to depict guidance information should be intuitively representative of the type of information provided.

(i) The use of colour needs to be appropriate and should follow signal convention, i.e. red, yellow and green mean hazard, caution and normal/correct conditions, respectively. The effects of colour contrasts also needs to be considered.

(ii) Information on the lateral displacement of the aircraft relative to the stand centre line should be provided at least 25 m prior to the stop position.

(iii) The indication of the distance of the aircraft from the stop position may be colour-coded and presented at a rate and distance proportional to the actual closure rate and distance of the aircraft approaching the stop point.

(iv) Continuous closure distance and closure rate shall be provided from at least 15 m prior to the stop position.

(v) Where provided, closure distance displayed in numerals should be provided in metre integers to the stop position and displayed to 1 decimal place at least 3 m prior to the stop position.

(vi) Throughout the docking manoeuvre, an appropriate means should be

provided on the Advanced visual docking guidance system to indicate the need to bring the aircraft to an immediate halt. In such an event, which includes a failure of the system, no other information shall be displayed.

(vii) Provision to initiate an immediate halt to the docking procedure should be made available to personnel responsible for the operational safety of the stand.

(viii) The word 'STOP' in red characters should be displayed when an immediate cessation of the docking manoeuvre is required.

Fraport AG

Paragraph (6) is already addressed in (4) (ii).

Paragraph (7) is already addressed in (4)(iv).

Proposal is to delete (6) and (7).

response *Accepted*

CS-ADR – Book 1 – CS-ADR-DSN.M.765 – Aircraft stand manoeuvring guidance lights

p. 124

comment

96

comment by: CAA-NL

We suggest to change the text in (a) 'where deemed necessary' into 'unless guidance is provided by other means', according to ICAO Annex 14, 5.3.26.1.

response

Accepted

ICAO wording has been inserted.

comment

257

comment by: Brussels Airport - BRU/EBBR

CS-ADR-DSN.M.765(a)

The text is to be rewritten in order to be 'closer' to the origin of what was mentioned in Annex 14. The current NPA text does not allow as much space to comply to this specification, in comparison to Annex 14.

Annex 14 text : Aircraft stand manoeuvring guidance lights should be provided to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions, unless adequate guidance is provided by other means.

NPA text : Where deemed necessary, aircraft stand manoeuvring guidance lights should be provided to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions.

The advantage of the Annex 14 text was, that the possibility remained to make use of other means, e.g. marshallers.

In the NPA text, when deemed necessary guidance lights should be provided and other means (such as the use of marshallers) are no longer an option. This, I cannot agree with. The option of using marshalling, should always remain.

So, I suggest to rewrite the text in the NPA, adding : *unless adequate guidance is provided by other means* :

CS-ADR-DSN.M.765(a) Applicability :

Where deemed necessary, aircraft stand manoeuvring guidance lights should be provided to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions, unless adequate guidance is provided by other means.

response *Partially accepted*

The CS text in (a) will be reviewed to read as paragraph 5.3.26.1 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO.

comment

566

comment by: *Union des Aéroports français - UAF*

Attachment [#425](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.765

Référence: CS-ADR-DSN.M.765

Aircraft stand manoeuvring guidance lights

Traduction de courtoisie

(a) It is appropriate to modify in the following way: « ~~Where deemed necessary, The purpose of the aircraft stand manoeuvring guidance lights should be provided is~~ to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions. »

The interest is to indicate the purpose of these lights. The indication of "where deemed necessary" is confusing notably because neither the cases where it is necessary to have these lights are indicated, nor the person who have to estimate if it is necessary.

(b) (1) et (b) (2) It is appropriate to add « where provided » before « aircraft stand manoeuvring guidance lights ...»

(b) (3) (5) et (6) It is appropriate to transfer these provisions to GM. They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

The CS text in (a) will be amended to read as paragraph 5.3.26.1 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO.

comment

776

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.M.765	Aircraft stand manoeuvring guidance lights
Proposition/commentaire	<p>(a) Il convient d'apporter la modification suivante: « Where deemed necessary, The purpose of the aircraft stand manoeuvring guidance lights should be provided is to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions. »</p> <p>(b) (1) et (b) (2) Il convient d'ajouter " where provided" devant "aircraft stand manoeuvring guidance lights..."</p> <p>(b) (3) (5) et (6) Il convient de transférer ces dispositions en Guidance Materials.</p>
Justification	<p>Pour le (a) l'intérêt est d'indiquer l'objectif de ces feux. L'indication « where deemed necessary » est source à confusion notamment parce qu'il n'est pas indiqué pour quels cas il est nécessaire d'avoir ces feux et qui le juge nécessaire. Ce qui reste essentiel est que si ces feux sont installés, ils doivent respecter les règles de la CS-ADR-DSN.M.765, d'où le rajout de « where provided ».</p> <p>Les dispositions (b) (3) (5) et (6) n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.</p>
Traduction de courtoisie	<p>(a) It is appropriate to modify in the following way: « Where deemed necessary, The purpose of the aircraft stand manoeuvring guidance lights should be provided is to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions. » The interest is to indicate the purpose of these lights. The indication of "where deemed necessary" is confusing notably because neither the cases where it is necessary to have these lights are indicated, nor the person who have to estimate if it is necessary.</p> <p>(b) (1) et (b) (2) It is appropriate to add « where provided » before « aircraft stand manoeuvring guidance lights ...»</p> <p>(b) (3) (5) et (6) It is appropriate to transfer these provisions to GM. They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p>

response *Not accepted*

The CS text in (a) will be amended to read as paragraph 5.3.26.1 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO.

comment *1060*

comment by: *Belgian CAA*

This article is based on Annex 14 §5.3.26.1, but why is the "unless adequate guidance is provided by other means" is omitted?

response *Accepted*

The CS text in (a) will be amended to read as paragraph 5.3.26.1 in the ICAO Annex 14 text.

comment *1616*

comment by: *Aéroport de Marseille - MRS/LFML*

(a) It is appropriate to modify in the following way: « ~~Where deemed necessary, The purpose of the aircraft stand manoeuvring guidance lights should be provided is~~ to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions. »

The interest is to indicate the purpose of these lights.

The indication of "where deemed necessary" is confusing notably because neither the cases where it is necessary to have these lights are indicated, nor the person who have to estimate if it is necessary.

(b) (1) et (b) (2) It is appropriate to add « where provided » before « aircraft stand manoeuvring guidance lights ...»

(b) (3) (5) et (6) It is appropriate to transfer these provisions to GM.

They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

The CS text in (a) will be amended to read as paragraph 5.3.26.1 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO.

comment *1629*

comment by: *Euroairport Bâle-Mulhouse*

Attachment [#426](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.765

Référence: CS-ADR-DSN.M.765
Aircraft stand manoeuvring guidance lights

Traduction de courtoisie

(a) It is appropriate to modify in the following way: « ~~Where deemed necessary, The purpose of the aircraft stand manoeuvring guidance lights should be provided~~ is to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions. »

The interest is to indicate the purpose of these lights. The indication of “where deemed necessary” is confusing notably because neither the cases where it is necessary to have these lights are indicated, nor the person who have to estimate if it is necessary.

(b) (1) et (b) (2) It is appropriate to add « where provided » before « aircraft stand manoeuvring guidance lights ...»

(b) (3) (5) et (6) It is appropriate to transfer these provisions to GM. They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

The CS text in (a) will be amended to read as paragraph 5.3.26.1 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO.

comment 1941

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#427](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.765

Référence: CS-ADR-DSN.M.765
Aircraft stand manoeuvring guidance lights

Traduction de courtoisie

(a) It is appropriate to modify in the following way: « ~~Where deemed necessary, The purpose of the aircraft stand manoeuvring guidance lights should be provided~~ is to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions. »

The interest is to indicate the purpose of these lights. The indication of “where deemed necessary” is confusing notably because neither the cases where it is necessary to have these lights are indicated, nor the person who have to estimate if it is necessary.

(b) (1) et (b) (2) It is appropriate to add « where provided » before « aircraft stand manoeuvring guidance lights ...»

(b) (3) (5) et (6) It is appropriate to transfer these provisions to GM. They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

The CS text in (a) will be amended to read as paragraph 5.3.26.1 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO.

comment

1970

comment by: *Pau Pyrénées Airport - PUF/LFBP*

(a) It is appropriate to modify in the following way: « ~~Where deemed necessary, The purpose of the aircraft stand manoeuvring guidance lights should be provided~~ is to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions. »

The interest is to indicate the purpose of these lights.

The indication of "where deemed necessary" is confusing notably because neither the cases where it is necessary to have these lights are indicated, nor the person who have to estimate if it is necessary.

(b) (1) et (b) (2) It is appropriate to add « where provided » before « aircraft stand manoeuvring guidance lights ...»

(b) (3) (5) et (6) It is appropriate to transfer these provisions to GM.

They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

The CS text in (a) will be amended to read as paragraph 5.3.26.1 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO.

comment

2209

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS ADR DSN – Book 1 — CS-ADR-DSN.M.765 — Aircraft stand manoeuvring guidance lights (p124)

2. Justification and proposed text / comment

In order to clarify the fact that aircraft stand maneuvering guidance lights are not provided everywhere because not mandatory everywhere, it is proposed to add "where provided" as follows:

CS-ADR-DSN.M. 765 — Aircraft stand manoeuvring guidance lights

"[...] (b) Characteristics:

(1) *Where provided, aircraft stand manoeuvring guidance lights should be collocated with the aircraft stand markings.*

(2) *Where provided, aircraft stand manoeuvring guidance lights, other than those indicating a stop position, should be fixed yellow lights, visible throughout the segments within which they are intended to provide guidance.*

"[...]"

response

Not accepted

The CS text in (a) will be amended to read as paragraph 5.3.26.1 in the ICAO Annex 14 text. The text that follows in CS will remain same as in ICAO.

comment

2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response

Noted

comment

2580

comment by: *Brussels Airport*

CS-ADR-DSN.M.765(a)

The text is to be rewritten in order to be 'closer' to the origin of what was mentioned in Annex 14. The current NPA text does not allow as much space to comply to this specification, in comparison to Annex 14.

Annex 14 text : Aircraft stand manoeuvring guidance lights should be provided to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions, unless adequate guidance is provided by other means.

NPA text : Where deemed necessary, aircraft stand manoeuvring guidance lights should be provided to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions.

The advantage of the Annex 14 text was, that the possibility remained to make use of other means, e.g. marshallers.

In the NPA text, when deemed necessary guidance lights should be provided and other means (such as the use of marshallers) are no longer an option. This, we cannot agree with. The option of using marshalling, should always remain.

So, we suggest to rewrite the text in the NPA, adding : *unless adequate guidance is provided by other means* :

CS-ADR-DSN.M.765(a) Applicability :

Where deemed necessary, aircraft stand manoeuvring guidance lights should be provided to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions, unless adequate guidance is provided by other means.

response

Partially accepted

The CS text in (a) will be amended to read as paragraph 5.3.26.1 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO.

comment 2750 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#428](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.M.765

Référence: CS-ADR-DSN.M.765
Aircraft stand manoeuvring guidance lights

Traduction de courtoisie

(a) It is appropriate to modify in the following way: « ~~Where deemed necessary, The purpose of the aircraft stand manoeuvring guidance lights should be provided is~~ to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions. »

The interest is to indicate the purpose of these lights.

The indication of "where deemed necessary" is confusing notably because neither the cases where it is necessary to have these lights are indicated, nor the person who have to estimate if it is necessary.

(b) (1) et (b) (2) It is appropriate to add « where provided » before « aircraft stand manoeuvring guidance lights ...»

(b) (3) (5) et (6) It is appropriate to transfer these provisions to GM.

They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

The CS text in (a) will be amended to read as paragraph 5.3.26.1 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO.

comment 2775 comment by: *Brussels Airport*

CS-ADR-DSN.M.765(a)

The text is to be rewritten in order to be 'closer' to the origin of what was mentioned in Annex 14. The current NPA text does not allow as much space to comply to this specification, in comparison to Annex 14.

Annex 14 text : Aircraft stand manoeuvring guidance lights should be provided to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions, unless adequate guidance is provided by other means.

NPA text : Where deemed necessary, aircraft stand manoeuvring guidance lights should be provided to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions.

The advantage of the Annex 14 text was, that the possibility remained to make use of other means, e.g. marshallers.

In the NPA text, when deemed necessary guidance lights should be provided and other means (such as the use of marshallers) are no longer an

option. This, I cannot agree with. The option of using marshalling, should always remain.

So, I suggest to rewrite the text in the NPA, adding : *unless adequate guidance is provided by other means* :

CS-ADR-DSN.M.765(a) Applicability :

Where deemed necessary, aircraft stand manoeuvring guidance lights should be provided to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions, unless adequate guidance is provided by other means.

response *Partially accepted*

The CS text in (a) will be reviewed to read as paragraph 5.3.26.1 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO.

comment 2917

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.M.765	Aircraft stand manoeuvring guidance lights
Proposition/commentaire	<p>(a) Il convient d'apporter la modification suivante: « Where deemed necessary, The purpose of the aircraft stand manoeuvring guidance lights should be provided is to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions. »</p> <p>(b) (1) et (b) (2) Il convient d'ajouter " where provided" devant "aircraft stand manoeuvring guidance lights..."</p> <p>(b) (3) (5) et (6) Il convient de transférer ces dispositions en Guidance Materials.</p>
Justification	<p>Pour le (a) l'intérêt est d'indiquer l'objectif de ces feux. L'indication « where deemed necessary » est source à confusion notamment parce qu'il n'est pas indiqué pour quels cas il est nécessaire d'avoir ces feux et qui le juge nécessaire. Ce qui reste essentiel est que si ces feux sont installés, ils doivent respecter les règles de la CS-ADR-DSN.M.765, d'où le rajout de « where provided ».</p> <p>Les dispositions (b) (3) (5) et (6) n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.</p>
Traduction de courtoisie	<p>(a) It is appropriate to modify in the following way: « Where deemed necessary, The purpose of the aircraft stand manoeuvring guidance</p>

	<p>lights should be provided is to facilitate the positioning of an aircraft on an aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions. » The interest is to indicate the purpose of these lights. The indication of "where deemed necessary" is confusing notably because neither the cases where it is necessary to have these lights are indicated, nor the person who have to estimate if it is necessary.</p> <p>(b) (1) et (b) (2) It is appropriate to add « where provided » before « aircraft stand manoeuvring guidance lights ...»</p> <p>(b) (3) (5) et (6) It is appropriate to transfer these provisions to GM. They are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p>
<p>response</p>	<p><i>Not accepted</i></p> <p>The CS text in (a) will be amended to read as paragraph 5.3.26.1 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO.</p>

<p>comment</p>	<p>33 comment by: <i>ACI EUROPE - Airports Council International</i></p> <p>(c) (1) add "iii) red flashing lights"</p> <p>Justification: to be in line with ICAO</p>
<p>response</p>	<p><i>Partially accepted</i></p> <p>"red flashing light" has been added; reference to runway guard lights has been deleted.</p>
<p>comment</p>	<p>34 comment by: <i>ACI EUROPE - Airports Council International</i></p>

response	<p>(b) & (c) move to GM</p> <p><i>Not accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The provisions in the CS are design requirements.</p>
comment	<p>97 comment by: CAA-NL</p> <p>We suggest to delete runway guard lights as a road-holding position light and replace this by a flashing-red light according to ICAO Annex 14, 5.3.27.4.b. Runway guard lights should be reserved for use on taxiway only for air traffic and should not be used for regulating vehicles.</p>
response	<p><i>Accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO. The guard light reference has been deleted.</p>
comment	<p>118 comment by: Swedavia AB - Swedish airports (currently 11 airports)</p> <p>(c) (1) Add "(iii) a flashing red light" according to ICAO Annex 14, 5.3.27.4.</p> <p>(a) (1) Stick to the exact wording from ICAO Annex 14, 5.3.27.1 (350m). Describe ICAO Annex 14, 5.3.27.2 as a GM. (Recommendation).</p>
response	<p><i>Partially accepted</i></p> <p>'red flashing light' has been added. Reference to runway guard lights has been deleted.</p>
comment	<p>171 comment by: CAA Norway</p> <p>We do not agree with CS-ADR-DSN.M.770 (c)(1)(ii), (c)(5) and (c)(6) on page 125. Runway guard lights are for entry onto a runway at runway holding positions. The road holding position light should be red flashing (see also A14 5.3.27.4 b) and not the same as rwy guard lights. This is a safety critical one.</p>
response	<p><i>Accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The text in CS will remain the same as in ICAO. The guard light reference has been deleted.</p>

comment	<p>258</p> <p>comment by: <i>Brussels Airport - BRU/EBBR</i></p> <p>CS-ADR-DSN.M.770 (c)(1)(ii)</p> <p>Road-holding position light versus Runway guard light : I do not understand why runway guard lights are mentioned under CS-ADR-DSN.M.770 (c)(1)(ii).</p> <p>The corresponding standard in Annex 14, 5.3.27.4b) mentions a flashing red light, which is clearly different to a runway guard light.</p> <p>The purpose of a runway guard light is to warn pilots, and drivers when they are operating <u>on taxiways</u>, that they are about to enter an active runway. (= Annex 14 5.3.22 and = CS-ADR-DSN.M.745(a))</p> <p>So it is not meant to be used for <u>roads</u>. For that purpose Road-holding position lights exist.</p> <p>Therefore the text in CS-ADR-DSN.M.770 (c)(1)(ii), (c)(5) & (c)(6) is inconsistent, since it mentions runway guard lights.</p> <p>I suggest to stick to the corresponding Annex 14 text (5.3.27), more specifically 5.3.27.4 b) a flashing-red light and to make clear distinction with runway guard lights, which, as previously mentioned, serve other interests.</p>
response	<p><i>Accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO. The guard light reference has been deleted.</p>
comment	<p>318</p> <p>comment by: <i>Icelandic Civil Aviation Administration</i></p> <p>We do not agree with CS-ADR-DSN.M.770 (c)(1)(ii), (c)(5) and (c)(6) on page 125. Runway guard lights are for entry onto a runway at runway holding positions. The road holding position light should be red flashing (see also A14 5.3.27.4 b) and not the same as rwy guard lights. This is a safety critical one.</p>
response	<p><i>Accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO. The guard light reference has been deleted.</p>
comment	<p>344</p> <p>comment by: <i>Vienna International Airport</i></p> <p>(a)(1) change to:</p> <p>A road-holding position light should be provided at each road-holding position serving a runway when it is intended that the runway will be used in runway visual range conditions less than a value of 550 m and there is no physical barrier.</p>

response	<p><i>Not accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text.</p>
comment	<p>375 comment by: <i>Estonian CAA</i></p> <p>We do not agree with CS-ADR-DSN.M.770 (c)(1)(ii), (c)(5) and (c)(6) on page 125. Runway guard lights are for entry onto a runway at runway holding positions. The road holding position light should be red flashing (see also A14 5.3.27.4 b) and not the same as rwy guard lights. This is a safety critical one.</p>
response	<p><i>Accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO. The guard light reference has been deleted.</p>
comment	<p>567 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #429</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.770</p> <p>Référence: CS-ADR-DSN.M.770 Road-holding position light</p> <p>Traduction de courtoisie (b) (1) It is appropriate to transfer values to GM and to modify in the following way : « A road-holding position light should be located adjacent to the holding position marking and at a certain distance from 1.5 m (± 0.5 m) from one edge of the road, i.e. left or right as appropriate to the local traffic regulations. » The distance of 1,5 m (± 0.5 m) is to put in GM. (b) (2) and (c) (2) (5) and (6) It is appropriate to transfer these provisions to GM. The distance of 1,5 m (± 0.5 m) and the provisions (b) (2) and (c) (2) (5) and (6) are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p>
response	<p><i>Not accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The provisions in the CS are design requirements.</p>
comment	<p>588 comment by: <i>Cologne/Bonn Airport</i></p>

response	<p>c) (1): add iii) red flashing lights according to ICAO</p> <p><i>Accepted</i></p>
comment	<p>593 comment by: <i>Cologne/Bonn Airport</i></p> <p>b) and c) should be moved to GM</p>
response	<p><i>Not accepted</i></p> <p>The CS text will be reviewed to read mainly as paragraph 5.3.27 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO. The provisions in the CS are design requirements.</p>
comment	<p>619 comment by: <i>Avinor</i></p> <p>CS.ADR.DSN.M.770 c) (1). Add "iii) red flashing lights". Mistake by ICAO, ICAO will also change this figure.</p>
response	<p><i>Partially accepted</i></p> <p>'red flashing light' has been added. Reference to runway guard lights has been deleted.</p>
comment	<p>620 comment by: <i>Avinor</i></p> <p>CS.ADR.DSN.M.770 (b) c). Move to GM. According to ICAO.</p>
response	<p><i>Not accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The provisions in the CS are design requirements.</p>
comment	<p>666 comment by: <i>Finnish Transport Safety Agency</i></p> <p>We do not agree with CS-ADR-DSN.M.770 (c)(1)(ii), (c)(5) and (c)(6) on page 125. Runway guard lights are for entry onto a runway at runway holding positions. The road holding position light should be red flashing (see also A14 5.3.27.4 b) and not the same as rwy guard lights. This is a safety critical one.</p>
response	<p><i>Accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO. The guard light reference has been deleted.</p>

comment	769	comment by: CAA Austria - Ministry of Transport
	(a)(1) change to: A road-holding position light should be provided at each road-holding position serving a runway when it is intended that the runway will be used in runway visual range conditions less than a value of 550 m and there is no physical barrier.	
response	Not accepted	
	The CS text will be reviewed to read mainly as paragraph 5.3.27 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO.	

comment	777	comment by: ADP : Aeroports de Paris
	Référence: CS-ADR-DSN.M.770	Road-holding position light
	Proposition/commentaire	(b) (1) Il convient CS transférer les valeurs en Guidance Materials et de modifier de la manière suivante: « A road-holding position light should be located adjacent to the holding position marking and at a certain distance from 1.5 m (±0.5 m) from one edge of the road, i.e. left or right as appropriate to the local traffic regulations. » La distance de 1,5 m (±0.5 m) est à mettre en GM. (b) (2) et (c) (2) (5) et (6) Il convient de transférer ces dispositions en Guidance Materials.
	Justification	La distance de 1,5 m (±0.5 m) et les dispositions (b) (2) et (c) (2) (5) et (6) ne sont que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI. Elles ont donc leur place en GM et non en CS.
	Traduction de courtoisie	(b) (1) It is appropriate to transfer values to GM and to modify in the following way : « A road-holding position light should be located adjacent to the holding position marking and at a certain distance from 1.5 m (±0.5 m) from one edge of the road, i.e. left or right as appropriate to the local traffic regulations. » The distance of 1,5 m (±0.5 m) is to put in GM. (b) (2) and (c) (2) (5) and (6) It is appropriate to transfer these provisions to GM.

	The distance of 1,5 m (± 0.5 m) and the provisions (b) (2) and (c) (2) (5) and (6) are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.
response	<p><i>Not accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The provisions in the CS are design requirements.</p>

comment	<p>807 comment by: <i>Munich Airport International</i></p> <p><u>(c)</u></p> <p>(1): add "iii) red flashing lights"</p> <p>Justification: according to ICAO</p> <p><u>(b)(c)</u></p> <p>move to GM</p>
response	<p><i>Partially accepted</i></p> <p>'red flashing light' has been added. Reference to runway guard lights has been deleted.</p> <p>The CS will remain the same as in ICAO as the provisions therein are design requirements.</p>

comment	<p>998 comment by: <i>Salzburger Flughafen GmbH</i></p> <p>(a)(1) change to: A road -holding position light should be provided at each road-holding position serving a runway when it is intended that the runway will be used in runway visual range conditions less than a value of 550 m and there is no physical barrier.</p>
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response	<p><i>Not accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text.</p>
comment	<p>1100 comment by: <i>Flughafen Graz Betriebs GmbH</i></p> <p>(a)(1) change to: A road-holding position light should be provided at each road-holding position serving a runway when it is intended that the runway will be used in runway visual range conditions less than a value of 550 m and there is no physical barrier.</p>
response	<p><i>Not accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text.</p>
comment	<p>1170 comment by: <i>Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH</i></p> <p>(a)(1) change to: A road-holding position light should be provided at each road-holding position serving a runway when it is intended that the runway will be used in runway visual range conditions less than a value of 550 m and there is no physical barrier.</p>
response	<p><i>Not accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text.</p>
comment	<p>1203 comment by: <i>Swedish Transport Agency</i></p> <p>We do not agree with CS-ADR-DSN.M.770 (c)(1)(ii), (c)(5) and (c)(6) on page 125. Runway guard lights are for entry onto a runway at runway holding positions. The road holding position light should be red flashing (see also A14 5.3.27.4 b) and not the same as rwy guard lights.</p>
response	<p><i>Accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO. The guard light reference has been deleted.</p>

comment	<p>1503 comment by: Flughafen Linz-Hörsching - LNZ/LOWL</p> <p>(a)(1) change to:</p> <p>A road-holding position light should be provided at each road-holding position serving a runway when it is intended that the runway will be used in runway visual range conditions less than a value of 550 m and there is no physical barrier.</p>
response	<p><i>Not accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text.</p>
comment	<p>1621 comment by: Aéroport de Marseille - MRS/LFML</p> <p>(b) (1) It is appropriate to transfer values to GM and to modify in the following way : « A road-holding position light should be located adjacent to the holding position marking and at a certain distance from 1.5 m (± 0.5 m) from one edge of the road, i.e. left or right as appropriate to the local traffic regulations. » The distance of 1,5 m (± 0.5 m) is to put in GM.</p> <p>(b) (2) and (c) (2) (5) and (6) It is appropriate to transfer these provisions to GM.</p> <p>The distance of 1,5 m (± 0.5 m) and the provisions (b) (2) and (c) (2) (5) and (6) are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p>
response	<p><i>Not accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The provisions in the CS are design requirements.</p>
comment	<p>1630 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #430</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.M.770</p> <p>Référence: CS-ADR-DSN.M.770 Road-holding position light</p> <p>Traduction de courtoisie</p> <p>(b) (1) It is appropriate to transfer values to GM and to modify in the following way : « A road-holding position light should be located adjacent to the holding position marking and at a certain distance from 1.5 m (± 0.5 m) from one edge of the road, i.e. left or right as appropriate to the local traffic regulations. »</p>

	<p>The distance of 1,5 m (± 0.5 m) is to put in GM (b) (2) and (c) (2) (5) and (6) It is appropriate to transfer these provisions to GM.</p> <p>The distance of 1,5 m (± 0.5 m) and the provisions (b) (2) and (c) (2) (5) and (6) are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p>
response	<p><i>Not accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The provisions in the CS are design requirements.</p>

comment	<p>1741 comment by: UK CAA</p> <p>Page No: 125</p> <p>Paragraph No: CS-ADR-DSN.M.770 (a) (1)</p> <p>Comment: The road-holding position lights should be in operation whenever the runway is active, regardless of runway visual range.</p> <p>Justification: To be consistent with the UK proposed requirement at CS-ADR-DSN.M.745 (b) (1) the road-holding position light should be in operation whenever the runway is active. This provides a consistent message to the drivers as to when the runway is in operation.</p> <p>Proposed Text: (1) A road-holding position light should be provided at each road-holding position serving a runway and should be illuminated when the runway is active.</p>
response	<p><i>Not accepted</i></p> <p>This is an operational consideration.</p>

comment	<p>1744 comment by: Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH</p> <p>(b) (c) move to GM</p>
response	<p><i>Not accepted</i></p> <p>The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The provisions in the CS are design requirements.</p>

comment	<p>1825 comment by: Geneva International Airport (ROMIG)</p> <p>c)1) Add "iii) red flashing lights" According to ICAO</p>
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response *Partially accepted*

'red flashing light' has been added. Reference to runway guard lights has been deleted.

comment 1827 comment by: *Geneva International Airport (ROMIG)*

b)c) Move to GM
Too detailed

response *Not accepted*

The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The provisions in the CS are design requirements.

comment 1853 comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.M.770 - Road-holding position light (p125)

2. Justification and proposed text / comment

The characteristics of road holding position lights in this CS are different from those in Annex 14 Volume 1. This CS specifies the use of runway guard lights whereas ICAO Annex 14 volume 1 specifies the use of lashing-red lights. DGAC is concerned about the high cost of runway guard lights compared to the one of flashing-red lights, while there is not any added safety value by using runway guard lights. The CS shall specify as the ICAO recommended practice 5.3.27.4. Moreover, paragraph (c)(2) is not in ICAO A14 and is more ATM matter than aerodrome design matter.

CS-ADR-DSN.M.770 - Road-holding position light

"[...] (c) Characteristics:

(1) The road-holding position light should comprise:

- (i) a controllable red (stop)/green (go) traffic light; or
(ii) ~~runway guard lights a flashing-red light.~~

~~(2) Provisions for control of the lights should be installed in the positions for the air traffic services.~~

~~(3) (2) [...]"~~

response *Accepted*

comment 1942 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#431](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.M.770

Référence: CS-ADR-DSN.M.770
Road-holding position light

Traduction de courtoisie

(b) (1) It is appropriate to transfer values to GM and to modify in the following way : « A road-holding position light should be located adjacent to the holding position marking and at a certain distance from 1.5 m (± 0.5 m) from one edge of the road, i.e. left or right as appropriate to the local traffic regulations. »

The distance of 1,5 m (± 0.5 m) is to put in GM.

(b) (2) and (c) (2) (5) and (6) It is appropriate to transfer these provisions to GM.

The distance of 1,5 m (± 0.5 m) and the provisions (b) (2) and (c) (2) (5) and (6) are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The provisions in the CS are design requirements.

comment 1969

comment by: *Pau Pyrénées Airport - PUF/LFBP*

(b) (1) It is appropriate to transfer values to GM and to modify in the following way : « A road-holding position light should be located adjacent to the holding position marking and at a certain distance from 1.5 m (± 0.5 m) from one edge of the road, i.e. left or right as appropriate to the local traffic regulations. »

The distance of 1,5 m (± 0.5 m) is to put in GM.

(b) (2) and (c) (2) (5) and (6) It is appropriate to transfer these provisions to GM.

The distance of 1,5 m (± 0.5 m) and the provisions (b) (2) and (c) (2) (5) and (6) are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The provisions in the CS are design requirements.

comment 2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment	2368	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	Add "iii) red flashing lights"; consistent with ICAO	
response	<i>Partially accepted</i>	
	'red flashing light' has been added. Reference to runway guard lights has been deleted.	

comment	2432 ❖	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	Suggest moving the "CS" to "GM"	
response	<i>Not accepted</i>	
	The CS contains numerical values and will be retained in Book 1.	

comment	2605	comment by: <i>Danish Transport Authority</i>
	The paragraph (c)(1)(ii), (c)(5) and (c)(6) should be revised. Runway guard lights are for entry onto a runway at runway holding positions. The road holding position light should be red flashing (see also ICAO Annex 14, para 5.3.27.4 b) and not the same as rwy guard lights.	
response	<i>Accepted</i>	
	The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO. The guard light reference has been deleted.	

comment	2731	comment by: <i>Flughafen Klagenfurt</i>
	(a)(1) change to: A road-holding position light should be provided at each road-holding position serving a runway when it is intended that the runway will be used in runway visual range conditions less than a value of 550 m and there is no physical barrier.	
response	<i>Not accepted</i>	
	The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text.	

comment	2751	comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
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Attachment [#432](#)

ADB M NPA 2011-20 (B.III) CS-ADR-DSN.M.770

Référence: CS-ADR-DSN.M.770
Road-holding position light

Traduction de courtoisie

(b) (1) It is appropriate to transfer values to GM and to modify in the following way : « A road-holding position light should be located adjacent to the holding position marking and at a certain distance from ~~1.5 m (±0.5 m)~~ from one edge of the road, i.e. left or right as appropriate to the local traffic regulations. »

The distance of 1,5 m (±0.5 m) is to put in GM.

(b) (2) and (c) (2) (5) and (6) It is appropriate to transfer these provisions to GM.

The distance of 1,5 m (±0.5 m) and the provisions (b) (2) and (c) (2) (5) and (6) are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The provisions in the CS are design requirements.

comment

2776

comment by: *Brussels Airport*

CS-ADR-DSN.M.770 (c)(1)(ii)

Road-holding position light versus Runway guard light : I do not understand why runway guard lights are mentioned under CS-ADR-DSN.M.770 (c)(1)(ii).

Therefore (b) location and (c) characteristics should be moved to GM

The corresponding standard in Annex 14, 5.3.27.4b) mentions a flashing red light, which is clearly different to a runway guard light.

The purpose of a runway guard light is to warn pilots, and drivers when they are operating on taxiways, that they are about to enter an active runway. (= Annex 14 5.3.22 and = CS-ADR-DSN.M.745(a))

So it is not meant to be used for roads. For that purpose Road-holding position lights exist.

Therefore the text in CS-ADR-DSN.M.770 (c)(1)(ii), (c)(5) & (c)(6) is inconsistent, since it mentions runway guard lights.

We suggest to stick to the corresponding Annex 14 text (5.3.27), more specifically 5.3.27.4 b) a flashing-red light and to make clear distinction with runway guard lights, which, as previously mentioned, serve other interests

response *Not accepted*

The CS text will be reviewed to read mainly as paragraph 5.3.27 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO. The

provisions in the CS are design requirements.

comment 2918

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.M.770	Road-holding position light
Proposition/commentaire	<p>(b) (1) Il convient CS transférer les valeurs en Guidance Materials et de modifier de la manière suivante: « A road-holding position light should be located adjacent to the holding position marking and at a certain distance from 1.5 m (±0.5 m) from one edge of the road, i.e. left or right as appropriate to the local traffic regulations. »</p> <p>La distance de 1,5 m (± 0.5 m) est à mettre en GM.</p> <p>(b) (2) et (c) (2) (5) et (6) Il convient de transférer ces dispositions en Guidance Materials.</p>
Justification	<p>La distance de 1,5 m (± 0.5 m) et les dispositions (b) (2) et (c) (2) (5) et (6) ne sont que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI. Elles ont donc leur place en GM et non en CS.</p>
Traduction de courtoisie	<p>(b) (1) It is appropriate to transfer values to GM and to modify in the following way : « A road-holding position light should be located adjacent to the holding position marking and at a certain distance from 1.5 m (±0.5 m) from one edge of the road, i.e. left or right as appropriate to the local traffic regulations. »</p> <p>The distance of 1,5 m (± 0.5 m) is to put in GM.</p> <p>(b) (2) and (c) (2) (5) and (6) It is appropriate to transfer these provisions to GM.</p> <p>The distance of 1,5 m (± 0.5 m) and the provisions (b) (2) and (c) (2) (5) and (6) are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p>

response *Not accepted*

The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14. The provisions in the CS are design requirements.

comment 2968

comment by: *Isavia*

We do not agree with CS-ADR-DSN.M.770 (c)(1)(ii), (c)(5) and (c)(6) on page 125. Runway guard lights are for entry onto a runway at runway holding positions. The road holding position light should be red flashing (see also A14 5.3.27.4 b) and not the same as rwy guard lights. This is a safety critical one.

response *Accepted*

The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO. The guard light reference has been deleted.

comment 3029

comment by: *ADV -German Airports Association*

CS.ADR.DSN.M.770 c) (1)
add "iii) red flashing lights"

Justification
according to ICAO

response *Partially accepted*

'red flashing light' has been added. Reference to runway guard lights has been deleted.

comment 3030

comment by: *ADV -German Airports Association*

CS.ADR.DSN.M.770 (b) c)
move to GM

response *Not accepted*

The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The provisions in the CS are design requirements.

comment 3064

comment by: *MST / STR - Stuttgart Airport*

CS.ADR.DSN.M.770 c) (1)

	add "iii) red flashing lights"
	Justificaiton according to ICAO
response	<i>Partially accepted</i>
	'red flashing light' has been added. Reference to runway guard lights has been deleted.

comment	3065	comment by: <i>MST / STR - Stuttgart Airport</i>
	CS.ADR.DSN.M.770 (b) c) move to GM	
response	<i>Not accepted</i>	
	The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The provisions in the CS are design requirements.	

comment	3098	comment by: <i>Fraport AG</i>
	CS-ADR-DSN.M.770 — Road-holding position light (c) (1)	
	Editorial	
	The road-holding position light should comprise: (i) a controllable red (stop)/green (go) traffic light; or (ii) runway guard lights.	
	Proposed Text The road-holding position light should comprise: (i) a controllable red (stop)/green (go) traffic light; or (ii) runway guard lights. (iii) red flashing lights	
	Fraport AG to be in line with ICAO	
response	<i>Partially accepted</i>	
	The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The text that follows in CS will remain the same as in ICAO. The guard light reference has been deleted and 'red flashing light' has been added.	

comment	3099	comment by: <i>Fraport AG</i>
	CS-ADR-DSN.M.770 — Road-holding position light (b) and (c)	

	Editorial	
	Complete paragraphs	
	Move complete paragraphs to GM	
	Fraport to be in line with ICAO	AG
response	<i>Not accepted</i>	
	The CS text will be amended to read as paragraph 5.3.27 in the ICAO Annex 14 text. The provisions in the CS are design requirements.	

CS-ADR – Book 1 – CS-ADR-DSN.N.775 – General

p. 126-127

comment	98	comment by: CAA-NL
	We suggest to delete (9) (iv) because this text is not related to a variable message sign.	
response	<i>Accepted</i>	
	This will be moved to CS.785 as 'Application: paragraph (14)'.	
comment	1658	comment by: ECA - European Cockpit Association
	Comment on (c)(4): Substitute N-3F by N-3H.	
	Justification: To match the content of the corresponding paragraph of ICAO Annex 14. Appendix 4 of ICAO Annex 14 also includes the equivalent figures to N-3G & N-3H.	
response	<i>Accepted</i>	
comment	1662	comment by: ECA - European Cockpit Association
	Amend (c)(5) as follows: (5) Signs should be illuminated <u>in accordance with the provisions of GM-ADR-DSN.N.785</u> when intended for use:	
	Justification:	

	To link the paragraph with the proper guidance material concerning the illumination of the signs.
response	<i>Not accepted</i>
	This is covered in the CS.

comment	1743 comment by: UK CAA
	Page No: 126
	Paragraph No: CS.ADR.DSN.N.775 (c) (5)
	Comment: The mode of illumination is not specified, yet it can greatly affect the visibility of a sign.
	Justification: All signs used in low visibility conditions should be internally illuminated. Reference should also be made to Annex 14, Appendix 4.
	Proposed Text: New N.775(c)(6) All signs used in low visibility conditions should be internally illuminated.
	Subsequent paragraphs to be renumbered

response	<i>Not accepted</i>
	CS.775 paragraphs (6), (7) and (8) give the required luminance values. Means of illuminance is determined by aerodrome operators.

comment	2348 ❖ comment by: HIA - Highlands and Islands Airports Limited
	Noted
response	<i>Noted</i>

CS-ADR – Book 1 – CS-ADR-DSN.N.780 – Mandatory instruction signs	p. 127-129
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comment	99 comment by: CAA-NL
	(a)(5), (b)(4) and example B2 at page 129 of 301 are related to runway holding positions that are established on a taxiway if the location or alignment of the taxiway is such that a taxiing aircraft or vehicle can infringe an obstacle limitation surface or interfere with the operation of radio navigation aids. However, this is not clear in the text of CS-ADR-DSN.N.780 (a)(5) and (b)(4).

response *Not accepted*

(a)(5) is not associated with operation of radio navigation aids. It requires a sign to supplement a marking at a runway holding position. (b)(4) is ICAO text.

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 3002 comment by: *IFATCA*

CS-ADR-DSN.N.780 – Mandatory instruction signs *MOVE to GM*

"Mandatory instruction signs", why are they mandatory? For runway safety! IFATCA therefore proposes that this should not be moved to GM.

response *Accepted*

The GM will be moved to CS.780, paragraph (c)(1).

CS-ADR – Book 1 – Figure N-1 Mandatory instruction signs

p. 130

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – CS-ADR-DSN.N.785 – Information signs

p. 130-133

comment 10 comment by: *Manchester Airport plc*

(11) Using a combination of a letter and numbers for a taxiway designator could result in duplication or confusion where there are also Intermediate Taxiway Holding Positions along the same taxiway, which may also have alphanumeric designators.

response	<p><i>Noted</i></p> <p>This is an ICAO standard.</p>
comment	<p>100 comment by: CAA-NL</p> <p>We suggest to change in (b) (9) the wording 'whenever practicable' into 'not normally', according to ICAO 5.4.3.22.</p>
response	<p><i>Accepted</i></p>
comment	<p>521 comment by: East Midlands Airport - EMA/EGNX</p> <p>C. (11) Using a combination of a letter and numbers for a taxiway designator could result in duplication or confusion where there are also Intermediate Taxiway Holding Positions along the same taxiway, which may also have alphanumeric designators.</p>
response	<p><i>Noted</i></p> <p>This is an ICAO standard.</p>
comment	<p>568 comment by: Union des Aéroports français - UAF</p> <p>Attachment #433</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.N.785</p> <p>Référence: CS-ADR-DSN.N.785 Information signs</p> <p>Traduction de courtoisie (a) (6), (12) and (13) (b) (6) and (9) (c) (9) It is appropriate to transfer these provisions to GM. They must remain a possibility but they do not have to be a normative reference.</p>
response	<p><i>Not accepted</i></p> <p>These details are included to provide completeness of information on signs in one location. If signs are not required as part of the aerodrome design, they can be omitted.</p>

comment

778

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.N.785	Information signs
Proposition/commentaire	(a) (6), (12) et (13) (b) (6) et (9) (c) (9) Il convient de transférer ces dispositions en Guidance Materials.
Justification	Ces dispositions doivent demeurer une possibilité mais ne doivent pas constituer une référence normative.
Traduction de courtoisie	(a) (6), (12) and (13) (b) (6) and (9) (c) (9) It is appropriate to transfer these provisions to GM. They must remain a possibility but they do not have to be a normative reference.

response

Not accepted

These details are included to provide completeness of information on signs in one location. If signs are not required as part of the aerodrome design, they can be omitted.

comment

1117

comment by: *Belgian CAA*

Why was the ICAO Annex 14 RP 5.4.3.24 omitted?

response

Noted

This is located in the CS under 'Application, paragraph (a)(13)'.

comment

1627

comment by: *Aéroport de Marseille - MRS/LFML*

(a) (6), (12) and (13)
(b) (6) and (9)
(c) (9)

It is appropriate to transfer these provisions to GM.
They must remain a possibility but they do not have to be a normative reference

response	<p><i>Not accepted</i></p> <p>These details are included to provide completeness of information on signs in one location. If signs are not required as part of the aerodrome design, they can be omitted.</p>
comment	<p>1632 comment by: Euroairport Bâle-Mulhouse</p> <p>Attachment #434</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.N.785</p> <p>Référence: CS-ADR-DSN.N.785 Information signs</p> <p>Traduction de courtoisie (a) (6), (12) and (13) (b) (6) and (9) (c) (9)</p> <p>It is appropriate to transfer these provisions to GM. They must remain a possibility but they do not have to be a normative reference.</p>
response	<p><i>Not accepted</i></p> <p>These details are included to provide completeness of information on signs in one location. If signs are not required as part of the aerodrome design, they can be omitted.</p>
comment	<p>1745 comment by: UK CAA</p> <p>Page No: 132</p> <p>Paragraph No: CS.ADR.DSN.N.785.(c)(2)</p> <p>Comment: This creates an inconsistency that will not readily be apparent to aircrew – all location signs, whether stand along or collocated, should have the same characteristics.</p> <p>Justification: Consistency, standardisation and interoperability.</p> <p>Proposed Text: A location sign should consist of an inscription on yellow on a black background and should have a yellow border.</p>
response	<p><i>Not accepted</i></p> <p>This is in accordance with the ICAO standard.</p>

comment	<p>1943 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #435</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.N.785</p> <p>Référence: CS-ADR-DSN.N.785 Information signs</p> <p>Traduction de courtoisie (a) (6), (12) and (13) (b) (6) and (9) (c) (9) It is appropriate to transfer these provisions to GM. They must remain a possibility but they do not have to be a normative reference.</p>
response	<p><i>Not accepted</i></p> <p>These details are included to provide completeness of information on signs in one location. If signs are not required as part of the aerodrome design, they can be omitted.</p>
comment	<p>1968 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i></p>
	<p>(a) (6), (12) and (13) (b) (6) and (9) (c) (9) It is appropriate to transfer these provisions to GM. They must remain a possibility but they do not have to be a normative reference.</p>
response	<p><i>Not accepted</i></p> <p>These details are included to provide completeness of information on signs in one location. If signs are not required as part of the aerodrome design, they can be omitted.</p>
comment	<p>2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p>
	<p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2752 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p>

Attachment [#436](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.N.785

Référence: CS-ADR-DSN.N.785
Information signs

Traduction de courtoisie

(a) (6), (12) and (13)

(b) (6) and (9)

(c) (9)

It is appropriate to transfer these provisions to GM.

They must remain a possibility but they do not have to be a normative reference.

response *Not accepted*

These details are included to provide completeness of information on signs in one location. If signs are not required as part of the aerodrome design, they can be omitted.

comment

2813

comment by: *ECA - European Cockpit Association*

Delete (c)(12) and add under (c)(11) as follows:

(i) Taxiways serving primary traffic routes should be restricted to one letter only. E.g. A (alpha), B (bravo), C (Charlie).

(ii) Designation of the taxiways should start at one end of the airport and follow a logical sequence to the opposite end, e.g. east to west or north to south.

(iii) The use of the letters I (India), O (Oscar) and Z (Zulu) should be avoided as they could be mistaken with the numbers 1, 0 and 2.

(iv) The use of the letter X (Xray) should not be used as it could be mistaken for a closed taxiway.

(v) Taxiway sequence numbering should start from 1 not 0.

(vi) Different taxiways on the same aerodrome should not have the same or similar designations.

(vii) Taxiways crossing a runway should be avoided, where this is not possible, the taxiways should have different names on each side of the runway. Note: Whenever possible the letter and number should be changed (e.g. from K5 to J4).

(viii) Those taxiways that connect to the runway should have an alpha numeric designation (e.g. A1, A2, A3...A12). The numbering should start at one end of the runway and follow a logical sequence to the other end (not leaving out any numbers or "jumping" back and forth in numbering).

(viii) Connecting taxiways (links between major traffic routes) should be designated in such a way that they cannot be mistaken as runway

entrances/exits.

(x) The use of standard taxi routes is recommended to reduce congestion on ground frequencies and to make taxi clearances predictable.

(xi) Holding Points should not have designations that could be mistaken for taxiways.

(xii) Intermediate holding points should be designated by the word "spot" and then the number (e.g. Spot 7).

(xii) Apron stand designators should not conflict with any other taxiway designators at the airport.

Justification:

Taxiway related incidents and accidents have increased significantly during the last few years. The majority of them have happened in a complex taxiway environment, where illogically designated taxiways have been used or where taxiways have similar or the same designations in different parts of the airport. Also misunderstanding of taxi clearances has led to runway incursions and accidents. To reduce such incidents and accidents all taxiways and especially taxiways that enter and exit the runway should be instinctive and logical to the pilots, air traffic controllers and vehicle drivers. That requires logical routings with logical nomenclature.

Reference: IFALPA Annex 14, paragraph 5.4.3.35.

response *Not accepted*

The CS covers these points. Some of the observations are operational.

comment

2919

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.N.785	Information signs
Proposition/commentaire	(a) (6), (12) et (13) (b) (6) et (9) (c) (9) Il convient de transférer ces dispositions en Guidance Materials.
Justification	Ces dispositions doivent demeurer une possibilité mais ne doivent pas constituer une référence normative.
Traduction de courtoisie	(a) (6), (12) and (13) (b) (6) and (9) (c) (9) It is appropriate to transfer these provisions to GM. They must remain a possibility but they do not have to be a normative reference.

response *Not accepted*

These details are included to provide completeness of information on signs in one location. If signs are not required as part of the aerodrome design, they can be omitted.

comment 3003

comment by: *IFATCA*

CS-ADR-DSN.N.785 – Information signs ICAO
ICAO = Where the Rule is the same as the **ICAO** SARP

So "mandatory" is GM, and "information" is a Rule. Another argument to make "mandatory instruction signs" also a Rule.

response *Partially accepted*

The GM will be moved back to CS. Superscripts have been deleted from all CSs.

CS-ADR – Book 1 – Figure N-2 Information signs

p. 134

comment 2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Figure N-3A Forms of characters for signs

p. 135

comment 2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Figure N-3B Forms of characters for signs

p. 136

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure N-3C Forms of characters for signs

p. 137

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure N-3D Forms of characters for signs

p. 138

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure N-3E Forms of characters for signs

p. 139

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure N-3F Forms of characters for signs

p. 140

comment	1660	comment by: <i>ECA - European Cockpit Association</i>
	<p>Comment: Change the word "shall" for "should" in the text in both notes associated to the figure.</p> <p>Justification: This is a CS and therefore the word "should" is to be used.</p>	
response	<i>Accepted</i>	
	The wording has been amended to read 'should'.	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure N-3G Runway vacated sign

p. 140

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure N-3H No entry sign

p. 141

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.N.790 – VOR aerodrome checkpoint sign p. 141

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure N-4 VOR aerodrome check-point sign p. 142

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.N.795 – Aircraft stand identification signs p. 143

comment	172	comment by: <i>CAA Norway</i>
	We suggest to take out the second sentence of CS-ADR-DSN.N.795 (c) on page 143, and maintain the Annex 14 recommendation of black inscription on yellow background. This is due to harmonization and to follow the ICAO recommendations.	
response	<i>Accepted</i>	

comment	319	comment by: <i>Icelandic Civil Aviation Administration</i>
	We suggest to take out the second sentence of CS-ADR-DSN.N.795 (c) on page 143, and maintain the Annex 14 recommendation of black inscription on yellow background. This is due to harmonization and to follow the ICAO recommendations.	
response	<i>Accepted</i>	

comment	<p>569 comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #437</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.N.795</p> <p>Référence: CS-ADR-DSN.N.795 Aircraft stand identification signs</p> <p>Traduction de courtoisie It is appropriate to transfer this article to GM replacing « should » by « may ». These dispositions must remain a possibility but they do not have to be a normative reference.</p>
response	<i>Not accepted</i>

comment	<p>667 comment by: <i>Finnish Transport Safety Agency</i></p> <p>We suggest to take out the second sentence of CS-ADR-DSN.N.795 (c) on page 143, and maintain the Annex 14 recommendation of black inscription on yellow background. This is due to harmonization and to follow the ICAO recommendations.</p>
response	<i>Accepted</i>

comment	<p>779 comment by: <i>ADP : Aeroports de Paris</i></p> <table border="1" style="width: 100%;"> <tr> <td style="width: 30%;">Référence: CS-ADR-DSN.N.795</td> <td>Aircraft stand identification signs</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de transférer cet article en Guidance Materials en remplaçant « should » par « may ».</td> </tr> <tr> <td>Justification</td> <td>Ces dispositions doivent demeurer une possibilité mais ne doivent pas constituer une référence normative.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>It is appropriate to transfer this article to GM replacing « should » by « may ». These dispositions must remain a possibility but they do not have to be a normative reference.</td> </tr> </table>	Référence: CS-ADR-DSN.N.795	Aircraft stand identification signs	Proposition/commentaire	Il convient de transférer cet article en Guidance Materials en remplaçant « should » par « may ».	Justification	Ces dispositions doivent demeurer une possibilité mais ne doivent pas constituer une référence normative.	Traduction de courtoisie	It is appropriate to transfer this article to GM replacing « should » by « may ». These dispositions must remain a possibility but they do not have to be a normative reference.
Référence: CS-ADR-DSN.N.795	Aircraft stand identification signs								
Proposition/commentaire	Il convient de transférer cet article en Guidance Materials en remplaçant « should » par « may ».								
Justification	Ces dispositions doivent demeurer une possibilité mais ne doivent pas constituer une référence normative.								
Traduction de courtoisie	It is appropriate to transfer this article to GM replacing « should » by « may ». These dispositions must remain a possibility but they do not have to be a normative reference.								
response	<i>Not accepted</i>								

comment	1118	comment by: <i>Belgian CAA</i>
	Why are also other conspicuous combinations allowed? We believe it's better to get more uniformity and only accept the yellow-black combination.	
response	<i>Accepted</i>	
comment	1204	comment by: <i>Swedish Transport Agency</i>
	We suggest to take out the second sentence of CS-ADR-DSN.N.795 (c) on page 143, and maintain the Annex 14 recommendation of black inscription on yellow background. This is due to harmonization and to follow the ICAO recommendations.	
response	<i>Accepted</i>	
comment	1251	comment by: <i>East Midlands Airport - EMA/EGNX</i>
	Aircraft apron stand signage specification has been relaxed and is less restrictive. Surely a common standard should be applied.	
response	<i>Noted</i>	
	This is from ICAO text.	
comment	1631	comment by: <i>Aéroport de Marseille - MRS/LFML</i>
	It is appropriate to transfer this article to GM replacing « should » by « may ». These dispositions must remain a possibility but they do not have to be a normative reference.	
response	<i>Not accepted</i>	
comment	1633	comment by: <i>Euroairport Bâle-Mulhouse</i>
	Attachment #438	
	Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.N.795	
	Référence: CS-ADR-DSN.N.795 Aircraft stand identification signs	
	Traduction de courtoisie	

	It is appropriate to transfer this article to GM replacing « should » by « may ». These dispositions must remain a possibility but they do not have to be a normative reference.
response	<i>Not accepted</i>

comment	1944 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	Attachment #439
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.N.795
	Référence: CS-ADR-DSN.N.795 Aircraft stand identification signs
	Traduction de courtoisie It is appropriate to transfer this article to GM replacing « should » by « may ». These dispositions must remain a possibility but they do not have to be a normative reference.
response	<i>Not accepted</i>

comment	1966 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	It is appropriate to transfer this article to GM replacing « should » by « may ». These dispositions must remain a possibility but they do not have to be a normative reference.
response	<i>Not accepted</i>

comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>

comment	2606 comment by: <i>Danish Transport Authority</i>
	(c): We suggest to maintain the Annex 14 recommendation of black inscription on yellow background. To keep the harmonization and to follow the ICAO recommendations.

response *Accepted*

comment 2753 comment by: *ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD*

Attachment [#440](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.N.795

Référence: CS-ADR-DSN.N.795
Aircraft stand identification signs

Traduction de courtoisie

It is appropriate to transfer this article to GM replacing « should » by « may ». These dispositions must remain a possibility but they do not have to be a normative reference.

response *Not accepted*

comment 2773 comment by: *Airport Nuremberg - NUE/EDDN*

Since adding an aircraft stand identification sign is in the least cases feasible, this CS should be moved to the guidance material. The aerodrome operator should not be forced on that matter. Misinterpretation (i.e. aircraft identification signs must be provided) could lead to a promulgation of safety risks due to obstacle free zones and jet blast areas to be kept free.

response *Not accepted*

The word 'must' is not used in the CS. There is scope for use of alternative signs.

comment 2789 comment by: *Brussels Airport*

CS-ADR-DSN.N.795 (c)

To delete last sentence

response *Accepted*

comment 2815 comment by: *ECA - European Cockpit Association*

Delete (a), (b) and (c) and replace with:

(a) Application: An aircraft stand identification sign shall be provided for all

aircraft stands where feasible.

(b) Location: An aircraft stand identification sign shall be located:

a) So pilots are able to visually acquire the sign and easily interpret the inscription from the distance at which pilots are reasonably expected to attempt visual acquisition but not later than a location well before manoeuvring to the stand must be initiated; and

b) So the sign face is perpendicular to and centred (or nearly so where centring is not possible) on the centreline upon which an aircraft conducts final progress to the stop point; and

c) At a height that is compatible with the eye height of pilots utilizing the stand.

(c) Characteristics: An aircraft stand identification sign shall consist of:

a) An inscription in black on a yellow background;

b) A character height suitable to meet the requirement of ICAO Annex 14 5.4.5.2 and in any case not less than .8m;

c) A distance between outer most characters and the edge of the black background suitable to provide sufficient contrast and readability of the characters and in any case not less than .25m; and

d) Internal illumination when intended for use during hours of darkness or other low ambient light conditions.

Justification:

IFALPA Annex 14, paragraphs 5.4.6.1; 5.4.6.2 and 5.4.6.3

response *Not accepted*

This is ICAO text. The proposals are too detailed and restrictive.

comment

2920

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.N.795	Aircraft stand identification signs
Proposition/commentaire	Il convient de transférer cet article en Guidance Materials en remplaçant « should » par « may ».
Justification	Ces dispositions doivent demeurer une possibilité mais ne doivent pas constituer une référence normative.
Traduction de courtoisie	It is appropriate to transfer this article to GM replacing « should » by « may ». These dispositions must remain a possibility but they do not have to be a normative reference.

response *Not accepted*

comment 2969

comment by: *Isavia*

We suggest taking out the second sentence of CS-ADR-DSN.N.795 (c) on page 143, and maintaining the Annex 14 recommendation of black inscription on yellow background. This is due to harmonization and to follow the ICAO recommendations.

response *Accepted*

CS-ADR – Book 1 – CS-ADR-DSN.N.800 – Road-holding position sign

p. 143

comment 376

comment by: *Estonian CAA*

We suggest to take out the second sentence of CS-ADR-DSN.N.795 (c) on page 143, and maintain the Annex 14 recommendation of black inscription on yellow background. This is due to harmonization and to follow the ICAO recommendations.

response *Accepted*

comment 1751

comment by: *UK CAA*

Page No: 143

Paragraph No: CS-ADR-DSN.N.800 (d) (3)

Comment: Repetition of a requirement. Suggest delete (3).

Justification: The requirement described at para (3) is repeated at the end of para (4). To maintain clarity we suggest deletion of para (3).

Proposed Text: DELETE para (3)

response *Partially accepted*

The repetition will be deleted from paragraph (4).

comment	2189	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Add - including emergency access.	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.P.805 – General

p. 144

comment	570	comment by: <i>Union des Aéroports français - UAF</i>
	Attachment #441	
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.P.805 à P.835	
	Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P) CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)	
	Traduction de courtoisie We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.	
response	<i>Not accepted</i>	
	This is ICAO text.	

comment	780	comment by: <i>ADP : Aeroports de Paris</i>
	Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)	CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)
	Proposition/commentaire	Nous proposons de transférer ces articles en Guidance Materials.
	Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.
	Traduction de courtoisie	We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

This is ICAO text.

comment *1128*

comment by: *Belgian CAA*

Why is Annex 14 §5.5.8 Boundary Markers not taken up in the NPA? This part can be omitted, but it should be documented why.

response *Noted*

This is not a requirement for aerodromes within the EASA scope.

comment *1634*

comment by: *Euroairport Bâle-Mulhouse*

Attachment [#442](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.P.805 à P.835

Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)
CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)

Traduction de courtoisie

We propose to transfer these articles to GM.

These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

This is ICAO text.

comment *1635*

comment by: *Aéroport de Marseille - MRS/LFML*

We propose to transfer these articles to GM.

These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS

response *Not accepted*

This is ICAO text.

comment	1965	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	<p>It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS.</p>	
response	<i>Not accepted</i>	
	This is ICAO text.	

comment	2029	comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i>
	<p>Attachment #443</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.P.805 à P.835</p> <p>Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P) CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)</p> <p>Traduction de courtoisie We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p>	
response	<i>Not accepted</i>	
	This is ICAO text.	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

comment	2755	comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
	<p>Attachment #444</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.P.805 à P.835</p> <p>Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P) CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)</p> <p>Traduction de courtoisie</p>	

	We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.
response	<i>Not accepted</i>
	This is ICAO text.

comment	2921	comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN								
	<table border="1"> <tr> <td>Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)</td> <td>CHAPTER P — VISUAL AIDS FOR NAVIGATION (MARKERS)</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Nous proposons de transférer ces articles en Guidance Materials.</td> </tr> <tr> <td>Justification</td> <td>Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</td> </tr> </table>	Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)	CHAPTER P — VISUAL AIDS FOR NAVIGATION (MARKERS)	Proposition/commentaire	Nous proposons de transférer ces articles en Guidance Materials.	Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.	Traduction de courtoisie	We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.	
Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)	CHAPTER P — VISUAL AIDS FOR NAVIGATION (MARKERS)									
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Traduction de courtoisie	We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.									
response	<i>Not accepted</i>									
	This is ICAO text.									

CS-ADR — Book 1 — CS-ADR-DSN.P.810 — Unpaved runway edge markers	p. 144
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comment	570 ❖	comment by: Union des Aéroports français - UAF
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.P.805 à P.835	
	Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P) CHAPTER P — VISUAL AIDS FOR NAVIGATION (MARKERS)	
	Traduction de courtoisie We propose to transfer these articles to GM.	

	These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.
response	<i>Not accepted</i>
	This is ICAO text.

comment	780 ❖	comment by: <i>ADP : Aeroports de Paris</i>
	Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)	CHAPTER P — VISUAL AIDS FOR NAVIGATION (MARKERS)
	Proposition/commentaire	Nous proposons de transférer ces articles en Guidance Materials.
	Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.
	Traduction de courtoisie	We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.
response	<i>Not accepted</i>	
	This is ICAO text.	

comment	1964	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS.	
response	<i>Not accepted</i>	
	This is ICAO text.	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
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	Noted
response	<i>Noted</i>

CS-ADR – Book 1 – CS-ADR-DSN.P.815 – Stopway edge markers

p. 144

comment	<p>570 ❖ comment by: <i>Union des Aéroports français - UAF</i></p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.P.805 à P.835</p> <p>Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P) CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)</p> <p>Traduction de courtoisie We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</p>
response	<p><i>Not accepted</i></p> <p>This is ICAO text.</p>

comment	<p>780 ❖ comment by: <i>ADP : Aeroports de Paris</i></p> <table border="1"> <tr> <td>Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)</td> <td>CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Nous proposons de transférer ces articles en Guidance Materials.</td> </tr> <tr> <td>Justification</td> <td>Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.</td> </tr> </table>	Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)	CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)	Proposition/commentaire	Nous proposons de transférer ces articles en Guidance Materials.	Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.	Traduction de courtoisie	We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.
Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)	CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)								
Proposition/commentaire	Nous proposons de transférer ces articles en Guidance Materials.								
Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.								
Traduction de courtoisie	We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.								
response	<i>Not accepted</i>								

This is ICAO text.

comment 1962 comment by: Pau Pyrénées Airport - PUF/LFBP

It is appropriate to transfer this article to GM.
These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS.

response *Not accepted*

This is ICAO text.

comment 2348 ❖ comment by: HIA - Highlands and Islands Airports Limited

Noted

response *Noted*

CS-ADR — Book 1 — CS-ADR-DSN.P.820 — Edge markers for snow-covered runways

p. 144

comment 11 comment by: Manchester Airport plc

(c) Surely it would not be advisable to use trees as runway edge markers? These could be an attractant to birds and other wildlife in a safety critical area. Some other type of inorganic frangible marker should be used.

response *Noted*

Paragraph (c) of this ICAO text will be moved to GM.

comment 173 comment by: CAA Norway

We suggest to remove the reference to **trees** and **height** in CS-ADR-DSN.P.820 (c) on page 144
(Trees not suitable for airports in EASA scope) (Height already covered in CS-ADR-DSN.P.805 as sufficiently low to preserve clearance for props and engine pods).

response	<p><i>Accepted</i></p> <p>Paragraph (c) of this ICAO text will be moved to GM.</p>
comment	<p>320 comment by: <i>Icelandic Civil Aviation Administration</i></p> <p>We suggest to remove the reference to trees and height in CS-ADR-DSN.P.820 (c) on page 144. (Trees not suitable for airports in EASA scope) (Height already covered in CS-ADR-DSN.P.805 as sufficiently low to preserve clearance for props and engine pods).</p>
response	<p><i>Accepted</i></p> <p>Paragraph (c) of this ICAO text will be moved to GM.</p>
comment	<p>377 comment by: <i>Estonian CAA</i></p> <p>We suggest to remove the reference to trees and height in CS-ADR-DSN.P.820 (c) on page 144. (Trees not suitable for airports in EASA scope) (Height already covered in CS-ADR-DSN.P.805 as sufficiently low to preserve clearance for props and engine pods).</p>
response	<p><i>Accepted</i></p> <p>Paragraph (c) of this ICAO text will be moved to GM.</p>
comment	<p>524 comment by: <i>East Midlands Airport - EMA/EGNX</i></p> <p>(c) Surely it would not be advisable to use trees as runway edge markers? These could be an attractant to birds and other wildlife in a safety critical area. Some other type of inorganic frangible marker should be used.</p>
response	<p><i>Noted</i></p> <p>Paragraph (c) of this ICAO text will be moved to GM.</p>
comment	<p>668 comment by: <i>Finnish Transport Safety Agency</i></p> <p>We suggest to remove the reference to trees and height in CS-ADR-DSN.P.820 (c) on page 144. (Trees not suitable for airports in EASA scope) (Height already covered in CS-ADR-DSN.P.805 as sufficiently low to preserve clearance for props and engine</p>

	Pods).
response	<i>Accepted</i>
	Paragraph (c) of this ICAO text will be moved to GM.

comment	780 ❖	comment by: <i>ADP : Aeroports de Paris</i>
	Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)	CHAPTER P — VISUAL AIDS FOR NAVIGATION (MARKERS)
	Proposition/commentaire	Nous proposons de transférer ces articles en Guidance Materials.
	Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.
	Traduction de courtoisie	We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.
response	<i>Partially accepted</i>	
		Paragraph (c) of this ICAO text will be moved to GM.

comment	1124	comment by: <i>Belgian CAA</i>
		Is there a specific reason why a part of the text in paragraph (b) was removed?
response	<i>Noted</i>	
		ICAO text will be reinserted in paragraph (b).

comment	1205	comment by: <i>Swedish Transport Agency</i>
		We suggest to remove the reference to trees and height in CS-ADR-DSN.P.820 (c) on page 144. (Trees not suitable for airports in EASA scope) (Height already covered in CS-

response	<p>ADR-DSN.P.805 as sufficiently low to preserve clearance for props and engine pods).</p> <p><i>Accepted</i></p> <p>Paragraph (c) of this ICAO text will be moved to GM.</p>
comment	<p>1961 comment by: Pau Pyrénées Airport - PUF/LFBP</p> <p>It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS.</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (c) of this ICAO text will be moved to GM.</p>
comment	<p>2175 comment by: DGAC Direction Générale de l'aviation civile</p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN.P.820 — Edge markers for snow-covered runways (p144) • CS-ADR - Book 2 - GM-ADR-DSN.P.820 — Edge markers for snow-covered runways (p281) <p><u>2. Justification and proposed text / comment</u></p> <p>Accepting non frangible objects such as trees as edge markers is totally inappropriate with regard to the specifications on objects on aerodrome infrastructures.</p> <p>Despite the limited use of this CS in European aerodromes, this CS could be used as an argument from aerodrome operators to justify the presence of other types of non frangible obstacles in the runway strips. It is proposed to remove this CS and corresponding GM.</p> <p>CS-ADR-DSN.P.820 — Edge markers for snow covered runways "(a) Applicability: Edge markers for snow covered runways should be used to indicate the usable limits of a snow covered runway when the limits are not otherwise indicated. (b) Location: Edge markers for snow covered runways should be placed along the sides of the usable runway at intervals of not more than 100 m. Sufficient markers should be placed across the threshold and end of the usable runway. (c) Characteristics: Edge markers for snow covered runways should consist of conspicuous objects such as evergreen trees about 1.5 m high, or light weight markers."</p> <p>GM-ADR-DSN.P.820 — Edge markers for snow covered runways "Runway lights could be used to indicate the limits."</p>
response	<p><i>Partially accepted</i></p>

Paragraph (c) of this ICAO text will be moved to GM.

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2607 comment by: *Danish Transport Authority*

We suggest to remove the reference to trees and height in CS-ADR-DSN.P.820 (c) on page 144.
(Trees not suitable for airports in EASA scope) (Height already covered in CS-ADR-DSN.P.805 as sufficiently low to preserve clearance for props and engine pods).

response *Accepted*

Paragraph (c) of this ICAO text will be moved to GM.

comment 2628 comment by: *Swedavia AB - Swedish airports (currently 11 airports)*

We suggest to remove the reference to trees and height in CS-ADR-DSN.P.820 (c) on page 144.
(Trees not suitable for airports in EASA scope) (Height already covered in CS-ADR-DSN.P.805 as sufficiently low to preserve clearance for props and engine pods).

response *Accepted*

Paragraph (c) of this ICAO text will be moved to GM.

comment 2970 comment by: *Isavia*

We suggest removing the reference to trees and height in CS-ADR-DSN.P.820 (c) on page 144.
(Trees not suitable for airports in EASA scope) (Height already covered in CS-ADR-DSN.P.805 as sufficiently low to preserve clearance for props and engine pods).

response *Accepted*

Paragraph (c) of this ICAO text will be moved to GM.

comment 570 ❖ comment by: *Union des Aéroports français - UAF*

UAF NPA 2011-20 (B.III) CS-ADR-DSN.P.805 à P.835

Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)
CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)

Traduction de courtoisie

We propose to transfer these articles to GM.

These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

This CS allows flexibility.

comment 780 ❖ comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)

CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)

Proposition/commentaire

Nous proposons de transférer ces articles en Guidance Materials.

Justification

Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.

Traduction de courtoisie

We propose to transfer these articles to GM.
These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

This CS allows flexibility.

comment	1959	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS.	
response	<i>Not accepted</i>	
	This CS allows flexibility.	
comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	
comment	2777	comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	(a) should be adapted according to the ICAO Annex 14 and the passage "and where the edge of the taxiway needs to be identified" should be cancelled due to the prevention of misinterpretation and in order to have the same specification.	
response	<i>Partially accepted</i>	
	The text 'and where the edge of the taxiway needs to be identified' will be deleted.	

comment	570 ❖	comment by: <i>Union des Aéroports français - UAF</i>
	UAF NPA 2011-20 (B.III) CS-ADR-DSN.P.805 à P.835	
	Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P) CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)	
	Traduction de courtoisie We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.	
response	<i>Not accepted</i>	

This CS allows flexibility.

comment

780 ❖

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)	CHAPTER P — VISUAL AIDS FOR NAVIGATION (MARKERS)
Proposition/commentaire	Nous proposons de transférer ces articles en Guidance Materials.
Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.
Traduction de courtoisie	We propose to transfer these articles to GM. These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response

Not accepted

This CS allows flexibility.

comment

1958

comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate to transfer this article to GM.
These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS.

response

Not accepted

This CS allows flexibility.

comment

2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response

Noted

comment 570 ❖ comment by: *Union des Aéroports français - UAF*

UAF NPA 2011-20 (B.III) CS-ADR-DSN.P.805 à P.835

Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)
CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)

Traduction de courtoisie

We propose to transfer these articles to GM.

These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

This CS allows flexibility.

comment 780 ❖ comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.P.805 à P.835 (Chapter P)

CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)

Proposition/commentaire

Nous proposons de transférer ces articles en Guidance Materials.

Justification

Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.

Traduction de courtoisie

We propose to transfer these articles to GM.
These dispositions are just good practices and not normative references in ICAO Annex 14 so they must be in GM and not in CS.

response *Not accepted*

This CS allows flexibility.

comment	1752	comment by: UK CAA
	<p>Page No: 145</p> <p>Paragraph No: CS.ADR.DSN.P.835.(b)2</p> <p>Comment: The specification to have conical shaped markers only is too rigid. Their purpose is to delineate, not to delimit, the taxiway.</p> <p>Justification: The purpose of the markers is to delineate the taxiway and other shapes have proved to be effective. In the UK, cylindrical markers (known as linlaners) have been widely and successfully used. As written, the CS is too restrictive.</p> <p>Proposed Text: Replace existing (b)(2) with: "Where there are no lights, suitable markers should be placed so as to clearly delineate the taxiway."</p>	
response	Accepted	

comment	1957	comment by: Pau Pyrénées Airport - PUF/LFBP
	<p>It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS.</p>	
response	Not accepted	
	This CS allows flexibility.	

comment	2348 ❖	comment by: HIA - Highlands and Islands Airports Limited
	Noted	
response	Noted	

CS-ADR – Book 1 – CS-ADR-DSN.Q.840 – Objects to be marked and/or lighted

p. 146-147

comment	174	comment by: CAA Norway
	<p>Please reword senteces in CS-ADR-DSN.Q.840 (b)(3), (c)(2) and (d)(3) on page 146. The meaning is hard to understand, the way they are written now.</p>	

response	<i>Noted</i>
	Additional text has been added to the original ICAO text to allow for flexibility in the type of light to be used (high or medium intensity for day as assessed by aerodrome operators).
comment	246 comment by: <i>Brussels Airport - BRU/EBBR</i>
	Omission of mobile objects. I suggest to add some text regarding mobile objects in both CS-ADR-DSN.Q.840 & CS-ADR-DSN.Q.845. Both CS's only mention fixed objects but in the CS on the lighting of objects (CS-ADR-DSN.Q.850) mobile objects are mentioned. For this reason and to be consistent, I'd prefer reference to mobile objects as well in those two CS's. Anyway, it is already mentioned in the corresponding GM : GM-ADR-DSN.Q.845. So to be consistent with that I'd like to see reference in the corresponding CS.
response	<i>Noted</i>
	Mobile objects are an operational consideration.
comment	321 comment by: <i>Icelandic Civil Aviation Administration</i>
	Unclear last part - "Please reword senteces in CS-ADR-DSN.Q.840 (b)(3), (c)(2) and (d)(3) on page 146. The meaning is hard to understand, the way they are written now.
response	<i>Noted</i>
	Additional text has been added to the original ICAO text to allow for flexibility in the type of light to be used (high or medium intensity for day as assessed by aerodrome operators).
comment	378 comment by: <i>Estonian CAA</i>
	Please reword senteces in CS-ADR-DSN.Q.840 (b)(3), (c)(2) and (d)(3) on page 146. The meaning is hard to understand, the way they are written now.
response	<i>Noted</i>
	Additional text has been added to the original ICAO text to allow for flexibility in

the type of light to be used (high or medium intensity for day as assessed by aerodrome operators).

comment 669 comment by: *Finnish Transport Safety Agency*

Please reword sentences in CS-ADR-DSN.Q.840 (b)(3), (c)(2) and (d)(3) on page 146. The meaning is hard to understand, the way they are written now.

response *Noted*

Additional text has been added to the original ICAO text to allow for flexibility in the type of light to be used (high or medium intensity for day as assessed by aerodrome operators).

comment 1050 comment by: *Federal Office of Civil Aviation FOCA*

CS-ADR-DSN.Q.840 (a): Delete paragraph (a) and integrate the Chapters "OBSTACLE BEYOND THE LIMITATION SURFACES", "OBSTACLES INSIDE THE LIMITATION SURFACES AND OUTSIDE THE AERODROME", "LIGHTING OF OBJECTS OUTSIDE THE AREA CONTROLLED BY THE AERODROME OPERATOR" and "WIND TURBINES" into this chapter. The specifications of markings and lightings of an obstacle should appear only in one place. At the moment, different tables and figures exist in the AMC/GM and in the CS chapter as well.

CS-ADR-DSN.Q.840 (e): Please define exemptions according to the obstacle protection surface. The obstacle protection surface should have the same exemptions as the obstacle limitation surfaces in this chapter.

CS-ADR-DSN.Q.840 (c);(d);(e): Please define exemptions such as (b)-(1)+(4) according to the obstacle protection surface. The obstacle protection surface should have the same exemptions as the obstacle limitation surfaces in this chapter.

CS-ADR-DSN.Q.840: Unclear scope of applicability. EASA should remove all chapters related to "visual aids denoting obstacles" and only refer to ICAO related material. This will avoid confusion and possible wrong interpretation as the criteria must remain the same among Member States. The NPA only deals with a specific range of aerodromes, which fulfill the conditions within the NPA scope.

response *Noted*

Not Agreed: (a) This observation is not in the scope of ADR Design.

Noted: (e) The obstacle protection surface is as described in ICAO Annex 14 relating to visual aids protection.

Noted: (c); (d); (e) The obstacle protection surfaces have distinct and different characteristics to the OLS. ICAO text is used in this part of the CS.

comment 1111 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.260 — Taxiway minimum separation distance (p25-26)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.315 — Width of taxiway strips (p29)
- BIII - CS-ADR - Book 1 - Figure D-1. Rapid exit taxiway (p28)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad (p35)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.Q.840 — Objects to be marked and/or lighted (p146-147)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.260 — Taxiway minimum separation distance
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.315 — Width of taxiway strips (p232)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad (p239)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.255 — Junction and intersection of taxiways
- Explanatory Note – paragraph 18 (page 8)

2. Proposed text / comment

The figures for taxiway minimum separation distances are intended for design purposes only and can be far less large than indicated: indeed, these figures are no more applied when maintaining taxiways and consequently no more relevant.

No safety concern has been noticed until now on this point.

But above all, verifying that the separation distances between taxiways are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured" (paragraph 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) either the certification specification gives only the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision, and the figures are in guidance material.
- (ii) or the figures are kept in the CS but specifying each time that they should be met "where practicable" and the CS gives the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision.

The option (i) is proposed by DGAC because less confusing and far clearer, and therefore more appropriate for a regulation and for future standardization. This is a critical point for DGAC.

All CSs referring to figures in table D-1 are to be changed consequently: their provisions corresponding to such distance should be move to GM, except for CS-ADR-DSN.Q.840 — *Objects to be marked and/or lighted* because the objective is marking and/or lighting thus is quite different and it is proposed to add the figures of table D-1 in this CS as Table Q-3 – *Taxiway minimum*

marking and/or lighting distances.

This option (i) and the consequences on CS referring to table D-1 are detailed below:

CS-ADR-DSN.D.260 – Taxiway minimum separation distance

~~"The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be sufficient for safe aircraft operations, in particular to prevent from aircraft collision less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.~~

~~[...]~~

~~Table D-1. Taxiway minimum separation distances"~~

GM-ADR-DSN.D.260 – Taxiway minimum separation distance

"[...] (c) The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

[...]

Table GM-D-1. Taxiway minimum separation distances

(d) The separation distances of ~~Book 1~~, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(~~d~~) (e) The separation distance between the centre line of an aircraft stand taxilane and an object shown in ~~Book 1~~, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

CS-ADR-DSN.D.315 – Width of taxiway strips

~~"A taxiway strip should extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table ADR-D-1, column 11."~~

GM-ADR-DSN.D.315 – Width of taxiway strips

"A taxiway strip may extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table GM-D-1, column 11."

CS-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

~~"[...] (b) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.~~

~~(c) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)~~

~~Figure G-1 Minimum separation distance on a de-icing/anti-icing facility"~~

GM-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

"[...] (d) If the pad layout is such as to include bypass configuration, the

minimum separation distances specified in Table D-1, column (12) should be provided.

(e) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)

Figure GM-G-1 Minimum separation distance on a de-icing/anti-icing facility"

CS-ADR-DSN.Q.840 – Objects to be marked and/or lighted p146

"[...] (g) All obstacles within the distance specified in Table ~~D-1~~ Q-3, from the centre line of a taxiway, an apron taxiway or aircraft stand taxilane should be marked and, if the taxiway, apron taxiway or aircraft stand taxilane is used at night, lighted.

Table Q-3 – Taxiway minimum marking and/or lighting distances"

GM-ADR-DSN.D.255 – Junction and intersection of taxiways

"(e) The separation distances of Book 1, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(f) The separation distance between the centre line of an aircraft stand taxilane and an object shown in Book 1, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

response *Not accepted*

There is no need to add a new table (Q-3) to repeat the specifications in Table D-1.

comment 1206

comment by: Swedish Transport Agency

Please reword sentences in CS-ADR-DSN.Q.840 (b)(3), (c)(2) and (d)(3) on page 146. The meaning is hard to understand, the way they are written now.

response *Noted*

Additional text has been added to the original ICAO text to allow for flexibility in the type of light to be used (high or medium intensity for day as assessed by aerodrome operators).

comment 1664

comment by: ECA - European Cockpit Association

Delete (c) and replace with:

Where take-off ceiling and visibility minima are specified for a runway, critical obstacles shall be marked and, if the runway is used at night, lighted, except where it can be shown that the obstacle is not a hazard to safe operation.

Justification:

Reference: IFALPA Annex 14, paragraph 6.1.2

response	<i>Not accepted</i>
	This observation refers to operational considerations.
comment	2193 comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	(a) Obstacle lighting requirements are limited only to areas under the control of the aerodrome. This does not comply with ICAO or UK requirements, where any obstacle within a 15km radius of the aerodrome is required to be lit.
response	<i>Noted</i>
	The areas outside the control of an aerodrome operator will be addressed to the respective Member State.
comment	2365 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	UNCLEAR: EASA should remove all chapters related to "visual aids denoting obstacles" and only refer to ICAO related material. This will avoid confusion and possible wrong interpretation as the criteria must remain the same among a whole State. The NPA only deals with some aerodromes, which are satisfying the conditions of the NPA scope.
response	<i>Noted</i>
comment	2553 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	CS-ADR-DSN.Q.840 – Objects to be marked and/or lighted p146 "[...] (g) All obstacles within the distance specified in Table D-1 Q-3, from the centre line of a taxiway, an apron taxiway or aircraft stand taxilane should be marked and, if the taxiway, apron taxiway or aircraft stand taxilane is used at night, lighted. Table Q-3 – Taxiway minimum marking and/or lighting distances"
response	<i>Not accepted</i>
	There is no need to add a new table (Q-3) to repeat the specifications in Table D-1.
comment	2608 comment by: <i>Danish Transport Authority</i>
	Query: Please reword sentences in CS-ADR-DSN.Q.840 (b)(3), (c)(2) and (d)(3) on page 146. The meaning is hard to understand, the way they are written now.

response *Noted*

Additional text has been added to the original ICAO text to allow for flexibility in the type of light to be used (high or medium intensity for day as assessed by aerodrome operators).

comment 2972

comment by: *Isavia*

Unclear last part - "Please reword sentences in CS-ADR-DSN.Q.840 (b)(3), (c)(2) and (d)(3) on page 146. The meaning is hard to understand, the way they are written now.

response *Noted*

Additional text has been added to the original ICAO text to allow for flexibility in the type of light to be used (high or medium intensity for day as assessed by aerodrome operators).

CS-ADR – Book 1 – CS-ADR-DSN.Q.845 – Marking of objects

p. 147-148

comment 245

comment by: *Brussels Airport - BRU/EBBR*

AMC-ADR-OPS.B.080(b) - (CS-ADR-DSN.Q.845) - GM-ADR-DSN.Q.845(d)
The text to be lined up with Annex 14. The words 'red or yellowish' were omitted.

In NPA 2011-20 B.II AMC-ADR-OPS.B.080(b) "Marking and lighting of vehicles and other mobile objects" it says : 'When mobile objects are marked by colour, a single conspicuous colour, preferably green for emergency vehicles and yellow for service vehicles should be used'. The corresponding Annex 14 recommendation 6.2.6 says : "preferably red or yellowish green".

In the Certification Specifications (CS-ADR-DSN.Q.845 – Marking of Objects) nothing is mentioned about the colour of mobile obstacles. But there is in the corresponding Guidance Material : GM-ADR-DSN.Q.845 – Marking of objects (d) : "A single colour, preferably red or yellowish green for emergency vehicles and yellow for service vehicles, is generally used." Here the words red or yellowish are not forgotten, but the word 'conspicuous' is omitted here.

Suggested text for AMC-ADR-OPS.B.080(b) and also for GM-ADR-DSN.Q.845(d) : "A single conspicuous colour, preferably red or yellowish green for emergency vehicles and yellow for service vehicles, is generally used."

response *Noted*

Marking and lighting of mobile objects is an operational consideration and is covered by an AMC.

comment	<p>247 comment by: <i>Brussels Airport - BRU/EBBR</i></p>
	<p>Omission of mobile objects.</p> <p>I suggest to add some text regarding mobile objects in both CS-ADR-DSN.Q.840 & CS-ADR-DSN.Q.845. Both CS's only mention fixed objects but in the CS on the lighting of objects (CS-ADR-DSN.Q.850) mobile objects are mentioned. For this reason and to be consistent, I'd prefer reference to mobile objects as well in those two CS's.</p> <p>Anyway, it is already mentioned in the corresponding GM : GM-ADR-DSN.Q.845. So to be consistent with that I'd like to see reference in the corresponding CS.</p>
response	<p><i>Noted</i></p> <p>Marking and lighting of mobile objects is an operational consideration and is covered by an AMC.</p>

comment	<p>453 comment by: <i>Brussels Airport</i></p>
	<p>The text to be lined up with Annex 14. The words 'red or yellowish' were omitted.</p> <p>In NPA 2011-20 B.II AMC-ADR-OPS.B.080(b) "Marking and lighting of vehicles and other mobile objects" it says : 'When mobile objects are marked by colour, a single conspicuous colour, preferably <u>green</u> for emergency vehicles and yellow for service vehicles should be used'. The corresponding Annex 14 recommendation 6.2.6 says : "preferably red or yellowish green".</p> <p>In the Certification Specifications (CS-ADR-DSN.Q.845 – Marking of Objects) nothing is mentioned about the colour of mobile obstacles. But there is in the corresponding Guidance Material : GM-ADR-DSN.Q.845 – Marking of objects (d) : "A single colour, preferably red or yellowish green for emergency vehicles and yellow for service vehicles, is generally used." Here the words red or yellowish are not forgotten, but the word 'conspicuous' is omitted here.</p> <p>Suggested text for AMC-ADR-OPS.B.080(b) and also for GM-ADR-DSN.Q.845(d) : "A single <u>conspicuous</u> colour, preferably <u>red or yellowish green</u> for emergency vehicles and yellow for service vehicles, is generally used."</p>
response	<p><i>Noted</i></p> <p>Marking and lighting of mobile objects is an operational consideration and is covered by an AMC.</p>

comment	<p>577</p> <p style="text-align: right;">comment by: <i>Union des Aéroports français - UAF</i></p> <p>Attachment #464</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.Q.845</p> <p>Référence: CS-ADR-DSN.Q.845 Marking of objects</p> <p>Traduction de courtoisie It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS. Moreover there are other methods much more effective and environment-friendly.</p>
response	<p><i>Not accepted</i></p> <p>The requirement for all fixed objects to be marked (coloured or by flags) is an ICAO standard. The CS text specifies how this should be achieved.</p>

comment	<p>781</p> <p style="text-align: right;">comment by: <i>ADP : Aeroports de Paris</i></p> <table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">Référence: CS-ADR-DSN.Q.845</td> <td>Marking of objects</td> </tr> <tr> <td>Proposition/commentaire</td> <td>Il convient de transférer cet article en Guidance Materials.</td> </tr> <tr> <td>Justification</td> <td>Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS. De plus il existe d'autres méthodes beaucoup plus efficaces et respectueuses de l'environnement.</td> </tr> <tr> <td>Traduction de courtoisie</td> <td>It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS. Moreover there are other methods much more effective and environment-friendly.</td> </tr> </table>	Référence: CS-ADR-DSN.Q.845	Marking of objects	Proposition/commentaire	Il convient de transférer cet article en Guidance Materials.	Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS. De plus il existe d'autres méthodes beaucoup plus efficaces et respectueuses de l'environnement.	Traduction de courtoisie	It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS. Moreover there are other methods much more effective and environment-friendly.
Référence: CS-ADR-DSN.Q.845	Marking of objects								
Proposition/commentaire	Il convient de transférer cet article en Guidance Materials.								
Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS. De plus il existe d'autres méthodes beaucoup plus efficaces et respectueuses de l'environnement.								
Traduction de courtoisie	It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS. Moreover there are other methods much more effective and environment-friendly.								
response	<p><i>Not accepted</i></p> <p>The requirement for all fixed objects to be marked (coloured or by flags) is an</p>								

ICAO standard. The CS text specifies how this should be achieved.

comment 963 comment by: *Belgian CAA*

On the column "Height of light unit above terrain" in the last line "P2" must be changed by "92"

response *Noted*

This comment seems to relate to lighting of objects (CS Q.850) and Table Q-1.

comment 1051 comment by: *Federal Office of Civil Aviation FOCA*

CS-ADR-DSN.Q.845 (a): Please complete the para. as follows: "... markers, flags or windsocks should be displayed..." Windsocks are sometimes appropriate.

CS-ADR-DSN.Q.845 (d): Please modify the heading in "Use of flags and windsocks", complete the description (1)-(3) with specifications for windsocks. Missing definition.

CS-ADR-DSN.Q.845 (b) Figure Q-2: Please change reference "See 6.3.12" to "CS-ADR-DSN.Q.485 (b) (3)". The ICAO reference is used instead of the CS reference.

response *Not accepted*

Specifications for wind direction indicators are in CS-ADR-DSN.K.490 (including use of colours). Additional marking is not required.

comment 1636 comment by: *Euroairport Bâle-Mulhouse*

Attachment [#465](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.Q.845

Référence: CS-ADR-DSN.Q.845
Marking of objects

Traduction de courtoisie

It is appropriate to transfer this article to GM.

These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS.

Moreover there are other methods much more effective and environment-

	friendly.
response	<p><i>Not accepted</i></p> <p>The requirement for all fixed objects to be marked (coloured or by flags) is an ICAO standard. The CS text specifies how this should be achieved.</p>

comment	<p>1639 comment by: <i>Aéroport de Marseille - MRS/LFML</i></p> <p>It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS. Moreover there are other methods much more effective and environment-friendly.</p>
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response	<p><i>Not accepted</i></p> <p>The requirement for all fixed objects to be marked (coloured or by flags) is an ICAO standard. The CS text specifies how this should be achieved.</p>
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comment	<p>1753 comment by: <i>UK CAA</i></p> <p>Page No: 147</p> <p>Paragraph No: CS.ADR.DSN.Q.845(b)(3)</p> <p>Comment: The dimensions for the marking band widths are provided in Table 6-1 in the guidance material. Reference to this should be included in the CS.</p> <p>Justification: Ease of reference and consistency</p> <p>Proposed Text: Additional sentence – “The dimensions of the marking band widths are shown in Table 6-1.”</p>
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response	<p><i>Accepted</i></p> <p>The table will be numbered 'Table Q-3'.</p>
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comment	<p>1754 comment by: <i>UK CAA</i></p> <p>Page No: 147</p> <p>Paragraph No: CS.ADR.DSN.Q.845(c)(2)</p> <p>Comment: The purpose of such markers is conspicuity. To facilitate this, other shapes should be permitted where deemed to be better.</p> <p>Justification: Conspicuity of overhead wires/cables.</p>
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	<p>Proposed Text: "Markers displayed on an overhead wire, cable etc., should be conspicuous and have a diameter of not less than 60cm."</p>
response	<p><i>Not accepted</i></p> <p>This is ICAO wording.</p>
comment	<p>1945 comment by: <i>Aéroport Nantes Atlantique - NTE/LFRS</i></p> <p>Attachment #466</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.Q.845</p> <p>Référence: CS-ADR-DSN.Q.845 Marking of objects</p> <p>Traduction de courtoisie It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS. Moreover there are other methods much more effective and environment-friendly.</p>
response	<p><i>Not accepted</i></p> <p>The requirement for all fixed objects to be marked (coloured or by flags) is an ICAO standard. The CS text specifies how this should be achieved.</p>
comment	<p>1956 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i></p> <p>It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS. Moreover there are other methods much more effective and environment-friendly.</p>
response	<p><i>Not accepted</i></p> <p>The requirement for all fixed objects to be marked (coloured or by flags) is an ICAO standard. The CS text specifies how this should be achieved.</p>
comment	<p>2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>

comment	2360	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	Modify the title in "Use of flags and windsocks", complete the description (1)-(3) with specifications for windsocks	
response	<i>Not accepted</i>	
	Specifications for wind direction indicators are in CS-ADR-DSN.K.490 (including use of colours). Additional marking is not required.	

comment	2361	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	amend the article as following: "... markers, flags or windsocks should be displayed..."	
response	<i>Not accepted</i>	
	Specifications for wind direction indicators are in CS-ADR-DSN.K.490 (including use of colours). Additional marking is not required.	

comment	2763	comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
	Attachment #467	
	ADBM NPA 2011-20 (B.III) CS-ADR-DSN.Q.845	
	Référence: CS-ADR-DSN.Q.845 Marking of objects	
	Traduction de courtoisie It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS. Moreover there are other methods much more effective and environment-friendly.	
response	<i>Not accepted</i>	
	The requirement for all fixed objects to be marked (coloured or by flags) is an ICAO standard. The CS text specifies how this should be achieved.	

comment	2779	comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	According to ICAO Annex 14, the use of flags should be specified for mobile objects as well:	

6.2.12 Flags used to mark fixed objects shall not be less than 0.6 m square and **flags used to mark mobile objects, not less than 0.9 m square.**

response *Noted*

The use of flags to mark mobile objects is an operational consideration and is covered by an AMC.

comment

2922

comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

Référence: CS-ADR-DSN.Q.845	Marking of objects
Proposition/commentaire	Il convient de transférer cet article en Guidance Materials.
Justification	Ces dispositions n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS. De plus il existe d'autres méthodes beaucoup plus efficaces et respectueuses de l'environnement.
Traduction de courtoisie	It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS. Moreover there are other methods much more effective and environment-friendly

response *Not accepted*

The requirement for all fixed objects to be marked (coloured or by flags) is an ICAO standard; the CS text specifies how this should be achieved.

comment 577 ❖

comment by: *Union des Aéroports français - UAF*

UAF NPA 2011-20 (B.III) CS-ADR-DSN.Q.845

	<p>Référence: CS-ADR-DSN.Q.845 Marking of objects</p> <p>Traduction de courtoisie It is appropriate to transfer this article to GM</p> <p>These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS. Moreover there are other methods much more effective and environment-friendly.</p>
response	<p><i>Not accepted</i></p> <p>The requirement for all fixed objects to be marked (coloured or by flags) is an ICAO standard. The CS text specifies how this should be achieved.</p>

comment	<p>1066 comment by: <i>Federal Office of Civil Aviation FOCA</i></p> <p>Less than 92 m AGL, incorrect number</p>
response	<p><i>Noted</i></p> <p>It is not clear from the comment where the value of 92 m AGL is derived from. Figure Q-1 relates to basic marking patterns and the greatest dimension shown is 4.5 m.</p> <p>If the comment was addressed to Table Q-1, this has been amended with the correct value 92 m.</p>

comment	<p>2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p><i>Noted</i></p>
response	<p><i>Noted</i></p>

comment	<p>2358 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>incorrect: Less than 92 m AGL</p>
response	<p><i>Noted</i></p> <p>It is not clear from the comment where the value of 92 m AGL is derived from. Figure Q-1 relates to basic marking patterns and the greatest dimension shown is 4.5 m.</p> <p>If the comment was addressed to Table Q-1, this has been amended with the correct value 92 m.</p>

CS-ADR – Book 1 – Figure Q-2 Examples of lighting and marking of tall structures

p. 149

comment 577 ❖ comment by: *Union des Aéroports français - UAF*

UAF NPA 2011-20 (B.III) CS-ADR-DSN.Q.845

Référence: CS-ADR-DSN.Q.845
Marking of objects

Traduction de courtoisie

It is appropriate to transfer this article to GM.

These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS.

Moreover there are other methods much more effective and environment-friendly.

response *Not accepted*

The requirement for all fixed objects to be marked (coloured or by flags) is an ICAO standard. The CS text specifies how this should be achieved.

comment 1067 comment by: *Federal Office of Civil Aviation FOCA*

The ICAO reference is used instead of CS reference. Please change reference (a) "See 6.3.25" to "CS-ADR-DSN.Q.850 (d) (3)".

response *Accepted*

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2359 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

Change reference "See 6.3.12" into "CS-ADR-DSN.Q.485 (b) (3)"

response *Accepted*

It is assumed that the reference CS is meant to be CS-ADR-DSN.Q.845 (b) (3).
The figure has been amended.

CS-ADR – Book 1 – Figure Q-3 Lighting of buildings

p. 150

comment	577 ❖	comment by: <i>Union des Aéroports français - UAF</i>
	<p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.Q.845</p> <p>Référence: CS-ADR-DSN.Q.845 Marking of objects</p> <p>Traduction de courtoisie It is appropriate to transfer this article to GM. These provisions are just good practices and not normative references in ICAO Annex 14, so they must be in GM and not in CS. Moreover there are other methods much more effective and environment-friendly.</p>	
response	<i>Not accepted</i>	
	<p>The requirement for all fixed objects to be marked (coloured or by flags) is an ICAO standard. The CS text specifies how this should be achieved.</p>	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.Q.850 – Lighting of objects

p. 150-153

comment	12	comment by: <i>Manchester Airport plc</i>
	<p>This whole section, taken from ICAO, is very difficult to interpret and apply. Surely there is considerable scope to simplify the rules with respect to lighting of obstacles in terms of the types and number of lights used.</p>	
response	<i>Noted</i>	

comment	<p>101 comment by: CAA-NL</p>
	<p>In (c) (7) and (8) we suggest to delete the phrase 'when technically feasible' and add the requirement 'with the spacing not exceeding 52 m' in line with ICAO Annex 14, 6.3. A lot of research has been done in the past which indicated that for the recognition of the obstacle and obstacle lighting system by air a maximal spacing of 52 m should be used where a medium-intensity obstacle light type C is applied. A spacing more than 52 meter might influence flight safety.</p> <p>In table Q-1 please change p2 into 92 as textual change.</p>
response	<p><i>Accepted</i></p>
comment	<p>213 comment by: CAA Austria - Ministry of Transport</p>
	<p>The crossreferences are incorrect within the chapter We suggest to correct the crossreferences</p> <p>At Table-Q2 the character "d" is missing Insert the character "d" near the word "Intensity" to correct the SI unit candela</p>
response	<p><i>Accepted</i></p>
comment	<p>526 comment by: East Midlands Airport - EMA/EGNX</p>
	<p>This whole section, taken from ICAO, is very difficult to interpret and apply. Surely there is considerable scope to simplify the rules with respect to lighting of obstacles in terms of the types and number of lights used.</p>
response	<p><i>Noted</i></p>
comment	<p>581 comment by: Union des Aéroports français - UAF</p>
	<p>Attachment #468</p> <p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.Q.850</p> <p>Référence: CS-ADR-DSN.Q.850 Lighting of objects</p> <p>Traduction de courtoisie (b) (2) and (3) (c) (5) and (11) Table Q-1 It is appropriate to transfer these provisions to GM.</p>

They are just good practices and not normative references so they must be in GM and not in CS.

response *Not accepted*

The ICAO requirement for the lighting of obstacles is intended to reduce hazards to aircraft by indicating the presence of obstacles. The presence of objects which must be lighted is an ICAO standard. The CS text specifies how this should be achieved.

comment

782

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.Q.850	Lighting of objects
Proposition/commentaire	(b) (2) et (3) (c) (5) et (11) Table Q-1 Il convient de transférer ces dispositions en Guidance Materials.
Justification	Ces dispositions ne sont que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI. Elles ont donc leur place en GM et non en CS.
Traduction de courtoisie	(b) (2) and (3) (c) (5) and (11) Table Q-1 It is appropriate to transfer these provisions to GM. They are just good practices and not normative references so they must be in GM and not in CS.

response

Not accepted

The ICAO requirement for the lighting of obstacles is intended to reduce hazards to aircraft by indicating the presence of obstacles. The presence of objects which must be lighted is an ICAO standard. The CS text specifies how this should be achieved.

comment

1637

comment by: *Euroairport Bâle-Mulhouse*Attachment [#469](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.Q.850

Référence: CS-ADR-DSN.Q.850
Lighting of objects

Traduction de courtoisie
(b) (2) and (3)
(c) (5) and (11)
Table Q-1

It is appropriate to transfer these provisions to GM.
They are just good practices and not normative references so they must be in GM and not in CS.

response *Not accepted*

The ICAO requirement for the lighting of obstacles is intended to reduce hazards to aircraft by indicating the presence of obstacles. The presence of objects which must be lighted is an ICAO standard. The CS text specifies how this should be achieved.

comment

1946

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#470](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.Q.850

Référence: CS-ADR-DSN.Q.850
Lighting of objects

Traduction de courtoisie
(b) (2) and (3)
(c) (5) and (11)
Table Q-1

It is appropriate to transfer these provisions to GM.
They are just good practices and not normative references so they must be in GM and not in CS.

response *Not accepted*

The ICAO requirement for the lighting of obstacles is intended to reduce hazards to aircraft by indicating the presence of obstacles. The presence of objects which must be lighted is an ICAO standard. The CS text specifies how this should be achieved.

comment

1955

comment by: *Pau Pyrénées Airport - PUF/LFBP*

(b) (2) and (3)
(c) (5) and (11)
Table Q-1

It is appropriate to transfer these provisions to GM.

	<p>They are just good practices and not normative references so they must be in GM and not in CS.</p>
response	<p><i>Not accepted</i></p> <p>The ICAO requirement for the lighting of obstacles is intended to reduce hazards to aircraft by indicating the presence of obstacles. The presence of objects which must be lighted is an ICAO standard. The CS text specifies how this should be achieved.</p>
comment	<p>2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2764 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i></p> <p>Attachment #471</p> <p>ADBM NPA 2011-20 (B.III) CS-ADR-DSN.Q.850</p> <p>Référence: CS-ADR-DSN.Q.850 Lighting of objects</p> <p>Traduction de courtoisie (b) (2) and (3) (c) (5) and (11) Table Q-1 It is appropriate to transfer these provisions to GM. They are just good practices and not normative references so they must be in GM and not in CS.</p>
response	<p><i>Not accepted</i></p> <p>The ICAO requirement for the lighting of obstacles is intended to reduce hazards to aircraft by indicating the presence of obstacles. The presence of objects which must be lighted is an ICAO standard. The CS text specifies how this should be achieved.</p>
comment	<p>2781 comment by: <i>Airport Nuremberg - NUE/EDDN</i></p> <p>In order to be compliant with international regulations in the ICAO Annex 14 "with the spacing not exceeding 52 m." should be added at the end of the passage (7) and (8).</p>

response *Accepted*

comment 2923 comment by: *ACA - Aéroports de la Côte d'Azur - NCE/LFMN*

<u>Référence: CS-ADR-DSN.Q.850</u>	Lighting of objects
Proposition/commentaire	(b) (2) et (3) (c) (5) et (11) Table Q-1 Il convient de transférer ces dispositions en Guidance Materials.
Justification	Ces dispositions ne sont que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI. Elles ont donc leur place en GM et non en CS.
Traduction de courtoisie	(b) (2) and (3) (c) (5) and (11) Table Q-1 It is appropriate to transfer these provisions to GM. They are just good practices and not normative references so they must be in GM and not in CS.

response *Not accepted*

The ICAO requirement for the lighting of obstacles is intended to reduce hazards to aircraft by indicating the presence of obstacles. The presence of objects which must be lighted is an ICAO standard. The CS text specifies how this should be achieved.

CS-ADR – Book 1 – Table Q -2 - Characteristics of obstacle lights

p. 154-156

comment 233

comment by: *Danish Transport Authority*

EDITORIAL:

- 1) Low-intensity Type C: fixed must be change to mobile.
- 2) Reference note a) i table is Annex 14. It should be Q.850 (d) (3)

response *Accepted*

Editorial changes will be made.

comment 234

comment by: *Danish Transport Authority*

Low-intensity Type C. Flash rate: According to standards for flashing light for emergency vehicles, the flash rate should be between 60 and 240. (ECE-regulativ nr. 6)

response *Noted*

The low-intensity flash rate for Type C lights (60-90 fpm) is an ICAO requirement.

comment 236

comment by: *Flughafen Düsseldorf GmbH*

Widerspruch zwischen EASA und ICAO bzgl. schwacher Feuer, Typ C: Gemäß EASA sind damit **nur** feste Hindernisse und gemäß ICAO **nur** bewegliche Hindernisse auszustatten. Gemäß EASA sind nur Follow-me-Fahrzeuge als bewegliche Hindernisse aufgeführt. Da aber an Flughäfen auch andere bewegliche Hindernisse vorkommen, ist der Text der ICAO in diesem Punkt zu übernehmen.

response *Accepted*

comment 244

comment by: *Brussels Airport - BRU/EBBR*

Incorrect reference in tabel Q-2 in chapter Q of CS-ADR-DSN.Q.850 (similar mistake as under AMC1-ADR-AR.C.065(b) – Obstacles – Objects)

Footnote a of Table Q-2 says : »See 6.3.25 ».

This is a reference to Annex 14, which was not correctly transposed in the NPA. It should refer to AMC1-ADR-AR.C.065(b)(c)(3) Low-intensity obstacle lights, Type C.

response *Partially accepted*

The ICAO reference has been replaced with EASA reference CS-ADR.DSN.Q.850(d)(3).

comment	1061	comment by: <i>Belgian CAA</i>
	Incorrect reference: "see 6.3.25".	
response	<i>Accepted</i>	
	The ICAO reference has been replaced with EASA reference CS-ADR.DSN.Q.850(d)(3).	
comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	
comment	2357	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	Change reference (a) "See 6.3.25" into "CS-ADR-DSN.Q.850 (d) (3)"	
response	<i>Accepted</i>	
comment	2783	comment by: <i>Airport Nuremberg - NUE/EDDN</i>
	Table Q-2 still contains references to ICAO Annex 14 chapters and should be adapted to EASA chapters accordingly.	
response	<i>Accepted</i>	
	The ICAO reference has been replaced with EASA reference CS-ADR.DSN.Q.850(d)(3).	

CS-ADR – Book 1 – CS-ADR-DSN.R.855 – Closed runways and taxiways, or parts thereof

p. 157

comment	1667	comment by: <i>CAA CZ</i>
	<p>Comment by Prague airport CS-ADR-DSN.R.855 – Closed runways and taxiways, or parts thereof Added to CS-ADR-DSN.R.855 or to GM-ADR-DSN.R.855: When an area is temporarily closed, frangible barriers or markings utilizing materials other than paint or other suitable means may be used to identify the</p>	

	closed area.
response	<i>Noted</i>
	This is an operational consideration, but text will be added to GM.
comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>
response	<i>Noted</i>

CS-ADR – Book 1 – Figure R-1 Runway and taxiway closed markings

p. 158

comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>
response	<i>Noted</i>

CS-ADR – Book 1 – CS-ADR-DSN.R.860 – Non-load-bearing surfaces

p. 158

comment	102 comment by: <i>CAA-NL</i>
	We suggest to add the text 'a taxi side stripe marking should be placed along the edge of the load-bearing pavement, with the outer edge of the marking approximately on the edge of the load-bearing pavement' according to ICAO Annex 14, 7.2.2.
response	<i>Noted</i>
	The CS contains the ICAO standard and a description of the side stripe characteristics. Additional guidance is provided in GM R.860.
comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>

response *Noted*

CS-ADR – Book 1 – CS-ADR-DSN.R.865 – Pre-threshold area

p. 158-159

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Figure R-2 Pre-threshold area marking

p. 159

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – CS-ADR-DSN.R.870 – Unserviceable areas

p. 159

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – CS-ADR-DSN.S.875 – Electrical power supply systems for air navigation facilities

p. 160

comment 1261 comment by: *East Midlands Airport - EMA/EGNX*

(c) Method of determining alternate power switch-over time is impossible to

achieve, especially when the requirement is less than 1 second. ie. how is the intensity of light output that falls from 50% and recovers to 50% expected to be measured.

response *Noted*

The text is taken from ICAO. The switch-over times in Table S-1 are the same as current requirements.

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2991 comment by: *Robert Shapton*

1. **CS ADR DSN – Book 1 – Chapter S – Electrical Systems** addresses the issue of 'preventative maintenance of visual aids' but does not state how the in-field measurement of intensity, beam spread and orientation of lights is measured? There is an old saying 'you cannot measure what you do not measure.' I therefore propose we add the following based on ICAO Recommendation 10.4.4 from annex 14: "In-field measurement of intensity, beam spread and orientation of lights included in approach and runway lighting systems for a precision approach runway category I, II or III should be undertaken by measuring all lights, as far as practicable, to ensure conformance with the applicable specification."

response *Noted*

This is an operational consideration.

CS-ADR – Book 1 – CS-ADR-DSN.S.880 – Electrical power supply systems for visual aids

p. 160-161

comment 1052 comment by: *Belgian CAA*

Under (d), the possibility of providing an "emergency lighting" is provided. In tis context, it is not logic that the Annex 14 requirements about emergency lighting (Annex 14 §5.3.2) are not taken up in the NPA.

response *Noted*

Paragraph (d) is deleted as it refers to runways not in the EASA certification

scope.

comment

1668

comment by: ECA - European Cockpit Association

Amend Table S-1 - Secondary power supply requirements as follows:

Non-instrument

Visual approach slope indicators^a

Runway edge^b

Runway threshold^b

Runway end^b

Obstacle^a See CS-ADR-DSN.M.850(d) and CS-ADR-DSN.M.855(d)

Non-precision approach

Approach lighting system 15 seconds

Visual approach slope indicators ~~15 seconds~~

Runway edge ~~15 seconds~~

Runway threshold ~~15 seconds~~

Runway end ~~15 seconds~~

Obstacle ^a 15 seconds

Precision approach category I

Approach lighting system 15 seconds

Runway edge ~~15 seconds~~

Visual approach slope indicators ~~15 seconds~~

Runway threshold ~~15 seconds~~

Runway end ~~15 seconds~~

Essential taxiway a 15 seconds

Obstacle a 15 seconds

Precision approach category II/III

Inner 300 m of the approach lighting system 1 second

Other parts of the approach lighting system 15 seconds

Obstacle ^a 15 seconds

Runway edge ~~15 seconds~~

Runway threshold 1 second

Runway end 1 second

Runway centre line 1 second

Runway touchdown zone 1 second

All stop bars 1 second

Essential taxiway 15 seconds

Runway meant for take-off in runway visual range conditions less than a value of 800 m

Runway edge ~~15 seconds~~

Runway end 1 second

Runway centre line 1 second

All stop bars 1 second

Essential taxiway^a 15 seconds

Obstacle^a 15 seconds

- a. Supplied with secondary power when their operation is essential to the safety of flight operation.
- b. The use of emergency lighting should be in accordance with any procedures established.
- c. One second where no runway centre line lights are provided.
- d. One second where approaches are over hazardous or precipitous terrain.

Justification:

response *Not accepted*

The table uses ICAO figures for switch-over times.

comment

1755

comment by: UK CAA

Page No: 160

Paragraph No: : CS.ADR.DSN.S.880(d)

Comment: Such an aerodrome would not be in scope. Suggest that this paragraph is deleted.

Justification: The scope requires an instrument approach procedure. This would apply to the primary runway, therefore the aerodrome mentioned in this CS would not be in scope.

Proposed Text: DELETE CS.ADR.DSN.S.880(d)

response *Accepted*

comment

2348 ❖

comment by: HIA - Highlands and Islands Airports Limited

Noted

response

Noted

comment

2348 ❖

comment by: HIA - Highlands and Islands Airports Limited

Noted

response *Noted*

CS-ADR – Book 1 – CS-ADR-DSN.S.890 – Monitoring

p. 161

comment

1757

comment by: *UK CAA*

Page No: 161

Paragraph No: CS.ADR.DSN.S.890 (d)

Comment: The intent of this paragraph is unattainable.

Justification: The CS infers that individual lights require to be monitored. No system exists to provide automatic monitoring of individual lamp photometric performance. Photometric testing at present is achieved using a mobile device operated at intervals to suit the activity levels on the runway.

Proposed Text: DELETE CS.ADR.DSN.S.890 (d)

response

Not accepted

This CS reflects the ICAO text.

comment

2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response

Noted

comment

2786

comment by: *Airport Nuremberg - NUE/EDDN*

(a) and (b) could be left within the CS. Subparts (c), (d) and (e) should be moved to the guidance material, because they are too specific and an ICAO Annex 14 recommendation. This should be left up to the aerodrome operator.

response

Not accepted

The ICAO standard requires lighting systems that are used for aircraft control purposes to be monitored automatically. The CS describes how this should be achieved.

comment	<p>2816 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p> <p>This is a critical for Aena Airports.</p> <p>The paragraphs (d,e) indicate that Aiport operating with runway visual range below 550 m, shall implement a system to monitor automatically the serviceability level of any element.</p> <p>This is an ICAO Recommended practice and it should be a Guide Material.</p> <p>In Spain it has not been implemented in all Airports because it is very expensive and sometimes it does not work.</p> <p>Therefore we propose paragraph (d,e) as guide material.</p> <p>Paragraph (c) is also an ICAO Recommended Practice and should be implented as a Guide Material.</p>
response	<p><i>Not accepted</i></p> <p>The ICAO standard requires lighting systems that are used for aircraft control purposes to be monitored automatically. The CS describes how this should be achieved.</p>

comment	<p>2990 comment by: <i>Robert Shapton</i></p> <p>1. CS-ADR-DSN.S.890 – Monitoring states, ‘a system of monitoring be employed to indicate the status of the lighting systems.’ This may be interpreted a number of ways. I suggest a more specific definition is provided to explain what is meant by ‘monitoring’.</p>
response	<p><i>Noted</i></p> <p>ICAO wording has been used in the CS. Monitoring is an operational consideration, but further guidance is provided in GM S.890.</p>

CS-ADR – Book 1 – CS-ADR-DSN.S.895 – Serviceability levels

p. 161-163

comment	<p>103 comment by: <i>CAA-NL</i></p> <p>We suggest to add the ICAO Annex 14 Recommendations of 10.4.3 – 6 and 10.4.13 into the text.</p> <p>We suggest to combine (g) (1) and (2), because they belong together.</p>
response	<p><i>Noted</i></p>

Noted: Frequency and timing of measurements are operational decisions for aerodrome operators.
Agreed: Combine (g)(1) and (2).

comment	212	comment by: CAA Austria - Ministry of Transport
	<p>b) In order to get information about the intensity from a lighting system measurements should be done often. The intensity of a lighting system is also a characteristic parameter with respect to the maintenance of an airport operator's performance and reflects the traffic on a runway.</p> <p>Declare how often measurements should take place!</p>	
response	<p><i>Noted</i></p> <p>The frequency of measurements is an operational decision for aerodrome operators.</p>	

comment	1253	comment by: East Midlands Airport - EMA/EGNX
	<p>No discussion of AGL fittings utilising LED technology and how detection of failure in such fittings should be addressed.</p>	
response	<p><i>Noted</i></p> <p>There are currently no recognised ICAO specifications for LED AGL.</p>	

comment	1759	comment by: UK CAA																			
	<p>Page No: 162</p> <p>Paragraph No: CS.ADR.DSN.S.895(c)</p> <p>Comment: This paragraph splits the requirements for the different sorts of lights and these would be better presented in a tabular form. Additionally, it does not address serviceability requirements for CAT I operations.</p> <p>Justification: Ease of reference and completeness.</p> <p>Proposed Text: Insert Table to replace subparagraph (1) to (4):</p> <p>Table Minimum Percentage of Serviceable Light Fittings</p>																				
	<table border="1"> <thead> <tr> <th rowspan="2">AGL</th> <th colspan="2">Landing</th> <th colspan="2">Take-off</th> </tr> <tr> <th>CAT I</th> <th>CAT II/III</th> <th>RVR <800m</th> <th>RVR >800m</th> </tr> </thead> <tbody> <tr> <td>App beyond 450 m</td> <td>85%</td> <td>85%</td> <td>-</td> <td>-</td> </tr> <tr> <td>App inner 450</td> <td>85%</td> <td>95%</td> <td>-</td> <td>-</td> </tr> </tbody> </table>		AGL	Landing		Take-off		CAT I	CAT II/III	RVR <800m	RVR >800m	App beyond 450 m	85%	85%	-	-	App inner 450	85%	95%	-	-
AGL	Landing			Take-off																	
	CAT I	CAT II/III	RVR <800m	RVR >800m																	
App beyond 450 m	85%	85%	-	-																	
App inner 450	85%	95%	-	-																	

Rwy threshold	85%	95%	-	-
Rwy end	85%	85%	85%	75%
Rwy edge	85%	95%	95%	85%
Rwy C/L where fitted	85%	95%	95%	85%
TDZ where fitted	85%	90%	-	85%

response *Not accepted*

The text in paragraph (c) is also presented in tabular form in *Table S-2 – Allowable percentages of unserviceable lights.*

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Table S-1 Secondary power supply requirements p. 164-165

comment 175 comment by: *CAA Norway*

Following lighting aids are missing in table S-1 on page 164: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for take off in RVR<800m.

response *Noted*

The ICAO standard requirement does not include these lights.

comment 322 comment by: *Icelandic Civil Aviation Administration*

Following lighting aids are missing in table S-1 on page 164: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for take off in RVR<800m.

response	<i>Noted</i>
	The ICAO standard requirement does not include these lights.
comment	379 comment by: <i>Estonian CAA</i>
	Following lighting aids are missing in table S-1 on page 164: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for take off in RVR<800m.
response	<i>Noted</i>
	The ICAO standard requirement does not include these lights.
comment	670 comment by: <i>Finnish Transport Safety Agency</i>
	Following lighting aids are missing in table S-1 on page 164: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for take off in RVR<800m.
response	<i>Noted</i>
	The ICAO standard requirement does not include these lights.
comment	1207 comment by: <i>Swedish Transport Agency</i>
	Following lighting aids are missing in table S-1 on page 164: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for take off in RVR<800m.
response	<i>Noted</i>
	The ICAO standard requirement does not include these lights.
comment	1796 comment by: <i>Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH</i>
	The footnote (a) for obstacles should be deleted.
	Obstacle lighting in mountainous terrain can technically not be provided with secondary power due to lack of space.
	Proposal: Second lighting unit and feedback signal in case of malfunction should be sufficient.

response	<i>Noted</i>	
	If the specification cannot be met, SC or ELOS mechanisms allow flexibility.	
comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>	
response	<i>Noted</i>	
comment	2609	comment by: <i>Danish Transport Authority</i>
	Following lighting aids are missing in table S-1 on page 164: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for take off in RVR<800m.	
response	<i>Noted</i>	
	The ICAO standard requirement does not include these lights.	
comment	2629	comment by: <i>Swedavia AB - Swedish airports (currently 11 airports)</i>
	Following lighting aids are missing in table S-1 on page 164: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for take off in RVR<800m.	
response	<i>Noted</i>	
	The ICAO standard requirement does not include these lights.	
comment	2974	comment by: <i>Isavia</i>
	Following lighting aids are missing in table S-1 on page 164: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for takeoff in RVR<800m.	
response	<i>Noted</i>	
	The ICAO standard requirement does not include these lights.	

lights

comment 176 comment by: CAA Norway

Following lighting aids are missing in table S-2 on page 166: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for take off in RVR<800m.

response *Noted*

The ICAO standard requirement does not include these lights.

comment 323 comment by: Icelandic Civil Aviation Administration

Following lighting aids are missing in table S-2 on page 166: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for take off in RVR<800m.

response *Noted*

The ICAO standard requirement does not include these lights.

comment 380 comment by: Estonian CAA

Following lighting aids are missing in table S-2 on page 166: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for take off in RVR<800m.

response *Noted*

The ICAO standard requirement does not include these lights.

comment 671 comment by: Finnish Transport Safety Agency

Following lighting aids are missing in table S-2 on page 166: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for take off in RVR<800m.

response *Noted*

The ICAO standard requirement does not include these lights.

comment	1208	comment by: <i>Swedish Transport Agency</i>
	Following lighting aids are missing in table S-2 on page 164: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for take off in RVR<800m.	
response	<i>Noted</i>	
	The ICAO standard requirement does not include these lights.	
comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>	
response	<i>Noted</i>	
comment	2630	comment by: <i>Swedavia AB - Swedish airports (currently 11 airports)</i>
	Following lighting aids are missing in table S-2 on page 166: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for take off in RVR<800m.	
response	<i>Noted</i>	
	The ICAO standard requirement does not include these lights.	
comment	2975	comment by: <i>Isavia</i>
	Following lighting aids are missing in table S-2 on page 166: RGL, RETIL and Road-holding position lights in the rows for Precision app Cat I/II and III, and for runway meant for takeoff in RVR<800m.	
response	<i>Noted</i>	
	The ICAO standard requirement does not include these lights.	
comment	2993	comment by: <i>Robert Shapton</i>
	1. CS ADR DSN – Book 1 – Chapter S – Electrical Systems Table S-2 CORRECTION: Allowable percentages of un serviceable lights.	
response	<i>Accepted</i>	
	The table has been amended to show the allowable percentage of <i>servicable</i>	

lights

CS-ADR — Book 1 — CS-ADR-DSN.T.900 — Emergency access and service roads

p. 167

comment

1761

comment by: UK CAA

Page No: 167**Paragraph No:** CS.ADR.DSN.T.900**Comment:** All emergency access and service roads should be equipped with runway holding positions.**Justification:** Prevention of runway incursions and consistency**Proposed Text:** REPLACE text with "**All emergency access and service roads should be equipped with road holding positions.**"

response

Partially accepted

Text will be amended to read 'Emergency access roads should be equipped with a road holding position at all intersections with runways and taxiways'.

comment

2348 ❖

comment by: HIA - Highlands and Islands Airports Limited

Noted

response

*Noted***CS-ADR — Book 1 — CS-ADR-DSN.T.905 — Fire stations**

p. 167

comment

582

comment by: Union des Aéroports français - UAF

Attachment [#472](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.T.905

Référence: CS-ADR-DSN.T.905

Traduction de courtoisie

It is appropriate to transfer these provisions to GM.
Only the respect of the response time must be in GM.
There are several possibilities to respect the response time: it can be the installation of fire stations, the pre positioning of vehicles or the construction of emergency roads.
The installation of several fire stations is only a solution among others. So it has to be in GM.

response *Not accepted*

The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature. Therefore, it is not included in the CS.

comment

783

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.T.905	Fire stations
Proposition/commentaire	Il convient de transférer ces dispositions en Guidance Materials. Seul le respect de l'objectif opérationnel (« response time ») doit se trouver en CS.
Justification	Il existe plusieurs possibilités pour respecter l'objectif opérationnel : ce peut être l'installation de plusieurs casernes de pompiers, mais aussi le pré positionnement des véhicules ou la construction de routes d'urgence. L'installation de plusieurs casernes de pompiers n'est qu'une solution parmi d'autres et relève donc du GM.
Traduction de courtoisie	It is appropriate to transfer these provisions to GM. Only the respect of the response time must be in GM. There are several possibilities to respect the response time: it can be the installation of fire stations, the pre positioning of vehicles or the construction of emergency roads. The installation of several fire stations is only a solution among others. So it has to be in GM.

response *Not accepted*

The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature. Therefore, it is not included in the CS.

comment	1303	comment by: Zürich Airport
	<p>The response time for fire fighting actually defined with 3 minutes shall be accepted and defined also in this CS. The Agency intention to decrease the fire fighting response time to 2 minutes will be very challenging (if at all possible) for all of the airports in Europe and will lead to the need for a big infrastructure change fire fighting stations and satellites.</p>	
response	<p><i>Not accepted</i></p> <p>Response time is an operational objective, not a design feature. Therefore, it is not included in the CS.</p>	

comment	1638	comment by: Euroairport Bâle-Mulhouse
	<p>Attachment #473</p> <p>Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.T.905</p> <p>Référence: CS-ADR-DSN.T.905</p> <p>Traduction de courtoisie It is appropriate to transfer these provisions to GM. Only the respect of the response time must be in GM. There are several possibilities to respect the response time: it can be the installation of fire stations, the pre positioning of vehicles or the construction of emergency roads. The installation of several fire stations is only a solution among others. So it has to be in GM.</p>	
response	<p><i>Not accepted</i></p> <p>The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature. Therefore, it is not included in the CS.</p>	

comment	1642	comment by: Aéroport de Marseille - MRS/LFML
	<p>It is appropriate to transfer these provisions to GM. Only the respect of the response time must be in GM. There are several possibilities to respect the response time: it can be the installation of fire stations, the pre positioning of vehicles or the construction of emergency roads. The installation of several fire stations is only a solution among others. So it has to be in GM.</p>	
response	<p><i>Not accepted</i></p>	

The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature. Therefore, it is not included in the CS.

comment 1797 comment by: *Tarbes-Lourdes-Pyrénées airport*

Attachment [#474](#)

NPA 2011-20 (B.III) CS-ADR-DSN.T.905

Référence: CS-ADR-DSN.T.905

Fire stations

Traduction de courtoisie

It is appropriate to transfer these provisions to GM.

Only the respect of the response time must be in GM.

There are several possibilities to respect the response time: it can be the installation of fire stations, the pre positioning of vehicles or the construction of emergency roads.

The installation of several fire stations is only a solution among others. So it has to be in GM.

response *Not accepted*

The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature. Therefore, it is not included in the CS.

comment 1947 comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#475](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.T.905

Référence: CS-ADR-DSN.T.905

Traduction de courtoisie

It is appropriate to transfer these provisions to GM.

Only the respect of the response time must be in GM.

There are several possibilities to respect the response time: it can be the installation of fire stations, the pre positioning of vehicles or the construction of emergency roads.

The installation of several fire stations is only a solution among others. So it has to be in GM.

response *Not accepted*

The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature. Therefore, it is not included in the CS.

comment	<p>1953 comment by: Pau Pyrénées Airport - PUF/LFBP</p> <p>It is appropriate to transfer these provisions to GM. Only the respect of the response time must be in GM. There are several possibilities to respect the response time: it can be the installation of fire stations, the pre positioning of vehicles or the construction of emergency roads. The installation of several fire stations is only a solution among others. So it has to be in GM.</p>
response	<p><i>Not accepted</i></p> <p>The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature. Therefore, it is not included in the CS.</p>
comment	<p>2131 comment by: Aeroport Paris Vatry - XCR/LFOK</p> <p>Attachment #476</p> <p>NPA 2011-20 (B.III) CS-ADR-DSN.T.905</p> <p>Référence: CS-ADR-DSN.T.905 Fire stations</p> <p>Traduction de courtoisie It is appropriate to transfer these provisions to GM. Only the respect of the response time must be in GM. There are several possibilities to respect the response time: it can be the installation of fire stations, the pre positioning of vehicles or the construction of emergency roads. The installation of several fire stations is only a solution among others. So it has to be in GM.</p>
response	<p><i>Not accepted</i></p> <p>The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature. Therefore, it is not included in the CS.</p>
comment	<p>2348 ❖ comment by: HIA - Highlands and Islands Airports Limited</p> <p>Noted</p>
response	<p><i>Noted</i></p>
comment	<p>2573 comment by: AENA - Aeropuertos Españoles y Navegación Aérea</p>

It is appropriate to move these provisions to GM, except for the operational objective (i.e. achieving the response time) that shall remain in the CS. Indeed, there are several possibilities to comply with the response time: it can be by the providing of fire stations, by the pre positioning of vehicles or by the construction of emergency roads.

The installation of several fire stations is thus only a possible solution to comply with the objective and thus it is essential to move it to GM.

CS-ADR-DSN.T.905 – Fire stations

"Fire stations, including satellite fire stations where necessary, should be so located on the aerodrome as to achieve the response time.

(a) All rescue and fire fighting vehicles should normally be housed in a fire station. Satellite fire stations should be provided whenever the response time cannot be achieved from a single fire station.

(b) The fire station should be located so that the access for rescue and fire-fighting vehicles into the runway area is direct and clear, requiring a minimum number of turns.

(c) The fire station, and any satellite fire stations, should be located outside taxiway and runway strips and not infringe obstacle limitation surfaces."

response *Not accepted*

The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature. Therefore, it is not included in the CS.

comment 2765 comment by: ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD

Attachment [#477](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.T.905

Référence: CS-ADR-DSN.T.905
Fire stations

Traduction de courtoisie

It is appropriate to transfer these provisions to GM.

Only the respect of the response time must be in GM.

There are several possibilities to respect the response time: it can be the installation of fire stations, the pre positioning of vehicles or the construction of emergency roads.

The installation of several fire stations is only a solution among others. So it has to be in GM.

response *Not accepted*

The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature. Therefore, it is not included in the CS.

comment 2899 comment by: SEARD - Societe d'exploitation des Aeroports de Rennes et Dinard

Attachment [#478](#)

SEARD NPA 2011-20 (B.III) CS-ADR-DSN.T.905

Référence: CS-ADR-DSN.T.905

Traduction de courtoisie

It is appropriate to transfer these provisions to GM.

Only the respect of the response time must be in GM.

There are several possibilities to respect the response time: it can be the installation of fire stations, the pre positioning of vehicles or the construction of emergency roads.

The installation of several fire stations is only a solution among others. So it has to be in GM.

response *Not accepted*

The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature. Therefore, it is not included in the CS.

comment 2924

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

<u>Référence: CS-ADR-DSN.T.905</u>	Fire stations
Proposition/commentaire	Il convient de transférer ces dispositions en Guidance Materials. Seul le respect de l'objectif opérationnel (« response time ») doit se trouver en CS.
Justification	Il existe plusieurs possibilités pour respecter l'objectif opérationnel : ce peut être l'installation de plusieurs casernes de pompiers, mais aussi le pré positionnement des véhicules ou la construction de routes d'urgence. L'installation de plusieurs casernes de pompiers n'est qu'une solution parmi d'autres et relève donc du GM.
Traduction de courtoisie	It is appropriate to transfer these provisions to GM. Only the respect of the response time must be in GM. There are several possibilities to respect the response time: it can be the installation of fire stations, the pre positioning of vehicles or the construction of emergency roads. The installation of several fire stations is only a solution among others. So it has to be in GM.

response *Not accepted*

The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature. Therefore, it is not included in the CS.

comment

3123

comment by: *ATB Aéroport Toulouse-Blagnac - TLS/LFBO*

Attachment [#479](#)

ATB NPA 2011-20 (B.III) CS-ADR-DSN.T.905

Référence: CS-ADR-DSN.T.905

Traduction de courtoisie

It is appropriate to transfer these provisions to GM.

Only the respect of the response time must be in GM.

There are several possibilities to respect the response time: it can be the installation of fire stations, the pre positioning of vehicles or the construction of emergency roads.

The installation of several fire stations is only a solution among others. So it has to be in GM.

response

Not accepted

The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature. Therefore, it is not included in the CS.

CS-ADR – Book 1 – CS-ADR-DSN.T.910 – Equipment frangibility requirements

p. 167

comment

119

comment by: *Swedavia AB - Swedish airports (currently 11 airports)*

(b) Move to GM. Recommendation in ICAO, Doc 9157/AN901, Aerodrome Design Manual, 3.3.2.

response

Partially accepted

Paragraph (a) will be moved to GM.

comment	605	comment by: Cologne/Bonn Airport
	Should be moved to GM	
response	<i>Partially accepted</i>	
	Paragraph (a) will be moved to GM.	
comment	1068	comment by: Federal Office of Civil Aviation FOCA
	Please define the missing scope of the frangibility requirements.	
response	<i>Noted</i>	
	The scope is in the definition.	
comment	1829	comment by: Geneva International Airport (ROMIG)
	Should be changed to a "GM" not as "CS"	
response	<i>Partially accepted</i>	
	Paragraph (a) will be moved to GM.	
comment	1862 ❖	comment by: DGAC Direction Générale de l'aviation civile
	<u>1. Affected paragraphs</u>	
	<ul style="list-style-type: none"> • CS ADR DSN – Book 1 – CS-ADR-DSN.T.910 – Equipment frangibility requirements (p167) • CS ADR DSN – Book 2 – CSGM-ADR-DSN.T.910 – Equipment frangibility requirements (p299) • CS-ADR - Book 1 - CS-ADR-DSN.A.002 – Definitions (p4-9) 	
	<u>2. Justification and proposed text / comment</u>	
	The first sentence is already in the definition of frangibility in CS-ADR-DSN.A.002 – Definitions: <i>“the ability of an object to retain its structural integrity and stiffness up to a specified maximum load but when subject to a load greater than specified or struck by an aircraft will break, distort or yield in a manner designed to present minimum hazard to an aircraft.”</i>	
	The following is more guidance and may not be applicable to all kind of visual aids. Moreover this comes from an ICAO Manual.	
	It is proposed to move the CS to GM as follows:	
	CS-ADR-DSN.T.910 – Equipment frangibility requirements	
	<i>“(a) Equipment and supports required to be frangible should be designed and constructed so that they will break, distort or yield in the event that they are</i>	

~~accidentally impacted by an aircraft. The design materials selected should preclude any tendency for the components, including the electrical conductors, etc., to 'wrap around' the colliding aircraft or any part of it.~~

~~(b) Frangible structures should be designed to withstand the static and operational wind or jet blast loads with a suitable factor of safety, but should break, distort or yield readily when subjected to the sudden collision forces of a 3 000 kg aircraft airborne and travelling at 140 km/h (75 kt) or moving on the ground at 50 km/h (27 kt)."~~

CSGM-ADR-DSN.T.910 – Equipment frangibility requirements

~~"(a) The design materials selected may preclude any tendency for the components, including the electrical conductors, etc., to 'wrap around' the colliding aircraft or any part of it.~~

~~(b) Frangible structures may be designed to withstand the static and operational wind or jet blast loads with a suitable factor of safety, but may break, distort or yield readily when subjected to the sudden collision forces of a 3 000 kg aircraft airborne and travelling at 140 km/h (75 kt) or moving on the ground at 50 km/h (27 kt).~~

~~Note — Guidance on design for frangibility is contained in the Aerodrome Design Manual (ICAO, Doc 9157, Part 6)."~~

response *Partially accepted*

Paragraph (a) will be moved to GM.

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2355 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

the scope of the frangibility requirements needs to be defined

response *Partially accepted*

Paragraph (a) will be moved to GM. The scope is provided in the definition.

comment 2432 ❖ comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

Suggest moving the "CS" to "GM"

response *Partially accepted*

Paragraph (a) will be moved to GM.

comment	2567 comment by: AENA - Aeropuertos Españoles y Navegación Aérea
	<p>The first sentence is already in the definition of frangibility in CS-ADR-DSN.A.002 — Definitions: <i>"the ability of an object to retain its structural integrity and stiffness up to a specified maximum load but when subject to a load greater than specified or struck by an aircraft will break, distort or yield in a manner designed to present minimum hazard to an aircraft."</i></p> <p>The following is more guidance and may not be applicable to all kind of visual aids. Moreover this comes from an ICAO Manual.</p> <p>It is proposed to move the CS to GM as follows:</p> <p>CS-ADR-DSN.T.910 — Equipment frangibility requirements</p> <p>"(a) Equipment and supports required to be frangible should be designed and constructed so that they will break, distort or yield in the event that they are accidentally impacted by an aircraft. The design materials selected should preclude any tendency for the components, including the electrical conductors, etc., to 'wrap around' the colliding aircraft or any part of it.</p> <p>(b) Frangible structures should be designed to withstand the static and operational wind or jet blast loads with a suitable factor of safety, but should break, distort or yield readily when subjected to the sudden collision forces of a 3 000 kg aircraft airborne and travelling at 140 km/h (75 kt) or moving on the ground at 50 km/h (27 kt)."</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (a) will be moved to GM.</p>
comment	3037 comment by: ADV -German Airports Association
	<p>CS.ADR.DSN.T.910 should be chaged to a "GM" not as "CS"</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (a) will be moved to GM.</p>
comment	3072 comment by: MST / STR - Stuttgart Airport
	<p>CS.ADR.DSN.T.910 should be chaged to a "GM" not as "CS"</p>
response	<p><i>Partially accepted</i></p> <p>Paragraph (a) will be moved to GM.</p>

comment 1762

comment by: UK CAA

Page No: 167**Paragraph No:** CS-ADR-DSN.T.915

Comment: The text is confusing and mixes different requirements from Annex 14. Suggest a re-write of the total CS to align with Annex 14 and clearly define the requirements.

Justification: The CS is proposing specifications that do not align with Annex 14. This could lead to confusion and inability of the aerodromes to meet the specifications.

Proposed Text:

(a) Equipment and installations should be sited as far away from the runway and taxiway centre lines as practicable.

(b) Unless its function requires it to be there for air navigation or for aircraft safety purposes, no equipment or installation endangering an aircraft should be located:

(1) on a runway strip, a runway end safety area **or a taxiway strip.**

(2) on a clearway if it would endanger an aircraft in the air.

(c) Any equipment or installation required for air navigation or for aircraft safety purposes should be frangible and mounted as low as possible, if located:

(1) on that portion of a runway strip within;

(i) 75 m of the runway centre line where the code number is 3 or 4 (77.5m where the code number is 4 and the code letter is F);

(ii) 45 m of the runway centre line where the code number is 1 or 2.

and in no circumstances located no closer than 15m from the edge of the runway.

(2) within 240 m from the end of the runway strip and:

(i) within 60 m of the extended runway centre line where the code number is 3 or 4;

(ii) within 45 m of the extended runway centre line where the code number is 1 or 2.

(3) on a runway end safety area;

(4) on a taxiway strip **(see (7)) below;**

(5) on a clearway endangering an aircraft in the air;

(6) in a way which penetrates the inner approach surface, the inner transitional surface or the baulked landing surface;

(7) within the following distances:

Code Letter	Taxiway and apron taxiway centreline to object in metres (see note)	Aircraft stand taxi-lane centreline to object in metres (see note)
A	16.25	12
B	21.5	16.5

C	26	24.5	
D	40.5	36	
E	47.5	42.5	
F	55	50.5	

Note: These distances may have to be increased on taxiway curves to accommodate the wing sweep of the critical aeroplane.

Objects essential to the use of a taxiway system which are required to be sited closer than shown in the table above should not exceed a height of 0.36 m* above the taxiway level within the following distances from the edge of the taxiway:

- (i) 22 m where the code letter is F;
- (ii) 18 m where the code letter is D or E;
- (iii) 11 m where the code letter is C;
- (iv) 7.5 m where the code letter is A or B.

Between the distances above and those shown in the table, objects should not exceed 1.5 m in height above the taxiway level.

*** In the case of runway guard lights, they should not exceed a height above which their presence may endanger aircraft and should be frangible.**

(d) Any equipment or installation required for air navigation or for aircraft safety purposes that are an obstacle of operational significance in accordance with CS-ADR-DSN.J.470, CS-ADR-DSN.J.475, CS-ADR-DSN.J.480 or CS-ADR-DSN.J.485 should be frangible and mounted as low as possible.

response *Accepted*

Refer to Annex 14 text.

comment 1832

comment by: *Geneva International Airport (ROMIG)*

c)1) Propose to add the text as found in Annex 14 9.9.2 and 9.9.4 with the specifications of distances.

If this is kept as the article specifies, it will not be possible to site and navigational instruments in the RWY Strip.

response *Noted*

Annex 14 text has replaced the previous NPA text.

comment 2194

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS ADR DSN – Book 1 — CS-ADR-DSN.T.915 — Siting of equipment and installations on operational areas (p167-168)
- CS ADR DSN – Book 2 — GM-ADR-DSN.T.915 — Siting of equipment and installations on operational areas (

2. Justification and proposed text / comment

* Paragraph (c)(1) is derived from ICAO standard §9.9.2 in Annex 14 Volume 1, but extends it with ICAO recommendation §9.9.4. However all navigation aids cannot be frangible on the non graded part of the runway strip such as the shelter of glide path antenna. Applying this CS would impact all precision approaches, without any possible alternative solution and it is essential to be able to install the shelter of glide path antenna on the non graded runway strip. It is thus essential to put in CS only the content of ICAO standard §9.9.2 and to move the content of ICAO recommendation §9.9.4 in GM.

* Paragraph (c)(2) of CS-ADR-DSN.T.915 is derived from ICAO standards § 9.9.5 and § 9.9.6 which only apply to precision approaches. In France, a thorough and costly work has been performed with ANSP to ensure compliance with this standard for precision approaches only. To extend this standard to all approaches would generate very high costs. It is proposed to restrict the CS to precision approaches only.

* Paragraph (d) is not binding in France because it is not applicable for several equipment, such as air navigation or meteorological antennas. Besides, it is derived from ICAO recommendation 9.9.8. It is essential to move it into GM.

Editorial improvements:

* Compliance with paragraph (a) cannot be proven and the specifications for siting are ruled by CSs related to obstacles (chapter J) as truly specified in paragraph (d) of the corresponding GM, hence the specification should be deleted and the following paragraphs renumbered.

* In paragraph (b)(2) "*if it would endanger an aircraft*" duplicates "*endangering an aircraft*" in paragraph (b). One of the two should be deleted and it would be better to revert to the original Annex 14 volume 1 Standard 9.9.1 text.

Therefore DGAC proposes:

CS-ADR-DSN.T.915 — Siting of equipment and installations on operational areas

~~"(a) Equipment and installations should be sited as far away from the runway and taxiway centre lines as practicable.~~

~~(b) Unless its function requires it to be there for air navigation or for aircraft safety purposes, no equipment or installation endangering an aircraft should be located:~~

~~(1) on a runway strip, a runway end safety area, a taxiway, strip or within the following distances specified in column (11) of Table D-1 contained in CS-ADR-DSN.D.260, if it would endanger an aircraft;~~

~~[...]~~

~~(eb) Any equipment or installation required for air navigation or for aircraft safety purposes should be frangible and mounted as low as possible, if located:~~

~~(1) on a runway strip;~~

~~(2) for precision approach, within 240 m from the end of the strip and:~~

~~(i) within 60 m of the extended runway centre line where the code number is 3~~

or 4;
 (ii) within 45 m of the extended runway centre line where the code number is 1 or 2.
 (3) on a runway end safety area;
 (4) on a taxiway strip;
 (5) on a clearway endangering if it would endanger an aircraft in the air;
 [...]
~~(d) Any equipment or installation required for air navigation or for aircraft safety purposes that is an obstacle of operational significance in accordance with CS-ADR-DSN.J.470, CS-ADR-DSN.J.475, CS-ADR-DSN.J.480 or CS-ADR-DSN.J.485 should be frangible and mounted as low as possible.~~

GM-ADR-DSN.T.915 – Siting of equipment and installations on operational areas

~~(a) Any equipment or installation required for air navigation or for aircraft safety purposes may be frangible and mounted as low as possible, if located:~~
~~(1) on a runway strip;~~
~~(2) within 240 m from the end of the strip and:~~
~~(i) within 60 m of the extended runway centre line where the code number is 3 or 4;~~
~~(ii) within 45 m of the extended runway centre line where the code number is 1 or 2.~~
~~(b) Any equipment or installation required for air navigation or for aircraft safety purposes that is an obstacle of operational significance in accordance with CS-ADR-DSN.J.470, CS-ADR-DSN.J.475, CS-ADR-DSN.J.480 or CS-ADR-DSN.J.485 may be frangible and mounted as low as possible.~~
~~(a) (c) The design of light fixtures and their supporting structures, light units of visual approach slope indicators, signs and markers is specified in CS-ADR-DSN.M.615, CS-ADR-DSN.M.640, CS-ADR-DSN.N.775 and Book 1 Chapter P, respectively.~~
 [...]"

response

Noted

Annex 14 text has replaced the previous NPA text.

comment

2348 ❖

comment by: HIA - Highlands and Islands Airports Limited

Noted

response

Noted

comment

2354

comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

suggest usingg the text as found in Annex 14 9.9.2 and 9.9.4, consistency with ICAO

response

Noted

Annex 14 text has replaced the previous NPA text.

comment 2569

comment by: AENA - Aeropuertos Españoles y Navegación Aérea

* Paragraph (c)(1) is derived from ICAO standard §9.9.2 in Annex 14 Volume 1, but extends it with ICAO recommendation §9.9.4. However all navigation aids cannot be frangible on the non graded part of the runway strip such as the shelter of glide path antenna. Applying this CS would impact all precision approaches, without any possible alternative solution and it is essential to be able to install the shelter of glide path antenna on the non graded runway strip. It is thus essential to put in CS only the content of ICAO standard §9.9.2 and to move the content of ICAO recommendation §9.9.4 in GM.

* Paragraph (c)(2) of CS-ADR-DSN.T.915 is derived from ICAO standards § 9.9.5 and § 9.9.6 which only apply to precision approaches. To extend this standard to all approaches would generate very high costs. It is proposed to restrict the CS to precision approaches only.

Also is important to point out that sometimes that terrain is not property of the aerodrome, or the terrain is rough in that case it has not make sense that the obstacle will be frangible.

* Paragraph (d) is not applicable for several equipment, such as air navigation or meteorological antennas. Besides, it is derived from ICAO recommendation 9.9.8. It is essential to move it into GM.

Editorial improvements:

* Compliance with paragraph (a) cannot be proven and the specifications for siting are ruled by CSs related to obstacles (chapter J) as truly specified in paragraph (d) of the corresponding GM, hence the specification should be deleted and the following paragraphs renumbered.

* In paragraph (b)(2) "*if it would endanger an aircraft*" duplicates "*endangering an aircraft*" in paragraph (b). One of the two should be deleted and it would be better to revert to the original Annex 14 volume 1 Standard 9.9.1 text.

Therefore It is proposed:

CS-ADR-DSN.T.915 — Siting of equipment and installations on operational areas

~~"(a) Equipment and installations should be sited as far away from the runway and taxiway centre lines as practicable.~~

~~(ba) Unless its function requires it to be there for air navigation or for aircraft safety purposes, no equipment or installation endangering an aircraft should be located:~~

~~(1) on a runway strip, a runway end safety area, a taxiway, strip or within the following distances specified in column (11) of Table D-1 contained in CS-ADR-DSN.D.260, if it would endanger an aircraft;~~

~~[...]~~

~~(eb) Any equipment or installation required for air navigation or for aircraft safety purposes should be frangible and mounted as low as possible, if located:~~

~~(1) on a runway strip;~~

~~(2) for precision approach, within 240 m from the end of the strip or the limit of the aerodrome and:~~

~~(i) within 60 m of the extended runway centre line where the code number is 3 or 4;~~

- (ii) within 45 m of the extended runway centre line where the code number is 1 or 2.
 (3) on a runway end safety area;
 (4) on a taxiway strip;
 (5) on a clearway ~~endangering~~ if it would endanger an aircraft in the air;

~~Note: If the terrain of the aerodrome is rough within 240 meter it could be possible obstacles not frangible~~

[...]

~~(d) Any equipment or installation required for air navigation or for aircraft safety purposes that is an obstacle of operational significance in accordance with CS-ADR-DSN.J.470, CS-ADR-DSN.J.475, CS-ADR-DSN.J.480 or CS-ADR-DSN.J.485 should be frangible and mounted as low as possible.~~

response Noted

Annex 14 text has replaced the previous NPA text.

CS-ADR – Book 1 – CS-ADR-DSN.T.920 – Fencing

p. 169

comment

583

comment by: *Union des Aéroports français - UAF*

Attachment [#480](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.T.920

Référence: CS-ADR-DSN.T.920
 Fencing

Traduction de courtoisie

It is appropriate to delete the (a).

The requirements are already given by the rules about protection against obstacles.

response

Not accepted

The requirement in (a) is not solely for obstacle limitation purposes.

comment

784

comment by: *ADP : Aeroports de Paris*

Référence: CS-ADR-DSN.T.920

Fencing

Proposition/commentaire

Il convient de supprimer le point (a).

Justification

Les contraintes sont déjà données par les règles relatives à la protection contre les obstacles.

Traduction de courtoisie

It is appropriate to delete the (a).
The requirements are already given by the rules about protection against obstacles.

response *Not accepted*

The requirement in (a) is not solely for obstacle limitation purposes.

comment

1640

comment by: *Euroairport Bâle-Mulhouse*

Attachment [#481](#)

Aéroport Bâle – Mulhouse NPA 2011-20 (B.III) CS-ADR-DSN.T.920

Référence: CS-ADR-DSN.T.920

Fencing

Traduction de courtoisie

It is appropriate to delete the (a).

The requirements are already given by the rules about protection against obstacles.

response

Not accepted

The requirement in (a) is not solely for obstacle limitation purposes.

comment

1643

comment by: *Aéroport de Marseille - MRS/LFML*

It is appropriate to delete the (a).

The requirements are already given by the rules about protection against obstacles

response

Not accepted

The requirement in (a) is not solely for obstacle limitation purposes.

comment

1948

comment by: *Aéroport Nantes Atlantique - NTE/LFRS*

Attachment [#482](#)

	<p>UAF NPA 2011-20 (B.III) CS-ADR-DSN.T.920</p> <p>Référence: CS-ADR-DSN.T.920 Fencing</p> <p>Traduction de courtoisie it is appropriate to delete the (a). The requirements are already given by the rules about protection against obstacles.</p>
response	<p><i>Not accepted</i></p> <p>(a) this requirement is not solely for obstacle limitation purposes.</p>

comment	<p>1951 comment by: Pau Pyrénées Airport - PUF/LFBP</p> <p>It is appropriate to delete the (a). The requirements are already given by the rules about protection against obstacles.</p>
response	<p><i>Not accepted</i></p> <p>The requirement in (a) is not solely for obstacle limitation purposes.</p>

comment	<p>2197 comment by: DGAC Direction Générale de l'aviation civile</p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> CS ADR DSN – Book 1 — CS-ADR-DSN.T.920 — Fencing (p169) <p><u>2. Justification and proposed text / comment</u></p> <p>* Compliance with paragraph (a) cannot be proven and the specifications for siting of fences are ruled by CSs related to obstacles (chapter J) or by CS-ADR-DSN.T.915, hence the specification should be deleted and the following paragraphs renumbered.</p> <p>* Paragraph (b): there are <u>other</u> means than fence and barriers to protect an aerodrome and the wording "<i>movement area and other operational areas of the aerodrome</i>" proposed by EASA in ADR-OPS.B.060 (a)(2) is better than the ICAO wording "<i>non-public area</i>". It is proposed to take the wording used in part OPS of the NPA. Therefore DGAC proposes:</p> <p>CS-ADR-DSN.T.920 — Fencing "(a) Fencing should be sited as far away from the runway and taxiway centre lines as practicable. (ba) <i>Suitable means of protection such as a A fence or other suitable barrier should be provided on an aerodrome to prevent the entrance to the aerodrome:</i> <i>(1) by animals large enough to which can be a hazard to aircraft;</i> <i>(2) by an unauthorised person onto a non-public-area movement area and other operational areas of the aerodrome.</i></p>
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	<i>This includes the barring of sewers, ducts, tunnels, etc., where necessary to prevent access. [...]"</i>
response	<i>Not accepted</i>
	The requirement in (a) is not solely for obstacle limitation purposes. Concerning (b), Ops.B.60 is for controlling access to the movement area, not excluding it from the whole aerodrome. 'Non-public' is ICAO wording.

comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>

comment	2571 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	<p>* Compliance with paragraph (a) cannot be proven and the specifications for siting of fences are ruled by CSs related to obstacles (chapter J) or by CS-ADR-DSN.T.915, hence the specification should be deleted and the following paragraphs renumbered.</p> <p>* Paragraph (b): there are <u>other</u> means than fence and barriers to protect an aerodrome and the wording "<i>movement area and other operational areas of the aerodrome</i>" proposed by EASA in ADR-OPS.B.060 (a)(2) is better than the ICAO wording "<i>non-public area</i>". It is proposed to take the wording used in part OPS of the NPA.</p> <p>Therefore It is proposed:</p> <p>CS-ADR-DSN.T.920 – Fencing "(a) Fencing should be sited as far away from the runway and taxiway centre lines as practicable. (b) Suitable means of protection such as a A fence or other suitable barrier should be provided on an aerodrome to prevent the entrance to the aerodrome: (1) by animals large enough to which can be a hazard to aircraft; (2) by an unauthorised person onto a non-public area movement area and other operational areas of the aerodrome.</p>
response	<i>Not accepted</i>
	(a) this requirement is not solely for obstacle limitation purposes. (b) Ops.B.060 is for controlling access to the movement area, not excluding it from the whole aerodrome; "non-public" is ICAO wording.

comment	2766 comment by: <i>ADBM - Aeroport de Bordeaux Merignac - BOD/LFBD</i>
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Attachment [#483](#)

ADBM NPA 2011-20 (B.III) CS-ADR-DSN.T.920

Référence: CS-ADR-DSN.T.920
Fencing

Traduction de courtoisie

It is appropriate to delete the (a).

The requirements are already given by the rules about protection against obstacles.

response *Not accepted*

The requirement in (a) is not solely for obstacle limitation purposes.

comment 2925

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.T.920	Fencing
Proposition/commentaire	Il convient de supprimer le point (a).
Justification	Les contraintes sont déjà données par les règles relatives à la protection contre les obstacles.
Traduction de courtoisie	It is appropriate to delete the (a). The requirements are already given by the rules about protection against obstacles.

response *Not accepted*

The requirement in (a) is not solely for obstacle limitation purposes.

comment 2348 ❖

comment by: HIA - Highlands and Islands Airports Limited

Noted

response	<i>Noted</i>	
comment	2971	comment by: <i>Fraport AG</i>
	Attachment #484	
	CS ADR DSN — BOOK 1 Chapter U	
	Editorial	
	New Charts for LED according to actual ICAO discussion has to be implemented (attachment)	
	Fraport	AG
	Cross check complete chapter U with ICAO state letter	
response	<i>Noted</i>	

CS-ADR — Book 1 — CS-ADR-DSN.U.930 Colours for aeronautical ground lights

p. 170-172

comment	1257	comment by: <i>East Midlands Airport - EMA/EGNX</i>
	No specifications or discussion of AGL LED technology.	
response	<i>Noted</i>	
	Currently there are no recognised ICAO specifications for LED AGL.	
comment	2179	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<u>1. Affected paragraphs</u>	
	<ul style="list-style-type: none"> • CS-ADR - Book 1 – CS-ADR-DSN.U.930 Colours for aeronautical ground lights (p170) • CS-ADR - Book 2 - GM-ADR-DSN.U.930 — Colours for aeronautical ground lights (p301) 	
	<u>2. Justification and proposed text / comment</u>	
	Paragraph (b) of this CS deals with a <u>seldom</u> case: visual runways without intensity adjustments or pilots with defective colour vision. It is very difficult to conform to it because that means a specific light has to be created for that purpose, in particular visual runway threshold lights, since <u>no equipment exists</u>	

today to comply with it. The case is today dealt with on a case by case basis. Besides, it is related an ICAO recommendation in Annex 14 Volume 1. It is essential to move paragraph (b) to GM:

CS-ADR-DSN.U.930 Colours for aeronautical ground lights

~~"[...] (b) Where dimming is not required, or where observers with defective colour vision must be able to determine the colour of the light, green signals should be within the following boundaries:
 (1) Yellow boundary $y = 0.726 - 0.726x$
 (2) White boundary $x = 0.650y$
 (3) Blue boundary $y = 0.390 - 0.171x$
 [...]"~~

GM-ADR-DSN.U.930 Colours for aeronautical ground lights

"Where dimming is not required, or where observers with defective colour vision must be able to determine the colour of the light, green signals may be within the following boundaries:
 (1) Yellow boundary $y = 0.726 - 0.726x$
 (2) White boundary $x = 0.650y$
 (3) Blue boundary $y = 0.390 - 0.171x$ "

response *Partially accepted*

Paragraph (b) will be moved to GM.

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – CS-ADR-DSN.U.935 – Colours for markings, signs and panels p. 172-176

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Figure U-1 Colours for aeronautical ground lights p. 177

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure U-2 Ordinary colours for markings and externally illuminated signs and panels

p. 178

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure U-3 Colours of retroreflective materials for markings, signs and panels

p. 179

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure U-4 Colours of luminescent or internally illuminated signs and panels

p. 180

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – CS-ADR-DSN.U.940 – Aeronautical ground light characteristics ICAO

p. 181

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure U-5 Isocandela diagram for approach centre line light and crossbars (white light)

p. 181

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure U-6 Isocandela diagram for approach side row light (red light)

p. 182

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure U-7 Isocandela diagram for threshold light (green light)

p. 183

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	

response *Noted*

CS-ADR – Book 1 – Figure U-8 Isocandela diagram for threshold wing bar light (green light) p. 184

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Figure U-9 Isocandela diagram for touchdown zone light (white light) p. 185

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Figure U-10 Isocandela diagram for runway centre line light with 30 m longitudinal spacing (white light) and rapid exit taxiway indicator light (yellow light) p. 186

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Figure U-11 Isocandela diagram for runway centre line light with 15 m longitudinal spacing (white light) and rapid exit taxiway indicator light (yellow light) p. 187

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure U-12 Isocandela diagram for runway end light (red light)	p. 188
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comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure U-13 Isocandela diagram for runway edge light where width of runway is 45 m (white light)	p. 189
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comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure U-14 Isocandela diagram for runway edge light where width of runway is 60 m (white light)	p. 190
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comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure U-15 Grid points to be used for the calculation of average intensity of approach and runway lights

p. 191

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Collective notes to Figures U-5 to U-15

p. 191-192

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

comment	2992	comment by: <i>Robert Shapton</i>
	<p>1. CS ADR DSN – Book 1 Chapter U, point h, should be corrected to state:</p> <p>“The importance of adequate maintenance cannot be overemphasised. The average intensity should never fall to a value less than 50 % of the value shown in the figures, and it should be the aim of airport authorities to maintain a level of light output close to <u>100%</u> of the specified minimum average intensity.</p>	
response	<p><i>Not accepted</i></p> <p>The wording is taken verbatim from ICAO.</p>	

CS-ADR – Book 1 – Figure U-16 Isocandela diagram for taxiway centre line (15 m spacing) and stop bar lights in straight sections intended for use in runway visual range conditions of less than a value of 350 m where large offsets can occur and for low-intensity runway guard lights, Configuration B

p. 193

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
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	Noted
response	<i>Noted</i>

CS-ADR – Book 1 – Figure U-17 Isocandela diagram for taxiway centre line (15 m spacing) and stop bar lights in straight sections intended for use in runway visual range conditions of less than a value of 350 m p. 194

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Figure U-18 Isocandela diagram for taxiway centre line (7.5 m spacing) and stop bar lights in curved sections intended for use in runway visual range conditions of less than a value of 350 m p. 195

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Figure U-19 Isocandela diagram for taxiway centre line (30 m, 60 m spacing) and stop bar lights in straight sections intended for use in runway visual range conditions of 350 m or greater p. 196

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Figure U-20 Isocandela diagram for taxiway centre line (7.5 m, 15 m, 30 m spacing) and stop bar lights in curved sections intended for use in runway visual range conditions of 350 m or greater	p. 197
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comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure U-21 Isocandela diagram for high-intensity taxiway centre line (15 m spacing) and stop bar lights in straight sections intended for use in an advanced surface movement guidance and control system where higher light intensities are required and where large offsets can occur	p. 198
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comment	120	comment by: <i>Swedavia AB - Swedish airports (currently 11 airports)</i>
	Move to GM, recommendation in ICAO, Annex 14.	
response	<i>Not accepted</i>	
	This is a design specification and will remain in the CS.	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 1 – Figure U-22 Isocandela diagram for high-intensity taxiway centre line (15 m spacing) and stop bar lights in straight sections intended for use in an advanced surface movement guidance and control system where higher light intensities are required	p. 199
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comment	121	comment by: <i>Swedavia AB - Swedish airports (currently 11 airports)</i>
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	Move to GM, recommendation in ICAO, Annex 14.
response	<i>Not accepted</i>
	This is a design specification and will remain in the CS.

comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>

CS-ADR – Book 1 – Figure U-23 Isocandela diagram for high-intensity taxiway centre line (7.5 m spacing) and stop bar lights in curved sections intended for use in an advanced surface movement guidance and control system where higher light intensities are required

p. 200

comment	122 comment by: <i>Swedavia AB - Swedish airports (currently 11 airports)</i>
	Move to GM, recommendation in ICAO, Annex 14.
response	<i>Not accepted</i>
	This is a design specification and will remain in the CS.

comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>

CS-ADR – Book 1 – Figure U-24 Isocandela diagram for high-intensity runway guard lights, Configuration B

p. 201

comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted

response *Noted*

CS-ADR – Book 1 – Collective notes to Figures U-16 to U-25

p. 202

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Figure U-26 Light intensity distribution of PAPI and APAPI

p. 202

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Figure U-27 Isocandela diagram for each light in low-intensity runway guard lights, Configuration A

p. 203

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 1 – Figure U-28 Isocandela diagram for each light in high-intensity runway guard lights, Configuration A

p. 204

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 2 – EASA GUIDANCE MATERIAL FOR AERODROME DESIGN	p. 205
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comment	785	comment by: <i>IDRF e.V. (association of regional airports)</i>
	<p>The GM for aerodrome design is an excellent dossier. The points are valid, very helpful for both, authorities and aerodrome operators. The GM explains some key-elements and complex interrelation in a comprehensive and traceable way. Overall we expect impulses for a better understanding of the design-elements. Some more elements could become objectives and purposes within the GM as a future task. We understand the guidance material as a living document and our association offers cooperation for further development via the European Regional Aerodromes Community - ERAC.</p>	
response	<i>Noted</i>	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.A.001 – Applicability	p. 205
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comment	1670	comment by: <i>ECA - European Cockpit Association</i>
	<p>Add note: Covered in Book 1 A.005</p> <p>Justification: It aids new users as to efficient use to the manuals Book 1/Book 2</p>	
response	<i>Noted</i>	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	Noted	

CS-ADR – Book 2 – GM-ADR-DSN.A.002 – Definition

p. 205

comment	1670 ❖	comment by: <i>ECA - European Cockpit Association</i>
	Add note: Covered in Book 1 A.005	
	Justification: It aids new users as to efficient use to the manuals Book 1/Book 2	
response	Noted	

comment	2266	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	<p>We propose:</p> <ul style="list-style-type: none"> - either to group together all the definitions in the cover regulation of book I or in the CS of book III - or to create a specific book for definitions. <p>We noticed an inconsistency between article 2 of the cover regulation (book I) and the article 2 of the CS (book III) related to definitions. Indeed, some terms are at the same time in book I and book III without being defined identically while some terms are defined only once.</p> <p><u>Runway strip</u> This definition should be specified to avoid any misunderstanding by well separating the cleared and graded area (CGA) previously defined but whose objectives are incoherent with the runway strip ones.</p> <p>We propose to add a definition for the portion of the runway which is not graded and which could be: « Cleared runway strip means the part of the runway strip intended to protect aircraft flying over it during take-off or landing operations ».</p> <p>Indeed, the runway strip has two objectives: reducing damages to aircrafts in case of running off the runway and protecting aircrafts flying over the runway strip. Being a part of the runway strip, the CGA should be submitted to the same objectives, which is not the case here because it does not take into account the protection of flying aircrafts.</p> <p>To not have two different parts of runway strip with identical objectives, it is appropriate to distinguish the graded portion from the non-graded portion of runway strip with different objectives.</p>	

Runway end safety area

This definition does not take into account the works of ICAO. It should be taken into account the letter to the States n°41 that specifies the objectives of RESA as follows:

“**Runway end safety area (RESA)**’ means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway, and also to allow an aeroplane overrunning to decelerate and an aeroplane undershooting to continue its approach or landing.”

The ICAO definition has the advantage to precise the function of RESA which is very important to carry out a safety study for ELOS or special conditions.

Non instrument runway

It is proposed:

- either to take up the ICAO Approach classification task force terms;
- or to add “only”: “Non-instrument runway means a runway intended only for the operation of aircraft using visual approach procedures”.

If we keep the definitions as written, we will have runways considered as infrastructure which will be at the same time « instrument runways » and « non-instrument runways ».

Indeed, the majority of the « instrument runways » are also used for visual approaches.

Regarding to the terms « instrument runways » and « non-instrument runways », it is understand that there are exclusives categories. Now, it will not be the case with such definition even if they come from the ICAO

Frangible object

“Frangible object”: what kind of impact is it ?

We propose the following modification : “Frangible object means an object of low mass designed to break, distort or yield on impact **due to an aircraft** so as to present the minimum hazard to aircraft.”

We suppose that this is only an impact caused by aircraft because frangible objects are put in places where it is necessary to reduce the risk of damages in the case of an aircraft runway or taxiway excursion.

By adding “due to aircraft” we are better in link with the definition of “frangibility”.

Clearway

We wonder who is the “appropriate authority” since it is not defined in the EASA rules.

Is it the competent authority or a third authority?

Cleared and graded area

There is an inconsistency between this definition and the definition of the runway strip.

Indeed, the runway strip has two objectives: reducing damages to aircrafts in case of running off the runway and protecting aircrafts flying over the runway strip. Being a part of the runway strip, the CGA should be submitted to the same objectives, which is not the case here because it does not take into account the protection of flying aircrafts.

Aerodrome equipment

Even if this definition is already in the basic regulation, it is too much detailed and it would be better **to describe the equipment as a whole than piece**

by piece.

We suggest the following writing :

"Aerodrome equipment shall mean any equipment, apparatus or appurtenance, ~~software or accessory~~, that is used or intended to be used to contribute to the operation of aircraft at an aerodrome."

This definition goes too far and we will have a multitude of equipments. It will create unnecessary administrative burden and uncertainty about who does what. It would be better to keep only important equipments considering that they include software and accessories.

response *Noted*

Noted: The definitions contained in Article 2 of the draft regulation are not the same as those contained in the book of certification specifications, because the terms used in the draft regulation are not the same as those used in the certification specifications.

In the few cases where any given definition is slightly different from that provided by ICAO, this is due to the fact that a different definition exists in the basic Regulation or that mature ICAO text has been taken into account.

Runway Strip

Not Agreed: the CGA definition states that it is part of the runway strip and therefore falls under the overarching definition of runway strip.

comment 2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 211

comment by: *CAA Austria - Ministry of Transport*

ARC for Aerodrome Reference Code should be checked with the EASA Acronym list. There are some other names for ARC within EASA

response	<i>Accepted</i> The initialisation will be deleted and replaced with the full title.
comment	345 comment by: <i>Vienna International Airport</i> (f) check EASA Acronym List "ARC - Airworthiness Review Certificate" ???
response	<i>Accepted</i> The initialisation will be deleted and replaced with the full title.
comment	999 comment by: <i>Salzburger Flughafen GmbH</i> (f) check EASA Acronym List "ARC - Airworthiness Review Certificate"???
response	<i>Accepted</i> The initialisation will be deleted and replaced with the full title.
comment	1069 comment by: <i>Federal Office of Civil Aviation FOCA</i> Remove the abbreviation "ARC". There is no need to add an abbreviation in this context. Furthermore, it is not consequently used in the NPA. ARC exists at ICAO level and stands for Area Chart.
response	<i>Accepted</i>
comment	1101 comment by: <i>Flughafen Graz Betriebs GmbH</i> (f) check EASA Acronym List "ARC - Airworthiness Review Certificate" ???
response	<i>Accepted</i> The initialisation will be deleted and replaced with the full title.
comment	1173 comment by: <i>Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH</i> (f) check EASA Acronym List "ARC - Airworthiness Review Certificate" ???

response *Accepted*

The initialisation will be deleted and replaced with the full title.

comment 1504 comment by: *Flughafen Linz-Hörsching - LNZ/LOWL*

(f) check EASA Acronym List "ARC - Airworthiness Review Certificate" ???

response *Accepted*

The initialisation will be deleted and replaced with the full title.

comment 2323 comment by: *HIA - Highlands and Islands Airports Limited*

Fully support the inclusion of this item and would wish retain

response *Noted*

comment 2353 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

do not use an abbreviation "ARC", confusion with ICAO

response *Accepted*

The initialisation will be deleted and replaced with the full title.

comment 2734 comment by: *Flughafen Klagenfurt*

(f) check AESA Acronym List "ARC - Airworthiness Review Certificate" ???

response *Accepted*

The initialisation will be deleted and replaced with the full title.

CS-ADR – Book 2 – GM-ADR-DSN.B.015 – Number, siting and orientation of runways p. 206-207

comment 1672 comment by: *ECA - European Cockpit Association*

	<p>Add a note: Note.— Flexibility to accommodate any future expansion of the runway infrastructure is fundamental to the planning and design of airports.</p> <p>Delete paragraph (a) and replace with: (a) The number of runways must be sufficient to meet air traffic demands, which consist of the number of aircraft arrivals and departures, and the mixture of aircraft types, to be accommodated in one hour during the busiest periods. A target usability factor of 95% should be achieved for aircraft types that intend to use aerodrome.</p> <p>Justification: As per ICAO Aerodrome design manual 2.1.1 This new paragraph combines best of ICAO Aerodrome design manual Part 1: 2.1.3 and the new NPA.</p>
response	<p><i>Not accepted</i></p> <p>These are operational considerations.</p>
comment	<p>1674 comment by: ECA - European Cockpit Association</p> <p>Copy and amend text from paragraph (d) and insert in paragraph (b) to read:</p> <p>(b) Many factors affect the determination of the orientation, siting and number of runways <u>Whatever the factors that determine the runway orientation, the siting and orientation of runways at an aerodrome should, where possible, be such that safety is optimised. Other factors to consider may be:</u> (...)</p> <p>Delete paragraph (d)</p> <p>Justification: To emphasize the highlighted focus on safety in corresponding CS above. Deletion of "where possible": Safety must be a priority not an after thought 'where possible'.</p>
response	<p><i>Noted</i></p> <p>The CS states that there should be no compromise on safety.</p>
comment	<p>2324 comment by: HIA - Highlands and Islands Airports Limited</p> <p>Fully support the inclusion of this item and would wish retain</p>
response	<p><i>Noted</i></p>

CS-ADR – Book 2 – GM-ADR-DSN.B.020 – Choice of maximum permissible crosswind components

p. 207

comment	866	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>2. Justification and proposed text / comment</u></p> <p>The content of CS-ADR-DSN.B.020 and of CS-ADR-DSN.B.025 is "See GM- [...]" Making such a reference to a Guidance Material in this Certification Specification is strongly confusing. Indeed, from a legal perspective, such a reference may make the content of the GM become binding, through the introduction of the CS in the certification Basis, which is absolutely not the intent of a guidance material.</p> <p>DGAC France understands this is an "empty" CS but a GM exists on the subject (respectively "Choice of maximum permissible crosswind components" and "Data to be used").</p> <p>To avoid any misunderstanding, it is proposed to delete CS-ADR-DSN.B.020 and of CS-ADR-DSN.B.025; and add a table of content for CS and GM so that a user can easily know some GM exist on this subject.</p>	
response	<i>Accepted</i>	
	The reference to GM has been removed and replaced with the words 'intentionally blank'.	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.B.025 – Data to be used

p. 208

comment	866 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>2. Justification and proposed text / comment</u></p> <p>The content of CS-ADR-DSN.B.020 and of CS-ADR-DSN.B.025 is "See GM- [...]" Making such a reference to a Guidance Material in this Certification Specification is strongly confusing. Indeed, from a legal perspective, such a reference may make the content of the GM become binding, through the introduction of the CS in the certification Basis, which is absolutely not the intent of a guidance material.</p> <p>DGAC France understands this is an "empty" CS but a GM exists on the subject (respectively "Choice of maximum permissible crosswind components" and "Data to be used").</p>	

To avoid any misunderstanding, it is proposed to delete CS-ADR-DSN.B.020 and of CS-ADR-DSN.B.025; and add a table of content for CS and GM so that a user can easily know some GM exist on this subject.

response *Accepted*

The reference to GM has been removed and replaced with the words 'intentionally blank'.

comment 1678 comment by: *ECA - European Cockpit Association*

Can be deleted, covered by new text above
(Ref: CS-ADR-DSN.B.015 — Number, siting and orientation of runways)

response *Noted*

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR — Book 2 — GM-ADR-DSN.B.030 — Runway threshold

p. 208-209

comment 1030 ❖ comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.030 — Runway threshold (p11)
- GM-ADR - Book 2 - GM-ADR-DSN.B.030 — Runway threshold (p208)

2. Justification and proposed text / comment

In CS-ADR-DSN.B.030 :

- paragraph (d): the start of pavement is not always defined with precision. Moreover, this is not coming from ICAO Annex 14 Volume 1. However, it is recognized that this paragraph is useful. Paragraphe (b) should consequently be deleted from the CS, and should be in GM.
- paragraph (f): This paragraph duplicates paragraph (c) of GM-ADR-DSN.B.045 — Width of runways, which deals with runway width and not runway threshold : This paragraph should be deleted from the CS.

Consequently, it is proposed to:

- **move paragraph (d) of CS-ADR-DSN.B.030 in GM.**
- **modify paragraph (f),as follows :**

"CS-ADR-DSN.B.030 – Runway threshold

	<p>[...] (d) The runway threshold should be measured at the start of the pavement [...] (f) The width of the runway should be measured at the outside edge of the runway edge marking. [...]"</p> <p>"GM-ADR-DSN.B.030 – Runway threshold [...] (d) [...] (3) The runway threshold should be measured at the start of the pavement. [...]"</p>
response	<p><i>Accepted</i></p> <p>Paragraphs (d) and (f) have been deleted from the CS. There is already a description in the GM of where the threshold is normally located (start of pavement).</p>
comment	<p>1070 comment by: <i>Federal Office of Civil Aviation FOCA</i></p> <p>GM-ADR-DSN.B.030 (b): Change wording to: [...] runway condition, a cleared and graded area of at least the length of the extended runway strip before the threshold should be available [...]. Justification: It should not be fixed to at least 60 m since the extended length of the runway strip according to CS-ADR.-DSN.B.155 is applicable.</p>
response	<p><i>Noted</i></p> <p>The 60 m distance is an ICAO requirement for abnormal operational circumstances (unserviceable runway condition) and not related to runway strip. This will be reviewed with AMC.OPS.</p>
comment	<p>2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p><i>Noted</i></p>
response	<p><i>Noted</i></p>
comment	<p>2352 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>ammend article to: [...] runway condition, a cleared and graded area of at least the length of the extended runway strip before the threshold should be available [...]; CS-ADR.-DSN.B.155 is applicable</p>
response	<p><i>Noted</i></p>

The 60 m distance is an ICAO requirement for abnormal operational circumstances (unserviceable runway condition) and not related to runway strip. This will be reviewed with AMC.OPS.

CS-ADR – Book 2 – GM-ADR-DSN.B.035 – Actual length of the runway and declared distances

p. 209-210

comment 104 comment by: *Manchester Airport plc*

No provision is made for the inclusion of a 'Starter Extension' in the declared TORA/TODA. The Starter Extension is provided for in the UK's CAP 168 document and is essential at some aerodromes to provide the required TORA/TODA where available land is limited. Manchester is an example - Runway 23L.

response *Noted*

ICAO does not cater for starter extensions. This can be resolved by the aerodrome operator and the NAA during the certification process as ELOS or SC.

comment 242 comment by: *BAA Airside operations*

(b) This section should include Runway Starter Extensions where a longer runway is provided by extending the runway at the "Start of Roll" end but not to the full width. This option should be explained and added to the diagram too.

This can be a practical way to lengthen a runway, for departures only in one direction when the far end of the runway cannot be extended due to the obstacle environment either on the airfield or further away. This is used in the UK and is detailed in CAP168 Chapter 3, Appendix 3H.

response *Noted*

ICAO does not cater for starter extensions. This can be resolved by the aerodrome operator and the NAA during the certification process as ELOS or SC.

comment 529 comment by: *East Midlands Airport - EMA/EGNX*

No provision is made for the inclusion of a 'Starter Extension' in the declared TORA/TODA. The Starter Extension is provided for in the UK's CAP 168 document and is essential at some aerodromes to provide the required TORA/TODA where available land is limited.

response *Noted*

ICAO does not cater for starter extensions. This can be resolved by the aerodrome operator and the NAA during the certification process as ELOS or SC.

comment *1071* comment by: *Federal Office of Civil Aviation FOCA*

A similar figure is already provided in the NPA, therefore no duplication is required. Please remove or move Figure GM-B-1 to the suitable place in AMC.

response *Accepted*

comment *1679* comment by: *ECA - European Cockpit Association*

Delete (a)(1) and insert following paragraph as a preamble:
The relationship between runway length and aeroplane performance characteristics is discussed in Chapter 4. The greater the head wind down a runway, the shorter the runway length required by an aeroplane taking off or landing. Conversely, a tail wind increases the length of runway required. The higher the temperature, the longer the runway required because higher temperatures create lower air densities resulting in lower output of thrust and reduced lift. The effect of runway slopes on runway length requirements is discussed in detail in Appendix 2, however it is evident that an aeroplane taking off on an uphill gradient requires more runway length than it would on a level or downhill gradient; the specific amount depends on the elevation of the aerodrome and the temperature.

All other factors being equal, the higher the elevation of the aerodrome with correspondingly lower barometric pressure, the longer the runway required. The runway length which can be provided at an aerodrome may be constrained by property boundaries or topographical features such as mountains, the sea or steep valleys.

Delete (3) and replace with:

Factors which have a bearing on the runway length to be provided are:

- a) performance characteristics and operating masses of the aeroplanes to be served;
- b) weather, particularly surface wind and temperature;
- c) runway characteristics such as slope and surface condition; and
- d) aerodrome location factors, for example, aerodrome elevation which affects the barometric pressure and topographical constraints.

Justification:

English wording does not make sense

As per ICAO Aerodrome design manual, the proposal provides useful background information to personnel not familiar with aircraft operations.

For paragraph (3), as per ICAO Aerodrome design manual Part 1 3.1

response *Not accepted*

These are operational considerations.

comment 1681 comment by: ECA - European Cockpit Association

Delete (b) (1) and replace with the following:

(1) The following distances shall be calculated for a runway intended for use by international commercial air transport:

a) Take-off distance available (TODA), that is, the length of the runway which is declared available for take-off and is suitable for the ground run of an aeroplane taking-off. In most cases this corresponds to the physical length of the runway pavement; it does not include the length of any Stopway or Clearway.

b) Landing distance available (LDA), that is, the length of runway which is declared available and suitable for the ground run of an aeroplane landing.

The landing distance commences at the threshold and extends for the length of the runway after the threshold. In most cases this corresponds to the physical length of the runway pavement. However, the threshold may be displaced from the extremity of the runway when it is considered necessary.

Note: Stopways and Clearways should be provided as additional safety areas.

Justification:

It should be noted that these distances do not take account of the loss of runway length available due to **alignment of the aeroplane prior to take-off**.

Reference: IFALPA Annex 14, paragraph 2.8.x (For IFALPA policy on the alignment distance allowance to be applied, see IFALPA Annex 6, paragraph 5.2.7.1.1).

response *Not accepted*

These are operational considerations and are in any case already described in the definitions.

comment 1763 comment by: UK CAA

Page No: 209

Paragraph No: GM.ADR.DSN.B.035

Comment: No guidance is provided on the origin and measurement of declared distances from intersections.

Justification: Guidance material should be provided to aid with consistency.

Proposed Text: Additional guidance material should be added, as can be found in UK CAP 168, chapter 3, paragraph 13.5 – including diagrams.

response

Noted

This is an operational consideration and will be addressed by GM.OPS.

comment

2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited**Noted*

response

Noted

comment

2351

comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

duplication, remove or move Figure GM-B-1 elsewhere in AMC

response

Accepted

CS-ADR – Book 2 – Figure GM-B-1 Illustration of declared distance

p. 211

comment

2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited**Noted*

response

Noted

CS-ADR – Book 2 – GM-ADR-DSN.B.040 – Runways with stopways or clearways

p. 212

comment

2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited**Noted*

response

Noted

CS-ADR – Book 2 – GM-ADR-DSN.B.045 – Width of runways

p. 212

comment	177	comment by: CAA Norway
	We suggest to delete GM-ADR-DSN.B.045 (c) on page 212. This is already appearing in CS-ADR-DSN.B.045 (b).	
response	<i>Accepted</i>	

comment	178	comment by: CAA Norway
	We suggest to delete GM-ADR-DSN.B.045 (d) on page 212 or combine with CS-ADR.DSN.B.035. GM-ADR-DSN.B.045 (d) is about length, the rest of article GM-ADR-DSN.B.045 is about width. The painted band has an ICAO name: Transverse stripe – please use Transverse stripe .	
response	<i>Accepted</i>	
	GM B.045 will be moved to CS B.035. 'Transverse stripe' will replace 'painted band'.	

comment	210	comment by: CAA Austria - Ministry of Transport
	Change title to: dimension of runways Within the text their a width and length of runways not only width (d) Change article to: [...] measured from the operational beginning of the runway, normally the start of the runway pavement or, where a transverse stripe is [...] The length of the runway should not be measured at the start of pavement as the pavement does normally start before the operational beginning of the runway	
response	<i>Not accepted</i>	
	Paragraph (d) is deleted from GM B.045 and added to CS B.035.	

comment	324	comment by: Icelandic Civil Aviation Administration
	We suggest to delete GM-ADR-DSN.B.045 (c) on page 212. This is already appearing in CS-ADR-DSN.B.045 (b).	
response	<i>Accepted</i>	

comment	<p>325 comment by: <i>Icelandic Civil Aviation Administration</i></p>
	<p>We suggest to delete GM-ADR-DSN.B.045 (d) on page 212 or combine with CS-ADR.DSN.B.035. GM-ADR-DSN.B.045 (d) is about length, the rest of article GM-ADR-DSN.B.045 is about width. The painted band has an ICAO name: Transverse stripe – please use Transverse stripe.</p>
response	<p><i>Accepted</i></p> <p>GM B.045 will be moved to CS B.035. 'Transverse stripe' will replace 'painted band'.</p>
comment	<p>346 comment by: <i>Vienna International Airport</i></p>
	<p>(d) Change article to: [...] measured from the operational beginning of the runway, normally the start of the runway pavement or, where a transverse stripe is [...] The length of the runway should not be measured at the start of pavement as the pavement does normally start before the operational beginning of the runway</p>
response	<p><i>Not accepted</i></p> <p>Paragraph (d) is deleted from GM B.045 and added to CS B.035.</p>
comment	<p>381 comment by: <i>Estonian CAA</i></p>
	<p>We suggest to delete GM-ADR-DSN.B.045 (c) on page 212. This is already appearing in CS-ADR-DSN.B.045 (b).</p>
response	<p><i>Accepted</i></p>
comment	<p>382 comment by: <i>Estonian CAA</i></p>
	<p>We suggest to delete GM-ADR-DSN.B.045 (d) on page 212 or combine with CS-ADR.DSN.B.035. GM-ADR-DSN.B.045 (d) is about length, the rest of article GM-ADR-DSN.B.045 is about width. The painted band has an ICAO name: Transverse stripe – please use Transverse stripe.</p>
response	<p><i>Accepted</i></p> <p>GM B.045 will be moved to CS B.035. 'Transverse stripe' will replace 'painted</p>

band'.

comment	383	comment by: <i>Estonian CAA</i>
	<p>We suggest to change GM-ADR-DSN.B.045 (d) on page 212 to: "... measured from the operational beginning of the runway, normally the start of the runway pavement or, where a transverse stripe is..."</p> <p>The length of the runway should not be measured at the start of the pavement as the pavement does normally start before the operational beginning of the runway.</p>	
response	<p><i>Not accepted</i></p> <p>Paragraph (d) is deleted from GM B.045 and added to CS B.035.</p>	
comment	672	comment by: <i>Finnish Transport Safety Agency</i>
	<p>We suggest to delete GM-ADR-DSN.B.045 (c) on page 212. This is already appearing in CS-ADR-DSN.B.045 (b).</p>	
response	<p><i>Accepted</i></p>	
comment	673	comment by: <i>Finnish Transport Safety Agency</i>
	<p>We suggest to delete GM-ADR-DSN.B.045 (d) on page 212 or combine with CS-ADR.DSN.B.035.</p> <p>GM-ADR-DSN.B.045 (d) is about length, the rest of article GM-ADR-DSN.B.045 is about width. The painted band has an ICAO name: Transverse stripe – please use Transverse stripe.</p>	
response	<p><i>Accepted</i></p> <p>GM B.045 will be moved to CS B.035. 'Transverse stripe' will replace 'painted band'.</p>	
comment	674	comment by: <i>Finnish Transport Safety Agency</i>
	<p>We suggest to change GM-ADR-DSN.B.045 (d) on page 212 to: "... measured from the operational beginning of the runway, normally the start of the runway pavement or, where a transverse stripe is..."</p> <p>The length of the runway should not be measured at the start of the pavement as the pavement does normally start before the operational beginning of the runway.</p>	

response *Not accepted*

Paragraph (d) is deleted from GM B.045 and added to CS B.035.

comment 840 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.045 — Width of runways - - Paragraph (b) - (p12)
- GM-ADR - Book 2 - GM-ADR-DSN.B.045 — Width of runways - Paragraph (c) — (p212)

2. Proposed text / comment

In this NPA, the expression "runway edge marking" is only used to detail how to measure a runway but is not defined. ICAO Annex 14 Volume 1 does not use nor define this expression. It seems here, the appropriate word would be "Runway side stripe marking" (as used in CS-ADR-DSN.L.550).

Moreover, paragraph (b) of CS-ADR-DSN.B.045 and paragraph (c) of GM-ADR-DSN.B.045 duplicate the same provision, with the wording of GM-ADR-DSN.B.045 which is more adequate (ie with "where provided"), as such markings only exist on precision approach runways, or on a paved runway where there is a lack of contrast between the runway edges and the shoulders or the surrounding terrain (see CS-ADR-DSN.L.550).

The content of this specification should be in GM (which is what the formal groups decided), with the writing proposed in the GM-ADR-DSN.B.045 and not the one added in CS-ADR-DSN.B.045.

Consequently, it is proposed to modify CS-ADR-DSN.B.045 and GM-ADR-DSN.B.045 as follows:

"CS-ADR-DSN.B.045 — Width of runways

[...]

~~(b) The width of the runway should be measured at the outside edge of the runway edge marking."~~

response *Partially accepted*

'Runway side stripe' will replace 'runway edge'. Paragraph (b) will be amended to read '...outside edge of the runway side stripe marking, where provided, or the edge of the runway'.

comment 1000

comment by: *Salzburger Flughafen GmbH*

(d) Change article to: [...] measured from the operational beginning of the runway, normally the start of the runway pavement or, where a transverse stripe is [...]

The length of the runway should not be measured at the start of pavement as the pavement does normally start before the operational beginning of the

response	<p>runway</p> <p><i>Not accepted</i></p> <p>Paragraph (d) is deleted from GM B.045 and added to CS B.035.</p>
comment	<p>1072 comment by: <i>Federal Office of Civil Aviation FOCA</i></p> <p>Para. (d): The length of the runway should not be measured at the start of pavement as the pavement does normally start before the operational beginning of the runway. Please change wording to: [...] measured from the operational beginning of the runway, normally the start of the runway pavement or, where a transverse stripe is [...].</p>
response	<p><i>Not accepted</i></p> <p>Paragraph (d) is deleted from GM B.045 and added to CS B.035.</p>
comment	<p>1102 comment by: <i>Flughafen Graz Betriebs GmbH</i></p> <p>(d) Change article to: [...] measured from the operational beginning of the runway, normally the start of the runway pavement or, where a transverse stripe is [...]</p> <p>The length of the runway should not be measured at the start of pavement as the pavement does normally start before the operational beginning of the runway</p>
response	<p><i>Not accepted</i></p> <p>Paragraph (d) is deleted from GM B.045 and added to CS B.035.</p>
comment	<p>1178 comment by: <i>Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH</i></p> <p>(d) Change article to: [...] measured from the operational beginning of the runway, normally the start of the runway pavement or, where a transverse stripe is [...]</p> <p>The length of the runway should not be measured at the start of pavement as the pavement does normally start before the operational beginning of the runway</p>
response	<p><i>Not accepted</i></p> <p>Paragraph (d) is deleted from GM B.045 and added to CS B.035.</p>

comment	1210	comment by: <i>Swedish Transport Agency</i>
	<p>We suggest to delete GM-ADR-DSN.B.045 (d) on page 212 or combine with CS-ADR.DSN.B.035. GM-ADR-DSN.B.045 (d) is about length, the rest of article GM-ADR-DSN.B.045 is about width. The painted band has an ICAO name: Transverse stripe – please use Transvers stripe.</p>	
response	<i>Accepted</i>	
comment	1211	comment by: <i>Swedish Transport Agency</i>
	<p>We suggest to change GM-ADR-DSN.B.045 (d) on page 212 to: "... measured from the operational beginning of the runway, normally the start of the runway pavement or, where a transverse stripe is..." The length of the runway should not be measured at the start of pavement as the pavement does normally start before the operational beginning of the runway.</p>	
response	<i>Not accepted</i>	
	Paragraph (d) is deleted from GM B.045 and added to CS B.035.	
comment	1252	comment by: <i>CAA Norway</i>
	<p>We suggest to change article to: "... measured from the operational beginning of the runway, normally the start of the runway pavement or, where a transverse stripe is..." The length of the runway should not be measured at the start of pavement as the pavement does normally start before the operational beginning of the runway</p>	
response	<i>Not accepted</i>	
	Paragraph (d) is deleted from GM B.045 and added to CS B.035.	
comment	1506	comment by: <i>Flughafen Linz-Hörsching - LNZ/LOWL</i>
	<p>(d) Change article to: [...] measured from the operational beginning of the runway, normally the start of the runway pavement or, where a transverse stripe is [...]</p> <p>The length of the runway should not be measured at the start of pavement as the pavement does normally start before the operational beginning of the runway</p>	
response	<i>Not accepted</i>	

Paragraph (d) is deleted from GM B.045 and added to CS B.035.

comment

1764

comment by: UK CAA

Page No: 212

Paragraph No: GM.ADR-DSN.B.045 – Width of runways

Comment: This section should contain additional information to cover operations from runways narrower than shown in the table.

Justification: ADR.OR.C.010 – Use of the aerodrome by large aircraft specifically covers how an aerodrome operator may permit such an operation, which may be the use of a narrow runway. The UK CAA has conducted a recent high level review of previous studies on this subject and the current regulatory framework around this. We suggest it would be prudent to add some additional information. Historically, Annex 14 criteria has been proven to be adequate. Permitting the use of a narrower runway requires highlighting and some prior consideration for both the aircraft operator and aerodrome operator. It is important for there to be no confusion between the aircraft and aerodrome operator regarding what approvals are required and from whom.

Proposed Text: New GM.ADR-DSN.B.045 “(c) The aerodrome operator should advise any aircraft operator whom they intend to permit to operate from a runway narrower than specified in (a) to check the Aircraft Flight Manual for any operational restrictions and/or crew training requirements for operations on narrow runways. The aerodrome operator should remind the aircraft operators to note that any such information within the Aircraft Flight Manual or the aerodrome terms of approval does not constitute an operational approval and the operator must check with their competent authority for such an approval. Any limitations should be published in the AIP.”

and renumber subsequent paragraphs.

response

Not accepted

This is an operational consideration.

comment

2348 ❖

comment by: HIA - Highlands and Islands Airports Limited

Noted

response

Noted

comment

2350

comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

amend article to: [...] measured from the operational beginning of the

response	<p>runway, normally the start of the runway pavement or, where a transverse stripe is [...]</p> <p><i>Accepted</i></p>
comment	<p>2610 comment by: <i>Danish Transport Authority</i></p> <p>We suggest to delete GM-ADR-DSN.B.045 (d) on page 212 or combine with CS-ADR.DSN.B.035. GM-ADR-DSN.B.045 (d) is about length, the rest of article GM-ADR-DSN.B.045 is about width. The painted band has an ICAO name: Transverse stripe – please use Transverse stripe.</p>
response	<p><i>Accepted</i></p> <p>GM B.045 will be moved to CS B.035. 'Transverse stripe' will replace 'painted band'.</p>
comment	<p>2739 comment by: <i>Flughafen Klagenfurt</i></p> <p>(d) Change article to: [...] measured from the operational beginning of the runway, normally the start of the runway pavement or, where a transverse stripe is [...] The length of the runway should not be measured at the start of pavement as the pavement does normally start before the operational beginning of the runway</p>
response	<p><i>Not accepted</i></p> <p>Paragraph (d) is deleted from GM B.045 and added to CS B.035.</p>
comment	<p>2976 comment by: <i>Isavia</i></p> <p>We suggest deleting GM-ADR-DSN.B.045 (c) on page 212. This is already appearing in CS-ADR-DSN.B.045 (b).</p>
response	<p><i>Accepted</i></p>
comment	<p>2977 comment by: <i>Isavia</i></p> <p>We suggest to delete GM-ADR-DSN.B.045 (d) on page 212 or combine with CS-ADR.DSN.B.035. GM-ADR-DSN.B.045 (d) is about length, the rest of article GM-ADR-DSN.B.045</p>

is about width. The painted band has an ICAO name: Transverse stripe – please use Transverse stripe.

response *Partially accepted*

(d) will be moved to GM-AD-DSN.B.035. 'Transverse stripe' will replace 'painted band'.

CS-ADR – Book 2 – GM-ADR-DSN.B.050 – Minimum distance between parallel non-instrument runways

p. 212

comment 179 comment by: *CAA Norway*

We suggest to delete GM-ADR-DSN.B.050 (b) on page 212. This already appears in CS-ADR-DSN.B.050 on page 12.

response *Accepted*

comment 326 comment by: *Icelandic Civil Aviation Administration*

We suggest to delete GM-ADR-DSN.B.050 (b) on page 212. This already appears in CS-ADR-DSN.B.050 on page 12.

response *Accepted*

comment 384 comment by: *Estonian CAA*

We suggest to delete GM-ADR-DSN.B.050 (b) on page 212. This already appears in CS-ADR-DSN.B.050 on page 12.

response *Accepted*

comment 675 comment by: *Finnish Transport Safety Agency*

We suggest to delete GM-ADR-DSN.B.050 (b) on page 212. This already appears in CS-ADR-DSN.B.050 on page 12.

response *Accepted*

comment	1073	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	<p>Para. (b): The required is already described in CS-ADR-DSN.B.050, please delete duplication.</p> <p>GM-ADR-DSN.B.055: Provision belongs to other specifications used in the CS-ADR-DSN.B.055, therefore please move to CS-ADR-DSN.B.055.</p>	
response	<i>Accepted</i>	
	<p>Paragraph (b) is deleted from GM B.050. GM B.055 will be deleted.</p>	

comment	1213	comment by: <i>Swedish Transport Agency</i>
	<p>We suggest to delete GM-ADR-DSN.B.050 (b) on page 212. This already appears in CS-ADR-DSN.B.050 on page 12.</p>	
response	<i>Accepted</i>	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

comment	2978	comment by: <i>Isavia</i>
	<p>We suggest deleting GM-ADR-DSN.B.050 (b) on page 212. This already appears in CS-ADR-DSN.B.050 on page 12</p>	
response	<i>Accepted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.B.060 Longitudinal slopes on runways p. 212-213

comment	843 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway 	

- (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
 - CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
 - CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM

(p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways****CS-ADR-DSN.B.060 – Longitudinal slopes of runway**

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and
- (3) 2 % where the code number is 1 or 2.

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such

that there will be an unobstructed line of sight from:

(1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;

(2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and

(3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface.~~"

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"~~The slopes are the same as those on the adjacent runway pavement surface. Slopes should be~~ are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %.~~"

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- (1) 1.5 % where the code number is 4;*
- (2) 1.75 % where the code number is 3; and*
- (3) 2 % where the code number is 1 or 2.*

(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;*
- (2) 1.75 % where the code number is 3; and*
- (3) 2 % where the code number is 1 or 2."*

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

"~~(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- (1) 2.5 % where the code number is 3 or 4; and*
- (2) 3 % where the code number is 1 or 2;*

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and*
- (2) 3 % where the code number is 1 or 2;*

except that to facilitate drainage the slope for the first 3 m outward from the

runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

~~(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA should ~~can~~ be amended accordingly."

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

(a) The longitudinal slope of a taxiway should not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B.

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

- (1) 1.5 % where the code letter is C, D, E or F; and*
- (2) 3 % where the code letter is A or B."*

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and*
- (2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.*

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

- (1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and*
- (2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.*

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:

- (1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;*
- (2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and*
- (3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."*

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

- (1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter*

is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes should may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and

(2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an~~

airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~“(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction.”~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

“(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~“(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.”~~

~~“(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. ”~~

response *Noted*

Comments will be addressed to under their individual CS reference.

comment 1074

comment by: Federal Office of Civil Aviation FOCA

There are no values indicated for the longitudinal slopes on runways, please add values.

response *Not accepted*

Slope values (expressed as a percentage) are in the CS.

comment 2191

comment by: Pau Pyrénées Airport - PUF/LFBP

All the rules concerning the slopes fall into the scope of best practices and not certification rules. It is more appropriate to have these rules into GM.

The respect of these rules can interfere with the objective of drainage.

However, for precisions approaches it is appropriate to write the following CS: “for precision approach runway category II and III, the longitudinal slope of runway should not exceed 0.8% on the first 900 meters in the landing way to comply with the requirements of ILS equipments of category II and III”.

Besides, in order to take into account the constraints of the land, it is appropriate to add the following CS :

«Longitudinal slopes of runway should be in coherency with the runway

	transversal slope to allow a rapid drainage".
response	<i>Not accepted</i>
	The requirements are design criteria. Longitudinal slopes are not intended for drainage of water.

comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>

comment	2349 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	values for the longitudinal slopes on runways necessary
response	<i>Noted</i>

comment	2511 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	<p>GM-ADR-DSN.B.060 – Longitudinal slopes on runways</p> <p><i>"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."</i></p>
response	<i>Not accepted</i>
	The requirements are design criteria for the maximum allowable slope gradient. Longitudinal slopes are not intended for drainage of water.

comment 843 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of

taxiways (p231)

- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 — Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and
- (3) 2 % where the code number is 1 or 2.

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

(b) For precision approach runways, slopes in a specified area from the runway

end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

(1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;

(2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and

(3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope should may be substantially the same throughout the

length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface.~~"

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface. Slopes ~~should be~~ are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %.~~"

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

"~~(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

- ~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
- ~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

- (1) is perpendicular to the vertical plane containing the runway centre line; and
- (2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas****CS-ADR-DSN.C.230 - Slopes on runway end safety areas**

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA ~~should~~ can be amended accordingly."

*** Longitudinal slopes on taxiways****CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways**

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways****CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways**

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways****CS-ADR-DSN.D.275 – Sight distance of taxiways**

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways****CS-ADR-DSN.D.280 – Transverse slopes on taxiways**

"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B."

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes should may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips****CS-ADR-DSN.D.330 – Slopes on taxiway strips**

"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and

(2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and

(2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons****CS-ADR-DSN.E.360 Slopes on aprons**

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~-(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

"(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.~~

~~(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "~~

response *Noted*

Comments will be addressed to under their individual CS reference.

comment 2190

comment by: Pau Pyrénées Airport - PUF/LFBP

This CS should be a GM.

All the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.

response *Not accepted*

The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.

comment 2348 ❖

comment by: HIA - Highlands and Islands Airports Limited

	Noted
response	Noted

comment	2512 comment by: AENA - Aeropuertos Españoles y Navegación Aérea
	<p>GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways</p> <p>"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.</p> <p>(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."</p>
response	Not accepted

CS-ADR – Book 2 – GM-ADR-DSN.B.070 – Sight distance
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p. 213

comment	843 ❖ comment by: DGAC Direction Générale de l'aviation civile
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN.B.060 – Longitudinal slopes of runway (p13) • CS-ADR - Book 1 - CS-ADR-DSN.B.065 – Longitudinal slope changes on runways (p13) • CS-ADR - Book 1 - CS-ADR-DSN.B.070 – Sight distance for slopes on runways (p14) • CS-ADR - Book 1 - CS-ADR-DSN.B.080 – Transverse slopes (p14) • CS-ADR - Book 1 - CS-ADR-DSN.B.100 – Slopes on runway turn pads (p16) • CS-ADR - Book 1 - CS-ADR-DSN.B.130 – Slopes on runway shoulders (p17) • CS-ADR - Book 1 - CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips (p19) • CS-ADR - Book 1 - CS-ADR-DSN.B.185 – Transverse Slopes on runway strips (p19-20) • CS-ADR - Book 1 - CS-ADR-DSN.B.195 – Clearways (p20-21) • CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22) • CS-ADR - Book 1 - CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways (p26) • CS-ADR - Book 1 - CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways (p26) • CS-ADR - Book 1 - CS-ADR-DSN.D.275 – Sight distance of taxiways (p26) • CS-ADR - Book 1 - CS-ADR-DSN.D.280 – Transverse slopes on

- taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
 - CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observed at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and
- (3) 2 % where the code number is 1 or 2.

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown

area, ~~are~~ should be designed so that they will correspond to the characteristics needed for such type of approach."

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface."~~

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface. Slopes ~~should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:

- ~~(1) 1.5 % where the code number is 4;
 (2) 1.75 % where the code number is 3; and
 (3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
 (2) 1.75 % where the code number is 3; and
 (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and
 (2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
 (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

- ~~(1) is perpendicular to the vertical plane containing the runway centre line; and
 (2) passes through a point located on the runway centre line at the end of the take-off run available.~~

~~[...]"~~

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

- (1) is perpendicular to the vertical plane containing the runway centre line; and

(2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA ~~should~~ can be amended accordingly."

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways****CS-ADR-DSN.D.275 – Sight distance of taxiways**

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways****CS-ADR-DSN.D.280 – Transverse slopes on taxiways**

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips****CS-ADR-DSN.D.330 – Slopes on taxiway strips**

~~“(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway.”~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

“(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and

(2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway.”

*** Slopes on aprons****CS-ADR-DSN.E.360 Slopes on aprons**

“(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~“(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction.”~~

GM-ADR-DSN.E.360 – Slopes on aprons —and GM

“(a) The design of slopes should may direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures should may be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the

*slope should **may** be kept as shallow as possible and should **may** be such that the operation of the aircraft and vehicles is not compromised. "*

response *Noted*

Comments will be addressed to under their individual CS reference.

comment

2188

comment by: *Pau Pyrénées Airport - PUF/LFBP*

This CS should be a GM.

All the rules concerning the slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.

We must note that this provision takes arbitrary height which should correspond to the height of the pilot's eye but this height does not depend directly on the code letter of the aerodrome.

response

Not accepted

The requirements are design criteria.

comment

2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response

Noted

comment

2513

comment by: *AENA - Aeropuertos Españoles y Navegación Aérea*

GM-ADR-DSN.B.070 – Sight distance

"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »

response

Not accepted

CS-ADR – Book 2 – GM-ADR-DSN.B.075 – Distance between slope changes

p. 213-214

comment

1733

comment by: *CAA Austria - Ministry of Transport*

	Check formula with ICAO.
response	<i>Accepted</i>
	The ICAO symbology has been added to the CS formula.

comment	2186 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	<p>We propose to conserve into CS by modifying only the following part: "Undulations or appreciable changes in slopes located close together along a runway should be avoided to avoid damage to the aeroplane undercarriage due to confining dynamic load of the undercarriage system the aeroplane when it moves at high speed".</p> <p>The rest of the provision has to be transferred into « guidance material » GM</p> <p>Rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p> <p>Besides, the objective of this provision has to be clarified. The respect of these rules can interfere with the objective of drainage</p>
response	<i>Not accepted</i>
	The requirements are design criteria. Longitudinal slope changes are not intended for drainage of water.

comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>

CS-ADR – Book 2 – Figure GM-B-2 Profile on centre line of runway

p. 214

comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>

comment 843 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)

- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 — Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and
- (3) 2 % where the code number is 1 or 2.

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 — Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 — Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

~~(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."~~

*** Sight distance for slopes on runways****CS-ADR-DSN.B.070 – Sight distance for slopes on runways**

~~"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:~~

~~(1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;~~

~~(2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and~~

~~(3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.~~

~~(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "~~

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways****CS-ADR-DSN.B.080 – Transverse slopes**

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

~~"The transverse slope may be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B;~~

except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface.~~"

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface. Slopes ~~should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %.~~"

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

"~~(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the~~

~~runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~
~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:
 (1) 2.5 % where the code number is 3 or 4; and
 (2) 3 % where the code number is 1 or 2;
 except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.
 (b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

"[...] (e) Slopes on clearways:
 Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.
 The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:
 (1) is perpendicular to the vertical plane containing the runway centre line; and
 (2) passes through a point located on the runway centre line at the end of the take-off run available.
 [...]"

GM-ADR-DSN.B.195 Clearways

"[...]
 (b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:
 (1) is perpendicular to the vertical plane containing the runway centre line; and
 (2) passes through a point located on the runway centre line at the end of the take-off run available.
 Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes
 (1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.
 (2) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~ Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.
 (b) Transverse slopes
 (1) ~~The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %.~~ Transitions between differing slopes should be as gradual as practicable."

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a

downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA should ~~can~~ be amended accordingly."

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

"The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the~~

~~taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B.~~

~~(b) Slopes should may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the~~

adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~(a)~~ Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

~~(a)~~ The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.~~

~~(ed)~~ Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "

response

Noted

GM-ADR-DSN.B.080: The GM text has been deleted.

The remaining comments are answered in the appropriate CS or GM segment.

comment

1075

comment by: Federal Office of Civil Aviation FOCA

The provision is already stated in CS-ADR-DSN.B.080 (c), please delete duplication.

response

Accepted

The GM text has been deleted.

comment	2183 comment by: Pau Pyrénées Airport - PUF/LFBP
	<p>We propose to keep into CS the following parts :</p> <ul style="list-style-type: none"> - (a) "To promote the most rapid drainage of water [...] rapid drainage." <p>The rest of the provision has to be moved to « guidance material » GM.</p> <p>Rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM. The respect of these rules can interfere with the objective of drainage.</p>
response	<p><i>Noted</i></p> <p>The CS comment is answered in the appropriate CS segment.</p> <p>The GM text has been deleted.</p>
comment	2336 comment by: Airport St. Gallen-Altenrhein - ACH/LSZR
response	<p>delete repetition of a CS</p> <p><i>Accepted</i></p> <p>The GM text has been deleted.</p>
comment	2348 ❖ comment by: HIA - Highlands and Islands Airports Limited
response	<p><i>Noted</i></p> <p><i>Noted</i></p>
comment	2514 comment by: AENA - Aeropuertos Españoles y Navegación Aérea
	<p>GM-ADR-DSN.B.080 – Transverse slopes on runways</p> <p><i>"The transverse slope may be:</i></p> <p><i>(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and</i></p> <p><i>(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.</i></p> <p><i>For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.</i></p> <p><i>The transverse slope should may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."</i></p>

response *Not accepted*

The proposed text remains in the CS. The GM text has been deleted.

CS-ADR – Book 2 – GM-ADR-DSN.B.085 – Runway strength

p. 214-215

comment

2182

comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate to delete: "~~Conditions for overload operations and ACN/PCN are in Book 2 – Guidance Material for Aerodrome Design~~".

The reference to « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.

response

Accepted

comment

2329

comment by: *HIA - Highlands and Islands Airports Limited*

B.085 (d) (1) (i, ii and iv)

Change.

Existing UK regulations allow airports to be free to decide their own criteria for permitting overload operations as long as pavements remain safe for use by aircraft.

The PCN value does include a safety factor so that a 10% increase of ACN over PCN is generally acceptable for pavements that are well consolidated.

This option we would wish to retain particularly where our smaller airports would only see one or two overload movements per year which could be detrimental to supporting island communities if not carried out.

response

Noted

This is guidance. The ELOS mechanism allows flexibility.

comment

2547

comment by: *IATA*

Page 211 Strength of pavements

Change

The California Bearing Test Ratio (CBR) is a ratio for classifying the strength of the subsoil on which flexible pavements are built and must be expressed in %,

	e.g CBR 10 %, similar to the k-value (classifying the stiffness of the soil underneath the concrete pavement) which is expressed in NM/m3
response	<i>Noted</i>

CS-ADR – Book 2 – GM-ADR-DSN.B.090 – Surface of runways

p. 215-217

comment	72	comment by: <i>Belfast International Airport - BFS/EGAA</i>
	We find this to be a very usefull addition to the regulations.	
response	<i>Noted</i>	

comment	209	comment by: <i>CAA Austria - Ministry of Transport</i>
	(c) Supplement the article (c) with a figure The table in (c) should be supplemented with a figure showing the minimum acceptable length of irregularity (similar to Figure A-3 of ICAO Annex 14, Vol.I)	
response	<i>Not accepted</i>	
	This will be moved to GM OPS.	

comment	1081	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	The table in para. (c) should be supplemented with a figure showing the minimum acceptable length of irregularity (similar to Figure A-3 of ICAO Annex 14, Vol. I).	
response	<i>Not accepted</i>	
	This will be moved to GM OPS.	

comment	1682	comment by: <i>ECA - European Cockpit Association</i>
	Delete paragraphs (a) and (b) Already covered as more binding in CS-ADR-DSN.B.090 – Surface of runways	
	Justification: Text should be described as a CS, not GM	

response *Not accepted*

These paragraphs are not described in the CS.

comment 2180 comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate to move the (c) to GM.

This provision is only a recommendation of the ICAO. It concerns only the conception and does not have to enter in the certification basis concerning runways in service.

Such provision is particularly hard to respect and to monitor.

response *Not accepted*

This will remain in CS and the duplication will be deleted from GM.

comment 2335 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

the article (c) really needs a figure

response *Noted*

GM B.090 paragraphs (c) to (f) will be moved to GM OPS.

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 2 – GM-ADR-DSN.B.095 – Runway turn pads

p. 217

comment 590 ❖ comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.B.095 – Runway Turn Pads (p15-16)
- CS-ADR - Book 1 – CS-ADR-DSN.L.565 – Runway Turn Pad Marking (p65)

- CS-ADR - Book 2 – GM-ADR-DSN.B.095 — Runway turn pads (p217)
- CS-ADR - Book 2 – GM-ADR-DSN.L.565 — Runway turn pad marking (p252)

2. Proposed text / comment

Providing a turn pad on a runway facilitates operations, but is not necessarily mandatory: it is proposed to revise paragraph (b) of CS-ADR-DSN.B.095 accordingly.

Moreover, it is proposed to include in this CS an “alternative turn pad”. Indeed:

- France has some provisions, detailed and different from Annex 14 Volume 1, which have been notified to ICAO, but are not included in NPA 2011-20 as an alternative design feature within the CS;
- Some alternative design features within a CS already exist in this NPA, which are not coming from Annex 14 volume 1 (ex: alternate aiming points in CS-ADR-DSN.L.540: (c) (2) page 58 and 59: EASA indicated it comes from UK).

Consequently, it is proposed to include the specifications of French turn pads in CS-ADR-DSN.B.095 (page 16), which are already included in the project for ICAO PANS Aerodromes agreed within the group (several States from all the world) and ICAO secretariat, written in cooperation with CAA UK, Germany, ACI, Boeing and Airbus.

It is proposed:

- to add a paragraph (h) in CS-ADR-DSN.B.095 to include this alternative shape for a turn pad,
- to move paragraph (a) and figure B-1 of CS-ADR-DSN.B.095 to GM,
- to add details on the alternative turn pad in GM (the content is taken from the draft PANS Aerodromes); and
- to add a paragraph on the marking of such turn pads.

Proposal for CS-ADR-DSN.B.095 – page 16 on Turn pads , and corresponding GM:

· Add to CS-ADR-DSN.B.095:

*At the beginning of (b): “*When provided*”, and

*Paragraph (h):

“(h) *An alternative turn pad than the one described above can be designed. In this case, the following criteria should be considered:*

the specific ground maneuvering capability of the considered aeroplane (notably the maximum effective steering angle of the nose landing gear);

the provision for adequate clearances

the provision for appropriate marking and lighting;

the provision of shoulders;

the protection from jet blast;

if relevant, the protection of ILS.”

· Move paragraph (a) of CS-ADR-DSN.B.095 and Figure B-1 from CS-ADR-DSN.B.095 to guidance material GM-ADR-DSN.B.095, and add the following content in GM-ADR-DSN.B.095:

“(a) **Turn pads are generally provided when an exit taxiway is not available at the runway end. A turn pad allows an aeroplane to turn back after landing and before take-off and to position itself correctly**

on the runway. (See Figure GM-B-1).

Note - In the event that a turn pad is either not available or does not allow an aeroplane to perform a turn-around, a tow vehicle may be used to maneuver the aeroplane via a series of short back and forth movements to bring the aeroplane into alignment with the runway centerline. If the shoulders of a turn pad are paved or are otherwise suitable to support the occasional pass of an aeroplane landing gear, a turn-around maneuver may be used. The maneuver guidance is generally provided by a marshaller.

(b) The ground maneuvering capabilities available from manufacturers (in aircraft characteristic for airport planning manuals) are one of the key factors to be considered in order to determine if an existing turn pad is suitable for a particular aeroplane. The speed of the maneuvering aeroplane is also a factor.

Note - Taxi cameras can assist the flight crew in preventing the wheels of the aeroplane from leaving the full-strength pavement during normal ground maneuvering. The taxi camera system or marshaller guidance should be required on an aeroplane dispatched to an aerodrome with turn pads having a width less than that the required one.

(c) In case an alternative turn pad is provided, it can have a different shape. For instance, the turn pad can be a half circle, as shown on Figure GM-B-2:

(see figure GM-B-2 given in the attached file, and the other attached file to show the whole comment including the figure GM-B-2)

Note: The following values are generally used:

$\gamma = 30$ degrees,

e being the same separation as for taxiways to objects, and

e' being a specific margin for the rotation, to take into account possible oversteering, and which can be chosen as follows:

	Code letter					
	A	B	C	D	E	F
e'	1.5m	2.25 m	5.7 m (a) or 8.8m (b)	8.8m	8.8m	8.8m

(a) if the turn pad is intended to be used by aeroplanes with a wheel base less than 18 m.

(b) if the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m.

In order to assist a pilot in knowing where the aeroplane should be positioned when the pilot initiates the turn around manoeuvre, some form of visual guidance can be provided. Alignment poles can be installed far enough away from the runway so that they are not obstructions, but within the range of vision of the pilot. Such poles can be set in a way that when the two poles align with one another, the pilot's position is essentially at the location where the turn around maneuver should be initiated. The poles can be painted a bright orange color to aid in their visibility and the two poles can be set on the order of 20 to 30 meters apart from one another, so that it is easy to detect when the two poles are in alignment with the pilot's eye. By careful setting of the two poles, any aeroplane up to the size of the most demanding (or critical) aeroplane will be able to easily perform the manoeuvre without placing the nose gear of the aeroplane off of a pavement edge as the aeroplane carries out the manoeuvre."

· And add a paragraph on markings in CS-ADR-DSN-L.565 page 65:

“CS-ADR-DSN-L.565 – Runway turn pad marking

(a) *Applicability: Where a runway turn pad is provided, [...]*

(b) *Characteristics:*

(1) *The runway turn pad marking should be curved from the runway centre line into [...]*

~~(6) The design of the turn pad marking should be such that, when the cockpit of the aeroplane remains over the runway turn pad marking, the clearance distance between any wheel of the aeroplane landing gear and the edge of the runway turn pad should be not less than those specified in the following tabulation:~~

~~Code letter _____ Clearance~~

~~A _____ 1.5 m~~

~~B _____ 2.25 m~~

~~C _____ 3 m if the turn pad is intended to be used by aeroplanes with a wheel base less than 18 m~~

~~4.5 m if the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m~~

~~D _____ 4.5 m~~

~~E _____ 4.5 m~~

~~F _____ 4.5 m~~

~~[...]~~

~~(c) Where alternative turn pads are provided, as specified in CS-ADR-DSN.B.095 paragraph (h), adequate marking should be provided, showing the trajectory the aeroplane should follow.”~~

“GM-ADR-DSN.L.565 – Runway turn pad marking

~~In case of a turn pad with the alternative shape proposed in GM-ADR-DSN.B.095, the marking should follow the trajectory of the aircraft which was used to dimension the turn pad (see Figure GM-B-2 of GM-ADR-DSN.B.095).”~~

response *Noted*

The ICAO design criteria will be used in the CS. There is flexibility for alternative designs by ELOS or SC.

comment 843 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 – CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 – CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 – CS-ADR-DSN.B.080 — Transverse slopes (p14)

- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.
(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal*

slope should not exceed 0.8 %; and
 (3) 2 % where the code number is 1 or 2.

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;*
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and*
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.*

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;*
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter*

is B; and

(3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface."

GM-ADR-DSN.B.100 – Slopes on runway turn pads

~~"The slopes are the same as those on the adjacent runway pavement surface. Slopes should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

~~"The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

~~"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;**
- (2) 1.75 % where the code number is 3; and**
- (3) 2 % where the code number is 1 or 2."**

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and**
- (2) 3 % where the code number is 1 or 2;**

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

*(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.*

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

*(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.*

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas****CS-ADR-DSN.C.230 - Slopes on runway end safety areas**

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

(2) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~ Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.

(b) Transverse slopes

(1) ~~The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %.~~ Transitions between differing slopes should be as gradual as practicable."

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA ~~should~~ can be amended accordingly."

*** Longitudinal slopes on taxiways****CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways**

(a) The longitudinal slope of a taxiway should not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B.

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:
 (1) 1.5 % where the code letter is C, D, E or F; and
 (2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter

is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~
~~(1) 1.5 % where the code letter is C, D, E or F; and~~
~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:
 (1) 1.5 % where the code letter is C, D, E or F; and
 (2) 2 % where the code letter is A or B.
 (b) Slopes ~~should~~ may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~
~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~
~~(2) 3 % for strips of taxiways where the code letter is A or B;~~
~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~
~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:
 (1) 2.5 % for strips where the code letter is C, D, E or F; and
 (2) 3 % for strips of taxiways where the code letter is A or B;
 the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~
~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

*"(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.*

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

*(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "*

response *Noted*

Comments will be addressed to under their individual CS reference.

comment

1683

comment by: ECA - European Cockpit Association

Add the two following clarifications:

(a) The most critical aircraft type taken into account when constructing the runway turn pad should be indicated on the Aerodrome Chart – ICAO).

(b) No interpretation of this section should infer a preference for a runway turn pad over a taxiway serving the runway threshold.

Justification:

Reference: IFALPA Annex 14, notes on Runway turn pads, page 14-I-3-31.

response

Not accepted

These are operational considerations.

comment

1685

comment by: ECA - European Cockpit Association

Attachment [#486](#)

Add text as follows (the illustration mentioned is attached):

(1) Future expansion of airport facilities to include a taxiway to serve the runway should be taken into account in determining the location of the runway turn pad.

(2) Examples of the location of runway turn pads are illustrated

	Justification: Reference: IFALPA Annex 14, paragraph 3.x.2
response	<i>Noted</i>

comment	2178 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	It is appropriate to transfer the figure B-1: "Typical turn pad layout » in « guidance material » (GM). It is only one example. Other shapes may be used as it is in France.
response	<i>Accepted</i>

comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>
response	<i>Noted</i>

comment	2515 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	<i>"The slopes are the same as those on the adjacent runway pavement surface. Slopes should be are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."</i>
response	<i>Noted</i>
	Slopes on turn pads are covered in CS/GM B.100.
	The proposed text is not added to GM. The existing GM text remains unaltered, i.e. 'should be', not 'are'.

comment	2331 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed
response	<i>Not accepted</i>

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.B.115 – Width of shoulders for runway turn pads

p. 217

comment	2332	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.B.120 – Strength of shoulders for runway turn pads

p. 217

comment	1086	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	GM-ADR-DSN.B.105 to 120: There are titles, but no text. Please supplement or remove titles.	
response	<i>Noted</i>	
	Numbering will be retained for continuity. The words 'intentionally blank' will be inserted.	

comment	2333	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.B.125 – Runway shoulders pads

p. 217-218

comment	208	comment by: <i>CAA Austria - Ministry of Transport</i>
	Change in article to: [...] operations by 4-engined aircraft with a code letter D or larger[...]	
response	<i>Accepted</i>	

comment	347	comment by: <i>Vienna International Airport</i>
	(c)(4) change to: Operations by 4-engined aircraft with a code letter D or larger.....	
response	<i>Accepted</i>	

comment	846 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<u>1. Affected paragraphs</u>	
	<ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN.B.135 – Width of runway shoulders (p17) • GM-ADR – Book 2 – GM-ADR-DSN.B.125 –Runway shoulders (p217-218) • GM-ADR – Book 2 – GM-ADR-DSN.B.135 – Width of runway shoulders 	

(p219)

2. Justification and proposed text / comment

CS-ADR-DSN.B.135 is compliant with ICAO Annex 14 volume 1.

ICAO Circular 305 ("Operation of new larger aeroplanes at existing aerodromes") details specific solutions which can be used for New larger aeroplanes (example: code F aeroplanes). This circular states that for the use of runways narrower than 60 m by large aeroplanes (including code F aeroplanes), shoulders can be composed of two parts:

- inner shoulders, paved and of adequate bearing strength to provide an overall width of the runway and its (inner) shoulders of 60 m;
- outer shoulders: paved/stabilized and with adequate bearing strength to provide an overall width of the runway and its shoulder of 75 m.

with 2 conditions :

- having inset runway edge lights (in lieu of elevated lights),
- additional runway centre line guidance.

This notion has been introduced in paragraph (e) of GM-ADR-DSN.B.125 – Runway shoulders, but some mitigation measures mentioned in ICAO Circular 305 are lacking : it is proposed to add them.

Moreover, GM-ADR-DSN.B.135 – Width of runway shoulders has no content, but some interesting guidance on possible reduced width of runway shoulders is contained in GM-ADR-DSN.B.125 (notably in paragraphs (d), (e) and (f)) as a reduced width is linked to an adapted structure of the runway shoulder). To facilitate the reader, it is suggested to make a reference to GM-ADR-DSN.B.125 in GM-ADR-DSN.B.135.

Consequently, it is proposed to modify GM-ADR-DSN.B.125 and 135 as follows:

GM-ADR-DSN.B.125 – Runway shoulders

"(a) [...]"

(e) *Where a reduced paved width of 60 m is accepted:*

(1) *The outer unpaved 7.5 m of runway shoulder should be stabilised; the ground is prepared so that there is full grass coverage with no loose gravel or other material. This may include additional materials if the bearing strength and surface of the ground are not sufficient.*

(2) *A programme of inspections of the shoulders and runway should be implemented to confirm its continuing serviceability and ensure that there is no deterioration that could create a risk of FOD or otherwise hazard aircraft operations.*

(3) *Possible additional mitigation measures are to provide the runway with inset runway edge lights (in lieu of elevated lights, to protect aeroplane from ingestion) and additional runway centre line guidance.*

(34) *As movements of code letter F aircraft increase, the need for full paved width shoulders should be assessed by local hazard analysis.*

[...]"

GM-ADR-DSN.B.135 – Width of runway shoulders

" *Guidance on possible reduced width of runway shoulders is contained in GM-ADR-DSN.B.125 (notably in paragraphs (d), (e) and (f)) as a reduced width of*

runway shoulder can be accepted if an adapted structure of the runway shoulder and adequate mitigation measures are in place."

response *Noted*

Text will be reviewed.

comment *1001* comment by: *Salzburger Flughafen GmbH*

(c)(4) change to:
Operations by 4-engined aircraft with a code letter D or larger.....

response *Accepted*

comment *1089* comment by: *Federal Office of Civil Aviation FOCA*

1. Para. (c) contains a runway where the code letter is D. A runway does only have a code number, not a code letter.

Please change para. (c) to: "However, for runways where only aeroplanes with a code letter D or smaller operate, there may be circumstances where they do not have to be paved. Where the runway is not used by 4-engined aircraft with a code letter D or bigger, it may be possible [...].

2. Para. (c) (4): It seems that the para. refers to a 4-engined aircraft with a code letter of D, E or F, which should be stated explicitly, otherwise an Avro RJ100 i.e. would be affected by this provision, which presumably is not intended. Please change para. (c) (4) to: If movement of 4-engined aircraft with a code letter D or bigger take place, [...].

response *Noted*

Text will be reviewed.

comment *1105* comment by: *Flughafen Graz Betriebs GmbH*

(c)(4) change to:
Operations by 4-engined aircraft with a code letter D or larger.....

response *Accepted*

comment *1180* comment by: *Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH*

response	<p>(c)(4) change to: Operations by 4-engined aircraft with a code letter D or larger.....</p> <p><i>Accepted</i></p>
comment	<p>1507 comment by: <i>Flughafen Linz-Hörsching - LNZ/LOWL</i></p> <p>(c)(4) change to:</p> <p>Operations by 4-engined aircraft with a code letter D or larger.....</p>
response	<p><i>Accepted</i></p>
comment	<p>1686 comment by: <i>ECA - European Cockpit Association</i></p> <p>Delete paragraph (d), (e) and (f)</p> <p>Justification: Not relevant with new proposed text in CS-ADR-DSN.B.135 — Width of runway shoulders</p>
response	<p><i>Partially accepted</i></p> <p>(d) and (e) will be deleted; (f) remains in the GM.</p>
comment	<p>2330 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>should read "for runways where only aeroplanes with a code letter D or smaller operate,"</p>
response	<p><i>Noted</i></p> <p>Text will be reviewed.</p>
comment	<p>2337 comment by: <i>HIA - Highlands and Islands Airports Limited</i></p> <p>(c) Relaxation of need for runway shoulders where runway is not used by 4 engine jets - we support and would wish to keep</p>
response	<p><i>Noted</i></p>

comment	2743	comment by: <i>Flughafen Klagenfurt</i>
	(c)(4) change to: Operations by 4-engined aircraft with a code letter D or larger.....	
response	<i>Accepted</i>	

comment	2929	comment by: <i>AIRBUS</i>
	Proposed text	
	(e) (1) The outer unpaved 7.5m of runway should be stabilised; the ground is prepared so that there is a full grass coverage ...	
	Rationale: At some states, "stabilised" means "paved" whereas the meaning of "stabilised" in the above sentence means "not necessarily paved"	
response	<i>Partially accepted</i>	
	The 'stabilised' reference has been deleted, and 'or constructed' has been added after 'prepared'.	

CS-ADR – Book 2 – GM-ADR-DSN.B.130 – Slopes on runway shoulders
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p. 218

comment	843 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<u>1. Affected paragraphs</u>	
	<ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13) • CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13) • CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14) • CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14) • CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16) • CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17) • CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19) • CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20) • CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21) • CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22) • CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on 	

- taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
 - CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observed at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid

contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. ~~Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft.~~ For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, ~~are should be~~ designed so that they will correspond to the characteristics needed for such type of approach."

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the~~

~~runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

~~“(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage.”~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

~~“The transverse slope may be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.~~

~~The transverse slope should may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage.”~~

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

~~“The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface.”~~

GM-ADR-DSN.B.100 – Slopes on runway turn pads

~~“The slopes are the same as those on the adjacent runway pavement surface.~~

~~Slopes should be are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft.”~~

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

~~“The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %.”~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

~~“The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %.”~~

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips**

~~"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.185 – Transverse Slopes on runway strips**

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

- ~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
- ~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

~~[...]"~~

GM-ADR-DSN.B.195 Clearways

"[...]

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:
 (1) is perpendicular to the vertical plane containing the runway centre line; and
 (2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas****CS-ADR-DSN.C.230 - Slopes on runway end safety areas**

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

~~CS-GM-ADR-DSN.C.230~~ – Slopes on runway end safety areas

~~"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~

~~(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %~~

~~(c) Where clearway is provided, the slope on the REASA ~~should~~ can be amended accordingly."~~

*** Longitudinal slopes on taxiways****CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways**

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways****CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways**

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code~~

letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B."

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of

surface water (or possible fluid contaminant) but may not exceed:

- (1) 1.5 % where the code letter is C, D, E or F; and
- (2) 2 % where the code letter is A or B.

(b) Slopes ~~should~~ **may** be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

- ~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~
- ~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

- (1) 2.5 % for strips where the code letter is C, D, E or F; and
- (2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 – Slopes on aprons —and GM

"(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service

road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ *may* be kept as shallow as possible and ~~should~~ *may* be such that the operation of the aircraft and vehicles is not compromised. "

response *Not accepted*

CS-ADR-DSN.B.130: The text will remain in the CS as it contains design criteria. This also answers the GM B.130 comment.

The remaining comments are answered in the appropriate CS or GM segment.

comment

2176

comment by: Pau Pyrénées Airport - PUF/LFBP

We propose to keep into CS the following part: « The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway. »

The rest of the provision has to be moved to « guidance material » GM : « and its transverse slope should not exceed 2.5% »

We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.

The respect of these rules can interfere with the objective of drainage.

response

Not accepted

The numerical specifications form the design criteria.

comment

2348 ❖

comment by: HIA - Highlands and Islands Airports Limited

Noted

response

Noted

comment

2516

comment by: AENA - Aeropuertos Españoles y Navegación Aérea

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

response

Not accepted

The text will remain in the CS as it contains design criteria.

comment 846 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.B.135 – Width of runway shoulders (p17)
- GM-ADR – Book 2 – GM-ADR-DSN.B.125 –Runway shoulders (p217-218)
- GM-ADR – Book 2 – GM-ADR-DSN.B.135 – Width of runway shoulders (p219)

2. Justification and proposed text / comment

CS-ADR-DSN.B.135 is compliant with ICAO Annex 14 volume 1.

ICAO Circular 305 ("Operation of new larger aeroplanes at existing aerodromes") details specific solutions which can be used for New larger aeroplanes (example: code F aeroplanes). This circular states that for the use of runways narrower than 60 m by large aeroplanes (including code F aeroplanes), shoulders can be composed of two parts:

- inner shoulders, paved and of adequate bearing strength to provide an overall width of the runway and its (inner) shoulders of 60 m;
- outer shoulders: paved/stabilized and with adequate bearing strength to provide an overall width of the runway and its shoulder of 75 m.

with 2 conditions :

- having inset runway edge lights (in lieu of elevated lights),
- additional runway centre line guidance.

This notion has been introduced in paragraph (e) of GM-ADR-DSN.B.125 – Runway shoulders, but some mitigation measures mentioned in ICAO Circular 305 are lacking : it is proposed to add them.

Moreover, GM-ADR-DSN.B.135 – Width of runway shoulders has no content, but some interesting guidance on possible reduced width of runway shoulders is contained in GM-ADR-DSN.B.125 (notably in paragraphs (d), (e) and (f)) as a reduced width is linked to an adapted structure of the runway shoulder). To facilitate the reader, it is suggested to make a reference to GM-ADR-DSN.B.125 in GM-ADR-DSN.B.135.

Consequently, it is proposed to modify GM-ADR-DSN.B.125 and 135 as follows:

GM-ADR-DSN.B.125 – Runway shoulders

"(a) [...]"

(e) *Where a reduced paved width of 60 m is accepted:*

(1) *The outer unpaved 7.5 m of runway shoulder should be stabilised; the ground is prepared so that there is full grass coverage with no loose gravel or other material. This may include additional materials if the bearing strength and surface of the ground are not sufficient.*

(2) *A programme of inspections of the shoulders and runway should be*

implemented to confirm its continuing serviceability and ensure that there is no deterioration that could create a risk of FOD or otherwise hazard aircraft operations.

(3) Possible additional mitigation measures are to provide the runway with inset runway edge lights (in lieu of elevated lights, to protect aeroplane from ingestion) and additional runway centre line guidance.

(34) As movements of code letter F aircraft increase, the need for full paved width shoulders should be assessed by local hazard analysis.

[...]”

GM-ADR-DSN.B.135 – Width of runway shoulders

“ Guidance on possible reduced width of runway shoulders is contained in GM-ADR-DSN.B.125 (notably in paragraphs (d), (e) and (f)) as a reduced width of runway shoulder can be accepted if an adapted structure of the runway shoulder and adequate mitigation measures are in place.”

response *Not accepted*

The ICAO circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion.

comment

2171

comment by: Pau Pyrénées Airport - PUF/LFBP

It is appropriate to delete : « ~~(2) 75 m~~ where the code letter is F. »

According to the circular ICAO n°305, it is possible to have runway shoulder of only 60 meters even for codes F provided that there are extra widths that do not answer to all objectives of the shoulder but only to the objective of the fight against blowing and injection of objects.

response *Not accepted*

The circular refers to 60 m runway plus shoulder width that should be paved for aeroplane deviations. There is still an overall requirement (outer shoulder in the circular 305 nomenclature) for 75 m runway plus shoulder width to cater for jet blast erosion and RFFS access.

comment

2348 ❖

comment by: HIA - Highlands and Islands Airports Limited

Noted

response

Noted

comment	131	comment by: <i>MWEBWV Ministerium für Wirtschaft, Energie, Bauen, Wohnen und Verkehr des Landes Nordrhein-Westfalen</i>
		In Art2) the definition of "inner shoulder" is missing.
response		<i>Noted</i>
		The text will be reviewed accordingly. The terms 'inner' and 'outer' runway shoulder are mentioned in ICAO Circular 305, but with no definition.
comment	243	comment by: <i>Flughafen Düsseldorf GmbH</i>
		Wo sind <inner shoulder> und <outer shoulder> definiert? Aus ICAO ist nur der Begriff <shoulder> bekannt.
response		<i>Accepted</i>
		The text will be reviewed accordingly. The terms 'inner' and 'outer' runway shoulder are mentioned in ICAO Circular 305, but with no definition.
comment	790	comment by: <i>Munich Airport International</i>
		Add definiton of inner and outer shoulder according to AACG
response		<i>Noted</i>
		The text will be reviewed accordingly. The terms 'inner' and 'outer' runway shoulder are mentioned in ICAO Circular 305, but with no definition.
comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
		<i>Noted</i>
response		<i>Noted</i>
comment	3012 ❖	comment by: <i>ADV -German Airports Association</i>
		GM-ADR-DSN.B.140 Add definiton of inner and outer shoulder according to AACG
response		<i>Noted</i>
		The text will be reviewed accordingly. The terms 'inner' and 'outer' runway shoulder are mentioned in ICAO Circular 305, but with no definition.

comment	3047	comment by: <i>MST / STR - Stuttgart Airport</i>
	GM-ADR-DSN.B.140 Add definiton of inner and outer shoulder according to AACG	
response	<i>Noted</i>	
	The text will be reviewed accordingly. The terms 'inner' and 'outer' runway shoulder are mentioned in ICAO Circular 305, but with no definition.	

CS-ADR – Book 2 – GM-ADR-DSN.B.145 – Surface of runway shoulders

p. 219

comment	207	comment by: <i>CAA Austria - Ministry of Transport</i>
	Change article to: [...] that accept operations by 4-engined aircraft with a code letter D or larger	
response	<i>Accepted</i>	

comment	348	comment by: <i>Vienna International Airport</i>
	change to: that accept operations by 4-engined aircraft with a code letter D or larger	
response	<i>Accepted</i>	

comment	1002	comment by: <i>Salzburger Flughafen GmbH</i>
	change to: ... that accept operations by 4-engined aircraft with a code letter D or larger	
response	<i>Accepted</i>	

comment	1090	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	The provision apparently refers to a 4-engined aircraft with a code letter of D, E or F, which must be mentioned explicitly, otherwise an Avro RJ100 i.e. would be affected by this provision, which presumably was not intended. Please change para. to: "[...] that accept operations by 4-engined aircraft with a code	

	letter D or bigger."
response	<i>Accepted</i>

comment	1106 comment by: <i>Flughafen Graz Betriebs GmbH</i>
	change to: ... that accept operations by 4-engined aircraft with a code letter D or larger
response	<i>Accepted</i>

comment	1183 comment by: <i>Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH</i>
	change to: ... that accept operations by 4-engined aircraft with a code letter D or larger
response	<i>Accepted</i>

comment	1509 comment by: <i>Flughafen Linz-Hörsching - LNZ/LOWL</i>
	change to: ...that accept operations by 4-engined aircraft with a code letter D or larger
response	<i>Accepted</i>

comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>

comment	2744 comment by: <i>Flughafen Klagenfurt</i>
	change to: ... that accept operations by 4-engined aircraft with a code letter D or larger

response *Accepted*

CS-ADR – Book 2 – GM-ADR-DSN.B.150 – Runway strip to be provided

p. 219

comment 1091 comment by: *Federal Office of Civil Aviation FOCA*

GM-ADR-DSN.B.150 to 160: There are titles, but no content. Please supplement or remove.

response *Noted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2168 comment by: *Pau Pyrénées Airport - PUF/LFBP*

(a) it is appropriate to delete "~~wherever practicable~~".

(b) and (c) have to be transferred into GM.

Indeed, (b) and (c) do not mention "wherever practicable". Now, these specifications are only taken from recommendations whereas the (a) is taken from a norm and mentions "wherever practicable". There is a lack of coherence.

The CS being a provision included in the certification basis, the "wherever practicable" is useless and can even involve juridical confusion.

The provisions about widths of runway strip for the runway with precision or non-precision approach are only good practices and not normative references. They should be in GM and not in CS.

response *Noted*

Noted: This comment should apply to CS. B.160. In that case, the proposal to amend the text in paragraph (a) is Agreed (even though this is from the ICAO standard).

Not Agreed: Paragraphs (b) and (c) will remain in the CS as they contain design specifications for differing runway type.

comment 2169 comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate to delete : "~~The runway strip is a defined area including the runway and stopway, if provided, intended:~~

~~(1(4) to reduce the risk of damage to aircraft running off a runway; and to protect aircraft flying over it during take-off or landing operations."~~

The definition and objectives of runway strip are useless at this part of the text

	because they are already mentioned elsewhere (CS-ADR-DSN.A002 – Definitions).
response	<i>Accepted</i>

comment	2326 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>

CS-ADR – Book 2 – GM-ADR-DSN.B.155 – Length of runway strip
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p. 219

comment	2327 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted
response	<i>Noted</i>

CS-ADR – Book 2 – GM-ADR-DSN.B.160 – Width of runway strip

p. 219

comment 1103 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- BIII - CS-ADR - Book 1 – CS-ADR-DSN.B.170 — Non-precision approach and non-instrument runway strips (p18)
- BIII - CS-ADR - Book 2 – GM-ADR-DSN.B.160 — Width of runway strip (p219)

2. Justification and proposed text / comment

The wording of paragraph (c) could be used to clarify paragraphs (a) and (b) as shown below, to clearly that the strip extends on each side of the centre line of the runway and its extended centre line throughout the length of the strip.

Moreover, DGAC France informs EASA that the provision of paragraph (b)(2) specifying the width of the runway strip for non precision approach runway of code 1 or 2 is not binding in France and is only a recommendation in ICAO Annex 14 volume 1. These provisions are only good practices. In France, **such runway strip extends at a distance of 40m on each side of the runway centre line, instead of 75m and there has never been any safety issue noticed on that subject.**

It is proposed to revise this CS-ADR-DSN.B.160 as follows :

CS-ADR-DSN.B.160 – Width of runway strip

"(a) A strip including a precision approach runway should, wherever practicable, extend on each side of the centre line of the runway and its extended centre line throughout the length of the strip, to a distance of at least:

(1) 150 m where the code number is 3 or 4; and

(2) 75 m where the code number is 1 or 2; ~~on each side of the centre line of the runway and its extended centre line throughout the length of the strip.~~

(b) A strip including a non-precision approach runway should extend laterally on each side of the centre line of the runway and its extended centre line throughout the length of the strip, to a distance of at least:

(1) 150 m where the code number is 3 or 4; and

(2) 75 m where the code number is 1 or 2; on each side of the centre line of the runway and its extended centre line throughout the length of the strip.

(c) A strip including a non-instrument runway should extend on each side of the centre line of the runway and its extended centre line throughout the length of the strip, to a distance of at least:

(1) 75 m where the code number is 3 or 4;

(2) 40 m where the code number is 2; and

(3) 30 m where the code number is 1."

response Noted

Incorrect references appear to have been used.

comment 2328

comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

titles should be removed

response Not accepted

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2348 ❖ comment by: HIA - Highlands and Islands Airports Limited

Noted

response Noted

comment 2527 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

GM-ADR-DSN.B.160 – Width of runway strip

"A strip including a non-precision approach runway should extend laterally on each side of the centre line of the runway and its extended centre line throughout the length of the strip, to a distance of at least 75 m where the code number is 1 or 2."

response Not accepted

This remains in the CS.

CS-ADR – Book 2 – GM-ADR-DSN.B.165 – Objects on runway strips

p. 219

comment 107 comment by: Manchester Airport plc

(a) The chamfering of vertical faces of buried structures within the full runway clear and graded strips should be a CS rather than GM.

response Noted

This is guidance from Annex 14, Attachment A, expanded by the addition of the last two sentences.

comment 180 comment by: CAA Norway

Is GM-ADR-DSN.B.165 (b) on page 219 referring to CS-ADR-DSN.B.170? If so, it is not necessary here, doesn't add anything and we suggest to delete. If it is not referring to CS-ADR-DSN.B.170, please clarify what this means.

response Accepted

comment	327	comment by: <i>Icelandic Civil Aviation Administration</i>
	Is GM-ADR-DSN.B.165 (b) on page 219 referring to CS-ADR-DSN.B.170? If so, it is not necessary here, doesn't add anything and we suggest to delete. If it is not referring to CS-ADR-DSN.B.170, please clarify what this means.	
response	<i>Accepted</i>	

comment	385	comment by: <i>Estonian CAA</i>
	Is GM-ADR-DSN.B.165 (b) on page 219 referring to CS-ADR-DSN.B.170? If so, it is not necessary here, doesn't add anything and we suggest to delete. If it is not referring to CS-ADR-DSN.B.170, please clarify what this means.	
response	<i>Accepted</i>	

comment	532	comment by: <i>East Midlands Airport - EMA/EGNX</i>
	(a) The chamfering of vertical faces of buried structures within the full runway clear and graded strips should be a CS rather than GM.	
response	<i>Noted</i>	
	This is guidance from Annex 14, Attachment A, expanded by the addition of the last two sentences.	

comment	676	comment by: <i>Finnish Transport Safety Agency</i>
	Is GM-ADR-DSN.B.165 (b) on page 219 referring to CS-ADR-DSN.B.170? If so, it is not necessary here, doesn't add anything and we suggest to delete. If it is not referring to CS-ADR-DSN.B.170, please clarify what this means.	
response	<i>Accepted</i>	

comment	1214	comment by: <i>Swedish Transport Agency</i>
	Is GM-ADR-DSN.B.165 (b) on page 219 referring to CS-ADR-DSN.B.170? If so, it is not necessary here, doesn't add anything and we suggest to delete. If it is not, please clarify what this means.	
response	<i>Accepted</i>	

comment	1887	comment by: <i>ENAC Ente Nazionale per l'Aviazione Civile</i>
	We suggest to reduce the chamfer slope. In GMADR-DSN.B.165 change "1:10" to "1:2" because in several cases it's no praticable due to area constraints	
response	<i>Noted</i>	
	This is guidance and can be modified as required to allow flexibility.	

comment	2166	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	It is appropriate to move this provision to OPS	
response	<i>Not accepted</i>	
	This is an ICAO design standard.	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>	
response	<i>Noted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.B.170 – Non-precision approach and non-instrument runway strips

p. 219

comment	1092	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	There are titles, but no content. Please supplement or remove.	
response	<i>Noted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

comment	2165	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	It is appropriate to move to OPS and to modify the ADR reference as follows : "CS-ADR-DSN.T.910"	
response	<i>Partially accepted</i>	

The reference will be amended. The CS will remain.

comment 2325 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 2 – GM-ADR-DSN.B.175 – Grading of runway strips

p. 219-220

comment 206 comment by: *CAA Austria - Ministry of Transport*

c) does not specify if the 90m is meant only from the end of a runway or also within the strip from the centre line of a runway. A figure similar to figure A-4 of ICAO Annex 14, Vol. I would increase the understanding of the number 90m

response *Noted*

The CS allows flexibility for increased width of the graded area as the specification is for a 'distance of at least'. Additional guidance from Annex 14, Attachment A, will replace paragraphs (a) to (c) in GM B.175.

comment 272 comment by: *Beat Kisseleff, private*

Change article as follows:

(c) For code number 4 precision approach runways a graded area of 90 m should be provided

(d) A graded area of 105 m for code number 4 runways may be designed and should be implemented on aerodromes with operations with code letter F aeroplanes.

Justification:

105 m graded area is already used in ICAO Annex 14, Vol. I as desirable in a Figure. This should be used in EASA as well since otherwise a degrading of

safety is possible, especially for aerodromes with code letter F environment or operations such a graded area is needed. Maybe the Figure from ICAO Annex 14, Vol. I can be used.

response *Noted*

The CS allows flexibility for increased width of the graded area as the specification is for a 'distance of at least'. Additional guidance from Annex 14, Attachment A, will be inserted in GM B.175.

comment

1093

comment by: *Federal Office of Civil Aviation FOCA*

Para. (c) does not specify if the 90 m are meant only from the end of a runway or if they are located also within the strip from the centre line of a runway. A figure similar to figure A-4 of ICAO Annex 14, Vol. I would increase the understanding of the number 90 m and would allow a differentiation. FOCA therefore suggests to move article (c) to CS-ADR-DSN.B.175 (b) (new) and rephrase it as follows: "[...] That portion of a strip of a code number 4 precision approach runway within a distance of at least 90 m from the centre line of a runway and its extended centre line should provide a graded area for aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway. "

response *Noted*

The CS allows flexibility for increased width of the graded area as the specification is for a 'distance of at least'. Additional guidance from Annex 14, Attachment A, will replace paragraphs (a) to (c) in GM B.175.

comment

1767

comment by: *UK CAA*

Page No: 220

Paragraph No: GM.ADR.DSN.B.175(c)

Comment: The guidance material offers an increased width of 90m for the cleared and graded area, for a code 4 precision approach runway. This is less than the ICAO Annex 14 guidance, that the cleared and graded area be increased to 105m from the centreline for a code 3 or 4 precision approach runway. No guidance is provided on the origin and measurement of declared distances from intersections. The guidance material should reflect ICAO, but may also permit a reduction in width to 90m where justified by a safety assessment

Justification: ICAO consistency and hazard reduction.

Proposed Text: Revised (c): A graded area **may be reduced to a width** of 90m **if justified by a safety assessment accepted by the competent authority.**

response *Noted*

ICAO CS figures are a *minimum* requirement. More can be provided by individual aerodrome operators (if space permits). Additional guidance from Annex 14, Attachment A, will replace paragraphs (a) to (c) in GM B.175.

comment 2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

CS-ADR – Book 2 – GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

p. 220

comment 843 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)

- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.

- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface."~~

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"~~The slopes are the same as those on the adjacent runway pavement surface.~~

Slopes ~~should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."~~

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

~~(1) 1.5 % where the code number is 4;~~

~~(2) 1.75 % where the code number is 3; and~~

~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be~~

as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

- ~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
- ~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

~~[...]"~~

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

- (1) is perpendicular to the vertical plane containing the runway centre line; and
- (2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas****CS-ADR-DSN.C.230 - Slopes on runway end safety areas**

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

(2) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~ Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.

(b) Transverse slopes

(1) ~~The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %.~~ Transitions between differing slopes should be as gradual as practicable."

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA ~~should~~ **can** be amended accordingly."

*** Longitudinal slopes on taxiways****CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways**

(a) ~~The longitudinal slope of a taxiway should not exceed:~~

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B.

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways****CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways**

"(a) ~~Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) ~~Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) ~~Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:~~

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes ~~should~~ **may be** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward~~

transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and

(2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and

(2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."

GM-ADR-DSN.E.360 – Slopes on aprons —and GM

"(a) The design of slopes should may direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures should may be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope should may be kept as shallow as possible and should may be such that the operation of the aircraft and vehicles is not compromised. "

response Noted

Comments will be addressed to under their individual CS reference.

comment	1127	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	GM-ADR-DSN.B.180 and 185: There are titles, but no content. Please supplement or remove titles.	
response	<i>Noted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

comment	2163	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	It is appropriate to transfer the (a) to « guidance material » (GM).	
	We consider that the rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.	
	The respect of these rules can interfere with the objective of drainage.	
response	<i>Not accepted</i>	
	These are ICAO design specifications. Longitudinal slopes are not intended for the drainage of water.	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>	
response	<i>Noted</i>	

comment	2517	comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips	
	<i>"A longitudinal slope along that portion of a strip to be graded may not exceed:</i>	
	<i>(1) 1.5 % where the code number is 4;</i>	
	<i>(2) 1.75 % where the code number is 3; and</i>	
	<i>(3) 2 % where the code number is 1 or 2."</i>	
response	<i>Not accepted</i>	
	This remains in the CS.	

CS-ADR – Book 2 – GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

p. 220

comment 843 ❖

comment by: *DGAC Direction Générale de l'aviation civile***1. Affected paragraphs**

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 – Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 – Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 – Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 – Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 – Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 – Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 – Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 – Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 – Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 – Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 – Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) – Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 – Longitudinal slopes on runways (p212 – 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 – Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 – Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 – Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 – Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 – Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 – Slopes on runway end safety

areas (p228)

- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 — Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and
- (3) 2 % where the code number is 1 or 2.

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 — Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 — Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

~~(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."~~

*** Sight distance for slopes on runways****CS-ADR-DSN.B.070 – Sight distance for slopes on runways**

~~"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:~~

~~(1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;~~

~~(2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and~~

~~(3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.~~

~~(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "~~

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways****CS-ADR-DSN.B.080 – Transverse slopes**

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

~~"The transverse slope may be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B;~~

except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface.~~"

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface. Slopes ~~should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %.~~"

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

"~~(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the~~

~~runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~
~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:
 (1) 2.5 % where the code number is 3 or 4; and
 (2) 3 % where the code number is 1 or 2;
 except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.
 (b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

"[...] (e) Slopes on clearways:
 Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.
 The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:
 (1) is perpendicular to the vertical plane containing the runway centre line; and
 (2) passes through a point located on the runway centre line at the end of the take-off run available.
 [...]"

GM-ADR-DSN.B.195 Clearways

"[...]
 (b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:
 (1) is perpendicular to the vertical plane containing the runway centre line; and
 (2) passes through a point located on the runway centre line at the end of the take-off run available.
 Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes
 (1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.
 (2) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~ Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.
 (b) Transverse slopes
 (1) ~~The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %.~~ Transitions between differing slopes should be as gradual as practicable."

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a

downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA should ~~can~~ be amended accordingly."

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

"The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the~~

~~taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B.~~

~~(b) Slopes should may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the~~

adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~-(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

"(a) The design of slopes should may direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures should may be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope should may be kept as shallow as possible and should may be such that the operation of the aircraft and vehicles is not compromised. "

response Noted

Comments will be addressed to under their individual CS reference.

comment 2162

comment by: Pau Pyrénées Airport - PUF/LFBP

We propose to keep in CS the following part :

(a) "Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface."

The rest has to be transferred to GM.

Rules concerning the slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.

The respect of these rules can interfere with the objective of drainage.

The first part of the (a) has to be kept because it shows the objective.

response *Not accepted*

These are ICAO design specifications. Transverse slope drainage requirements follow paragraph (a)(2).

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2518 comment by: *AENA - Aeropuertos Españoles y Navegación Aérea*

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

“(a) Transverse slopes on that portion of a strip to be graded may not exceed: (1) 2.5 % where the code number is 3 or 4; and (2) 3 % where the code number is 1 or 2; except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %. (b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway.”

response *Not accepted*

This remains in the CS.

CS-ADR – Book 2 – GM-ADR-DSN.B.190 – Strength of runway strips

p. 220

comment 1508 comment by: *TU Dresden*

Concerning the strength of runway strips, the Guidance Material *GM-ADR-DSN.B.190* (with regard to *CS-ADR-DSN.B.190*) refers to the *Aerodrome Design Manual (Doc. 9157)*, published by ICAO. In this document, especially in chapter 5.3.22, definitions regarding general requirements (preventing the collapse of nose landing gear and providing drag to an aircraft) are given. In order to avoid heavy structural damage, e.g. during a runway excursion, a maximum nose gear sink value of 15 cm is a mandatory requirement from aircraft manufacturers and the authority. Therefore another limit value is required: a *California Bearing Ratio (CBR) value of 15 – 20*.

California Bearing Ratio:

The CBR method was originally developed to rate flexible pavements under the

influence of static loads. Hence it is questionable, if the CBR value is suitable for representing dynamic load changes on cohesive resp. non-cohesive soils at all. A further disadvantage of CBR method is that the test is empirical and measurement results have to be correlated (modeling and conversions are needed). Beyond that, ICAO does not provide recommendations describing measurement methods to prove a strip's bearing strength/CBR. In addition, no information is given if the CBR value has to be in a range of 15 to 20 under all weather conditions (e.g. dry soil vs. muddy soil after heavy rainfalls).

Sinkage:

ICAO does not state any justification for the accepted sink values. Neither an evidence of validity nor a technical derivation is given. Investigations in Germany (TU Dresden) have shown that a static sink value is not suitable for such dynamic processes as those occurring at the contact surface between tire and ground. Furthermore the sink magnitude obviously depends on several characteristics of the aircraft (e.g. tire size/diameter and tire fulling, geometry of the landing and nose gear, velocity and mass/vertical g-load) and soil (e.g. bearing strength, density, cohesive/non-cohesive, and moisture content) in the same way. Obviously a target sink value of 15 cm would imply more fatal consequences for the gear if configured with small wheel tires (e.g. business jet) compared to a configuration with larger ones (e.g. commercial aircraft). An additional very important metric for the subject safety considerations is the resulting rolling drag resistance from a given basement. Drag forces induced by soil, acting against the direction of motion stress physically the landing gear which can become subject to overload and break. This force is depending on aircraft size and soil variables as well as the tire's movement status (rolling/slipping, braking and steering).

By solely referring to the ICAO ADM Doc., EASA CS-ADR DSN would not give any clarification either. So we suggest an ADD statement to the existing ADM version: The chapter *GM-ADR-DSN.B.190* should so be supplemented with the following topics, twofold into mandatory guidelines and recommendations:

Mandatory guidelines:

· The present method consisting of CBR and sink values determination is worthwhile but there are in-transparencies that should be solved as follows to create a uniform measurement method:

- Define an existing, specific measuring device linked to pre-set CBR values (e.g. Dynamic Cone Penetrometer – DCP or Bevameter device)
- Fix the number and locations where to take measurements in order to grant for a homogenous result over the area of interest (e.g. the runway strip)
- Describe regular transfer/correlation functions to be used when determining the CBR metric from measurement values
- The composition and state of the underground should be carefully considered when performing measurements with regard to weather conditions (humidity, contamination, temperature)
- To allow a timely unrestricted, universal measurement methodology,

correction charts should be provided to migrate measurement results into standardized environmental "ISA" conditions

- Recurrent measurement strategies should be required to constantly monitor the strength of strips or other pavement areas over all seasons of the year

Recommendations:

- Application of a measurement procedure that determines rolling drag resistance forces
- Correlations have to be made concerning aircraft characteristics (like wheel diameters and width) to consider the different effects on aircraft structure induced by drag forces
- Adding maximum allowable rolling drag resistance forces that nose landing gears have to sustain according to representative aircraft classes (e.g. pursuant to ICAO's *aircraft categories A – E* concerning speeds for procedure calculations, see *Doc. 8168 PANS OPS, Table I-4-1-1*)
- Transfer these requirements to all those chapters where strengths are described and ICAO ADM is referred (e.g. *CS-ADR-DSN.C.235 – Strength of runway end safety areas*)

response *Noted*

The guidance in ICAO Aerodrome Design Manual 5.3.22 will be inserted into GM B.190 as a trigger for design engineers to seek further technical information and methodology.

comment 2348 ❖ comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response *Noted*

comment 2811 comment by: *AENA - Aeropuertos Españoles y Navegación Aérea*

The guidance of Aerodrome Design Manual are very restrictive and the methodology proposed and values are very old, and they are non in relation with the propose CS-ADR-DSN.B.190.

Therefore we proposed to delete it.

response *Noted*

The guidance in ICAO Aerodrome Design Manual 5.3.22 will be inserted into GM B.190 as a trigger for design engineers to seek further technical information and methodology.

CS-ADR – Book 2 – GM-ADR-DSN.B.195 Clearways

p. 220-222

comment	181	comment by: CAA Norway
	The text in article GM-ADR-DSN.B.195 on page 220 is containing a lot of information about stopways as well as clearways. We suggest the heading to change to: " Clearways and stopways ". Possible also to edit and put stopway material under the GM on stopways. Or combine the two GM's.	
response	Noted	
	Text relating to stopways will be moved to GM B.200.	
comment	328	comment by: Icelandic Civil Aviation Administration
	The text in article GM-ADR-DSN.B.195 on page 220 is containing a lot of information about stopways as well as clearways. We suggest the heading to change to: "Clearways and stopways". Possible also to edit and put stopway material under the GM on stopways. Or combine the two GM's.	
response	Noted	
	Text relating to stopways will be moved to GM B.200.	
comment	386	comment by: Estonian CAA
	The text in article GM-ADR-DSN.B.195 on page 220 is containing a lot of information about stopways as well as clearways. We suggest the heading to change to: "Clearways and stopways". Possible also to edit and put stopway material under the GM on stopways. Or combine the two GM's.	
response	Noted	
	Text relating to stopways will be moved to GM B.200.	
comment	677	comment by: Finnish Transport Safety Agency
	The text in article GM-ADR-DSN.B.195 on page 220 is containing a lot of	

	<p>information about stopways as well as clearways. We suggest the heading to change to: "Clearways and stopways". Possible also to edit and put stopway material under the GM on stopways. Or combine the two GM's.</p>
response	<p><i>Noted</i></p> <p>Text relating to stopways will be moved to GM B.200.</p>
comment	<p>1137 comment by: <i>Federal Office of Civil Aviation FOCA</i></p> <p>GM-ADR-DSN.B.195 (a): Article should be moved to CS-ADR-DSN.B.195 (c). The length of clearways in CS-ADR-DSN.B.195 should be defined in connection with the current paragraph in GM-ADR-DSN.B.195 (a).</p> <p>GM-ADR-DSN.B.195 (d): The provision "The length of a clearway, however, cannot exceed half the length of take-off run available" is already stated in GM-ADR-DSN.B.195 (a), please avoid duplication.</p> <p>GM-ADR-DSN.B.195 (d), (e), (f), (g), (h), (i), (j), (k) and (l): Provision provide information and guidance material concerning clearways, stopways, accelerate-stop distances, take-off distances, etc. thus all DECL DIST do not offer particular information on clearways as the title indicates. All these articles should be moved relocated to another more suitable place (e.g. GM-ADR-DSN.B.035) or a new chapter.</p> <p>GM-ADR-DSN.B.195 (m): The provision does only provide information on stopways and should thus be included in the respective chapter. Please move to GM-ADR-DSN.B.200.</p>
response	<p><i>Noted</i></p> <p><i>Agreed:</i> Comments regarding paragraphs (a), (d) and (m) as proposed. <i>Noted:</i> Comments regarding paragraphs (d) to (l) will be reviewed.</p>
comment	<p>1215 comment by: <i>Swedish Transport Agency</i></p> <p>The text in article GM-ADR-DSN.B.195 on page 220 is containing a lot of information about stopways as well as clearways. We suggest the heading to change to: "Clearways and stopways". Possible also to edit and put stopway material under the GM on stopways. Or combine the two GM's.</p>
response	<p><i>Noted</i></p> <p>Text relating to stopways will be moved to GM B.200.</p>
comment	<p>2160 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i></p> <p>(a) It is appropriate to delete the reference "Book 2 - Guidance Material for</p>

Aerodrome design provides information on the use of clearways."

(b) It is appropriate to modify as follows: "The origin of a **possible** clearway".

(c) It is appropriate to move the (c) to IR-OPS with the following change: "The length of a **possible** clearway".

(d) (1) It is appropriate to move the the (d) (1) to IR-OPS with the following change: "The width of a **possible** clearway".

(d) (2) It is appropriate to move the GM.

(e) It is appropriate to move to GM.

(f) is to be deleted.

Referring to a GM in a CS involve to have referenced element at the same level as CS which is not the aim.

It is appropriate to **add the word "possible" to "clearway" in order to point out that such clearway is not an obligation.**

c) and d) 1) are actions under the responsibility of the aerodrome operator and so should be placed into IR OPS.

For the d) 2 and the e) we are confronted to good practices and not normative references.

The f) has to be deleted because it is already written in another provision.

response *Noted*

Agreed: (a) The reference to GM will be deleted.

Not Agreed: Inclusion of the word 'possible' is addressed in paragraph (a).

Partially Agreed: (c) Existing text will be deleted and replaced with the ICAO length requirement.

Partially Agreed: (d)(1) will be deleted.

Not Agreed: (e) contains the design specifications from ICAO.

Agreed: (f) will be deleted.

comment

2322

comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

suggest moving to GM-ADR-DSN.B.200

response

Noted

GM B.195 will be reviewed and any text referred to stopway will be moved to GM B.200.

comment

2348 ❖

comment by: *HIA - Highlands and Islands Airports Limited*

Noted

response

Noted

comment	2519	comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	<p>GM-ADR-DSN.B.195 Clearways</p> <p>"[...]</p> <p>(b) <i>The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:</i></p> <p><i>(1) is perpendicular to the vertical plane containing the runway centre line; and</i></p> <p><i>(2) passes through a point located on the runway centre line at the end of the take-off run available.</i></p> <p><i>Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"</i></p>	
response	<p><i>Not accepted</i></p> <p>This remains in the CS.</p>	

comment	2611	comment by: <i>Danish Transport Authority</i>
	<p>The text in article GM-ADR-DSN.B.195 on page 220 is containing a lot of information about stopways as well as clearways. We suggest the heading to change to: "Clearways and stopways". Possible also to edit and put stopway material under the GM on stopways. Or combine the two GM's.</p>	
response	<p><i>Noted</i></p> <p>Text relating to stopways will be moved to GM B.200.</p>	

comment	2980	comment by: <i>Isavia</i>
	<p>The text in article GM-ADR-DSN.B.195 on page 220 is containing a lot of information about stop ways as well as clearways. We suggest the heading to change to: "Clearways and stop ways". Possible also to edit and put stopway material under the GM on stop ways. Or combine the two GM's.</p>	
response	<p><i>Noted</i></p> <p>Text relating to stopways will be moved to GM B.200.</p>	

comment	1140	comment by: <i>Federal Office of Civil Aviation FOCA</i>
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	<p>GM-ADR-DSN.B.200 (a):Missing definition of use therefore FOCA suggests to relocate the provision to a more suitable/contextual provision (e.g. GM-ADR-DSN.B.035) or a new chapter. Please delete "GM-ADR-DSN.B.195 provides information on the use of stopways".</p> <p>GM-ADR-DSN.B.200 (c) (1): Incorrect reference to CS-ADR-DSN.B.060.</p>
response	<p><i>Noted</i></p> <p>The text 'The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided' will be added to the CS.</p> <p>The references to stopway in GM B.195 will be reviewed and moved to GM B.200 where appropriate.</p> <p>GM B.200(c) will be deleted as it already appears in the CS B.200.</p>
comment	<p>2150 comment by: Pau Pyrénées Airport - PUF/LFBP</p> <p>As done in the CS-ADR-DSN.B.195 (a), it is appropriate to add: "The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided".</p> <p>It is appropriate to delete the (b) which is not enough clear and can conduct to discussions between the operator and the certifier.</p> <p>It is appropriate to delete the reference to "Book 2 - Guidance Material for Aerodrome Design presents guidance relative to the support capability of a stopway".</p> <p>It is appropriate to replace the (1) and (2) of the (d) by the new provision introduced in the States letter n° 41 from the works of the Friction task Force of the ICAO : "the surface of a stopway shall be so constructed or resurfaced as to provide or above those of the associated runway".</p>
response	<p><i>Noted</i></p> <p><i>Partially Agreed:</i> The text 'The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided' will be added to the CS.</p> <p>In paragraph (b), the slope requirements from CS-ADR-DSN.060 will be added to CS-ADR-DSN.080.</p> <p><i>Agreed:</i> The reference to GM will be deleted from paragraph (c).</p> <p><i>Not Agreed:</i> ICAO wording will be used in paragraph (d)(1). Reference to unpaved stopway friction characteristics in (d)(2) will be deleted.</p>
comment	<p>2320 comment by: Airport St. Gallen-Altenrhein - ACH/LSZR</p> <p>incorrect reference to CS-ADR-DSN.B.060</p>
response	<p><i>Noted</i></p> <p>GM B.200(c) will be deleted as the information is already in the CS.</p>

comment	2348 ❖	comment by: HIA - Highlands and Islands Airports Limited
	Noted	
response	Noted	

CS-ADR – Book 2 – GM-ADR-DSN.B.205 – Radio altimeter operating area p. 222-223

comment	1814 ❖	comment by: DGAC Direction Générale de l'aviation civile
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS ADR DSN – Book 1 – CS-ADR-DSN.B.205 – Radio altimeter operating area (p21) • GM ADR DSN – Book 2 – GM-ADR-DSN.B.205 – Radio altimeter operating area (p222-223) <p><u>2. Justification and proposed text / comment</u></p> <p>CS-ADR-DSN.B.205 is applicable on precision approach runways according to Annex 14, Volume 1, Recommendation 3.8.1 and may be considered suitable at other runways but in no case at every runway. Therefore the specification contained in CS-ADR-DSN.B.205 should explicitly apply only “where a radio altimeter operating area is required”.</p> <p>In France the recommended length and width of a radio altimeter operating area for a Cat II precision approach are respectively 700m and 60m.</p> <p>In addition when a radio altimeter operating area is required, a specific implementation study should be performed taking into account, inter alia, the ground profile of the aerodrome, the type of operations intended and the type of equipment used. This study may conclude that an artificial plane in the pre-threshold area is needed, the dimension of which may widely differ from the ones stipulated in CS-ADR-DSN.B.205.</p> <p>Therefore DGAC proposes:</p> <ul style="list-style-type: none"> • CS-ADR-DSN.B.205 – Radio altimeter operating area <p>“Where a radio altimeter operating area is required:</p> <p>(a) Length of the area: A radio altimeter operating area It should extend before the threshold for a distance of at least 300 m.</p> <p>(b) Width of the area: A radio altimeter operating area It should extend laterally, on each side of the extended centre line of the runway, to a distance of 60 m, except that, when special circumstances so warrant, the distance may be reduced to no less than 30 m if an aeronautical study indicates that such reduction would not affect the safety of operations of aircraft.</p>	

- GM-ADR-DSN.B.205 — Radio altimeter operating area

[...]

(c) With a radio altimeter operating area in the pre-threshold area of a precision approach runway the margin to calculate the decision altitude ~~should~~ **may** be smaller and the usability of the adjacent runway may be enhanced.

(d) An implementation study may be performed to establish the required distances at the runway which may conclude that an artificial plane is required, the dimension of which may widely differ from the ones stipulated in CS-ADR-DSN.M.205 and may be lower.

(e) Further guidance on radio altimeter operating area is given in Manual of All-Weather

Operations, (ICAO, Doc 9365, Section 5.2). Guidance on the use of radio altimeter is

given in the ICAO, PANS-OPS, Volume II, Part II, Section 1.

response *Partially accepted*

Reference to the requirement of the radio altimeter operating area for precision approach runways is inserted (as new paragraph (a)). The ICAO text relating to longitudinal slope changes is incorporated in GM B.205(a).

comment 2147 comment by: Pau Pyrénées Airport - PUF/LFBP

It is appropriate to transfer this provision to GM as annotated.

response *Not accepted*

comment 2348 ❖ comment by: HIA - Highlands and Islands Airports Limited

Noted

response *Noted*

comment 2809 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

This is **critical** for Aena Airports.

In our experience managing airports, and in meetings with pilots and air carriers we have concluded that the Radio altimeter operating area is not needed for Category I Precision approach runways.

In Spain we have made safety studies for Category I Airports without Radio Altimeter area and the conclusion was that it has no safety effect.

Therefore we propose change Precision Approach Runway for Cat II /III Precision

	approach runway, that was the original text of Annex 14 in previous versions.
response	<i>Partially accepted</i>
	Reference to the requirement of the radio altimeter operating area for precision approach runways is inserted as a new paragraph: (a). The ICAO text relating to longitudinal slope changes is incorporated in GM B.205(a)

CS-ADR – Book 2 – GM-ADR-DSN.C.210 – Runway end safety areas

p. 224-227

comment	261	comment by: <i>Flughafen Düsseldorf GmbH</i>
	a)1) Eine Modifizierung der RESA ist in Abhängigkeit der örtlichen Gegebenheiten (Topographie und Flughafengrenzen) zu betrachten. Es ist davon auszugehen, dass die EASA in diesem Punkt daher nur für zukünftige Maßnahmen gilt und genehmigte vorhandene Anlagen diesbezüglich Bestandsschutz besitzen.	

response	<i>Not accepted</i>
	The proposed text (which will be reviewed according to other comments that were received) allows an adequate level of flexibility, ELOS, SC. Article 7 of Cover Regulation deals with deviations from Certification specifications. Grandfathering clause is not possible.

comment	1143	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	GM-ADR-DSN.C.210 (b) (1) (i): FOCA does not consider this provision being GM, please delete the second part of the sentence.	
	GM-ADR-DSN.C.210 (b) (1) (iv): PAPI is a special case of a VASIS, thus VASIS should be used as a common term.	
	GM-ADR-DSN.C.210 (b) (2) (ii): Please clarify "landing RESA"	
	GM-ADR-DSN.C.210 (b) (6): The abbreviation LRST is not defined and used in the ADR regulation. FOCA suggests to use the term Local Runway Safety Team instead.	

response	<i>Partially accepted</i>
	C.210(b)(1)(iv): 'PAPI' will be retained. All other comments Agreed ('landing RESA' will be replaced by 'undershoot RESA').

comment	1218	comment by: <i>Swedish Transport Agency</i>
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	Remove "aerodrome" since there is no aerodrome AIP.
response	<i>Not accepted</i>
	The term 'aerodrome' is universally recognised and widely used.
comment	2299 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	what is a LRST, not defined
response	<i>Noted</i>
	The abbreviation 'LRST' will be replaced by 'Local Runway Safety Team'.
comment	2304 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	what is a landing RESA?
response	<i>Noted</i>
	The term 'landing RESA' will be replaced by 'undershoot RESA'.
comment	2312 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	VASIS would be better, PAPI is too specific
response	<i>Noted</i>
comment	2348 ❖ comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	<i>Noted</i>
response	<i>Noted</i>
comment	2613 comment by: <i>Danish Transport Authority</i>
	(b) (5) Revise "the state aviation authority" to "The competent authority"
response	<i>Accepted</i>

CS-ADR – Book 2 – CS-ADR-DSN.C.215 – Dimensions of runway end safety areas

p. 227-228

comment	821	comment by: <i>Finnish Transport Safety Agency</i>
	...suitable level of safety...? We suggest ...acceptable level of safety...	
response	<i>Partially accepted</i>	
	This comment appears to be misplaced. It appears in the GM under a wrongly named 'CS' title instead of 'GM'. The title will be amended and 'acceptable' will replace 'suitable'.	
comment	1836	comment by: <i>Geneva International Airport (ROMIG)</i>
	The code "CS" is used for thies articles. The code "GM" should be used in order to be consistant with the rest of the articles. Formating	
response	<i>Accepted</i>	
comment	2149	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	Replacement of point (3) by the ICAO Standard of Annex 14: "a runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m" and to move points (1) and (2) to guidance material (GM).	
	Specifications of the runway end safety area are being reviewed by the ICAO on the founding of clear objectives. These specifications will concern other points than the length. Considering the costs involved and technical difficulties, it seems very early to impose the ICAO recommendation. In France, as mentioned in the RIA, the 90m RESA are only imposed for new runways or lengthening of runway taking into account the "grand father right" and to avoid a shortening of declared distances which would be contrary to the safety.	
response	<i>Partially accepted</i>	
	The current and proposed (SL 41) figures are recognised globally. 90 metres is an ICAO standard. There is adequate flexibility in the CS to provide a range of RESA between 90 and 240 metres. The term 'at least' in the first sentence of paragraph (a) will be deleted, and 'with a minimum width at least twice that of the associated runway' will be added to paragraph (d).	

comment	2287	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	GM not CS	
response	<i>Accepted</i>	
comment	2338	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Accepted that many aerodromes were constructed before the requirement for RESAs. Where distances cannot be achieved the aerodrome should undertake a safety assessment to confirm that a suitable level of safety is achieved - we fully support this statement	
response	<i>Noted</i>	
comment	2390	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 2 – CS^{GM}-ADR-DSN.C.215 — Dimensions of runway end safety areas (p227-228) • CS-ADR - Book 2 – CS^{GM} -ADR-DSN.C.220 — Objects on runway end safety areas (p228) • CS-ADR - Book 2 – CS^{GM} -ADR-DSN.C.225 — Clearing and grading of runway end safety areas (p228) • CS-ADR - Book 2 – CS^{GM} -ADR-DSN.C.230 — Slopes on runway end safety areas (p228) • CS-ADR - Book 2 – CS^{GM} -ADR-DSN.C.235 — Strength on runway end safety areas (p228) <p><u>2. Proposed text / comment</u></p> <p>There is a mistake in the title of these specifications which are guidance material, and in book 2 of the CSs, but should be named "GM".</p> <p>It is proposed to rename these specifications as follows :</p> <ul style="list-style-type: none"> • CS^{GM}-ADR-DSN.C.215 — Dimensions of runway end safety areas (p227-228) • CS^{GM} -ADR-DSN.C.220 — Objects on runway end safety areas (p228) • CS^{GM} -ADR-DSN.C.225 — Clearing and grading of runway end safety areas (p228) • CS^{GM} -ADR-DSN.C.230 — Slopes on runway end safety areas (p228) • CS^{GM} -ADR-DSN.C.235 — Strength on runway end safety areas (p228) 	
response	<i>Accepted</i>	

comment	2614	comment by: <i>Danish Transport Authority</i>
	The paragraph should be change from CS to GM.	
response	<i>Accepted</i>	

CS-ADR – Book 2 – CS-ADR-DSN.C.220 – Objects on runway end safety areas

p. 228

comment	1147	comment by: <i>Federal Office of Civil Aviation FOCA</i>
	The correct provision is GM-ADR-DSN.C.220, not CS-ADR.DSN.C.220.	
response	<i>Accepted</i>	

comment	2125	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	It is appropriate to transfer this provision into IR-OPS	
	It is an operational rule (notably for equipments) concerning the aerodrome operator.	
response	<i>Not accepted</i>	
	This CS is design-related.	

comment	2287 ❖	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	GM not CS	
response	<i>Accepted</i>	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

comment 2390 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 2 – CS~~GM~~-ADR-DSN.C.215 — Dimensions of runway end safety areas (p227-228)
- CS-ADR - Book 2 – CS~~GM~~ -ADR-DSN.C.220 — Objects on runway end safety areas (p228)
- CS-ADR - Book 2 – CS~~GM~~ -ADR-DSN.C.225 — Clearing and grading of runway end safety areas (p228)
- CS-ADR - Book 2 – CS~~GM~~ -ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- CS-ADR - Book 2 – CS~~GM~~ -ADR-DSN.C.235 — Strength on runway end safety areas (p228)

2. Proposed text / comment

There is a mistake in the title of these specifications which are guidance material, and in book 2 of the CSs, but should be named "GM".

It is proposed to rename these specifications as follows :

- €S~~GM~~-ADR-DSN.C.215 — Dimensions of runway end safety areas (p227-228)
- €S~~GM~~ -ADR-DSN.C.220 — Objects on runway end safety areas (p228)
- €S~~GM~~ -ADR-DSN.C.225 — Clearing and grading of runway end safety areas (p228)
- €S~~GM~~ -ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- €S~~GM~~ -ADR-DSN.C.235 — Strength on runway end safety areas (p228)

response *Accepted*

comment 2806

comment by: ECA - European Cockpit Association

Add the following paragraph:

An object situated on a runway end safety area, which may endanger aeroplanes or impede the rapid access of emergency vehicles, should be regarded as an obstacle. Objects within the Runway End Safety Area should be removed.

Justification:

Missing paragraph from ICAO Annex 14, paragraph 3.5.6. Furthermore, an amplification of the ICAO text is proposed to include the qualification that such objects should also not impede the rapid access of emergency vehicles.

Reference: IFALPA Annex 14, paragraph 3.5.6.

response *Not accepted*

The function of some objects requires them to be situated on the RESA. This is recognised in ICAO wording with references to obstacle height and frangibility requirements.

Paragraph 3.5.6 has been assimilated into the CS text.

CS-ADR – Book 2 – CS-ADR-DSN.C.225 – Clearing and grading of runway end safety areas

p. 228

comment	1153	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	Wrong title in the article: The article is GM-ADR-DSN.C.225 and not CS-ADR.DSN.C.225.	
response	<i>Accepted</i>	
comment	2124	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	This CS has to be deleted.	
	Respecting this CS will exclude any establishment of EMAS which is contrary to the safety.	
	Besides, the (b) is useless because it is necessary to comply with the objectives of the RESA definition.	
response	<i>Partially accepted</i>	
	EMAS will not have an adverse effect on RESA objectives. Paragraph (b) will be moved to GM.	
comment	2287 ❖	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	GM not CS	
response	<i>Accepted</i>	
comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

comment 2390 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 2 – CS~~GM~~-ADR-DSN.C.215 — Dimensions of runway end safety areas (p227-228)
- CS-ADR - Book 2 – CS~~GM~~ -ADR-DSN.C.220 — Objects on runway end safety areas (p228)
- CS-ADR - Book 2 – CS~~GM~~ -ADR-DSN.C.225 — Clearing and grading of runway end safety areas (p228)
- CS-ADR - Book 2 – CS~~GM~~ -ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- CS-ADR - Book 2 – CS~~GM~~ -ADR-DSN.C.235 — Strength on runway end safety areas (p228)

2. Proposed text / comment

There is a mistake in the title of these specifications which are guidance material, and in book 2 of the CSs, but should be named "GM".

It is proposed to rename these specifications as follows :

- €S~~GM~~-ADR-DSN.C.215 — Dimensions of runway end safety areas (p227-228)
- €S~~GM~~ -ADR-DSN.C.220 — Objects on runway end safety areas (p228)
- €S~~GM~~ -ADR-DSN.C.225 — Clearing and grading of runway end safety areas (p228)
- €S~~GM~~ -ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- €S~~GM~~ -ADR-DSN.C.235 — Strength on runway end safety areas (p228)

response *Accepted*

CS-ADR — Book 2 — CS-ADR-DSN.C.230 — Slopes on runway end safety areas

p. 228

comment 843 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 – CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 – CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 – CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 – CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 – CS-ADR-DSN.B.130 — Slopes on runway shoulders

- (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
 - CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
 - CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and

consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not

to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;*
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and*
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.*

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;*
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and*
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter*

is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 — Sight distance

"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 — Transverse slopes

"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.

(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

GM-ADR-DSN.B.080 — Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope should may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface."

GM-ADR-DSN.B.100 — Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface. Slopes should be are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders****CS-ADR-DSN.B.130 – Slopes on runway shoulders**

~~"The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips**

~~"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.185 – Transverse Slopes on runway strips**

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~
~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) ~~The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~
~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

(1) ~~The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.~~

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~

~~(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %~~

~~(c) Where clearway is provided, the slope on the REASA should~~ **can** ~~be amended accordingly."~~

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

~~The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" ~~The longitudinal slope of a taxiway may not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B."~~

*** Longitudinal slope changes on taxiways****CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways**

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways****CS-ADR-DSN.D.275 – Sight distance of taxiways**

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 — Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~
~~(1) 1.5 % where the code letter is C, D, E or F; and~~
~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 — Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:
 (1) 1.5 % where the code letter is C, D, E or F; and
 (2) 2 % where the code letter is A or B.
 (b) Slopes ~~should~~ **may** be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips****CS-ADR-DSN.D.330 — Slopes on taxiway strips**

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~
~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~
~~(2) 3 % for strips of taxiways where the code letter is A or B;~~
~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~
~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 — Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:
 (1) 2.5 % for strips where the code letter is C, D, E or F; and
 (2) 3 % for strips of taxiways where the code letter is A or B;
 the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons****CS-ADR-DSN.E.360 Slopes on aprons**

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~
~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

"(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures

should may be taken to reduce the fire hazard resulting from fuel spillage.
 (b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.
 (c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.
 (ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope *should may* be kept as shallow as possible and *should may* be such that the operation of the aircraft and vehicles is not compromised. "

response *Noted*

Comments will be addressed to under their individual CS reference.

comment 1161 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

Wrong title in the article: The article is GM-ADR-DSN.C.230 and not CS-ADR.DSN.C.230.

Typo: Use RESA instead of REASA

response *Accepted*

comment 2123 comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate to keep into CS only the following part :
 - (a) (1)

The rest of the provision has to be transferred to « guidance material » GM.

We consider that the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.

The respect of these rules can interfere with the objective of drainage.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

comment	2287 ❖	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	GM not CS	
response	<i>Accepted</i>	

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	<i>Noted</i>	

comment	2390 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p>1. Affected paragraphs</p> <ul style="list-style-type: none"> • CS-ADR - Book 2 – CSGM-ADR-DSN.C.215 — Dimensions of runway end safety areas (p227-228) • CS-ADR - Book 2 – CSGM -ADR-DSN.C.220 — Objects on runway end safety areas (p228) • CS-ADR - Book 2 – CSGM -ADR-DSN.C.225 — Clearing and grading of runway end safety areas (p228) • CS-ADR - Book 2 – CSGM -ADR-DSN.C.230 — Slopes on runway end safety areas (p228) • CS-ADR - Book 2 – CSGM -ADR-DSN.C.235 — Strength on runway end safety areas (p228) <p>2. Proposed text / comment</p> <p>There is a mistake in the title of these specifications which are guidance material, and in book 2 of the CSs, but should be named "GM".</p> <p>It is proposed to rename these specifications as follows :</p> <ul style="list-style-type: none"> • CSGM-ADR-DSN.C.215 — Dimensions of runway end safety areas (p227-228) • CSGM -ADR-DSN.C.220 — Objects on runway end safety areas (p228) • CSGM -ADR-DSN.C.225 — Clearing and grading of runway end safety areas (p228) • CSGM -ADR-DSN.C.230 — Slopes on runway end safety areas (p228) • CSGM -ADR-DSN.C.235 — Strength on runway end safety areas (p228) 	
response	<i>Accepted</i>	

comment	2520	comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
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CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA should ~~can~~ be amended accordingly."

response *Partially accepted*

Title will be amended from 'CS' to 'GM'. The remaining text stays in CS. Paragraph (c) will be amended correcting 'REASA' to 'RESA'.

CS-ADR – Book 2 – CS-ADR-DSN.C.235 – Strength of runway end safety areas	p. 228
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comment 1174 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

Wrong title in the article: The article is GM-ADR-DSN.C.235 and not CS-ADR.DSN.C.235.

response *Accepted*

comment 1837 comment by: *Geneva International Airport (ROMIG)*

The code 'CS' is used for these articles. The code 'GM' should be used in order to be consistent with the rest of the articles.

response *Accepted*

comment 2287 ❖ comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

GM not CS

response *Accepted*

The term 'landing RESA' will be replaced by 'undershoot RESA'.

comment	2348 ❖	comment by: <i>HIA - Highlands and Islands Airports Limited</i>
	Noted	
response	Noted	

comment	2390 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 2 - CSGM-ADR-DSN.C.215 — Dimensions of runway end safety areas (p227-228) • CS-ADR - Book 2 - CSGM -ADR-DSN.C.220 — Objects on runway end safety areas (p228) • CS-ADR - Book 2 - CSGM -ADR-DSN.C.225 — Clearing and grading of runway end safety areas (p228) • CS-ADR - Book 2 - CSGM -ADR-DSN.C.230 — Slopes on runway end safety areas (p228) • CS-ADR - Book 2 - CSGM -ADR-DSN.C.235 — Strength on runway end safety areas (p228) <p><u>2. Proposed text / comment</u></p> <p>There is a mistake in the title of these specifications which are guidance material, and in book 2 of the CSs, but should be named "GM".</p> <p>It is proposed to rename these specifications as follows :</p> <ul style="list-style-type: none"> • CSGM-ADR-DSN.C.215 — Dimensions of runway end safety areas (p227-228) • CSGM -ADR-DSN.C.220 — Objects on runway end safety areas (p228) • CSGM -ADR-DSN.C.225 — Clearing and grading of runway end safety areas (p228) • CSGM -ADR-DSN.C.230 — Slopes on runway end safety areas (p228) • CSGM -ADR-DSN.C.235 — Strength on runway end safety areas (p228) 	
response	Accepted	

CS-ADR — Book 2 — GM-ADR-DSN.D.240 — Taxiways General

p. 229

comment	1687	comment by: <i>ECA - European Cockpit Association</i>
	Amend text as follows :	
	(a) Taxiways should be provided to permit the safe and expeditious surface movement of aircraft. Sufficient entrance and exit taxiways for a runway should	

be provided to expedite the movement of aeroplanes to and from the runway ~~and provision of rapid exit taxiways considered when traffic volumes are high.~~

Add paragraphs (c) and (d) as follows:

(c) The taxiway system should be designed to minimize restriction to aircraft movement to and from the runways and apron areas. It should be capable of maintaining a smooth, continuous flow of aircraft ground traffic at the maximum practical speed with a minimum of acceleration or deceleration.
(d) Taxiway crossings of runways and other taxiways should be avoided whenever possible.

Justification:

In view of the comment below regarding runway exits, the words "and provision of rapid exit taxiways considered when traffic volumes are high" should be deleted.

Reference: IFALPA Annex 14, paragraph 3.9.2; 3.9.2.xx and 3.9.2.z

response *Not accepted*

These are operational considerations.

comment

1688

comment by: *ECA - European Cockpit Association*

Add new GM-ADR-DSN.D.XXX on Runway exits as follows:

A runway exit is defined as a paved surface adjoining a runway at an oblique angle, which is provided as a link between the runway and the aerodrome taxiway system.

- a) Runway exits should be provided for all runways in Codes 2, 3 and 4.
- b) To reduce runway occupancy, a number of runway exits should be provided suitable for the aircraft types using the aerodromes. The location of the exits should be determined using the "segmental method" as applied in normal operations.
- c) The surface of a runway exit should be constructed and be maintained so as to provide good friction characteristics when the surface is wet. The runway exits should be provided with adequate fillets.
- d) A runway exit taxiway should include a straight portion following the turnoff curve sufficient for an exiting aircraft to come to a full stop, clear of both the duty runway and an intersecting taxiway
- e) Rapid exit taxiways shall be constructed in such a way that crossing the runway via a rapid exit taxiway is not possible.

Justification:

Runway exits are particularly necessary where a high rate of runway movement is required. The advantage of runway exits is that less time is taken to turn off the runway, and **not** that it allows part of the landing run to be completed on it;

b) The "segmental method" mentioned involves dividing the landing distance into three segments, Segment 1 (Flare), Segment 2 (touchdown to the point of achieving full deceleration configuration) and Segment 3 (deceleration to end of landing roll-out using normal airline procedures). It is recommended that, for runway exit design purposes, specific exit speeds should not be stipulated;

rather, it should be left to the pilot's discretion to decide at what speed the aircraft turns on to the exit.

Reference: IFALPA Annex 14, paragraphs 3.9.x; 3.9.y; 3.9.z; 3.9.xx; and 3.9.yy.

response *Not accepted*

These are operational rather than design considerations.

CS-ADR – Book 2 – GM-ADR-DSN.D.245 – Width of Taxiways

p. 229

comment

2122

comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate to transfer this article into GM

This article is a repetition of the previous article (CS-ADR-DSN.D.240). Indeed, the widths of taxiways are directly obtained by the provisions related to the space between the external wheel of the landing gear and the edge of the taxiway.

response

Not accepted

The specification figures are identical to ICAO; therefore, they will stay in the CS.

CS-ADR – Book 2 – GM-ADR-DSN.D.250 – Taxiways curves

p. 229

comment

35

comment by: *ACI EUROPE - Airports Council International*

should be made clear that the reference numbers in the figure of the following page are from ICAO Annex 14

response

Accepted

Correct EASA references will replace the ICAO references.

comment

597

comment by: *Cologne/Bonn Airport*

It should be made clear, that the reference numbers are from A 14

response

Accepted

Correct EASA references will replace the ICAO references.

comment	621	comment by: <i>Avinor</i>
	GM.ADR.DSN.D.250. Should be made clear that the reference numbers are from ICAO Annex 14.	
response	<i>Accepted</i>	
	Correct EASA references will replace the ICAO references.	

comment	808	comment by: <i>Munich Airport International</i>
	should be made clear that the reference numbers are from ICAO Annex 14	
response	<i>Accepted</i>	
	Correct EASA references will replace the ICAO references.	

comment	921 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • BIII - CS-ADR - Book 1 – CS-ADR-DSN.D.250 — Taxiways curves (p25) • BIII - CS-ADR - Book 1 – CS-ADR-DSN.D.255 — Junction and intersection of taxiways (p25) • BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.250 — Taxiways curves (p229-230) • BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.255 — Junction and intersection of taxiways (p230) 	
	<p><u>2. Proposed text / comment</u></p> <p>The duplication of the last sentence of both CS in the corresponding GM is very confusing as it is not known whether it should be regarded as a certification specification or only a guide. As written, they seem to be more guidance since they are already dealt with by CS-ADR-DSN.D.240. Moreover, the use of "should" in a guidance material is confusing. Thus the proposed modification:</p>	
	<p>CS-ADR-DSN.D.250 — Taxiways curves</p> <p><i>"Changes in direction of taxiways should be as few and small as possible. The radii of the curves should be compatible with the manoeuvring capability and normal taxiing speeds of the aeroplanes for which the taxiway is intended. The design of the curve should be such that, when the cockpit of the aeroplane for which the taxiway is intended remains over the taxiway centre line markings, the clearance distance between the outer main wheels of the aeroplane and the edge of the taxiway should be not less than those specified in CS-ADR-DSN.D.240."</i></p>	

GM-ADR-DSN.D.250 – Taxiways curves

"(a) The design of the curve ~~should~~ **needs to** be such that, when the cockpit of the aeroplane remains over the taxiway centre line markings, the clearance distance between the outer main wheels of the aeroplane and the edge of the taxiway ~~should~~ **may** not be less than those specified in CS-ADR-DSN.D.250~~240~~. [...]"

CS-ADR-DSN.D.255 – Junction and intersection of taxiways ICAO

"To facilitate the movement of aeroplanes, fillets should be provided at junctions and intersections of taxiways with runways, aprons and other taxiways. ~~The design of the fillets should ensure that the minimum wheel clearances specified in CS-ADR-DSN.D.240 are maintained when aeroplanes are manoeuvring through the junctions or intersections.~~"

GM-ADR-DSN.D.255 – Junction and intersection of taxiways

"(a) The design of the fillets ~~should~~ **needs to** ensure that the minimum wheel clearances specified in CS-ADR-DSN.D.240 are maintained when aeroplanes are manoeuvring through the junctions or intersections.

(b) Consideration ~~should~~ **needs to** be given to the aeroplane datum length when designing fillets. Guidance on the design of fillets and the definition of the term aeroplane datum length are given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(c) Guidance on factors which may be considered in the aeronautical study is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2). [...]"

response *Not accepted*

The proposed deletion of CS text. The text will remain, but the duplicate text in paragraph (a) of GM D.250 will be deleted.

comment

1838

comment by: Geneva International Airport (ROMIG)

Should be made clear that the reference numbers used in the diagram are from ICAO Annex 14 and refer to articles out of annex 14.
Formating

response

Accepted

Correct EASA references will replace the ICAO references.

comment

2286

comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

Needs to be made clear that the reference numbers used in the diagram are from ICAO Annex 14 and refer to articles out of annex 14.

response

Noted

The correct EASA references will replace the ICAO references.

comment	2533	comment by: AENA - Aeropuertos Españoles y Navegación Aérea
	<p>GM-ADR-DSN.D.250 – Taxiways curves “(a) The design of the curve should needs to be such that, when the cockpit of the aeroplane remains over the taxiway centre line markings, the clearance distance between the outer main wheels of the aeroplane and the edge of the taxiway should may not be less than those specified in CS-ADR-DSN.D.250240. [...]”</p>	
response	Noted	
	This paragraph has been deleted from GM.	

comment	3031	comment by: ADV -German Airports Association
	GM.ADR.DSN.D.250 should be made clear that the reference numbers are from ICAO Annex 14	
response	Accepted	
	Correct EASA references will replace the ICAO references.	

comment	3066	comment by: MST / STR - Stuttgart Airport
	GM.ADR.DSN.D.250 should be made clear that the reference numbers are from ICAO Annex 14	
response	Accepted	
	Correct EASA references will replace the ICAO references.	

CS-ADR – Book 2 – Figure GM-D-1 Taxiway curve
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p. 230

comment	205	comment by: CAA Austria - Ministry of Transport
	Rewrite completely with EASA references.	
response	Accepted	
	Correct EASA references will replace the ICAO references in Table GM-D-1.	

comment	1689	comment by: <i>ECA - European Cockpit Association</i>
	<p>Comment: All the references in the figure are ICAO.</p> <p>Justification: The references should be correlated to EASA document, not ICAO.</p>	
response	<i>Accepted</i>	
	Correct EASA references will replace the ICAO references.	

comment	2285	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	Needs to be made clear that the reference numbers used in the diagram are from ICAO Annex 14 and refer to articles out of annex 14.	
response	<i>Accepted</i>	
	The correct EASA references will replace the ICAO references.	

comment	3100	comment by: <i>Fraport AG</i>
	<p>GM-ADR-DSN.D.250 — TaxiwayCurves Figure GM-D-1</p> <p>Editorial</p> <p>Cross references in Figure GM-D-1</p> <p>Cross references in Figure GM-D-1 should be adapted to EASA paragraphs</p> <p>Fraport AG Cross references in figure are from ICAO</p>	
response	<i>Accepted</i>	
	Correct EASA references will replace the ICAO references.	

CS-ADR — Book 2 — GM-ADR-DSN.D.255 — Junction and intersection of taxiways

p. 230-231

comment	182	comment by: <i>CAA Norway</i>
	GM-ADR-DSN.D.255 on page 230-231 is not on junction and intersections. We	

response	<p>suggest to delete (d, e and f) from here. This is already in GM-ADR-DSN.D.260, which is the proper place.</p> <p><i>Accepted</i></p> <p>Paragraph (c) is also repeated; therefore, it will be deleted.</p>
comment	<p>329 comment by: <i>Icelandic Civil Aviation Administration</i></p> <p>GM-ADR-DSN.D.255 on page 230-231 is not on junction and intersections. We suggest to delete (d, e and f) from here. This is already in GM-ADR-DSN.D.260, which is the proper place.</p>
response	<p><i>Accepted</i></p> <p>Paragraph (c) is also repeated; therefore, it will be deleted.</p>
comment	<p>387 comment by: <i>Estonian CAA</i></p> <p>GM-ADR-DSN.D.255 on page 230-231 is not on junction and intersections. We suggest to delete (d, e and f) from here. This is already in GM-ADR-DSN.D.260, which is the proper place.</p>
response	<p><i>Accepted</i></p> <p>Paragraph (c) is also repeated; therefore, it will be deleted.</p>
comment	<p>678 comment by: <i>Finnish Transport Safety Agency</i></p> <p>GM-ADR-DSN.D.255 on page 230-231 is not on junction and intersections. We suggest to delete (d, e and f) from here. This is already in GM-ADR-DSN.D.260, which is the proper place.</p>
response	<p><i>Accepted</i></p> <p>Paragraph (c) is also repeated; therefore, it will be deleted.</p>
comment	<p>921 ❖ comment by: <i>DGAC Direction Générale de l'aviation civile</i></p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • BIII - CS-ADR - Book 1 – CS-ADR-DSN.D.250 — Taxiways curves (p25) • BIII - CS-ADR - Book 1 – CS-ADR-DSN.D.255 — Junction and intersection of taxiways (p25)

- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.250 — Taxiways curves (p229-230)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.255 — Junction and intersection of taxiways (p230)

2. Proposed text / comment

The duplication of the last sentence of both CS in the corresponding GM is very confusing as it is not known whether it should be regarded as a certification specification or only a guide. As written, they seem to be more guidance since they are already dealt with by CS-ADR-DSN.D.240.

Moreover, the use of "should" in a guidance material is confusing.

Thus the proposed modification:

CS-ADR-DSN.D.250 — Taxiways curves

"Changes in direction of taxiways should be as few and small as possible. The radii of the curves should be compatible with the manoeuvring capability and normal taxiing speeds of the aeroplanes for which the taxiway is intended. ~~The design of the curve should be such that, when the cockpit of the aeroplane for which the taxiway is intended remains over the taxiway centre line markings, the clearance distance between the outer main wheels of the aeroplane and the edge of the taxiway should be not less than those specified in CS-ADR-DSN.D.240.~~"

GM-ADR-DSN.D.250 — Taxiways curves

"(a) The design of the curve ~~should~~ needs to be such that, when the cockpit of the aeroplane remains over the taxiway centre line markings, the clearance distance between the outer main wheels of the aeroplane and the edge of the taxiway ~~should~~ may not be less than those specified in CS-ADR-DSN.D.250~~240~~. [...]"

CS-ADR-DSN.D.255 — Junction and intersection of taxiways ICAO

"To facilitate the movement of aeroplanes, fillets should be provided at junctions and intersections of taxiways with runways, aprons and other taxiways. ~~The design of the fillets should ensure that the minimum wheel clearances specified in CS-ADR-DSN.D.240 are maintained when aeroplanes are manoeuvring through the junctions or intersections.~~"

GM-ADR-DSN.D.255 — Junction and intersection of taxiways

"(a) The design of the fillets ~~should~~ needs to ensure that the minimum wheel clearances specified in CS-ADR-DSN.D.240 are maintained when aeroplanes are manoeuvring through the junctions or intersections.

(b) Consideration ~~should~~ needs to be given to the aeroplane datum length when designing fillets. Guidance on the design of fillets and the definition of the term aeroplane datum length are given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(c) Guidance on factors which may be considered in the aeronautical study is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

[...]"

response Not accepted

The proposed deletion of CS text. The text will remain, but the duplicate text in paragraph (a) of GM D.250 will be deleted.

comment	1181 comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	<p>GM-ADR-DSN.D.255 (b) The article has nothing to do with junction and intersection of taxiways: It should be moved to GM-ADR-DSN.D.250.</p> <p>GM-ADR-DSN.D.255 (c)-(f) The articles are already implemented in GM-ADR-DSN.D.260: They are redundant and should be deleted.</p>
response	<i>Partially accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.
comment	1220 comment by: <i>Swedish Transport Agency</i>
	GM-ADR-DSN.D.255 on page 230-231 is not on junction and intersections. We suggest to delete (d, e and f) from here. This is already in GM-ADR-DSN.D.260, which is the proper place.
response	<i>Accepted</i>
	Paragraph (c) is also repeated; therefore, it will be deleted.
comment	1690 comment by: <i>ECA - European Cockpit Association</i>
	<p>Delete paragraphs (c), (d) ,(e) & (f).</p> <p>Justification: They are duplicated in GM-ADR-DSN.D.260.</p>
response	<i>Accepted</i>
comment	2269 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	c-f should be deleted, repeated in D260 where they are better placed
response	<i>Accepted</i>
comment	2279 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	b should be moved to D250, where it is better placed

response *Not accepted*

comment 2534 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

GM-ADR-DSN.D.255 – Junction and intersection of taxiways

"(a) The design of the fillets ~~should~~ **needs to** ensure that the minimum wheel clearances specified in CS-ADR-DSN.D.240 are maintained when aeroplanes are manoeuvring through the junctions or intersections.

(b) Consideration ~~should~~ **needs to** be given to the aeroplane datum length when designing fillets. Guidance on the design of fillets and the definition of the term aeroplane datum length are given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(c) Guidance on factors which may be considered in the aeronautical study is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

[...]"

"(e) The separation distances of Book 1, Table **GM-D-1**, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(f) The separation distance between the centre line of an aircraft stand taxilane and an object shown in Book 1, Table **GM-D-1**, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

response *Not accepted*

Paragraph (a) has been deleted from GM. Since this is GM, EASA uses the modal verb 'should'. In paragraph (e) of GM D.255, the table referenced is in the CS; therefore, to avoid duplication 'GM' will not be added to the title.

comment 2612 comment by: Danish Transport Authority

GM-ADR-DSN.D.255 on page 230-231 is not on junction and intersections. We suggest to delete (d, e and f) from here. This is already in GM-ADR-DSN.D.260, which is the proper place.

response *Accepted*

Paragraph (c) is also repeated; therefore, it will be deleted.

comment 2981 comment by: Isavia

GM-ADR-DSN.D.255 on page 230-231 is not on junction and intersections. We suggest deleting (d, e and f) from here. This is already in GM-ADR-DSN.D.260, which is the proper place.

response *Accepted*

Paragraph (c) is also repeated; therefore, it will be deleted.

CS-ADR – Book 2 – GM-ADR-DSN.D.260 260 – Taxiway minimum separation distance

p. 231

comment

1111 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.260 — Taxiway minimum separation distance (p25-26)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.315 — Width of taxiway strips (p29)
- BIII - CS-ADR - Book 1 - Figure D-1. Rapid exit taxiway (p28)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad (p35)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.Q.840 — Objects to be marked and/or lighted (p146-147)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.260 — Taxiway minimum separation distance
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.315 — Width of taxiway strips (p232)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad (p239)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.255 — Junction and intersection of taxiways
- Explanatory Note – paragraph 18 (page 8)

2. Proposed text / comment

The figures for taxiway minimum separation distances are intended for design purposes only and can be far less large than indicated: indeed, these figures are no more applied when maintaining taxiways and consequently no more relevant.

No safety concern has been noticed until now on this point.

But above all, verifying that the separation distances between taxiways are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured" (paragraph 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) either the certification specification gives only the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision, and the figures are in guidance material.
- (ii) or the figures are kept in the CS but specifying each time that they

should be met "where practicable" and the CS gives the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision.

The option (i) is proposed by DGAC because less confusing and far clearer, and therefore more appropriate for a regulation and for future standardization. This is a critical point for DGAC.

All CSs referring to figures in table D-1 are to be changed consequently: their provisions corresponding to such distance should be move to GM, except for CS-ADR-DSN.Q.840 — *Objects to be marked and/or lighted* because the objective is marking and/or lighting thus is quite different and it is proposed to add the figures of table D-1 in this CS as Table Q-3 — *Taxiway minimum marking and/or lighting distances*.

This option (i) and the consequences on CS referring to table D-1 are detailed below:

CS-ADR-DSN.D.260 — Taxiway minimum separation distance

"The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should ~~not~~ be sufficient for safe aircraft operations, in particular to prevent from aircraft collision less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

[...]

Table D-1. Taxiway minimum separation distances"

GM-ADR-DSN.D.260 — Taxiway minimum separation distance

"[...] (c) The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

[...]

Table GM-D-1. Taxiway minimum separation distances

(d) The separation distances of ~~Book 1~~, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(~~d~~)(e) The separation distance between the centre line of an aircraft stand taxilane and an object shown in ~~Book 1~~, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

CS-ADR-DSN.D.315 — Width of taxiway strips

"A taxiway strip should extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table ADR-D-1, column 11."

GM-ADR-DSN.D.315 — Width of taxiway strips

"A taxiway strip may extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table GM-D-1, column 11."

CS-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

~~"[...] (b) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.~~

~~(c) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)~~

~~Figure G-1 Minimum separation distance on a de-icing/anti-icing facility"~~

GM-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

"[...] (d) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.

(e) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)

Figure GM-G-1 Minimum separation distance on a de-icing/anti-icing facility"

CS-ADR-DSN.Q.840 – Objects to be marked and/or lighted p146

"[...] (g) All obstacles within the distance specified in Table ~~D-1~~ Q-3, from the centre line of a taxiway, an apron taxiway or aircraft stand taxilane should be marked and, if the taxiway, apron taxiway or aircraft stand taxilane is used at night, lighted.

Table Q-3 – Taxiway minimum marking and/or lighting distances"

GM-ADR-DSN.D.255 – Junction and intersection of taxiways

"(e) The separation distances of Book 1, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(f) The separation distance between the centre line of an aircraft stand taxilane and an object shown in Book 1, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

response Not accepted

CS-ADR-DSN.D260: The proposed text change has been superseded by DGAC's request to include a safety objective, which covers the spirit of the change. Therefore, it is not included in the CS.

The proposed move of additional text and Table D-1 to GM is not appropriate as it contains design specifications.

comment 1192 comment by: Federal Office of Civil Aviation, FOCA, Switzerland

Typo: Delete 260 in the title (printed twice).

response Accepted

comment	1691	comment by: <i>ECA - European Cockpit Association</i>
	Correct the number of the article. Reference 260 is duplicated.	
response	<i>Accepted</i>	
comment	1692	comment by: <i>ECA - European Cockpit Association</i>
	<p>Add new paragraph as follows:</p> <p>(a) The distance between a parallel taxiway and an operational runway should be sufficient to ensure that any aircraft positioned on the taxiway does not infringe the ILS Obstacle Assessment Surface.</p> <p>Note: In cases where the aircraft on the taxiway does penetrate the Obstacle Assessment Surface, the aircraft should be regarded as an obstacle and as such taken into account when calculating the Obstacle Clearance Altitude / Height (OCA/H).</p> <p>See ICAO PANS-OPS, Volume II, Part III, Section 2.1 (ILS Approach Procedures) and Attachment A to Part III (ILS Obstacle Clearance) for background information concerning the above procedure.</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 3.9.8.1</p>	
response	<i>Not accepted</i>	
	This is an operational consideration.	
comment	2121	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	<p>It is appropriate to transfer into « guidance material » GM.</p> <p>The separation distances are just recommendations of ICAO. Some studies have demonstrated, notably for code F, that we can have lower distances than indicated in the figure. We propose to take up these values approved by most of European States.</p>	
response	<i>Not accepted</i>	
	The specification figures are identical to ICAO and proposed changes in Table D-1, columns (10) and (11), for Code F. Therefore, they will stay in the CS.	
comment	2251	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	title incorrect, 260 repeated	

response

Accepted

Duplicates will be deleted.

comment

2535

comment by: AENA - Aeropuertos Españoles y Navegación Aérea

GM-ADR-DSN.D.260 – Taxiway minimum separation distance

"[...] (c) The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

[...]

Table GM-D-1. Taxiway minimum separation distances

(d) The separation distances of ~~Book 1~~, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

~~(d)~~(e) The separation distance between the centre line of an aircraft stand taxilane and an object shown in ~~Book 1~~, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

response

Not accepted

This remains in the CS.

CS-ADR – Book 2 – GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways p. 231

comment

843 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 – Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 – Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 – Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 – Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 – Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 – Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 – Longitudinal Slopes on

- runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
 - CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
 - CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical. (See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention

of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid

contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

~~(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."~~

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the

runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 — Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 — Transverse slopes

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 — Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface."

GM-ADR-DSN.B.100 — Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface.

Slopes ~~should be~~ are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 — Slopes on runway shoulders

~~"The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

~~"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward~~

~~slope of 1.25 %, the lower limit of this plane being a horizontal line which:
(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

~~(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:
(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

~~Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"~~

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

~~(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.~~

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

~~(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~

~~(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %~~

~~(c) Where clearway is provided, the slope on the REASA should can be amended accordingly."~~

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

~~The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~" The longitudinal slope of a taxiway may not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B."~~

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

- ~~(1) 1.5 % where the code letter is C, D, E or F; and
(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 — Transverse slopes on taxiways

~~"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:~~

- ~~(1) 1.5 % where the code letter is C, D, E or F; and
(2) 2 % where the code letter is A or B.~~

~~(b) Slopes ~~should~~ may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 — Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

- ~~(1) 2.5 % for strips where the code letter is C, D, E or F; and
(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 — Slopes on taxiway strips

~~"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:~~

- ~~(1) 2.5 % for strips where the code letter is C, D, E or F; and
(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~-(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

~~"(a) The design of slopes ~~should~~ may direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ may be taken to reduce the fire hazard resulting from fuel spillage.~~

~~(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant)~~

on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "

response *Noted*

Comments will be addressed to under their individual CS reference.

comment 1195 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2118 comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate to transfer this provision to GM

In order to comply with drainage objectives it is necessary to add: "Longitudinal slopes on taxiways should be in coherency with the transversal slope to allow a rapid drainage".

All the rules concerning the slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM.

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

ICAO Annex 14 only mentions 'most rapid drainage of water' under the heading 'Transverse Slopes'.

comment 2239 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment

2521

comment by: AENA - Aeropuertos Españoles y Navegación Aérea

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" *The longitudinal slope of a taxiway may not exceed:*

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

response

Not accepted

This remains in the CS.

CS-ADR – Book 2 – GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways ICA

p. 231

comment

843 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 – Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 – Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 – Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 – Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 – Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 – Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 – Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 – Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 – Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 – Transverse slopes on

- taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
 - CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting

slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.

- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways****CS-ADR-DSN.B.065 – Longitudinal slope changes on runways**

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways****CS-ADR-DSN.B.070 – Sight distance for slopes on runways**

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways****CS-ADR-DSN.B.080 – Transverse slopes**

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the~~

runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. ~~The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface."~~

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"~~The slopes are the same as those on the adjacent runway pavement surface.~~

Slopes ~~should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."~~

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

~~(1) 1.5 % where the code number is 4;~~

~~(2) 1.75 % where the code number is 3; and~~

~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

- ~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
- ~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

~~[...]"~~

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

- (1) is perpendicular to the vertical plane containing the runway centre line; and
- (2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

(2) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~ Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.

(b) Transverse slopes

(1) ~~The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %.~~ Transitions between differing slopes should be as gradual as practicable."

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA ~~should~~ can be amended accordingly."

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

(a) The longitudinal slope of a taxiway should not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B.

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~“(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway.”~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

“(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and

(2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway.”

*** Slopes on aprons****CS-ADR-DSN.E.360 Slopes on aprons**

~~“(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~“(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction.”~~

GM-ADR-DSN.E.360 – Slopes on aprons —and GM

“(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. ”

response	<i>Noted</i>
	Comments will be addressed to under their individual CS reference.
comment	1197 comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	There is no content: Please remove title or provide content.
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.
comment	2114 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	It is appropriate to transfer this provision to GM
	All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules in GM.
response	<i>Not accepted</i>
	The specification figures are identical to ICAO; therefore, they will stay in the CS.
comment	2241 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.
comment	2522 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways
	"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:
	(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and
	(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.
	(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all

aircraft in all weather conditions."

response *Not accepted*

The specification figures are identical to ICAO; therefore, they will stay in the CS.

CS-ADR – Book 2 – GM-ADR-DSN.D.275 – Sight distance of taxiways ICAO p. 231

comment 843 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads

- (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently

agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and
- (3) 2 % where the code number is 1 or 2.

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;

- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
 (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

(1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;

(2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and

(3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.

(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even

~~transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 — Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface."~~

GM-ADR-DSN.B.100 — Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface.

Slopes ~~should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 — Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."~~

GM-ADR-DSN.B.130 — Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips

"~~(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

(1) 1.5 % where the code number is 4;

(2) 1.75 % where the code number is 3; and

(3) 2 % where the code number is 1 or 2.

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

(1) 1.5 % where the code number is 4;

(2) 1.75 % where the code number is 3; and

(3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.185 – Transverse Slopes on runway strips**

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

~~(1) 2.5 % where the code number is 3 or 4; and~~

~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

(1) 2.5 % where the code number is 3 or 4; and

(2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~

~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

~~[...]"~~

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

(1) is perpendicular to the vertical plane containing the runway centre line; and

(2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas****CS-ADR-DSN.C.230 - Slopes on runway end safety areas**

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be~~

avoided.

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA should ~~shoudl~~ **can** be amended accordingly."

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways****CS-ADR-DSN.D.275 – Sight distance of taxiways**

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways****CS-ADR-DSN.D.280 – Transverse slopes on taxiways**

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes should may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips****CS-ADR-DSN.D.330 – Slopes on taxiway strips**

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and

(2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons****CS-ADR-DSN.E.360 Slopes on aprons**

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 – Slopes on aprons —and GM

"(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "

response Noted

Comments will be addressed to under their individual CS reference.

comment 1198

comment by: Federal Office of Civil Aviation, FOCA, Switzerland

There is no content: Please remove title or provide content.

response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.
comment	2112 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	It is appropriate to transfer this provision into GM
	All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules in GM.
response	<i>Not accepted</i>
	The specification figures are identical to ICAO; therefore, they will stay in the CS.
comment	2242 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.
comment	2523 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	GM-ADR-DSN.D.275 – Sight distance of taxiways
	<i>"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:</i>
	<i>(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;</i>
	<i>(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and</i>
	<i>(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."</i>
response	<i>Not accepted</i>
	This is from ICAO design criteria; therefore, it will stay in CS.

ICAO

comment 843 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
- CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
- CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
- CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
- CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
- CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)

- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and
- (3) 2 % where the code number is 1 or 2.

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

~~(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."~~

*** Sight distance for slopes on runways****CS-ADR-DSN.B.070 – Sight distance for slopes on runways**

~~"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:~~

~~(1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;~~

~~(2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and~~

~~(3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.~~

~~(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "~~

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways****CS-ADR-DSN.B.080 – Transverse slopes**

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

~~"The transverse slope may be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B;~~

except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ **may** be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. ~~The slopes should be the same as those on the adjacent runway pavement surface.~~"

GM-ADR-DSN.B.100 – Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface. Slopes ~~should be~~ **are** so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

"~~The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %.~~"

GM-ADR-DSN.B.130 – Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"~~(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips**

CS-ADR-DSN.B.185 – Transverse Slopes on runway strips

"~~(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the~~

~~runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~
~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:
 (1) 2.5 % where the code number is 3 or 4; and
 (2) 3 % where the code number is 1 or 2;
 except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.
 (b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways**

CS-ADR-DSN.C.195 - Slopes on clearways

"[...] (e) Slopes on clearways:
 Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.
 The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:
 (1) is perpendicular to the vertical plane containing the runway centre line; and
 (2) passes through a point located on the runway centre line at the end of the take-off run available.
 [...]"

GM-ADR-DSN.B.195 Clearways

"[...]
 (b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:
 (1) is perpendicular to the vertical plane containing the runway centre line; and
 (2) passes through a point located on the runway centre line at the end of the take-off run available.
 Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas**

CS-ADR-DSN.C.230 - Slopes on runway end safety areas

"(a) Longitudinal slopes
 (1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.
 (2) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~ Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.
 (b) Transverse slopes
 (1) ~~The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %.~~ Transitions between differing slopes should be as gradual as practicable."

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a

downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

(c) Where clearway is provided, the slope on the REASA should ~~can~~ be amended accordingly."

*** Longitudinal slopes on taxiways**

CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

"The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways**

CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the~~

~~taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B."~~

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

~~"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 2 % where the code letter is A or B.~~

~~(b) Slopes should may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."~~

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:~~

~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~

~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the~~

adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~(a)~~ Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

~~(a)~~ The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

~~(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.~~

~~(ed)~~ Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ **may** be kept as shallow as possible and ~~should~~ **may** be such that the operation of the aircraft and vehicles is not compromised. "

response Noted

Comments will be addressed to under their individual CS reference.

comment 2111

comment by: Pau Pyrénées Airport - PUF/LFBP

It is appropriate to keep into CS only the following part: « The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway. »

The rest of the provision has to be transferred to « guidance material » GM.

All rules concerning slopes fall into the scope of good practices and not certification rules. It is more appropriate to have these rules into GM.

But the beginning of the (a) gives the main objective of these slopes and has to be kept.

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment

2524

comment by: AENA - Aeropuertos Españoles y Navegación Aérea

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B.

(b) Slopes ~~should~~ may be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

response

Not accepted

This is from ICAO design criteria; therefore, it will stay in CS.

CS-ADR – Book 2 – GM-ADR-DSN.D.285 – Strength of taxiways

p. 231

comment

2109

comment by: Pau Pyrénées Airport - PUF/LFBP

It is appropriate to keep into CS only the beginning of the article: « The strength of a taxiway should be suitable for the aircraft that the taxiway is intended to serve. »

The rest of the provision has to be transferred into « guidance material » GM by modifying the following part: "the fact that some portions of a taxiway ~~will~~ could be subjected..."

It is appropriate to delete the reference "Book 2 - Guidance Material for Aerodrom Design".

Provisions which are good practices and not normative references of Annex 14 must be placed in GM and not CS.

The use of "could" is more appropriate in GM than "will".

Referring to a « guidance material » (GM) in a Certification specification gives a superior regulatory value to the concerned GM, which is not wanted.

response

Accepted

The first sentence will be retained. The rest will be moved to GM.

CS-ADR – Book 2 – GM-ADR-DSN.D.290 – Surface of taxiways

p. 231

comment 1200 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2103 comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate to modify the (b) by taking the ICAO State letter 41: "The surface of a ~~paved~~ taxiway should be so constructed ~~or resurfaced~~ as to provide ~~good~~ suitable surface friction characteristics ~~when the taxiway is wet.~~"

The EASA has to anticipate the future revision of Annex 14 by integrating directly the changes of the ICAO State letter 41.

response *Accepted*

Paragraph (b) will be amended to reflect ICAO SL 41.

comment 2244 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR – Book 2 – GM-ADR-DSN.D.295 – Rapid exit taxiways

p. 231-232

comment 1209 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

Figure and article are already in CS-ADR-DSND.295: Please remove Figure GM-D-2 "Rapid exit taxiway" and paragraph (c).

response *Accepted*

comment 1693 comment by: ECA - European Cockpit Association

Add four paragraphs as follow:

((d) Runway exits should be provided for all runways in Codes 2, 3 and 4.

((e) To reduce runway occupancy, a number of runway exits should be provided suitable for the aircraft types using the aerodromes. The location of the exits should be determined using the "segmental method" as applied in normal operations.

(f)The surface of a runway exit should be constructed and be maintained so as to provide good friction characteristics when the surface is wet. The runway exits should be provided with adequate fillets.

Rapid exit taxiways should be constructed in such a way that crossing the runway via a rapid exit taxiway is not possible.

Justification:

Runway exits are particularly necessary where a high rate of runway movement is required. The advantage of runway exits is that less time is taken to turn off the runway, and **not** that it allows part of the landing run to be completed on it;

b) The "segmental method" mentioned involves dividing the landing distance into three segments, Segment 1 (Flare), Segment 2 (touchdown to the point of achieving full deceleration configuration) and Segment 3 (deceleration to end of landing roll-out using normal airline procedures). It is recommended that, for runway exit design purposes, specific exit speeds should not be stipulated; rather, it should be left to the pilot's discretion to decide at what speed the aircraft turns on to the exit.

Reference: IFALPA Annex 14, paragraphs 3.9.x; 3.9.y; 3.9.z; 3.9.xx; and 3.9.yy.

response *Not accepted*

(d) is not specifically for rapid exit taxiways.

(e) is an operational consideration.

(f) is covered elsewhere in the specifications.

Other comments are operational.

comment 2231 comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

Figure GM-D-2 Rapid exit taxiway and article (c) already in CS material, remove?

response *Accepted*

comment 2538 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

GM-ADR-DSN.D.295 — Rapid exit taxiways TXT

"(a) The following specifications detail requirements particular to rapid exit taxiways. See ~~Book 1~~, Figure ~~D-1~~ GM-D-2. General requirements for taxiways also apply to this type of taxiway. Guidance on the provision, location and

design of rapid exit taxiways is included in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(b) A rapid exit taxiway may be designed with a radius of turn-off curve of at least:

(1) 550 m where the code number is 3 or 4; and

(2) 275 m where the code number is 1 or 2; to enable exit speeds under wet conditions of:

(i) 93 km/h where the code number is 3 or 4; and

(ii) 65 km/h where the code number is 1 or 2.

(bc) The locations of rapid exit taxiways along a runway are based on several criteria described in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2), in addition to different speed criteria.

(ed) The intersection angle of a rapid exit taxiway with the runway ~~should~~ may not be greater than 45°, preferably be 30°, but lower angles may be suitable depending on the aerodrome layout and traffic mix."

Figure GM-D-2 Rapid exit taxiway

response *Not accepted*

This is from ICAO design criteria; therefore, it will stay in CS.

CS-ADR – Book 2 – Figure GM-D-2 Rapid exit taxiway

p. 232

comment

2234

comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

Figure GM-D-2 Rapid exit taxiway and article (c) already in CS material, remove?

response

Accepted

CS-ADR – Book 2 – GM-ADR-DSN.D.300 – Taxiways on bridges

p. 232

comment

2080

comment by: Pau Pyrénées Airport - PUF/LFBP

It is appropriate to transfer this provision to GM.

Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.

response

Not accepted

The specifications are the same as ICAO; therefore, they will stay in the CS.

CS-ADR – Book 2 – GM-ADR-DSN.D.305 – Taxiway shoulders

p. 232

comment	<p>1694 comment by: <i>ECA - European Cockpit Association</i></p> <p>Add the following paragraph: A taxiway shoulder should be prepared or constructed so as to be capable of supporting any aeroplane which the taxiway is intended to serve without incurring structural damage to the aeroplane in the event of it accidentally running off the taxiway.</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 3.10.x</p>
response	<i>Accepted</i>

comment	<p>2072 comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i></p> <p>It is appropriate to delete the (b)</p> <p>This provision is useless because it is more important to respect the objectives of minimal widths and shoulders.</p>
response	<p><i>Not accepted</i></p> <p>This is from ICAO design criteria.</p>

CS-ADR – Book 2 – GM-ADR-DSN.D.310 Taxiway Strip

p. 232

comment	<p>1695 comment by: <i>ECA - European Cockpit Association</i></p> <p>Add the following paragraph: A taxiway strip should be so prepared or constructed as to minimise hazards arising from differences in load bearing capacity to aeroplanes which the taxiway is intended to serve in the event of an aeroplane accidentally running off the taxiway.</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 3.11.x</p>
response	<i>Accepted</i>

comment	<p>1696</p> <p style="text-align: right;">comment by: <i>ECA - European Cockpit Association</i></p> <p>Add the following paragraph: Open drainage ditches shall not be located within the graded portion of the taxiway strip. Where drainage ditches are located at the edge of the graded area, they shall be covered in order to preclude structural damage in the event an aeroplane overruns the ditch.</p> <p>Justification: Reference: IFALPA Annex 14, paragraph 3.11.y</p>
response	<p><i>Noted</i></p> <p>This is covered by the CS for objects on the taxiway strip and grading of the taxiway strip.</p>

CS-ADR – Book 2 – GM-ADR-DSN.D.315 – Width of taxiway strips	p. 232
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comment	<p>1111 ❖</p> <p style="text-align: right;">comment by: <i>DGAC Direction Générale de l'aviation civile</i></p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • BIII - CS-ADR - Book 1 – CS-ADR-DSN.D.260 – Taxiway minimum separation distance (p25-26) • BIII - CS-ADR - Book 1 – CS-ADR-DSN.D.315 – Width of taxiway strips (p29) • BIII - CS-ADR - Book 1 - Figure D-1. Rapid exit taxiway (p28) • BIII - CS-ADR - Book 1 - CS-ADR-DSN.G.400 – Clearance distances on a de-icing/anti-icing pad (p35) • BIII - CS-ADR - Book 1 – CS-ADR-DSN.Q.840 – Objects to be marked and/or lighted (p146-147) • BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.260 – Taxiway minimum separation distance • BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.315 – Width of taxiway strips (p232) • BIII - CS-ADR - Book 2 - GM-ADR-DSN.G.400 – Clearance distances on a de-icing/anti-icing pad (p239) • BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.255 – Junction and intersection of taxiways • Explanatory Note – paragraph 18 (page 8) <p><u>2. Proposed text / comment</u></p> <p>The figures for taxiway minimum separation distances are intended for design purposes only and can be far less large than indicated: indeed, these figures are no more applied when maintaining taxiways and consequently no more relevant.</p> <p>No safety concern has been noticed until now on this point.</p> <p>But above all, verifying that the separation distances between taxiways are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de</p>
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Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured" (paragraph 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) either the certification specification gives only the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision, and the figures are in guidance material.
- (ii) or the figures are kept in the CS but specifying each time that they should be met "where practicable" and the CS gives the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision.

The option (i) is proposed by DGAC because less confusing and far clearer, and therefore more appropriate for a regulation and for future standardization. This is a critical point for DGAC.

All CSs referring to figures in table D-1 are to be changed consequently: their provisions corresponding to such distance should be move to GM, except for CS-ADR-DSN.Q.840 — *Objects to be marked and/or lighted* because the objective is marking and/or lighting thus is quite different and it is proposed to add the figures of table D-1 in this CS as Table Q-3 – *Taxiway minimum marking and/or lighting distances*.

This option (i) and the consequences on CS referring to table D-1 are detailed below:

CS-ADR-DSN.D.260 – Taxiway minimum separation distance

~~"The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be sufficient for safe aircraft operations, in particular to prevent from aircraft collision less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.~~

~~[...]~~

~~Table D-1. Taxiway minimum separation distances"~~

GM-ADR-DSN.D.260 – Taxiway minimum separation distance

"[...] (c) The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

[...]

Table GM-D-1. Taxiway minimum separation distances

(d) The separation distances of ~~Book 1~~, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

~~(d)~~(e) The separation distance between the centre line of an aircraft stand taxilane and an object shown in ~~Book 1~~, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous

conditions for ground servicing.”

CS-ADR-DSN.D.315 – Width of taxiway strips

“A taxiway strip should extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table ADR-D-1, column 11.”

GM-ADR-DSN.D.315 – Width of taxiway strips

“A taxiway strip may extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table GM-D-1, column 11.”

CS-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

~~“[...] (b) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.~~

~~(c) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)~~

~~Figure G-1 Minimum separation distance on a de-icing/anti-icing facility”~~

GM-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

“[...] (d) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.

(e) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)

Figure GM-G-1 Minimum separation distance on a de-icing/anti-icing facility”

CS-ADR-DSN.Q.840 – Objects to be marked and/or lighted p146

“[...] (g) All obstacles within the distance specified in Table D-1 Q-3, from the centre line of a taxiway, an apron taxiway or aircraft stand taxilane should be marked and, if the taxiway, apron taxiway or aircraft stand taxilane is used at night, lighted.

Table Q-3 – Taxiway minimum marking and/or lighting distances”

GM-ADR-DSN.D.255 – Junction and intersection of taxiways

(e) The separation distances of Book 1, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(f) The separation distance between the centre line of an aircraft stand taxilane and an object shown in Book 1, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing.”

response Not accepted

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment

1217

comment by: Federal Office of Civil Aviation, FOCA, Switzerland

response	<p>There is no content: Please remove title or provide content.</p> <p><i>Not accepted</i></p> <p>Numbering is for continuity. The words 'intentionally blank' will be inserted.</p>
comment	<p>2067 comment by: Pau Pyrénées Airport - PUF/LFBP</p> <p>It is appropriate to keep into CS only the beginning of the article: « A taxiway strip should extend symmetrically on each side of the centre line of the taxiway. »</p> <p>The rest of the provision has to be transferred to « guidance material » GM.</p> <p>Being only good practices and not normative references of the Annex 14, these provisions have to be put into GM and not CS.</p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>
comment	<p>2219 comment by: Airport St. Gallen-Altenrhein - ACH/LSZR</p> <p>titles should be removed</p>
response	<p><i>Not accepted</i></p> <p>Numbering is for continuity. The words 'intentionally blank' will be inserted.</p>
comment	<p>2551 comment by: AENA - Aeropuertos Españoles y Navegación Aérea</p> <p>GM-ADR-DSN.D.315 – Width of taxiway strips <i>"A taxiway strip may extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table GM-D-1, column 11."</i></p>
response	<p><i>Not accepted</i></p> <p>The specifications are the same as ICAO; therefore, they will stay in the CS.</p>

comment	1219	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	There is no content: Please remove title or provide content.	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	
comment	2066	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>
	It is appropriate to delete this article	
	The provisions of this article are already in CS-ADR-DSN.T.915.	
response	<i>Not accepted</i>	
	CS D.320 relates to objects on the taxiway strip. CS T.915 relates to equipment and installations on operational areas. The wording is taken from the respective ICAO source.	
comment	2220	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

CS-ADR – Book 2 – GM-ADR-DSN.D.325 – Grading of taxiway strips

p. 233

comment	1126 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<u>1. Affected paragraphs</u>	
	<ul style="list-style-type: none"> • BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.325 — Grading of taxiway strips (p29) • BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.325 — Grading of taxiway strips (p233) 	
	<u>2. Justification and proposed text / comment</u>	
	This comment is critical.	
	This ICAO recommendation in Annex 14 Volume 1 is not binding in France where it is more good practices.	

These figures are not verified during audits as no safety concern has been noticed on this point until now. Systematically verifying that these figures are met, as required to deliver a certificate, will generate huge costs without any identified safety value.

Moreover, there is no possibility of proposing an ELOS since there is no identified purpose.

DGAC proposes to move the whole CS to guidance material:

CS-ADR-DSN.D.325 – Grading of taxiway strips

~~"(a) The centre portion of a taxiway strip should provide a graded area to a distance from the centre line of the taxiway of at least:~~

~~(1) 11 m where the code letter is A;~~

~~(2) 12.5 m where the code letter is B or C;~~

~~(3) 19 m where the code letter is D;~~

~~(4) 22 m where the code letter is E; and~~

~~(5) 30 m where the code letter is F."~~

GM-ADR-DSN.D.325 – Grading of taxiway strips

"The centre portion of a taxiway strip may provide a graded area to a distance from the centre line of the taxiway of at least:

(1) 11 m where the code letter is A;

(2) 12.5 m where the code letter is B or C;

(3) 19 m where the code letter is D;

(4) 22 m where the code letter is E; and

(5) 30 m where the code letter is F."

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment 1221 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2064 comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate to transfer this provision into GM.

Being only good practices and not normative references of the Annex 14, these provisions have to be put in GM and not in CS.

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment	2216	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	
comment	2539	comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	<p>GM-ADR-DSN.D.325 – Grading of taxiway strips</p> <p><i>"The centre portion of a taxiway strip may provide a graded area to a distance from the centre line of the taxiway of at least:</i></p> <p><i>(1) 11 m where the code letter is A;</i></p> <p><i>(2) 12.5 m where the code letter is B or C;</i></p> <p><i>(3) 19 m where the code letter is D;</i></p> <p><i>(4) 22 m where the code letter is E; and</i></p> <p><i>(5) 30 m where the code letter is F."</i></p>	
response	<i>Not accepted</i>	
	The specifications are the same as ICAO; therefore, they will stay in the CS.	

CS-ADR – Book 2 – GM-ADR-DSN.D.330 – Slopes on taxiway strips
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p. 233

comment	843 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN.B.060 – Longitudinal slopes of runway (p13) • CS-ADR - Book 1 - CS-ADR-DSN.B.065 – Longitudinal slope changes on runways (p13) • CS-ADR - Book 1 - CS-ADR-DSN.B.070 – Sight distance for slopes on runways (p14) • CS-ADR - Book 1 - CS-ADR-DSN.B.080 – Transverse slopes (p14) • CS-ADR - Book 1 - CS-ADR-DSN.B.100 – Slopes on runway turn pads (p16) • CS-ADR - Book 1 - CS-ADR-DSN.B.130 – Slopes on runway shoulders (p17) • CS-ADR - Book 1 - CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips (p19) • CS-ADR - Book 1 - CS-ADR-DSN.B.185 – Transverse Slopes on runway strips (p19-20) • CS-ADR - Book 1 - CS-ADR-DSN.B.195 – Clearways (p20-21) • CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22) 	

- CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
- CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
- CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
- CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
- CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
- CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
- CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
- CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
- CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
- CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
- CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
- CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
- CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
- CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observed at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and*
- (3) 2 % where the code number is 1 or 2.*

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid

contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. ~~Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft.~~ For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, ~~are should be~~ designed so that they will correspond to the characteristics needed for such type of approach."

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

- (1) 1.5 % where the code number is 3 or 4; and
- (2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

- (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
- (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
- (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action."

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the~~

~~runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

~~“(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage.”~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

~~“The transverse slope may be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.~~

~~The transverse slope should may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage.”~~

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

~~“The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface.”~~

GM-ADR-DSN.B.100 – Slopes on runway turn pads

~~“The slopes are the same as those on the adjacent runway pavement surface.~~

~~Slopes should be are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft.”~~

*** Slopes on runway shoulders**

CS-ADR-DSN.B.130 – Slopes on runway shoulders

~~“The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %.”~~

GM-ADR-DSN.B.130 – Slopes on runway shoulders

~~“The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %.”~~

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.180 – Longitudinal Slopes on runway strips**

~~"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:~~

- ~~(1) 1.5 % where the code number is 4;~~
- ~~(2) 1.75 % where the code number is 3; and~~
- ~~(3) 2 % where the code number is 1 or 2.~~

~~(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."~~

GM-ADR-DSN.B.180 – Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;
- (2) 1.75 % where the code number is 3; and
- (3) 2 % where the code number is 1 or 2."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.185 – Transverse Slopes on runway strips**

~~"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:~~

- ~~(1) 2.5 % where the code number is 3 or 4; and~~
- ~~(2) 3 % where the code number is 1 or 2;~~

~~except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.~~

~~(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."~~

GM-ADR-DSN.B.185 – Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and
- (2) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

~~The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:~~

- ~~(1) is perpendicular to the vertical plane containing the runway centre line; and~~
- ~~(2) passes through a point located on the runway centre line at the end of the take-off run available.~~

~~[...]"~~

GM-ADR-DSN.B.195 Clearways

"[...]

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:
 (1) is perpendicular to the vertical plane containing the runway centre line; and
 (2) passes through a point located on the runway centre line at the end of the take-off run available.

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas****CS-ADR-DSN.C.230 - Slopes on runway end safety areas**

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

~~(2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.~~

(b) Transverse slopes

~~(1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable."~~

~~CS-GM-ADR-DSN.C.230~~ – Slopes on runway end safety areas

~~"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~

~~(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %~~

~~(c) Where clearway is provided, the slope on the REASA ~~should~~ can be amended accordingly."~~

*** Longitudinal slopes on taxiways****CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways**

~~(a) The longitudinal slope of a taxiway should not exceed:~~

~~(1) 1.5 % where the code letter is C, D, E or F; and~~

~~(2) 3 % where the code letter is A or B.~~

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

" The longitudinal slope of a taxiway may not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways****CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways**

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code~~

letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways**

CS-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 2 % where the code letter is A or B."

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of

surface water (or possible fluid contaminant) but may not exceed:

- (1) 1.5 % where the code letter is C, D, E or F; and
- (2) 2 % where the code letter is A or B.

(b) Slopes ~~should~~ **may** be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

~~"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:~~

- ~~(1) 2.5 % for strips where the code letter is C, D, E or F; and~~
- ~~(2) 3 % for strips of taxiways where the code letter is A or B;~~

~~the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.~~

~~(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."~~

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

- (1) 2.5 % for strips where the code letter is C, D, E or F; and
- (2) 3 % for strips of taxiways where the code letter is A or B;

the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.

(b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

~~"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.~~

~~(b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."~~

GM-ADR-DSN.E.360 – Slopes on aprons —and GM

"(a) The design of slopes ~~should~~ **may** direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ **may** be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service

road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ *may* be kept as shallow as possible and ~~should~~ *may* be such that the operation of the aircraft and vehicles is not compromised. "

response *Noted*

Comments will be addressed to under their individual CS reference.

comment 1222 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2063 comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate to transfer this provision into GM

All the rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment 2218 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2525 comment by: *AENA - Aeropuertos Españoles y Navegación Aérea*

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:

(1) 2.5 % for strips where the code letter is C, D, E or F; and
 (2) 3 % for strips of taxiways where the code letter is A or B;
 the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

CS-ADR – Book 2 – GM-ADR-DSN.D.335 – Holding Bays, runway-holding positions, intermediate holding positions and road-holding positions

p. 233

comment 108

comment by: *Manchester Airport plc*

(c) Where Holding Bays are provided and intended to enable aircraft to manoeuvre around each other, ground markings and AGL should provide clear and unambiguous surface movement guidance to pilots. Markings and AGL should indicate the correct path to follow and the correct location to hold at in order than the required clearances can be maintained between one aircraft and another. These clearances should be in accordance with CS-ADR-DSN.D.260.

response *Noted*

These are operational considerations.

comment 534

comment by: *East Midlands Airport - EMA/EGNX*

(c) Where Holding Bays are provided and intended to enable aircraft to manoeuvre around each other, ground markings and AGL should provide clear and unambiguous surface movement guidance to pilots. Markings and AGL should indicate the correct path to follow and the correct location to hold at in order than the required clearances can be maintained between one aircraft and another. These clearances should be in accordance with CS-ADR-DSN.D.260.

response *Noted*

These are operational considerations.

CS-ADR – Book 2 – GM-ADR-DSN.D.340 – Location of holding Bays, runway-holding positions, intermediate holding positions and road-

p. 233-234

holding positions

comment 1129

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- BIII - CS-ADR - Book 1 - GM-ADR-DSN.D.340 — Location of holding Bays, runway-holding positions, intermediate holding positions and road-holding positions (p233-234)

2. Justification and proposed text / comment

Incursions are an important safety issue.

To prevent incursions, one of the possible relevant actions is, when designing an aerodrome, to determine holding points taking into account the fact that pilots and vehicle drivers should be able, when enabled by good meteorological conditions, to see an aircraft aligned on the runway, or in a final approach.

It is proposed to add 2 sub paragraphs, in GM-ADR-DSN.D.340, to deal with that.

GM-ADR-DSN.D.340 — Location of holding Bays, runway-holding positions, intermediate holding positions and road-holding positions

(a) Care will be taken so that propeller wash and jet blast from holding aircraft do not interfere with aircraft operations, cause damage to vehicles or injure people.

[...]

(h) An aircraft taxiing could also endanger aircraft operation, when the aircraft is too close to other taxiing aircraft. For this, separation distances or margins between taxiing aircraft or taxiways will be considered.

(i) When designing an aerodrome, and to prevent incursions, the determination of the location of holding points takes into account the fact that pilots and vehicle drivers should be able, when enabled by good meteorological conditions, to see an aircraft aligned on the runway, or in a final approach.

(j)

[...]"

response Noted

Not Agreed: The specifications are the same as ICAO; therefore, they will stay in the CS.

Noted: For completeness of the CS, the relevant information is retained in the same place. (d) is already covered by (b).

comment 1769

comment by: UK CAA

Page No: 234**Paragraph No:** GM.ADR.DSN.D.340 (d)

Comment: This guidance material contains a requirement that is not contained in the CS as the GM includes references to the infringement of the approach and take-off surfaces. The paragraph should be deleted.

Justification: This is not consistent with the applicable CS. Many aerodromes have holding points situated within the approach surface (whenever the runway threshold is displaced by more than 60m) without adverse effect on safety.

Proposed Text: New paragraph (d): "For all runways, it will be verified that the distance between a holding bay, runway holding position established at a taxiway/runway intersection or road-holding position and the centre line of a runway is so that a holding aircraft or vehicle will not:

- a) cause interference with navigation aids;
- b) penetrate the obstacle free zone."

response *Not accepted*

GM paragraph (d) covers the need to not infringe the approach and take-off climb surface.
The proposed text for GM paragraph (d) is covered in the CS text, paragraph (a) (not interfere with the operation of radio navigation aids) and in the CS Table D-2 notes.

comment

1770

comment by: UK CAA

Page No: 234

Paragraph No: GM.ADR.DSN.D.340 (f)

Comment: This guidance does not make sense as currently written. The paragraph should be rewritten or deleted.

Justification: The meaning of the current text is not understood.

response *Accepted*

GM D.340(f) will be deleted.

comment

2061

comment by: Pau Pyrénées Airport - PUF/LFBP

(b) It is appropriate to transfer this provision into GM

Table D-2

- It is appropriate to transfer the note 3 to GM.
- (b) It is appropriate to transfer to GM the following part: « Information on critical and sensitive areas of ILS and MLS is contained in Annex 10, Volume I, Attachements C and G, respectively » which only relates to GM.
- It is appropriate to add a (d): "Elevation of the aerodrome should be taken into account for possible increase of the values indicated in this table."

What we propose to place into GM are much good practices than normative rules or give explanations.

response *Noted*

Not Agreed: The specifications are the same as ICAO; therefore, they will stay in the CS.

Noted: Table D-2. Paragraph (b) will be deleted (reference to ICAO). For completeness of the CS, the relevant information is retained in the same place. (d) is already covered by (b).

CS-ADR – Book 2 – GM-ADR-DSN.E.350 Size of aprons 3.13.2

p. 235

comment 1697 comment by: *ECA - European Cockpit Association*

Paragraphs (c) & (d) lack the reference to the numeral for the ICAO document (Doc 9157).

Justification:
Text clarification.

response *Accepted*

comment 2973 comment by: *AIRBUS*

(c) cargo loading / unloading should also be considered

response *Noted*

CS-ADR – Book 2 – GM-ADR-DSN.E.360 – Slopes on aprons – and GM

p. 236

comment 843 ❖ comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.B.060 — Longitudinal slopes of runway (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.065 — Longitudinal slope changes on runways (p13)
- CS-ADR - Book 1 - CS-ADR-DSN.B.070 — Sight distance for slopes on

- runways (p14)
- CS-ADR - Book 1 - CS-ADR-DSN.B.080 — Transverse slopes (p14)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.100 — Slopes on runway turn pads (p16)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.130 — Slopes on runway shoulders (p17)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p19)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.185 — Transverse Slopes on runway strips (p19-20)
 - CS-ADR - Book 1 - CS-ADR-DSN.B.195 — Clearways (p20-21)
 - CS-ADR - Book 1 - CS-ADR-DSN.C.230 - Slopes on runway end safety areas (p22)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.270 — Longitudinal slope changes on taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.275 — Sight distance of taxiways (p26)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.280 — Transverse slopes on taxiways (p26-27)
 - CS-ADR - Book 1 - CS-ADR-DSN.D.330 — Slopes on taxiway strips (p29-30)
 - CS-ADR - Book 1 - CS-ADR-DSN-E.360(b) — Slopes on aprons (p32)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.060 — Longitudinal slopes on runways (p212 - 213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.065 — Longitudinal slopes changes on runways (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.070 — Sight distance (p213)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.080 — Transverse slopes on runways (p214)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.100 — Slopes on runway turn pads (p217)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.130 — Slopes on runway shoulders (p218)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.B.185 — Transverse Slopes on runway strips (p220)
 - CS-ADR - Book 2 - GM-ADR-DSN.C.230 — Slopes on runway end safety areas (p228)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.265 — Longitudinal slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.270 — Longitudinal slope changes on taxiways ICAO (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.275 — Sight distance of taxiways (p231)
 - CS-ADR - Book 2 - Book 2 - GM-ADR-DSN.D.280 — Transverse slopes on taxiways (p231)
 - CS-ADR - Book 2 - GM-ADR-DSN.D.330 — Slopes on taxiway strips (p233)
 - CS-ADR - Book 2 - GM-ADR-DSN.E.360 — Slopes on aprons - and GM (p236)

2. Justification and proposed text / comment

This comment is linked to comment XXX ("No CS but GM") and is critical.

(See comments 1087 in book I and 839 in book II)

The values of slopes on infrastructures (such as runways, taxiways, strips, aprons) are intended for design purposes only: indeed, these values are no more applied when maintaining the runway or taxiway pavement, and consequently no more relevant.

Moreover, no safety concern has been noticed until now on this point and, in some cases, higher slopes can be needed to fulfil the drainage and prevention of accumulation of water objective without impacting adversely the safety of operations of aeroplanes.

Slopes values can not be verified so precisely and verifying that the slopes are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured". (para 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) or the certification specification gives only the objective of limiting slopes on pavements, e.g. prevent accumulation of water and provide sufficient drainage, and the values of slopes that may be observe at the design of the aerodrome are moved to guidance material.
- (ii) or the certification specifications gives the objective of limiting slopes on pavements, which are often given in guidance materials in this NPA, and the values are given specifying each time that they should be met "where practicable".

The option (i) is proposed by DGAC because less confusing and more clear, and consequently more appropriate for a regulation and for future standardisation. This option is detailed below for each CS and GM associated.

For longitudinal slopes on runways, there are less problems, it is consequently agreed to keep the figures in the CS, but to move the objective from GM to CS to enable ELOS.

For RESA, it is not appropriate to have only the value of the slope in the CS, as the slope can be higher but part of a system (ex : an arresting system) intended to stop an aeroplane overrunning, and consequently help to achieve the objective of a RESA: is proposed to delete the numeric values from the CS and put them in GM. Moreover, there is a mistake in GM-ADR-DSN.C.230 (p228: which is codified as a CS).

Consequently, DGAC France proposal on the specifications listed above is the following:

*** Longitudinal slopes on runways**

CS-ADR-DSN.B.060 – Longitudinal slopes of runway

"(a) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:

- (1) 1 % where the code number is 3 or 4; and*
- (2) 2 % where the code number is 1 or 2.*

(b) Along no portion of a runway should the longitudinal slope exceed:

- (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway the longitudinal slope should not exceed 0.8 %;*
- (2) 1.5 % where the code number is 3, except that for the first and last quarter*

of the length of a precision approach runway category II or III the longitudinal slope should not exceed 0.8 %; and

(3) 2 % where the code number is 1 or 2.

(c) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant)."

GM-ADR-DSN.B.060 – Longitudinal slopes on runways

~~"The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are should be designed so that they will correspond to the characteristics needed for such type of approach."~~

*** Longitudinal slope changes on runways**

CS-ADR-DSN.B.065 – Longitudinal slope changes on runways

"(a) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:

(1) 1.5 % where the code number is 3 or 4; and

(2) 2 % where the code number is 1 or 2.

(b) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:

(1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;

(2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and

(3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(c) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane."

GM-ADR-DSN.B.065 – Longitudinal slopes changes on runways

~~"(a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways, where aircraft move at high speeds.~~

(b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they will correspond to the characteristics needed for such type of approach."

*** Sight distance for slopes on runways**

CS-ADR-DSN.B.070 – Sight distance for slopes on runways

"(a) Where slope changes on runways cannot be avoided, they should be such that there will be an unobstructed line of sight from:

(1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;

(2) any point 2 m above a runway to all other points 2 m above the runway

within a distance of at least half the length of the runway where the code letter is B; and

(3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(b) Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. "

GM-ADR-DSN.B.070 – Sight distance

~~"Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action. »~~

*** Transverse slopes on runways**

CS-ADR-DSN.B.080 – Transverse slopes

~~"(a) To promote the most rapid drainage of water and to prevent the accumulation of water (or possible fluid contaminant) on the surface, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:~~

~~(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and~~

~~(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.~~

~~(b) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.~~

~~(c) The transverse slope should be the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."~~

GM-ADR-DSN.B.080 – Transverse slopes on runways

"The transverse slope may be:

(1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and

(2) not less than 1 % and not more than 2 % where the code letter is A or B; except at runway or taxiway intersections where flatter slopes may be necessary.

For a cambered surface, the transverse slope on each side of the centre line may be symmetrical.

The transverse slope ~~should~~ may be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage."

*** Slopes on runway turn pads**

CS-ADR-DSN.B.100 Slopes on runway turn pads

"The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface."

GM-ADR-DSN.B.100 — Slopes on runway turn pads

"The slopes are the same as those on the adjacent runway pavement surface. Slopes ~~should be~~ are so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on runway shoulders****CS-ADR-DSN.B.130 — Slopes on runway shoulders**

"The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %."

GM-ADR-DSN.B.130 — Slopes on runway shoulders

"The surface of the paved shoulder that abuts the runway is flush with the surface of the runway and its transverse slope does not exceed 2.5 %."

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.180 — Longitudinal Slopes on runway strips**

"(a) A longitudinal slope along that portion of a strip to be graded should not exceed:

- (1) 1.5 % where the code number is 4;*
- (2) 1.75 % where the code number is 3; and*
- (3) 2 % where the code number is 1 or 2.*

(b) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided."

GM-ADR-DSN.B.180 — Longitudinal Slopes on runway strips

"A longitudinal slope along that portion of a strip to be graded may not exceed:

- (1) 1.5 % where the code number is 4;*
- (2) 1.75 % where the code number is 3; and*
- (3) 2 % where the code number is 1 or 2."*

*** Transverse Slopes on runway strips****CS-ADR-DSN.B.185 — Transverse Slopes on runway strips**

"(a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:

- (1) 2.5 % where the code number is 3 or 4; and*
- (2) 3 % where the code number is 1 or 2;*

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway."

GM-ADR-DSN.B.185 — Transverse Slopes on runway strips

"(a) Transverse slopes on that portion of a strip to be graded may not exceed:

- (1) 2.5 % where the code number is 3 or 4; and*
- (2) 3 % where the code number is 1 or 2;*

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge may be negative as measured in the direction away from the runway and may be as great as 5 %.

(b) The transverse slopes of any portion of a strip beyond that to be graded may not exceed an upward slope of 5 % as measured in the direction away from the runway."

*** Slopes on clearways****CS-ADR-DSN.C.195 - Slopes on clearways**

"[...] (e) Slopes on clearways:

Slopes on clearways should be appropriate to meet the objective of a clearway which is detailed in its definition.

The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

*(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.*

[...]"

GM-ADR-DSN.B.195 Clearways

"[...]"

(b) The ground in a clearway may not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:

*(1) is perpendicular to the vertical plane containing the runway centre line; and
(2) passes through a point located on the runway centre line at the end of the take-off run available.*

Because of transverse or longitudinal slopes on a runway, shoulder or strip, in certain cases the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder or strip. [...]"

*** Slopes on runway end safety areas****CS-ADR-DSN.C.230 - Slopes on runway end safety areas**

"(a) Longitudinal slopes

(1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

(2) ~~The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.~~ Longitudinal slope changes should be as gradual as practicable and abrupt changes or sudden reversals of slopes should be avoided.

(b) Transverse slopes

(1) ~~The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %.~~ Transitions between differing slopes should be as gradual as practicable."

CS-GM-ADR-DSN.C.230 – Slopes on runway end safety areas

"(a) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %.

(b) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %

*(c) Where clearway is provided, the slope on the REASA ~~should~~ **can** be amended accordingly."*

*** Longitudinal slopes on taxiways****CS-ADR-DSN.D.265 – Longitudinal slopes on taxiways**

(a) ~~The longitudinal slope of a taxiway should not exceed:~~

(1) 1.5 % where the code letter is C, D, E or F; and

(2) 3 % where the code letter is A or B.

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

GM-ADR-DSN.D.265 – Longitudinal slopes on taxiways

"The longitudinal slope of a taxiway may not exceed:

- (1) 1.5 % where the code letter is C, D, E or F; and
- (2) 3 % where the code letter is A or B."

*** Longitudinal slope changes on taxiways****CS-ADR-DSN.D.270 – Longitudinal slope changes on taxiways**

~~"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:~~

~~(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and~~

~~(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.~~

~~(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."~~

GM-ADR-DSN.D.270 – Longitudinal slope changes on taxiways

"(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface with a rate of change not exceeding:

(1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E or F; and

(2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.

(b) Where slope changes in (a)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope may be accomplished by a curved surface which will allow the safe operation of all aircraft in all weather conditions."

*** Sight distance of taxiways****CS-ADR-DSN.D.275 – Sight distance of taxiways**

~~"(a) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:~~

~~(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;~~

~~(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and~~

~~(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point, where the code letter is A."~~

GM-ADR-DSN.D.275 – Sight distance of taxiways

"(a) Where a change in slope on a taxiway cannot be avoided, the change may be such that, from any point:

(1) 3 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point, where the code letter is C, D, E or F;

(2) 2 m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point, where the code letter is B; and

(3) 1.5 m above the taxiway, it will be possible to see the whole surface of the

taxiway for a distance of at least 150 m from that point, where the code letter is A."

*** Transverse slopes on taxiways**

CS-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway, but should not exceed:
 (1) 1.5 % where the code letter is C, D, E or F; and
 (2) 2 % where the code letter is A or B."

GM-ADR-DSN.D.280 – Transverse slopes on taxiways

"(a) The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant) but may not exceed:
 (1) 1.5 % where the code letter is C, D, E or F; and
 (2) 2 % where the code letter is A or B.
 (b) Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft."

*** Slopes on taxiway strips**

CS-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip should be flush at the edge of the taxiway or shoulder, if provided, and the graded portion should not have an upward transverse slope exceeding:
 (1) 2.5 % for strips where the code letter is C, D, E or F; and
 (2) 3 % for strips of taxiways where the code letter is A or B;
 the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

GM-ADR-DSN.D.330 – Slopes on taxiway strips

"(a) The surface of the strip may be flush at the edge of the taxiway or shoulder, if provided, and the graded portion may not have an upward transverse slope exceeding:
 (1) 2.5 % for strips where the code letter is C, D, E or F; and
 (2) 3 % for strips of taxiways where the code letter is A or B;
 the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope may not exceed 5 % measured with reference to the horizontal.
 (b) The transverse slopes on any portion of a taxiway strip beyond that to be graded may not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway."

*** Slopes on aprons**

CS-ADR-DSN.E.360 Slopes on aprons

"(a) Slopes on an apron should be sufficient to prevent accumulation of water (or possible fluid contaminant) on the surface of the apron but should be kept to the minimum required to facilitate effective drainage and to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.
 (b) On an aircraft stand the maximum slope should not exceed 1 % in any direction."

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

"(a) The design of slopes ~~should~~ may direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ may be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ may be kept as shallow as possible and ~~should~~ may be such that the operation of the aircraft and vehicles is not compromised. "

response Noted

Comments will be addressed to under their individual CS reference.

comment 2060

comment by: Pau Pyrénées Airport - PUF/LFBP

(b) It is appropriate to transfer this provision into GM

All rules concerning slopes fall into the scope of good practices and not certification. It is more appropriate to have these rules into GM.

response Not accepted

The specifications are the same as ICAO; therefore, they will stay in the CS.

comment 2526

comment by: AENA - Aeropuertos Españoles y Navegación Aérea

GM-ADR-DSN.E.360 — Slopes on aprons —and GM

"(a) The design of slopes ~~should~~ may direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures ~~should~~ may be taken to reduce the fire hazard resulting from fuel spillage.

(b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, will specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise

the manoeuvrability of the airplane or of the push-back device.

(c) On an aircraft stand the maximum slope may not exceed 1 % in any direction.

(ed) Where the slope limitation of 1% on the stands cannot be achieved, the slope ~~should~~ may be kept as shallow as possible and ~~should~~ may be such that the operation of the aircraft and vehicles is not compromised. "

response *Not accepted*

The specifications are the same as ICAO; therefore, they will stay in the CS.

CS-ADR – Book 2 – GM-ADR-DSN.E.365 – Clearance distances on aircraft stands

p. 236

comment 109

comment by: *Manchester Airport plc*

(b) (4) The dimension of 5.0 metres is not consistent with the dimensions given at CS-ADR-DSN.E.365.

response *Accepted*

The GM figure of 5.0 metres will be amended to read 4.5 metres.

comment 249

comment by: *Brussels Airport - BRU/EBBR*

GM-ADR-DSN.E.365 (a)

Text to be added : "and stopping guidance"

The text should be lined-up with the CS on Visual docking guidance systems : CS-ADR-DSN.M.755(b)(1) "The system should provide both azimuth and stopping guidance."

So the text in GM-ADR-DSN.E.365 (a) should read : "For code letters D, E and F reduced separation at the gate is possible where both azimuth and stopping guidance by a visual docking guidance system is provided, ..."

Stopping guidance is important, since not all aircraft stands are perpendicular to the airport terminal building, or not all aircraft stands are exactly parallel to each other. In these cases the stop position is also important, not the azimuth only, in determining the clearance distances on aircraft stands.

response *Accepted*

The CS M.755 text will be reviewed.

comment	<p>250 comment by: <i>Brussels Airport - BRU/EBBR</i></p> <p>GM-ADR-DSN.E.365 (a)(2)</p> <p>Text to be removed.</p> <p>The “apron stand in lights” are unknown to Annex 14, nor in this NPA they are mentioned in any other point. So I suggest to remove this text, or to clearly define what is meant by apron stand in lights.</p>
response	<p><i>Accepted</i></p> <p>Text will be deleted.</p>
comment	<p>251 comment by: <i>Brussels Airport - BRU/EBBR</i></p> <p>GM-ADR-DSN.E.365 (b)(2)</p> <p>Incorrect reference.</p> <p>The reference mentioned, is the one to the corresponding Annex 14 chapter 6. To be consistent, it should refer to the subject as described in this NPA, so reference should be made to CS-ADR-DSN Chapter Q Visual Aids For Denoting Obstacles.</p>
response	<p><i>Accepted</i></p>
comment	<p>252 comment by: <i>Brussels Airport - BRU/EBBR</i></p> <p>GM-ADR-DSN.E.365 (b)(4)</p> <p>‘Ambiguity’ between GM-ADR-DSN.E.365 (b)(4) & CS-ADR-DSN.E.365(b)</p> <p>Only in the CS it is mentioned that clearance distances on stands can be reduced, <u>for code letters D, E & F</u>. The corresponding GM, does not mention these code letters. It would be more clear if these code letters should also be mentioned in the corresponding GM.</p> <p>When reading GM-ADR-DSN.E.365 (b)(4), one might think that it is not a reduction of the clearance distance, but an increase, for code letters A,B,C.</p>
response	<p><i>Noted</i></p>

comment	<p>253 comment by: <i>Brussels Airport - BRU/EBBR</i></p>
	<p>GM-ADR-DSN.E.365 (b)(4)</p> <p>Interpretation of the text</p> <p>The sentence, the way it is written in GM-ADR-DSN.E.365 (b)(4), may be interpreted as, if a stand is equipped with a visual docking guidance system, separation at the gate, may be reduced. In case the, on the stand installed, VDGS is defective or unserviceable, one might think that the reduced separation is still allowed, since the aircraft stand is (still) equipped with a VDGS.</p> <p>The guidance given by the VDGS is of importance, because that is the actual mitigating measure. A defective VDGS, not providing good guidance, is of no use, and should not be used as a reason for reducing the clearance distance.</p> <p>Therefore I suggest to change the sentence under GM-ADR-DSN.E.365 (b)(4) as follows : "An aircraft stand where both azimuth and stopping guidance by visual docking guidance system is being provided during docking of an aircraft code letter D, E or F should provide the minimum clearance of 5.0 metres between an aircraft using the stand and any adjacent building, aircraft and another stand or other objects."</p>
response	<p><i>Noted</i></p> <p>Text will be reviewed.</p>
comment	<p>543 comment by: <i>East Midlands Airport - EMA/EGNX</i></p>
	<p>b) (4) The dimension of 5.0 metres is not consistent with the dimensions given at CS-ADR-DSN.E.365.</p> <p>No provision detailed for aircraft under marshall guidance</p>
response	<p><i>Partially accepted</i></p> <p>The GM figure of 5.0 metres will be amended to read 4.5 metres. The provision of marshaller guidance is an operational consideration.</p>
comment	<p>844 comment by: <i>Brussels Airport</i></p>
	<p>GM-ADR-DSN.E.365 (a)(2)</p> <p>Text to be removed.</p> <p>The "apron stand in lights" are unknown to Annex 14, nor in this NPA they are mentioned in any other point.</p> <p>So we suggest to remove this text, or to clearly define what is meant by apron stand in lights.</p>

response *Accepted*

Text will be deleted.

comment 1104 comment by: *Belgian CAA*

It is unclear what is meant by "apron stand in lights".

response *Accepted*

Text will be deleted.

comment 1131 ❖ comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.E.365 Clearance distances on aircraft stands (p32-33)
- CS-ADR - Book 2 – GM-ADR-DSN.E.365 – Clearance distances on aircraft stands (p236)

2. Proposed text / comment

This comment is linked to comment on some ICAO recommendations that should not be put in CS.

(See comments n° 1087 in book I and 839 in book II)

Flexibility is needed for aircraft stands on apron. These specifications should be in GM to allow having adaptable stands; in particular two stands for small aircraft can be located on the same place as one stand for a bigger aircraft.

Besides, these specifications are only recommended by Annex 14 Volume 1.

Two possibilities could be chosen:

- (i) either the certification specification gives only the objective of providing sufficient clearance between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects, in particular to prevent from collisions, and the figures are move to guidance material.
- (ii) or the figures are kept in the CS but specifying each time that they should be met "*where practicable*" and the CS gives the objective of providing sufficient clearance between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects, in particular to prevent from collisions.

The option (i) is proposed by DGAC because less confusing and far clearer, and therefore more appropriate for a regulation and for future standardization. A study has in any ways to be provided to demonstrate safety is not compromised.

DGAC proposes to move parts of the CS to guidance material:

CS-ADR-DSN.E.365 Clearance distances on aircraft stands

"(a) An aircraft stand should provide ~~the following minimum~~ **sufficient**

clearances between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects, in particular to prevent from collision.†

Code Letter Clearance

A 3 m

B 3 m

C 4.5 m

D 7.5 m

E 7.5 m

F 7.5 m

~~(b) The minimum clearance distance for code letters D, E and F can be reduced:~~

~~(1) for height limited objects,~~

~~(2) if the stand is restricted for aircraft with specific characteristics,~~

~~(3) in the following locations (for aircraft using a taxi-in, push-back procedure only):~~

~~(i) between the terminal (including passenger loading bridges) and the nose of an aircraft; and~~

~~(ii) over a portion of the stand provided with azimuth guidance by a visual docking guidance system."~~

GM-ADR-DSN.E.365 – Clearance distances on aircraft stands

"(a) An aircraft stand may provide the following minimum clearances between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects:

Code Letter Clearance

A 3 m

B 3 m

C 4.5 m

D 7.5 m

E 7.5 m

F 7.5 m

(b) The minimum clearance distance for code letters D, E and F can be reduced:

(1) for height limited objects,

(2) if the stand is restricted for aircraft with specific characteristics,

(3) in the following locations (for aircraft using a taxi-in, push-back procedure only):

(i) between the terminal (including passenger loading bridges) and the nose of an aircraft; and

(ii) over a portion of the stand provided with azimuth guidance by a visual docking guidance system.

(ac) Reduced separation at the gate is possible where azimuth guidance by a visual docking guidance system is provided, in combination with additional mitigation measures, such as:

(1) good condition of marking and signage;

(2) apron stand in lights;

(3) maintenance of visual docking systems.

(bd) Reduced Clearance Distances on Aircraft Stands:

(1) On aircraft stands where reduced clearance distances exist, guidance by visual docking guidance system ~~should~~ **may** be provided.

(2) All objects for which reduced clearances apply ~~should~~ **may** be properly marked or lighted (ICAO Annex 14, chapter 6).

(3) Aircraft stands where reduced clearance distances apply ~~should~~ **may** be identified and the information published in the AIP.

(4) An aircraft stand equipped with a visual docking guidance system ~~should~~

may provide the minimum clearance of 5.0 metres between an aircraft using the stand and any adjacent building, aircraft on another stand or other objects. (ee) The clearance distance between an aircraft on a stand provided with azimuth guidance by visual docking guidance system and an object or edge of service road may further be reduced subject to local circumstances provided that the object (e.g. blast fence) does not exceed a height of 3.0 metres above the surface of the relative aircraft stand."

response *Not accepted*

The clearances are derived from ICAO. (b) is retained to allow flexibility.

comment 1224 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

Title is not consistent with the text: The text deals with reduced separation and clearances, whereas the title only talks about clearances.

response *Noted*

Text will be reviewed.

comment 2059 comment by: *Pau Pyrénées Airport - PUF/LFBP*

(a) It is appropriate to modify as follow : "An aircraft stand should be **provide** sufficient **clearances** between an aircraft using ..." en déplaçant le tableau chiffré en GM.

(b) It is appropriate to transfer this provision to GM

The values of the (a) are only informative elements because it is possible to have inferior values regarding some process, equipments or apron configurations, which in consistency with the (b).

But a study has to demonstrate that these margins are sufficient.

In these conditions, the (b) does not give additional information

response *Noted*

Note: (a) The GM will be reviewed.

Not Agreed: (b) The clearances are derived from ICAO. (b) is retained to allow flexibility.

comment 2215 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

Title is inconsistent with the text.

response *Noted*

Text will be reviewed.

comment

2542

comment by: AENA - Aeropuertos Españoles y Navegación Aérea

It is proposed to change the word using (what is the meaning of this word when the aircraft is stopped, moving or both?) for entering or leaving the stand, because this distances apply when the aircraft is moving not when it is stopped (handling equipment...)

GM-ADR-DSN.E.365 – Clearance distances on aircraft stands

"(a) An aircraft stand may provide the following minimum clearances between an aircraft entering or leaving the stand and any adjacent building, aircraft on another stand and other objects:

Code Letter Clearance

A 3 m

B 3 m

C 4.5 m

D 7.5 m

E 7.5 m

F 7.5 m

(b) The minimum clearance distance for code letters D, E and F can be reduced:

(1) for height limited objects,

(2) if the stand is restricted for aircraft with specific characteristics,

(3) in the following locations (for aircraft using a taxi-in, push-back procedure only):

(i) between the terminal (including passenger loading bridges) and the nose of an aircraft; and

(ii) over a portion of the stand provided with azimuth guidance by a visual docking guidance system.

(ac) Reduced separation at the gate is possible where azimuth guidance by a visual docking guidance system is provided, in combination with additional mitigation measures, such as:

(1) good condition of marking and signage;

(2) apron stand in lights;

(3) maintenance of visual docking systems.

(bd) Reduced Clearance Distances on Aircraft Stands:

*(1) On aircraft stands where reduced clearance distances exist, guidance by visual docking guidance system ~~should~~ **may** be provided.*

*(2) All objects for which reduced clearances apply ~~should~~ **may** be properly marked or lighted (ICAO Annex 14, chapter 6).*

*(3) Aircraft stands where reduced clearance distances apply ~~should~~ **may** be identified and the information published in the AIP.*

*(4) An aircraft stand equipped with a visual docking guidance system ~~should~~ **may** provide the minimum clearance of 5.0 metres between an aircraft using the stand and any adjacent building, aircraft on another stand or other objects.*

(ee) The clearance distance between an aircraft on a stand provided with azimuth guidance by visual docking guidance system and an object or edge of service road may further be reduced subject to local circumstances provided that the object (e.g. blast fence) does not exceed a height of 3.0 metres above the surface of the relative aircraft stand."

response *Not accepted*

The clearances are derived from ICAO. (b) is retained to allow flexibility.

comment

2578

comment by: *Brussels Airport*

GM-ADR-DSN.E.365 (b)(4)

'Ambiguity' between GM-ADR-DSN.E.365 (b)(4) & CS-ADR-DSN.E.365(b)

Only in the CS it is mentioned that clearance distances on stands can be reduced, for code letters D, E & F. The corresponding GM, does not mention these code letters. It would be more clear if these code letters should also be mentioned in the corresponding GM.

When reading GM-ADR-DSN.E.365 (b)(4), one might think that it is not a reduction of the clearance distance, but an increase, for code letters A,B,C. Therefore we suggest to change the value of 5.0metres into 4.5 metres, which is equal to the clearance distance of code letter C.

response *Partially accepted*

The value of 5.0 metres in GM-ADR-DSN.E.365 will be amended to read 4.5 metres.

comment

2579

comment by: *Brussels Airport*

GM-ADR-DSN.E.365 (b)(4)

'Ambiguity' between GM-ADR-DSN.E.365 (b)(4) & CS-ADR-DSN.E.365(b)

Only in the CS it is mentioned that clearance distances on stands can be reduced, for code letters D, E & F. The corresponding GM, does not mention these code letters. It would be more clear if these code letters should also be mentioned in the corresponding GM.

When reading GM-ADR-DSN.E.365 (b)(4), one might think that it is not a reduction of the clearance distance, but an increase, for code letters A,B,C. Therefore we suggest to change the value of 5.0metres into 4.5 metres, which is equal to the clearance distance of code letter C.

response *Partially accepted*

The value of 5.0 metres in GM-ADR-DSN.E.365 will be amended to read 4.5 metres.

comment	2772	comment by: <i>Brussels Airport</i>
	<p>GM-ADR-DSN.E.365 (b)(4)</p> <p>'Ambiguity' between GM-ADR-DSN.E.365 (b)(4) & CS-ADR-DSN.E.365(b)</p> <p>Only in the CS it is mentioned that clearance distances on stands can be reduced, <u>for code letters D, E & F</u>. The corresponding GM, does not mention these code letters. It would be more clear if these code letters should also be mentioned in the corresponding GM.</p> <p>When reading GM-ADR-DSN.E.365 (b)(4), one might think that it is not a reduction of the clearance distance, but an increase, for code letters A,B,C. Therefore we suggest to change the value of 5.0metres into 4.5 metres, which is equal to the clearance distance of code letter C</p>	
response	<p><i>Partially accepted</i></p> <p>The value of 5.0 metres in GM-ADR-DSN.E.365 will be amended to read 4.5 metres.</p>	

CS-ADR – Book 2 – GM-ADR-DSN.F.370 – Isolated aircraft parking position	p. 237
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comment	1135 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN.F.370 — Isolated aircraft parking position (p34) • CS-ADR - Book 2 - GM- ADR-DSN.F.370 — Isolated aircraft parking position (p237) <p><u>2. Proposed text / comment</u></p> <p>This comment is linked to comment on some ICAO recommendations that should not be put in CS.</p> <p>(See comments n° 1087 in book I and 839 in book II)</p> <p>The location of isolated aircraft parking position is adapted case by case to the threat. On small aerodromes with very few traffic, the isolated aircraft parking position could be located safely at a distance less than 100m from other parking positions. Besides, paragraph (b) is only recommended by Annex 14 Volume 1.</p> <p>Two possibilities could be chosen:</p> <ul style="list-style-type: none"> • (i) either the certification specification gives only the objective that is parking of aircraft that needs isolation from normal aerodrome activities, and the figures are move to guidance material. • (ii) or the figures are kept in the CS but specifying each time that they should be met "<i>where practicable</i>" and the CS gives the <u>objective</u> that is parking of aircraft that needs isolation from normal aerodrome activities. 	

The option (i) is proposed by DGAC because less confusing and far clearer, and therefore more appropriate for a regulation and for future standardization. DGAC proposes to move parts of the CS to GM:

CS-ADR-DSN.F.370 – Isolated aircraft parking position

~~“(a) General~~

~~An isolated aircraft parking position should be designated by the aerodrome operator for parking of aircraft that needs isolation from normal aerodrome activities.~~

~~“(b) Location~~

~~The isolated aircraft parking position should be located at the maximum distance practicable and in any case never less than 100 m from other parking positions, buildings or public areas, etc.”~~

GM-ADR-DSN.F.370 – Isolated aircraft parking position

“The isolated aircraft parking position may be located at the maximum distance practicable and in any case never less than 100 m from other parking positions, buildings or public areas, etc. Care ~~should~~ **may** be taken to ensure that the position is not located over underground utilities, such as gas and aviation fuel and, to the extent feasible, electrical or communication cables. The aerodrome control tower ~~should~~ **may** be advised of an area or areas suitable for the parking of an aircraft.”

response *Partially accepted*

Paragraph (b) had a second sentence in ICAO text. It has been moved to GM. The remainder is from ICAO design criteria; therefore, it will remain in the CS.

comment 1698

comment by: ECA - European Cockpit Association

Second part of the paragraph in GM-ADR-DSN.F.370 should be merged in CS-ADR-DSN.F.370 as an alternative to a specific parking position.

Justification:

The wording now is confusing as it is not clear that an alternative for the isolated parking position is the designation of an area to be communicated to the tower. See proposed text to corresponding CS.

response *Partially accepted*

Paragraph (b) had a second sentence in ICAO text. It has been moved to GM. The remainder is from ICAO design criteria; therefore, it will remain in the CS.

comment 2024

comment by: Aéroport Nantes Atlantique - NTE/LFRS

Attachment [#487](#)

UAF NPA 2011-20 (B.III) CS-ADR-DSN.F.370

Référence: CS-ADR-DSN.F.370

	Isolated	aircraft	parking	position
	<p>Traduction de courtoisie (a) It is appropriate to transfer this provision into IR-OPS (b) It is appropriate to transfer this provision into GM The designation of an Isolated aircraft parking position falls within the competences of the aerodrome operator or the local authorities for safety/security reasons. Thus the (a) is an IR-OPS. The (b) is a best practice considering that the final choice takes into account more imperatives elements outside of the safety scope.</p>			
response	<p><i>Partially accepted</i></p> <p>Paragraph (b) had a second sentence in ICAO text. It has been moved to GM. The remainder is from ICAO design criteria; therefore, it will remain in the CS.</p>			
comment	2055	comment by: <i>Pau Pyrénées Airport - PUF/LFBP</i>		
	<p>(a(a) It is appropriate to transfer this provision into IR-OPS (b(b) It is appropriate to transfer this provision into GM The designation of an Isolated aircraft parking position falls within the competences of the aerodrome operator or the local authorities for safety/security reasons. Thus the (a) is an IR-OPS. The (b) is a best practice considering that the final choice takes into account more imperatives elements outside of the safety scope</p>			
response	<p><i>Partially accepted</i></p> <p>Paragraph (b) had a second sentence in ICAO text. It has been moved to GM. The remainder is from ICAO design criteria; therefore, it will remain in the CS.</p>			
comment	2554	comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>		
	<p>This comment is linked to comment on some ICAO recommendations that should not be put in CS. The location of isolated aircraft parking position is adapted case by case to the threat. On small aerodromes with very few traffic, the isolated aircraft parking position could be located safely at a distance less than 100m from other parking positions. Besides, paragraph (b) is only recommended by Annex 14 Volume 1. Two possibilities could be chosen: (i) either the certification specification gives only the objective that is parking of aircraft that needs isolation from normal aerodrome activities, and the figures are move to guidance material. (ii) or the figures are kept in the CS but specifying each time that they should be met "<i>where practicable</i>" and the CS gives the <u>objective</u> that is parking of aircraft that needs isolation from normal aerodrome activities. The option (i) is proposed because less confusing and far clearer, and therefore more appropriate for a regulation and for future standardization.</p>			

It is proposed to move parts of the CS to GM:
CS-ADR-DSN.F.370 — Isolated aircraft parking position

~~“(a) General~~

~~An isolated aircraft parking position should be designated by the aerodrome operator for parking of aircraft that needs isolation from normal aerodrome activities.~~

~~(b) Location~~

~~The isolated aircraft parking position should be located at the maximum distance practicable and in any case never less than 100 m from other parking positions, buildings or public areas, etc.”~~

GM-ADR-DSN.F.370 — Isolated aircraft parking position

*The isolated aircraft parking position may be located at the maximum distance practicable and in any case never less than 100 m from other parking positions, buildings or public areas, etc. Care ~~should~~ **may** be taken to ensure that the position is not located over underground utilities, such as gas and aviation fuel and, to the extent feasible, electrical or communication cables. The aerodrome control tower ~~should~~ **may** be advised of an area or areas suitable for the parking of an aircraft.”*

response *Partially accepted*

Paragraph (b) had a second sentence in ICAO text. It has been moved to GM. The remainder is from ICAO design criteria; therefore, it will remain in the CS.

comment 1772

comment by: UK CAA

Page No: 238

Paragraph No: GM.ADR.DSN.G.375

Comment: This paragraph needs text to clarify that specific de-icing facilities may not be required. Instead provision should be made by the aerodrome operator to ensure that aircraft de/anti-icing is available.

Justification: It is important that aircraft de-icing is carried out. How this is carried out is not the purpose of these requirements, which appear to prescribe dedicated de-icing facilities.

Proposed Text: ADD: **“The specifications below are not intended to infer that dedicated de-icing/anti-icing facilities are provided at an aerodrome. Where dedicated facilities are not provided the aerodrome operator should make provisions to ensure that aircraft de/anti-icing is available.”**

response *Noted*

The CS allows flexibility. If a fixed facility is not required, other means of carrying out de-icing can be proposed.

CS-ADR – Book 2 – GM-ADR-DSN.G.380 – Location

p. 238

comment 1225 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

Please Add "ICAO" to "Doc 9640".

response *Accepted*

comment 1699 comment by: *ECA - European Cockpit Association*

Delete paragraph (a) and (c)

Justification:
Already covered as a proposed CS

response *Not accepted*

These paragraphs are not in the CS.

comment 2214 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

should read "ICAO Doc 9640"

response *Accepted*

comment 2377 comment by: *Pau Pyrénées Airport - PUF/LFBP*

It is appropriate to modify the title as follow : ""Location **and number**""

There is a relation between the localisation and the number of de-icing facilities or equipment. It depends on the configuration of the aerodrome and respects the objective that an aircraft can take off in a limited time after de-icing in order to keep the efficiency of the de-icing.

response *Noted*

comment

2543

comment by: AENA - Aeropuertos Españoles y Navegación Aérea

GM-ADR-DSN.G.380 – Location

"(a) The de-icing/anti-icing facilities ~~should~~ **may** be so located as to ensure that the holdover time of the anti-icing treatment is still in effect at the end of taxiing and when take-off clearance of the treated aeroplane is given.

(b) The de-icing/anti-icing facilities **may** be so located as to provide for an expeditious traffic flow and not require unusual taxiing manoeuvre into and out of the pads. To further maximise departure flow rates for all aeroplanes, the location and size of deicing/anti-icing facilities ~~should~~ **may** be such that they allow for bypass taxiing during deicing/anti-icing operations. (Doc 9640: – Manual of aircraft ground de-icing/anti-icing operations, paragraph 8.5(e).)

(c) Remote de-icing/anti-icing facilities located near departure runway ends or along taxiways are recommended when taxi times from terminals or off-terminal de-icing/antiicing locations frequently exceed holdover times.

(d) Remote facilities compensate for changing weather conditions when icing conditions or blowing snow are expected to occur along the taxi-route taken by the aeroplane to the runway meant for take-off.

(e) The jet blast effects caused by a moving aeroplane on other aeroplanes receiving the anti-icing treatment or taxiing behind will have to be taken into account to prevent degradation of the treatment."

response

Partially accepted

Paragraph (c) of the CS is moved to GM.

CS-ADR – Book 2 – GM-ADR-DSN.G.385 – Size and number of de-icing/anti-icing pads – and GM

p. 238

comment

1427 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.G.385 - Size and number of de-icing/anti-icing pads (p35)
- CS-ADR - Book 2 – GM-ADR-DSN.G.385 – Size and number of de-icing/anti-icing pads ~~—and GM~~ (p238)
- CS-ADR - Book 2 – GM-ADR-DSN.G.400 – Clearance distances on a de-icing/anti-icing pad

.

2. Proposed text / comment

The title of this CS does not suit its content because the number of pads is not dealt with in it.

Moreover, the size is provided depending on the size most demanding aeroplane for which it is intended, that's why it is not relevant to impose a minimum size of 3.8m.

This figure can be proposed as guidance, but rather in the GM corresponding to the size (GM-ADR-DSN.G.385) than in paragraph(b) of GM-ADR-DSN.G.400 — *Clearance distances*.

Thus the proposed modifications:

CS-ADR-DSN.G.385 Size and number of de-icing/anti-icing pads

"The size of a de-icing/anti-icing pad should be equal to the parking area required by the most demanding aeroplane for which the pad is intended in a given category with at least 3.8 m a clear paved area all around the aeroplane for the movement of the de-icing/anti-icing vehicles."

GM-ADR-DSN.G.385 — Size and number of de-icing/anti-icing pads — and GM

"[...] (c) An aeroplane de-icing/anti-icing pad consists of:

(1) an inner area for parking of an aeroplane to be treated; and

(2) an outer area for movement of two or more mobile de-icing/anti-icing equipment. In the absence of specific requirements, a 3.8 m cleared paved area for the movement of deicing/anti-icing vehicles round the aircraft may be considered suitable.

"[...]"

GM-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad

"[...] (b) The minimum clearance distance of 3.8 m is necessary for the movement of deicing/anti-icing vehicles round the aircraft. [...]"

response *Not accepted*

ICAO text used for the clearance distance specifies 3.8 metres. The number of pads will be modified to reflect ICAO design criteria relating to vehicle movement and adjacent pads not overlapping.

comment 2556 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

GM-ADR-DSN.G.385 — Size and number of de-icing/anti-icing pads — and GM

"[...] (c) An aeroplane de-icing/anti-icing pad consists of:

(1) an inner area for parking of an aeroplane to be treated; and

(2) an outer area for movement of two or more mobile de-icing/anti-icing equipment. In the absence of specific requirements, a 3.8 m cleared paved area for the movement of deicing/anti-icing vehicles round the aircraft may be considered suitable.

"[...]"

response *Not accepted*

The proposed change is covered by the CS.

comment	<p>36 comment by: <i>ACI EUROPE - Airports Council International</i></p> <p>change figure of "3,8m" to "3m"</p> <p>Justification: to be consistent with CS.ADR.DSN.E.365</p>
response	<p><i>Not accepted</i></p> <p>Although the clearance distance for Code A and B aeroplanes is 3 metres, this is for aeroplanes on stand. The clearance distance of 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.</p>
comment	<p>204 comment by: <i>CAA Austria - Ministry of Transport</i></p> <p>b) Change figure of 3,8m to 3m To be consistent with CS.ADR.DSN.E.365</p>
response	<p><i>Not accepted</i></p> <p>Although the clearance distance for Code A and B aeroplanes is 3 metres, this is for aeroplanes on stand. The clearance distance of 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.</p>
comment	<p>622 comment by: <i>Avinor</i></p> <p>GM.ADR.DSN.G.400. Change figure of "3,8m" to "3m".</p>
response	<p><i>Not accepted</i></p> <p>Although the clearance distance for Code A and B aeroplanes is 3 metres, this is for aeroplanes on stand. The clearance distance of 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.</p>
comment	<p>809 comment by: <i>Munich Airport International</i></p> <p><u>(b)</u></p> <p>change figure of "3,8m" to "3m"</p> <p>Justification: to be consistent with CS.ADR.DSN.E.365</p>
response	<p><i>Not accepted</i></p> <p>Although the clearance distance for Code A and B aeroplanes is 3 metres, this is for aeroplanes on stand. The clearance distance of 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.</p>

comment 1111 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.260 — Taxiway minimum separation distance (p25-26)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.D.315 — Width of taxiway strips (p29)
- BIII - CS-ADR - Book 1 - Figure D-1. Rapid exit taxiway (p28)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad (p35)
- BIII - CS-ADR - Book 1 - CS-ADR-DSN.Q.840 — Objects to be marked and/or lighted (p146-147)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.260 — Taxiway minimum separation distance
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.315 — Width of taxiway strips (p232)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad (p239)
- BIII - CS-ADR - Book 2 - GM-ADR-DSN.D.255 — Junction and intersection of taxiways
- Explanatory Note – paragraph 18 (page 8)

2. Proposed text / comment

The figures for taxiway minimum separation distances are intended for design purposes only and can be far less large than indicated: indeed, these figures are no more applied when maintaining taxiways and consequently no more relevant.

No safety concern has been noticed until now on this point.

But above all, verifying that the separation distances between taxiways are applied everywhere on an aerodrome would generate huge costs without any added safety value (as an example, a big aerodrome like Paris-Charles de Gaulle airport has 80km of taxiways).

Finally, NPA 2011-20 Explanatory Note states that "some Recommended Practices may be more appropriate as GM, particularly for those provisions for which compliance cannot be measured" (paragraph 18 page 8). This is the case for this specification.

Two possibilities could be chosen:

- (i) either the certification specification gives only the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision, and the figures are in guidance material.
- (ii) or the figures are kept in the CS but specifying each time that they should be met "where practicable" and the CS gives the objective of having sufficient taxiways separation distances in particular to prevent from aircraft collision.

The option (i) is proposed by DGAC because less confusing and far clearer, and therefore more appropriate for a regulation and for future standardization. This is a critical point for DGAC.

All CSs referring to figures in table D-1 are to be changed consequently: their provisions corresponding to such distance should be move to GM, except for CS-ADR-DSN.Q.840 — *Objects to be marked and/or lighted* because the

objective is marking and/or lighting thus is quite different and it is proposed to add the figures of table D-1 in this CS as Table Q-3 – *Taxiway minimum marking and/or lighting distances*.

This option (i) and the consequences on CS referring to table D-1 are detailed below:

CS-ADR-DSN.D.260 – Taxiway minimum separation distance

~~"The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be sufficient for safe aircraft operations, in particular to prevent from aircraft collision less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.~~

~~[...]~~

~~Table D-1. Taxiway minimum separation distances"~~

GM-ADR-DSN.D.260 – Taxiway minimum separation distance

"[...] (c) The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be less than the appropriate dimension specified in Table D-1, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

[...]

Table GM-D-1. Taxiway minimum separation distances

(d) The separation distances of ~~Book 1~~, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

~~(d)~~(e) The separation distance between the centre line of an aircraft stand taxilane and an object shown in ~~Book 1~~, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

CS-ADR-DSN.D.315 – Width of taxiway strips

~~"A taxiway strip should extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table ADR-D-1, column 11."~~

GM-ADR-DSN.D.315 – Width of taxiway strips

"A taxiway strip may extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table GM-D-1, column 11."

CS-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

~~"[...] (b) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.~~

~~(c) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)~~

~~Figure G-1 Minimum separation distance on a de-icing/anti-icing facility"~~

GM-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

"[...] (d) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.

(e) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)

Figure GM-G-1 Minimum separation distance on a de-icing/anti-icing facility"

CS-ADR-DSN.Q.840 – Objects to be marked and/or lighted p146

"[...] (g) All obstacles within the distance specified in Table ~~D-1~~ Q-3, from the centre line of a taxiway, an apron taxiway or aircraft stand taxilane should be marked and, if the taxiway, apron taxiway or aircraft stand taxilane is used at night, lighted.

Table Q-3 – Taxiway minimum marking and/or lighting distances"

GM-ADR-DSN.D.255 – Junction and intersection of taxiways

"(e) The separation distances of Book 1, Table GM-D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the Aerodrome Design Manual (ICAO, Doc 9157, Part 2).

(f) The separation distance between the centre line of an aircraft stand taxilane and an object shown in Book 1, Table GM-D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing."

response Not accepted

CS-ADR-DSN.G.400: The text will remain in the CS as it contains design specifications. The incorrect ICAO references in Figure G-1 are amended to show EASA references.

The remaining comments are answered in the appropriate CS/GM segment.

comment 1427 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.G.385 - Size and number of de-icing/anti-icing pads (p35)
- CS-ADR - Book 2 – GM-ADR-DSN.G.385 – Size and number of de-icing/anti-icing pads —and GM (p238)
- CS-ADR - Book 2 – GM-ADR-DSN.G.400 – Clearance distances on a de-icing/anti-icing pad

2. Proposed text / comment

The title of this CS does not suit its content because the number of pads is not dealt with in it.

Moreover, the size is provided depending on the size most demanding aeroplane for which it is intended, that's why it is not relevant to impose a minimum size of 3.8m.

This figure can be proposed as guidance, but rather in the GM corresponding to

the size (GM-ADR-DSN.G.385) than in paragraph(b) of GM-ADR-DSN.G.400 — *Clearance distances*.

Thus the proposed modifications:

CS-ADR-DSN.G.385 Size and number of de-icing/anti-icing pads

"The size of a de-icing/anti-icing pad should be equal to the parking area required by the most demanding aeroplane for which the pad is intended in a given category with at least 3.8 m a clear paved area all around the aeroplane for the movement of the de-icing/anti-icing vehicles."

GM-ADR-DSN.G.385 — Size and number of de-icing/anti-icing pads — and GM

"[...] (c) An aeroplane de-icing/anti-icing pad consists of:

(1) an inner area for parking of an aeroplane to be treated; and

(2) an outer area for movement of two or more mobile de-icing/anti-icing equipment. In the absence of specific requirements, a 3.8 m cleared paved area for the movement of deicing/anti-icing vehicles round the aircraft may be considered suitable.

"[...]"

GM-ADR-DSN.G.400 — Clearance distances on a de-icing/anti-icing pad

"[...] (b) The minimum clearance distance of 3.8 m is necessary for the movement of deicing/anti-icing vehicles round the aircraft. [...]"

response *Not accepted*

ICAO text used for the clearance distance is 3.8 metres. The number of pads will be modified to reflect ICAO design criteria relating to vehicle movement and adjacent pads not overlapping.

comment 1840 comment by: Geneva International Airport (ROMIG)

Change figure of "3,8m" to "3m"
To be consistent with CS.ADR.DSN.E.365

response *Not accepted*

Although the clearance distance for Code A and B aeroplanes is 3 metres, this is for aeroplanes on stand. The clearance distance of 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.

comment 2211 comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

correct "3,8m" to "3m", inconsistent with the CS

response *Not accepted*

Although the clearance distance for Code A and B aeroplanes is 3 metres, this is for aeroplanes on stand. The clearance distance of 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.

comment	2552	comment by: AENA - Aeropuertos Españoles y Navegación Aérea
	<p>GM-ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad "[...] (b) The minimum clearance distance of 3.8 m is necessary for the movement of deicing/anti-icing vehicles round the aircraft. [...]"</p> <p>"[...] (d) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.</p> <p>(e) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided. (See Figure G-1.)</p> <p>Figure GM-G-1 Minimum separation distance on a de-icing/anti-icing facility"</p>	
response	Not accepted	

comment	3032	comment by: ADV -German Airports Association
	<p>GM.ADR.DSN.G.400 change figure of "3,8m" to "3m"</p> <p>Justification to be consistent with CS.ADR.DSN.E.365</p>	
response	Not accepted	
	<p>Although the clearance distance for Code A and B aeroplanes is 3 metres, this is for aeroplanes on stand. The clearance distance of 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.</p>	

comment	3067	comment by: MST / STR - Stuttgart Airport
	<p>GM.ADR.DSN.G.400 change figure of "3,8m" to "3m"</p> <p>Justification to be consistent with CS.ADR.DSN.E.365</p>	
response	Not accepted	
	<p>Although the clearance distance for Code A and B aeroplanes is 3 metres, this is for aeroplanes on stand. The clearance distance of 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.</p>	

comment	3101	comment by: Fraport AG
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GM-ADR-DSN.G.400 — Clearance distances on a deicing/ anti-icing pad (b)

Editorial

The minimum clearance distance of **3.8 m** is necessary for the movement of deicing/ anti-icing vehicles round the aircraft.

The minimum clearance distance of **3.0 m** is necessary for the movement of deicing/ anti-icing vehicles round the aircraft.

Fraport
to be consistent with CS.ADR.DSN.E.365

AG

response *Not accepted*

Although the clearance distance for Code A and B aeroplanes is 3 metres, this is for aeroplanes on stand. The clearance distance of 3.8 metres is the minimum distance required for de-icing vehicles to manoeuvre around the aeroplane.

CS-ADR — Book 2 — GM-ADR-DSN.H.405 — Applicability

p. 240

comment

1700

comment by: *ECA - European Cockpit Association*

Difficult to understand:

The sentence: "to call for other restrictions to development on and in the vicinity....etc."

Request for clarification: development of what? Are we talking about construction? If yes, then replace development with construction.

response

Noted

The words 'and construction' will be inserted after 'development'.

CS-ADR — Book 2 — GM-ADR-DSN.H.410 — Outer horizontal surface

p. 241

comment

822 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN. H.410 — Outer horizontal surface (p37)
- CS-ADR - Book 2 - GM-ADR-DSN.H.410 — Outer horizontal surface

(p241)

2. Justification and proposed text / comment

This obstacle limitation surface is not binding in France and comes from an ICAO Manual introduced by a note in Annexe 14 Volume 1.

Besides, to prevent the erection of obstacles outside the OLS (so it is no more an aerodrome matter, but rather an ATM matter), France introduced a law so that the DGAC is systemically consulted for every construction above 50 meters high outside towns, and 100 meters high inside towns. This law is more efficient than the Outer horizontal surface. That's why the Outer horizontal surface is not binding in France.

DGAC proposes to move the whole CS to GM:

CS-ADR-DSN.H.410 – Outer horizontal surface

~~"The outer horizontal surface should extend from the periphery of the conical surface to a minimum radius of 15 000 m from the aerodrome reference point when the main runway is 1860 m or more in length and to a minimum radius of 10 000 m where the main runway is 1100 m or more but less than 1860 m in length."~~

GM-ADR-DSN.H.410 – Outer horizontal surface

"(a) An outer horizontal surface is a specified portion of a horizontal plane around an aerodrome beyond the limits of the conical surface. It represents the level above which consideration needs to be given to the control of new obstacles in order to facilitate practicable and efficient instrument approach procedures, and together with the conical and inner horizontal surfaces to ensure safe visual manoeuvring in the vicinity of an aerodrome.

(b) The OHS is of particular importance for safe operations in areas of high ground or where there are concentrations of obstacles.

(c) The outer horizontal surface should extend from the periphery of the conical surface to a minimum radius of 15 000 m from the aerodrome reference point when the main runway is 1860 m or more in length and to a minimum radius of 10 000 m where the main runway is 1100 m or more but less than 1860 m in length."

response *Accepted*

This CS will be moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

comment 1227 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

Please remove the acronym "OHS": there is no need to use this acronym.

response *Accepted*

comment 2210 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

the abbreviation "OHS" shouldn't be used, not necessary

response *Accepted*

comment 2477 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

This obstacle limitation surface is not binding in Spain and comes from an ICAO Manual introduced by a note in Annexe 14 Volume 1.
Besides, to prevent the erection of obstacles outside the OLS (so it is no more an aerodrome matter, but rather an ATM matter.

It is proposed to move the whole CS to GM:

CS-ADR-DSN.H.410 – Outer horizontal surface

~~"The outer horizontal surface should extend from the periphery of the conical surface to a minimum radius of 15 000 m from the aerodrome reference point when the main runway is 1860 m or more in length and to a minimum radius of 10 000 m where the main runway is 1100 m or more but less than 1860 m in length."~~

GM-ADR-DSN.H.410 – Outer horizontal surface

"(a) An outer horizontal surface is a specified portion of a horizontal plane around an aerodrome beyond the limits of the conical surface. It represents the level above which consideration needs to be given to the control of new obstacles in order to facilitate practicable and efficient instrument approach procedures, and together with the conical and inner horizontal surfaces to ensure safe visual manoeuvring in the vicinity of an aerodrome.

(b) The OHS is of particular importance for safe operations in areas of high ground or where there are concentrations of obstacles.

(c) The outer horizontal surface should extend from the periphery of the conical surface to a minimum radius of 15 000 m from the aerodrome reference point when the main runway is 1860 m or more in length and to a minimum radius of 10 000 m where the main runway is 1100 m or more but less than 1860 m in length."

response *Accepted*

This CS will be moved to GM. Annex 14 and the Aerodrome Services Manual, Part 6, do not specify a distance. Therefore, distances will be deleted.

CS-ADR – Book 2 – GM-ADR-DSN.H.420 – Inner horizontal surface

p. 241

comment 827 ❖ comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN. H.420 – Inner horizontal surface (p37)
- CS-ADR - Book 1 - Figure H-1. Inner horizontal surface where the

- runway is code 4 (p40)
- CS-ADR - Book 1 - Figure H-2. Obstacle limitation surfaces (p41)
- CS-ADR - Book 2 – GM-ADR-DSN.H.420 – Inner horizontal surface (p241)

2. Justification and proposed text / comment

The elevation datum is “established for such purpose” (as specified in ICAO Annex 14 Volume1).

Moreover, paragraph (d)(1) of CS-ADR-DSN. H.420 proposes four possibilities to determine this elevation point, with the use of the word “may”. These different possibilities are meant to be in guidance material.

Finally, figure H-1 and figure H-2 are meant to be in guidance material because they are only an example of a possible design of the OLS, particularly concerning the design of the inner horizontal surface which is not, as said truly in the GM associated, necessary circular. The option of designing the OLS from the transitional surface support line (see CS-ADR-DSN.H.430 paragraphs (c)(3) and (d)(3)) is not taken into account either by these examples.

Thus DGAC proposes to move parts of this CS to GM and proposes to move figure H-1 and figure H-2 to GM as “figure GM-H-1” and “Figure GM-H-2” respectively. Existing figure GM-H-1 thus becomes “Figure GM-H-3”.

Moreover, to avoid any confusion in the numbering of the figures, it is proposed to delete the words “figure 1.2” from the title of existing Figure GM-H-1 (which is the numbering of ICAO Annex 14 volume 1).

See detailed modifications below:

CS-ADR-DSN.H.420 – Inner horizontal surface

“(a) Applicability: The purpose of the inner horizontal surface is to protect airspace for visual manoeuvring prior to landing.

(b) Description: A surface located in a horizontal plane above an aerodrome and its environs.

(c) Characteristics: The outer limits of the inner horizontal surface are defined by circular arcs centred on the intersection of the extended RWY centre line with the end of the RWY strip joined tangentially by straight lines. (Figure H-1.)

(d) The height of the inner horizontal surface should be measured above an established elevation datum established for such purpose.

~~(1) The elevation datum used for the height of the inner horizontal surface may be:~~

~~(i) the elevation of the highest point of the lowest threshold of the related runway;~~

~~(ii) the elevation of the highest point of the highest threshold of the related runway;~~

~~(iii) the elevation of the highest point of the runway;~~

~~(iv) the aerodrome elevation.”~~

~~Figure H-1 Inner horizontal surface where the runway is code 4~~

~~Figure H-2 Obstacle limitation surfaces~~

GM-ADR-DSN.H.420 – Inner horizontal surface

“(a) The shape of the inner horizontal surface need not necessarily be circular. Guidance on determining the extent of the inner horizontal surface is contained in the Airport Services Manual (ICAO, Doc 9137, Part 6).

(b) The limits of the inner horizontal surface for longer runways (1 800 m or more in length) are defined as circles of radius 4 000 m centred on the strip ends of the runway. These circles are joined by common tangents parallel to the runway centre line to form a racetrack pattern. The boundary of this pattern is the boundary of the inner horizontal surface.

(c) For runways less than 1 800 m in length, the inner horizontal surface is

defined as a circles centred on the midpoint of the runway.

(d) The elevation datum used for the height of the inner horizontal surface may be:

(1) the elevation of the highest point of the lowest threshold of the related runway;

(2) the elevation of the highest point of the highest threshold of the related runway;

(3) the elevation of the highest point of the runway;

(4) the aerodrome elevation."

(de) To protect two or more runways, a more complex pattern could become necessary. In this situation, all the circles are joined tangentially by straight lines: illustrated at the Figure GM-H-1.

(ef) For more complex inner horizontal surfaces, with runways on different levels or runways where the thresholds differ more than 6 m, a common elevation is not essential, but where surfaces overlap, the lower surface should be regarded as dominant.

(fg) Further guidance is contained in the Airport Services Manual (ICAO, DOC 9137, part 6)."

Figure GM-H-1 Inner horizontal surface where the runway is code 4

Figure GM-H-2 Obstacle limitation surfaces

Figure ~~GM-H-1~~ GM-H-3 Example of composite inner horizontal surface for two parallel runways (where the runway code number is 4)

response *Not accepted*

The CS provides four options to allow flexibility in selecting a datum for the Inner Horizontal Surface.

Figures H-1 and H-2 are illustrative of the relationship between the obstacle limitation surfaces, not an example of construction of those surfaces.

comment 1228 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2202 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR – Book 2 – GM-ADR-DSN.H.430 – Transitional surface

p. 242

comment 1229 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2203 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR – Book 2 – GM-ADR-DSN.H.435 – Take-off climb surface

p. 242

comment 1241 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2204 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR – Book 2 – GM-ADR-DSN.H.440 – Slew Take-off climb surface

p. 242

comment	1242	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	There is no content: Please remove title or provide content.	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

comment	2205	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

CS-ADR – Book 2 – GM-ADR-DSN.H.445 – Obstacle-Free Zone

p. 242

comment	1243	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	There is no content: Please remove title or provide content.	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

comment	2206	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

CS-ADR – Book 2 – GM-ADR-DSN.H.450 – Inner approach surface

p. 242

comment	1244	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	There is no content: Please remove title or provide content.	

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2207 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR – Book 2 – GM-ADR-DSN.H.460 – Balked landing surface

p. 243

comment 183 comment by: *CAA Norway*

No text in GM-ADR-DSN.H.460(?)

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 330 comment by: *Icelandic Civil Aviation Administration*

No text in GM-ADR-DSN.H.460 - pls insert text or delete.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 1245 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2201 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

	titles should be removed
response	<i>Not accepted</i> Numbering is for continuity. The words 'intentionally blank' will be inserted.
comment	2982 comment by: <i>Isavia</i> No text in GM-ADR-DSN.H.460
response	<i>Not accepted</i> Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR – Book 2 – GM-ADR-DSN.J.465 – General

p. 244

comment	1249 comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i> The structure and content of Chapter J, which lacks topical consistency, should be changed.
response	<i>Noted</i>
comment	2196 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i> Re-write Chapter J, the subject matter is very inconsistent and difficult to follow.
response	<i>Noted</i>

CS-ADR – Book 2 – GM-ADR-DSN.J.470 – Non-instrument runways

p. 244

comment	2196 ❖ comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i> Re-write Chapter J, the subject matter is very inconsistent and difficult to follow.
response	<i>Noted</i>

CS-ADR – Book 2 – GM-ADR-DSN.J.475 – Non-precision approach runways p. 244

comment 2196 ❖ comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

Re-write Chapter J, the subject matter is very inconsistent and difficult to follow.

response *Noted*

CS-ADR – Book 2 – GM-ADR-DSN.J.480 – Precision approach runways p. 244-245

comment 829 ❖ comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.J.480 – Precision approach runways (p46)
- CS-ADR - Book 2 – GM-ADR-DSN.J.480 – Precision approach runways (p244-245)

2. Justification and proposed text / comment

This specification is not binding in France and is only a recommendation in ICAO Annex 14 Volume1. Removing all the obstacles concerned by this CS for precision approach runway category I would be impossible.

DGAC proposes to provide for the needed flexibility in using a “may” instead of a “should”:

CS-ADR-DSN.J.480 – Precision approach runways

“[...]”

(b) *The following obstacle limitation surfaces ~~should~~ may be established for a precision approach runway category I:*

- (1) *inner approach surface;*
- (2) *inner transitional surfaces; and*
- (3) *balked landing surface.*

“[...]”

response *Partially accepted*

Paragraph (b) will be moved to GM.

comment 2196 ❖ comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

response

Re-write Chapter J, the subject matter is very inconsistent and difficult to follow.

Noted

CS-ADR – Book 2 – GM-ADR-DSN.J.485 – Runways meant for take-off

p. 245

comment

830 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.J.485 – Runways meant for take-off (p47-48)
- CS-ADR - Book 2 - GM-ADR-DSN.J.485 – Runways meant for take-off (p245)

2. Justification and proposed text / comment

Paragraph (c) and (e) of CS-ADR-DSN.J.485, which are recommendations in ICAO Annex 14 Volume1, have no safety justification and are just possibilities for particular cases. These provisions are thus meant to be guidance materials. In particular, there is a contradiction in paragraph (e) of this CS: indeed, the obstacle free surface of 2% is sufficient, otherwise it would not be in Annex 14 volume 1; thus it is not necessary to establish another lower one of 1.6% that may not be complied with because of obstacles. The wording below in GM-ADR-DSN.J.485 is proposed.

Note: the duplication of figures and tables that are in the book I of the CS to book II - guidance materials brings too much confusion since one not knows if the figure or table is a guidance material or not. It is proposed to delete these duplications.

CS-ADR-DSN.J.485 – Runways meant for take-off

"[...]

~~(c) The operational characteristics of aeroplanes for which the runway is intended should be examined to see if it is desirable to reduce the slope specified in Table J-2 when critical operating conditions are to be catered to. If the specified slope is reduced, corresponding adjustment in the length of the take off climb surface should be made so as to provide protection to a height of 300 m.~~

[...]

~~(e) If no object reaches the 2 % (1:50) take-off climb surface, an obstacle free surface of 1.6 % (1:62.5) should be established.~~

"[...]"

GM-ADR-DSN.J.485 – Runways meant for take-off

(a) The operational characteristics of aeroplanes for which the runway is intended may be examined to see if it is desirable to reduce the slope specified in Table J-2 when critical operating conditions are to be catered to. If the specified slope is reduced, corresponding adjustment in the length of the take-off climb surface may be made so as to provide protection to a height of 300 m.

(b) If no object reaches the 2 % (1:50) take-off climb surface, an obstacle free surface with a lower slope may be established.

(ac) When local conditions differ widely from sea level standard atmospheric conditions, it may be advisable for the slope specified in Book 1, Table J-2 (~~repeated below as Table GM-J-1~~) to be reduced. The degree of this reduction depends on the divergence between local conditions and sea level standard atmospheric conditions, and on the performance characteristics and operational requirements of the aeroplanes for which the runway is intended. [...]"

response *Partially accepted*

Paragraph (e) will be moved to GM. The table in GM will be deleted.

comment 1255 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

Table GM-J-1 should be removed, as the same table exists in the GM and in the CS chapter as well. In the table, the final width for code number 1 should be changed to 380 m: 60 m plus 1600 m with a divergence of 10 % each side equals to 380 m.

response *Accepted*

comment 1701 comment by: *ECA - European Cockpit Association*

Move this paragraph (a) from GM to CS

And amend as follows:

When local conditions differ widely from sea level standard atmospheric conditions, it ~~may be is~~ advisable for the slope specified in Book 1, Table J-2 (repeated below as Table GM-J-1) to be reduced. The degree of this reduction depends on the divergence between local conditions and sea level standard atmospheric conditions, and on the performance characteristics and operational requirements of the aeroplanes for which the runway is intended. **The effect of these conditions on the performance is contained in the appropriate Aeroplane Flight Manual.**

Justification:

Reference: IFALPA Annex 14, paragraph 4.2.24

IFALPA recommends this to be a standard instead of recommendation.

response *Not accepted*

This is not CS wording and is an operational consideration.

comment 1702 comment by: *ECA - European Cockpit Association*

Amend table GM-J-1:

	<p>Final width for code number 1 (2) should be 380 m instead of 280 m. Slope for code number 2 (3) should be 1.5% Slope for code numbers 3 or 4 (4) should be 1%</p> <p>Justification: For final width for code number 1 (2), this is an editorial comment, as it is a wrong copy-paste from ICAO table 4-2. For the slope, reference is IFALPA Annex 14, paragraph 4.2.26</p>
response	<p><i>Partially accepted</i></p> <p>Table GM-J-1 has been deleted. Table CS-J-1 has been amended with the distance of 380 m. The slopes are derived from ICAO design criteria; therefore, they are not amended.</p>
comment	<p>2184 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>incorrect final width for code number 1 should be 380 m</p>
response	<p><i>Accepted</i></p> <p>Table J-2 will be amended.</p>
comment	<p>2192 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>table already exists CS material, remove it?</p>
response	<p><i>Accepted</i></p>
comment	<p>2196 ❖ comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>Re-write Chapter J, the subject matter is very inconsistent and difficult to follow.</p>
response	<p><i>Noted</i></p>
comment	<p>2482 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i></p> <p>Paragraph (c) and (e) of CS-ADR-DSN.J.485, which are recommendations in ICAO Annex 14 Volume1, have no safety justification and are just possibilities for particular cases. These provisions are thus meant to be guidance materials. In particular, there is a contradiction in paragraph (e) of this CS: indeed, the obstacle free surface of 2% is sufficient, otherwise it would not be in Annex 14 volume 1; thus it is not necessary to establish another lower one of 1.6% that</p>

may not be complied with because of obstacles. The wording below in GM-ADR-DSN.J.485 is proposed.

Note: the duplication of figures and tables that are in the book I of the CS to book II - guidance materials brings too much confusion since one not knows if the figure or table is a guidance material or not. It is proposed to delete these duplications.

CS-ADR-DSN.J.485 – Runways meant for take-off

[...]

~~(c) The operational characteristics of aeroplanes for which the runway is intended should be examined to see if it is desirable to reduce the slope specified in Table J-2 when critical operating conditions are to be catered to. If the specified slope is reduced, corresponding adjustment in the length of the take-off climb surface should be made so as to provide protection to a height of 300 m.~~

[...]

~~(e) If no object reaches the 2 % (1:50) take-off climb surface, an obstacle free surface of 1.6 % (1:62.5) should be established.~~

[...]"

GM-ADR-DSN.J.485 – Runways meant for take-off

(a) The operational characteristics of aeroplanes for which the runway is intended may be examined to see if it is desirable to reduce the slope specified in Table J-2 when critical operating conditions are to be catered to. If the specified slope is reduced, corresponding adjustment in the length of the take-off climb surface may be made so as to provide protection to a height of 300 m.

(b) If no object reaches the 2 % (1:50) take-off climb surface, an obstacle free surface with a lower slope may be established.

(ac) When local conditions differ widely from sea level standard atmospheric conditions, it may be advisable for the slope specified in Book 1, Table J-2 (repeated below as Table GM-J-1) to be reduced. The degree of this reduction depends on the divergence between local conditions and sea level standard atmospheric conditions, and on the performance characteristics and operational requirements of the aeroplanes for which the runway is intended.

[...]"

response Accepted

CS-ADR – Book 2 – GM-ADR-DSN.K.490 – Wind direction indicator

p. 246

comment 37

comment by: ACI EUROPE - Airports Council International

(g) (1) add "strips" behind "runway" and "taxiway"

Justification: to be consistent with definitions

response Accepted

(g)(1) will be amended.

comment	38	comment by: <i>ACI EUROPE - Airports Council International</i>
	(g) (1) replace "1:10 obstacle surface" by "1:3 inner transitional surface"	
	Justification: ICAO	
response	<i>Partially accepted</i>	
	<i>Partially Agreed:</i> GM will amended to remove reference to the 1:10 slope. The guidance to be outside the runway and taxiway strip graded areas and clear of the OFZ is in GM at paragraphs (g)(1) and (2).	

comment	197	comment by: <i>CAA Austria - Ministry of Transport</i>
	(g)(1) Add strips behind runway and taxiway Consistency with the definitions.	
	(g)(1) Replace 1:10 obstacle surface by 1:3 inner transitional surface Consistency with ICAO.	
response	<i>Partially accepted</i>	
	<i>Agreed:</i> (g)(1) will be amended.	
	<i>Partially Agreed:</i> GM will amended to remove reference to the 1:10 slope. The guidance to be outside the runway and taxiway strip graded areas and clear of the OFZ is in GM at paragraphs (g)(1) and (2).	

comment	599	comment by: <i>Cologne/Bonn Airport</i>
	(g) (1): Should mean runway strips and taxiway strips and replace "1:10 obstacle surface" by "1:3 inner transitional surface" this is according to A 14	
response	<i>Partially accepted</i>	
	<i>Agreed:</i> (g)(1) will be amended.	
	<i>Partially Agreed:</i> GM will amended to remove reference to the 1:10 slope. The guidance to be outside the runway and taxiway strip graded areas and clear of the OFZ is in GM at paragraphs (g)(1) and (2).	

comment	623	comment by: <i>Avinor</i>
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response	<p>GM.ADR.DSN.K.490 (g) (1). Add "strips" behind "runway" and "taxiway" to be consistent with CS.ADR.DSN.E.365.</p> <p><i>Accepted</i></p> <p>(g)(1) will be amended.</p>
comment	<p>624 comment by: <i>Avinor</i></p> <p>GM.ADR.DSN.K.490 (g) (1). Replace "1:10 obstacle surface" by "1:3 inner transitional surface" to achive consistency with the definitions.</p>
response	<p><i>Partially accepted</i></p> <p><i>Partially Agreed:</i> GM will amended to remove reference to the 1:10 slope. The guidance to be outside the runway and taxiway strip graded areas and clear of the OFZ is in GM at paragraphs (g)(1) and (2).</p>
comment	<p>810 comment by: <i>Munich Airport International</i></p> <p><u>(g)</u></p> <p>(1): add "strips" behind "runway" and "taxiway"</p> <p>Justification: consistency with the definitions</p> <p>(1): replace "1:10 obstacle surface" by "1:3 inner transitional surface"</p> <p>Justification: According to ICAO</p>
response	<p><i>Partially accepted</i></p> <p><i>Agreed:</i> (g)(1) will be amended.</p> <p><i>Partially Agreed:</i> GM will amended to remove reference to the 1:10 slope. The guidance to be outside the runway and taxiway strip graded areas and clear of the OFZ is in GM at paragraphs (g)(1) and (2).</p>
comment	<p>1260 comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i></p> <p>There is mixed use of various terms for the "wind direction indicator": the term should be used consistently with ICAO.</p>
response	<p><i>Accepted</i></p>

comment	1703	comment by: <i>ECA - European Cockpit Association</i>
	<p>Comment on (d): Correct the word "arround". Change with "around"</p> <p>Justification: Editorial comment.</p>	
response	<i>Accepted</i>	
comment	1841	comment by: <i>Geneva International Airport (ROMIG)</i>
	<p>g)1) Add "strips" behind "runway" and "taxiway" Consistency with the definitions.</p> <p>Replace "1:10 obstacle surface" by "1:3 inner transitional surface" Consistency with ICAO.</p>	
response	<p><i>Partially accepted</i></p> <p><i>Agreed:</i> (g)(1) will be amended. <i>Partially Agreed:</i> GM will amended to remove reference to the 1:10 slope. The guidance to be outside the runway and taxiway strip graded areas and clear of the OFZ is in GM at paragraphs (g)(1) and (2).</p>	
comment	1905	comment by: <i>ENAC Ente Nazionale per l'Aviazione Civile</i>
	<p>We propose to add the text at the end of the point (d): The measure of the diameter of the wind sleeve must be not less than 15 meters and the width must be not less 1 meters.</p> <p>(g)(6) We propose to remove the text at the end pf the phrase used for public transport operations....</p>	
response	<p><i>Partially accepted</i></p> <p><i>Partially Agreed:</i> the ICAO text relating to the circular band will be added. <i>Agreed:</i> (g)(6) will be amended.</p>	
comment	2173	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	<p>"1:3 inner transitional surface" should replace "1:10 obstacle surface" , inconsistent with ICAO</p>	

response	<i>Partially accepted</i>
	GM will amended to remove reference to the 1:10 slope. The guidance to be outside the runway and taxiway graded areas and clear of the OFZ is in GM at paragraphs (g)(1) and (2).
comment	2174 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	use the terms "runway strips" and "taxiway strips", inconsistent
response	<i>Accepted</i>
comment	2181 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	inconsistent use of terminology, use the term "wind direction indicator", as in ICAO.
response	<i>Accepted</i>
comment	2801 comment by: <i>ECA - European Cockpit Association</i>
	Change (c) as follows: (c) For an indicator of a single colour white or orange should preferably be used. Where a combination of two colours is required, they should preferably be orange and white, red and white, or black and white <u>the first and last bands being the darker colour.</u> Justification: Reference: IFALPA Annex 14, paragraph 5.1.1.10
response	<i>Partially accepted</i>
	This is already in the CS. Therefore, paragraph (c) will be deleted from GM.
comment	2802 comment by: <i>ECA - European Cockpit Association</i>
	Add new paragraph (h) stating: (h) A wind direction indicator should be provided at runway/runway intersections. A wind direction indicator serving a runway/runway intersection should be placed in one quadrant of the intersection so as to be easily visible to aircraft utilizing either runway. Justification:

Establish guidance material for the windsocks to be provided in the vicinity of runway/runway intersections. Such placement will provide wind information to flight crews (i.e., unusual winds or wake vortex turbulence resulting from a landing or departure on the intersected runway) and alert flight crews to the location of the intersected runway.
Reference: IFALPA Annex 14, paragraphs 5.1.1.2 & 5.1.1.5

response *Not accepted*

comment 3033 comment by: *ADV -German Airports Association*

GM.ADR.DSN.K.490 (g) (1)
add "strips" behind "runway" and "taxiway"

Justification
consistency with the definitions

response *Accepted*

(g)(1) will be amended.

comment 3034 comment by: *ADV -German Airports Association*

GM.ADR.DSN.K.490 (g) (1)
replace "1:10 obstacle surface" by "1:3 inner transitional surface"

response *Partially accepted*

Partially Agreed: GM will amended to remove reference to the 1:10 slope. The guidance to be outside the runway and taxiway strip graded areas and clear of the OFZ is in GM at paragraphs (g)(1) and (2).

comment 3068 comment by: *MST / STR - Stuttgart Airport*

GM.ADR.DSN.K.490 (g) (1)
add "strips" behind "runway" and "taxiway"

Justification
consistency with the definitions

response *Accepted*

(g)(1) will be amended.

comment 3069 comment by: *MST / STR - Stuttgart Airport*

	GM.ADR.DSN.K.490 (g) (1) replace "1:10 obstacle surface" by "1:3 inner transitional surface"
	Justificaiton ICAO
response	<i>Partially accepted</i>
	<i>Partially Agreed:</i> GM will amended to remove reference to the 1:10 slope. The guidance to be outside the runway and taxiway strip graded areas and clear of the OFZ is in GM at paragraphs (g)(1) and (2).

comment	3102 comment by: <i>Fraport AG</i>
	GM-ADR-DSN. K.490 — Wind direction indicator (g) (1)
	Editorial
	outside the Cleared and Graded Area of the runways and taxiways and beneath the 1:10 obstacle surface;
	Proposed Text outside the Cleared and Graded Area of the runways strips and taxiways strips and beneath the 1:3 inner transitional surface;
	Fraport AG to be consistent with ICAO definitions
response	<i>Partially accepted</i>
	<i>Agreed:</i> (g)(1) will be amended. <i>Partially Agreed:</i> GM will amended to remove reference to the 1:10 slope. The guidance to be outside the runway and taxiway strip graded areas and clear of the OFZ is in GM at paragraphs (g)(1) and (2).

CS-ADR — Book 2 — GM-ADR-DSN.K.495 — Landing direction indicator

p. 247

comment	331 comment by: <i>Icelandic Civil Aviation Administration</i>
	Suggest to delete, landing direction indicators not used at airports in scope.
response	<i>Not accepted</i>

comment	1823 comment by: <i>ENAC Ente Nazionale per l'Aviazione Civile</i>
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As first point of GM-ADR-DSN.K.495 we propose to add the following text: The landing indicator indicates to airplanes which are in take-off or landing manoeuvring to do this manoeuvre parallel to T leg and in the direction of the perpendicular line of the T letter.

In the GM between the phrase which ends with: "It can be set in any direction" and before the phrase which starts with "The under surface of the landing T, when mounted on its" we propose to add the following text: it's possible to use different materials for the structure if it will be shown that the final product it's equivalent, regarding strength, elasticity and other parameters, to the cement concrete pedestal structure.

We propose to remove the following text: the under surface of the landing 'T', when mounted on its pedestal, should be not less than 1.25 m above ground level.

response *Partially accepted*

The text indicated in the last paragraph will be deleted.

comment 2984

comment by: *Isavia*

Suggest to delete, landing direction indicators not used at airports in scope.

response *Not accepted*

CS-ADR – Book 2 – GM-ADR-DSN.K.500 – Signalling lamp

p. 247

comment 184

comment by: *CAA Norway*

We suggest to elevate GM-ADR-DSN.K.500 on page 247 from GM to CS. Signalling lamp is of important safety critical use for aircraft without radio contact.

response *Accepted*

comment 332

comment by: *Icelandic Civil Aviation Administration*

We suggest to elevate GM-ADR-DSN.K.500 on page 247 from GM to CS. Signalling lamp is of important safety critical use for aircraft without radio contact.

response *Accepted*

comment	679	comment by: <i>Finnish Transport Safety Agency</i>
	We suggest to elevate GM-ADR-DSN.K.500 on page 247 from GM to CS. Signalling lamp is of important safety critical use for aircraft without radio contact.	
response	<i>Accepted</i>	

comment	1705	comment by: <i>ECA - European Cockpit Association</i>
	Amend (a) as follows:	
	(a) A signalling lamp should be provided at a controlled aerodrome in the aerodrome control tower when required for air traffic management reasons .	
	Justification: The possibility of a NORDO visual circuit should be assessed clearly when deciding whether or not to have this tool installed and at disposal.	
response	<i>Partially accepted</i>	
	This has been moved to the CS.	

comment	2985	comment by: <i>Isavia</i>
	We suggest to elevate GM-ADR-DSN.K.500 on page 247 from GM to CS. Signaling lamp is of important safety critical use for aircraft without radio contact.	
response	<i>Accepted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.K.505 – Signal panels and signal area	p. 247-248
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comment	185	comment by: <i>CAA Norway</i>
	We suggest to delete GM-ADR-DSN.K.505 on page 247. Signal panels and signal area is not used at airports in scope.	
response	<i>Not accepted</i>	

comment	333	comment by: <i>Icelandic Civil Aviation Administration</i>
	We suggest to delete GM-ADR-DSN.K.505 on page 247. Signal panels and signal area is not used at airports in scope.	
response	<i>Not accepted</i>	
comment	680	comment by: <i>Finnish Transport Safety Agency</i>
	We suggest to delete GM-ADR-DSN.K.505 on page 247. Signal panels and signal area is not used at airports in scope.	
response	<i>Not accepted</i>	
comment	1706	comment by: <i>ECA - European Cockpit Association</i>
	Delete paragraph (d).	
	Justification: It is duplicated literally in the last part of paragraph (a).	
response	<i>Accepted</i>	
comment	1830	comment by: <i>ENAC Ente Nazionale per l'Aviazione Civile</i>
	This is a duplication of second part of par. a), we propose to remove G.M. par. (d).	
response	<i>Accepted</i>	
comment	2987	comment by: <i>Isavia</i>
	We suggest deleting GM-ADR-DSN.K.505 on page 247. Signal panels and signal area is not used at airports in scope.	
response	<i>Not accepted</i>	

comment	186	comment by: CAA Norway
	We suggest to delete GM-ADR-DSN.K.510 on page 248. Signal area is not used at airports in scope.	
response	<i>Not accepted</i>	

comment	334	comment by: Icelandic Civil Aviation Administration
	We suggest to delete GM-ADR-DSN.K.510 on page 248. Signal area is not used at airports in scope.	
response	<i>Not accepted</i>	

comment	681	comment by: Finnish Transport Safety Agency
	We suggest to delete GM-ADR-DSN.K.510 on page 248. Signal area is not used at airports in scope.	
response	<i>Not accepted</i>	

comment	2988	comment by: Isavia
	We suggest deleting GM-ADR-DSN.K.510 on page 248. Signal area is not used at airports in scope.	
response	<i>Not accepted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.K.515 – Characteristics of signal area
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p. 248

comment	187	comment by: CAA Norway
	Suggest to delete GM-ADR-DSN.K.515 on page 248. Signal area is not used at airports in scope.	
response	<i>Not accepted</i>	

comment	335	comment by: <i>Icelandic Civil Aviation Administration</i>
	Suggest to delete GM-ADR-DSN.K.515 on page 248. Signal area is not used at airports in scope.	
response	<i>Not accepted</i>	

comment	682	comment by: <i>Finnish Transport Safety Agency</i>
	Suggest to delete GM-ADR-DSN.K.515 on page 248. Signal area is not used at airports in scope.	
response	<i>Not accepted</i>	

comment	1839	comment by: <i>ENAC Ente Nazionale per l'Aviazione Civile</i>
	We propose to add the following CS or GM. it's possible to use different materials for the structure if it will be shown that the final product it's equivalent, regarding strenght, elasticity and other parameters, to the cement concrete pedestal structure.	
response	<i>Noted</i>	

comment	2989	comment by: <i>Isavia</i>
	Suggest deleting GM-ADR-DSN.K.515 on page 248. Signal area is not used at airports in scope.	
response	<i>Not accepted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.L.520 – General – Colour and conspicuity	p. 249
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comment	1263	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	GM.ADR.DSN.L520 (f) "Threshold piano keys" is a new term. Instead, ICAO terminology should be used.	
response	<i>Accepted</i>	

comment	1775	comment by: UK CAA
	<p>Page No: 249</p> <p>Paragraph No: GM.ADR.DSN.L.520(b)</p> <p>Comment: The use of reflective paints at aerodromes where operations take place at night is neither necessary nor practical. Suggest that paragraph (b) is deleted.</p> <p>Justification: At night guidance is provided by surface lighting or, for apron areas, floodlighting. The UK does not require the use of reflective paint, which is expensive and is more easily worn down (owing to the additional reflective materials included in it) and there have been no adverse safety reports that would suggest it is necessary.</p> <p>Proposed Text: DELETE GM.ADR.DSN.L.520(b)</p>	
response	<p><i>Partially accepted</i></p> <p>Since providing such markings is optional, 'should' will be changed to 'may'.</p>	

comment	2172	comment by: Airport St. Gallen-Altenrhein - ACH/LSZR
	<p>(f) the term "threshold piano keys" should not to be used, inconsistent with ICAO</p>	
response	<p><i>Accepted</i></p>	

CS-ADR – Book 2 – GM-ADR-DSN.L.540 Aiming point marking
--

p. 249-250

comment	1270	comment by: Federal Office of Civil Aviation, FOCA, Switzerland
	<p>There is no need to have UK CAA markings in the NPA. The article should be deleted.</p>	
response	<p><i>Accepted</i></p>	

comment	2136	comment by: Airport St. Gallen-Altenrhein - ACH/LSZR
	<p>delete the article, not ICAO</p>	
response	<p><i>Accepted</i></p>	

CS-ADR – Book 2 – GM-ADR-DSN.L.545 – Touchdown zone marking

p. 250

comment 1275 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

The article should be put in CS Book 1.

response *Not accepted*

CS-ADR – Book 2 – GM-ADR-DSN.L.550 – Runway side stripe marking

p. 250

comment 1276 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

The article should be put in CS Book 1.

response *Not accepted*

CS-ADR – Book 2 – GM-ADR-DSN.L.555 – Taxiway centre line marking

p. 250

comment 39 comment by: *ACI EUROPE - Airports Council International*

delete RETIL related markings

Justification: does not exist in ICAO - why should we have this in Europe only

response *Accepted*

comment 196 comment by: *CAA Austria - Ministry of Transport*

RETIL related markings have to be clarified. That's not in accordance with any ICAO - Document.
Should be deleted

response *Accepted*

comment	349	comment by: <i>Vienna International Airport</i>
	Delete (b) and (c)	
response	<i>Accepted</i>	
comment	603	comment by: <i>Cologne/Bonn Airport</i>
	(b) ICAO doesn't have RETIL related marking	
response	<i>Accepted</i>	
comment	625	comment by: <i>Avinor</i>
	GM.ADR.DSN.L.555. Delete RETIL related markings.	
response	<i>Accepted</i>	
comment	811	comment by: <i>Munich Airport International</i>
	delete RETIL related markings	
	Justification: does not exist in ICAO - why have this in Europe only?	
response	<i>Accepted</i>	
comment	1003	comment by: <i>Salzburger Flughafen GmbH</i>
	Delete (b) and (c)	
response	<i>Accepted</i>	
comment	1107	comment by: <i>Flughafen Graz Betriebs GmbH</i>
	Delete (b) and (c)	
response	<i>Accepted</i>	

comment	1185	comment by: <i>Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH</i>
	Delete (b) and (c)	
response	<i>Accepted</i>	
comment	1278	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	The article should be put in CS Book 1.	
response	<i>Not accepted</i>	
comment	1289	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	Figure GM-L-2 contains Italian visual aids, which are not translated. RETIL related markings and Figure GM-L-2 should be deleted.	
response	<i>Accepted</i>	
comment	1510	comment by: <i>Flughafen Linz-Hörsching - LNZ/LOWL</i>
	delete (b) and (c)	
response	<i>Accepted</i>	
comment	1845	comment by: <i>Geneva International Airport (ROMIG)</i>
	Delete RETIL related markings Does not exist in ICAO. This is an invention that is not needed and should not be found in Europe only - can create confusion for pilots and subsequent safety issues.	
response	<i>Accepted</i>	
comment	2129	comment by: <i>Airport St. Gallen-Altentrhein - ACH/LSZR</i>
	RETIL related markings and Figure GM-L-2 should be deleted, this is not from ICAO	

response	<i>Accepted</i>	
comment	2746	comment by: <i>Flughafen Klagenfurt</i>
	Delete (b) and (c)	
response	<i>Accepted</i>	
comment	3035	comment by: <i>ADV -German Airports Association</i>
	GM.ADR.DSN.L.555 delete RETIL related markings	
	Justification does not exist in ICAO - why have this in Europe only?	
response	<i>Accepted</i>	
comment	3070	comment by: <i>MST / STR - Stuttgart Airport</i>
	GM.ADR.DSN.L.555 delete RETIL related markings	
	Justification does not exist in ICAO - why have this in Europe only?	
response	<i>Accepted</i>	
comment	3103	comment by: <i>Fraport AG</i>
	GM-ADR-DSN.L.555 — Taxiway centre line marking (b) and Figure GML- 2	
	Editorial	
	Complete paragraph and Figure GM-L-2	
	Delete complete paragraph and Figure GM-L-2	
	Fraport	AG
	does not exist in ICAO - why should we have this in Europe only	
response	<i>Accepted</i>	

CS-ADR – Book 2 – Figure GM-L-2 RETIL markings

p. 252

comment	40	comment by: <i>ACI EUROPE - Airports Council International</i>
	delete RETIL markings Justification: does not exist in ICAO - why should we have this in Europe only	
response	<i>Accepted</i>	
comment	350	comment by: <i>Vienna International Airport</i>
	delete	
response	<i>Accepted</i>	
comment	770	comment by: <i>CAA Austria - Ministry of Transport</i>
	delete Figure	
response	<i>Accepted</i>	
comment	1004	comment by: <i>Salzburger Flughafen GmbH</i>
	delete	
response	<i>Accepted</i>	
comment	1108	comment by: <i>Flughafen Graz Betriebs GmbH</i>
	delete	
response	<i>Accepted</i>	

comment	1188	comment by: <i>Innsbruck Airport Authority - Tiroler Flughafenbetriebsges. mbH</i>
	delete	
response	<i>Accepted</i>	
comment	1297	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	Figure GM-L-2 contains Italian visual aids, which are not translated. RETIL related markings and Figure GM-L-2 should be deleted.	
response	<i>Accepted</i>	
comment	1511	comment by: <i>Flughafen Linz-Hörsching - LNZ/LOWL</i>
	delete	
response	<i>Accepted</i>	
comment	2749	comment by: <i>Flughafen Klagenfurt</i>
	delete	
response	<i>Accepted</i>	
comment	3103 ❖	comment by: <i>Fraport AG</i>
	GM-ADR-DSN.L.555 – Taxiway centre line marking (b) and Figure GML- 2	
	Editorial	
	Complete paragraph and Figure GM-L-2	
	Delete complete paragraph and Figure GM-L-2	
	Fraport does not exist in ICAO - why should we have this in Europe only	AG
response	<i>Accepted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.L.560 – Interruption of runway markings p. 252

comment 1290 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2119 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR – Book 2 – GM-ADR-DSN.L.565 – Runway turn pad marking p. 252

comment 590 ❖ comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.B.095 – Runway Turn Pads (p15-16)
- CS-ADR - Book 1 – CS-ADR-DSN.L.565 – Runway Turn Pad Marking (p65)
- CS-ADR - Book 2 – GM-ADR-DSN.B.095 – Runway turn pads (p217)
- CS-ADR - Book 2 – GM-ADR-DSN.L.565 – Runway turn pad marking (p252)

2. Proposed text / comment

Providing a turn pad on a runway facilitates operations, but is not necessarily mandatory: it is proposed to revise paragraph (b) of CS-ADR-DSN.B.095 accordingly.

Moreover, it is proposed to include in this CS an "alternative turn pad". Indeed:

- France has some provisions, detailed and different from Annex 14 Volume 1, which have been notified to ICAO, but are not included in NPA 2011-20 as an alternative design feature within the CS;
- Some alternative design features within a CS already exist in this NPA, which are not coming from Annex 14 volume 1 (ex: alternate aiming points in CS-ADR-DSN.L.540: (c) (2) page 58 and 59: EASA indicated it

comes from UK).

Consequently, it is proposed to include the specifications of French turn pads in CS-ADR-DSN.B.095 (page 16), which are already included in the project for ICAO PANS Aerodromes agreed within the group (several States from all the world) and ICAO secretariat, written in cooperation with CAA UK, Germany, ACI, Boeing and Airbus.

It is proposed:

- to add a paragraph (h) in CS-ADR-DSN.B.095 to include this alternative shape for a turn pad,
- to move paragraph (a) and figure B-1 of CS-ADR-DSN.B.095 to GM,
- to add details on the alternative turn pad in GM (the content is taken from the draft PANS Aerodromes); and
- to add a paragraph on the marking of such turn pads.

Proposal for CS-ADR-DSN.B.095 – page 16 on Turn pads , and corresponding GM:

· Add to CS-ADR-DSN.B.095:

*At the beginning of (b): "*When provided*", and

*Paragraph (h):

"(h) *An alternative turn pad than the one described above can be designed. In this case, the following criteria should be considered:*

the specific ground maneuvering capability of the considered aeroplane (notably the maximum effective steering angle of the nose landing gear);

the provision for adequate clearances

the provision for appropriate marking and lighting;

the provision of shoulders;

the protection from jet blast;

if relevant, the protection of ILS."

· Move paragraph (a) of CS-ADR-DSN.B.095 and Figure B-1 from CS-ADR-DSN.B.095 to guidance material GM-ADR-DSN.B.095, and add the following content in GM-ADR-DSN.B.095:

"(a) Turn pads are generally provided when an exit taxiway is not available at the runway end. A turn pad allows an aeroplane to turn back after landing and before take-off and to position itself correctly on the runway. (See Figure GM-B-1).

Note - In the event that a turn pad is either not available or does not allow an aeroplane to perform a turn-around, a tow vehicle may be used to maneuver the aeroplane via a series of short back and forth movements to bring the aeroplane into alignment with the runway centerline. If the shoulders of a turn pad are paved or are otherwise suitable to support the occasional pass of an aeroplane landing gear, a turn-around maneuver may be used. The maneuver guidance is generally provided by a marshaller.

(b) The ground maneuvering capabilities available from manufacturers (in aircraft characteristic for airport planning manuals) are one of the key factors to be considered in order to determine if an existing turn pad is suitable for a particular aeroplane. The speed of the maneuvering aeroplane is also a factor.

Note – Taxi cameras can assist the flight crew in preventing the wheels of the aeroplane from leaving the full-strength pavement during normal ground maneuvering. The taxi camera system or marshaller guidance should be required on an aeroplane dispatched to an aerodrome with turn pads having a

width less than that the required one.

(c) In case an alternative turn pad is provided, it can have a different shape. For instance, the turn pad can be a half circle, as shown on Figure GM-B-2:

(see figure GM-B-2 given in the attached file, and the other attached file to show the whole comment including the figure GM-B-2)

Note: The following values are generally used:

$\gamma = 30$ degrees,

e being the same separation as for taxiways to objects, and

e' being a specific margin for the rotation, to take into account possible oversteering, and which can be chosen as follows:

	Code letter					
	A	B	C	D	E	F
e'	1.5m	2.25 m	5.7 m (a) or 8.8m (b)	8.8m	8.8m	8.8m

(a) if the turn pad is intended to be used by aeroplanes with a wheel base less than 18 m.

(b) if the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m.

In order to assist a pilot in knowing where the aeroplane should be positioned when the pilot initiates the turn around manoeuvre, some form of visual guidance can be provided. Alignment poles can be installed far enough away from the runway so that they are not obstructions, but within the range of vision of the pilot. Such poles can be set in a way that when the two poles align with one another, the pilot's position is essentially at the location where the turn around maneuver should be initiated. The poles can be painted a bright orange color to aid in their visibility and the two poles can be set on the order of 20 to 30 meters apart from one another, so that it is easy to detect when the two poles are in alignment with the pilot's eye. By careful setting of the two poles, any aeroplane up to the size of the most demanding (or critical) aeroplane will be able to easily perform the manoeuvre without placing the nose gear of the aeroplane off of a pavement edge as the aeroplane carries out the manoeuvre."

And add a paragraph on markings in CS-ADR-DSN-L.565 page 65:

"CS-ADR-DSN-L.565 – Runway turn pad marking

(a) Applicability: Where a runway turn pad is provided, [...]

(b) Characteristics:

(1) The runway turn pad marking should be curved from the runway centre line into [...]

~~(6) The design of the turn pad marking should be such that, when the cockpit of the aeroplane remains over the runway turn pad marking, the clearance distance between any wheel of the aeroplane landing gear and the edge of the runway turn pad should be not less than those specified in the following tabulation:~~

Code letter ————— Clearance

A ————— 1.5 m

B ————— 2.25 m

C ————— 3 m if the turn pad is intended to be used by aeroplanes with a wheel base less than 18 m

4.5 m if the turn pad is intended to be used by aeroplanes with a wheel base

~~equal to or greater than 18 m~~

~~D 4.5 m~~

~~E 4.5 m~~

~~F 4.5 m~~

[...]

(c) Where alternative turn pads are provided, as specified in CS-ADR-DSN.B.095 paragraph (h), adequate marking should be provided, showing the trajectory the aeroplane should follow."

"GM-ADR-DSN.L.565 – Runway turn pad marking

In case of a turn pad with the alternative shape proposed in GM-ADR-DSN.B.095, the marking should follow the trajectory of the aircraft which was used to dimension the turn pad (see Figure GM-B-2 of GM-ADR-DSN.B.095)."

response *Noted*

The ICAO design criteria will be used in the CS. There is flexibility for alternative designs by ELOS or SC.

comment 1291 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2120 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR – Book 2 – GM-ADR-DSN.L.575 – Runway-holding position marking p. 253

comment 1294 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

	There is no content: Please remove title or provide content.
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.
comment	2115 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.L.580 — Intermediate holding position marking

p. 253

comment	1295 comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	There is no content: Please remove title or provide content.
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.
comment	2116 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.L.585 — VOR aerodrome checkpoint marking

p. 253

comment	1296 comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment

2117

comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response

Not accepted

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR – Book 2 – GM-ADR-DSN.M.615 – General

p. 255-256

comment

2384

comment by: *Airport Partner International /SOLERO*

Attachment [#489](#)

**(k) The elements here above can be applied to solar panels
(l) (1) solar panels are inclined so as to efficiently capture the sunlight**

This is the unique place where mention is made over **solar modules** in aerodromes. We would like to provide a larger overview about safety guidance required for possible solar photovoltaic systems on aerodromes.

Dazzle is a first hand safety issue, from any kind of reflecting surface which could affect landing pilots or air traffic controllers. Antiglare (an not antireflective) cover glasses are enabling to limit reflected luminance below 20.000 cd/m².

But solar photovoltaic systems are power generators on specific structures, which could further interfere with aerodrome operations and navigational aid equipment. Other safety issues have to be controled, and we need therefore a specific risk assessment.

We ask to create a specific NPA topic on solar photovoltaic issues, in relation with the industry, here cross references could be made on all important items to respect, and particularly with

1. GM –ADR-DSN.M.615 about dazzle assessment
2. NPA 2011-20 (B.II) AMC/GM to Annex II – Part OR – Subpart D – Management – Safety Risk Assessment
3. Number of references as indicated including conception of aerodromes, runway and taxiway strips, obstacles and related frangibility, electrical requirements, installation, operations and maintenance.

We believe that photovoltaic systems placed un maneuvering areas could interfere with nav aids and aircraft equipment, and the risk assessment must be

fully made under the airport risk manager duty. If such equipment could interfere with the aerodrome certification process, approved changes should be submitted to the local authority.

Photovoltaic risk assessment is an airport by airport procedure, as airports are different from each other, including frequency, type of aircrafts and surrounding conditions.

On one hand, we wish that most of airports could produce such solar photovoltaic renewable energy on their site, which is a social contribution to sustainable aviation, and on the other hand we wish that improved safety control is made to protect aviation operations.

The document in annex is a Letter to EASA, detailing current available expertise and detailing most important cross references in NPA 2011-20.

We wait EASA position on our proposal.

response *Noted*

CS-ADR – Book 2 – GM-ADR-DSN.M.620 – Aeronautical beacons

p. 256

comment 1858

comment by: *ENAC Ente Nazionale per l'Aviazione Civile*

We propose to include a paragraph where it's reported the possibility to establish, for obstacle clearance purposes, areas with different shapes and different technical parameters respect the rectangular area.

response *Noted*

CS-ADR – Book 2 – GM-ADR-DSN.M.625 Approach lighting systems, general and applicability

p. 257-260

comment 1299

comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

Paragraphs (c) (3) and (d) (1) contain redundant elements. The whole article should be consolidated. Paragraphs (c) (6) contains an unclear formulation of "in the outer portion of the system".

Refers to GM-ADR-DSN.M.625 and following articles: there are no indication to SALS and to ALS for non-precision approach runways. The corresponding criteria for SALS and to ALS for non-precision approach runways should be added. Many requirements are already provided in the CS Book 1; the complete Section 1 about ALS should be rewritten.

response *Noted*

comment 1771 ❖ comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN. M.625 — Approach lighting systems, general and applicability (p80-82)
- CS-ADR - Book 1 - CS-ADR-DSN. M.630 — Precision approach category I lighting system (p84-85)
- CS-ADR - Book 1 - Figure M-2 Precision approach category I lighting systems (p85)
- CS-ADR - Book 1 - Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations (p86)
- CS-ADR - Book 1 - CS-ADR-DSN.M.635 — Precision approach category II and III lighting system (p87-88)
- CS-ADR - Book 2 - GM-ADR-DSN.M.625 — Approach lighting systems, general and applicability (p256-257)
- CS-ADR - Book 2 - Figure GM-M-2 Precision approach category I lighting systems (p262)
- CS-ADR - Book 2 - Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights (p263)
- CS-ADR - Book 2 - GM-ADR-DSN.M.630 — Precision approach category I lighting system (p265-267)

2. General comment

For precision approach category I runways, paragraph (c) of CS-ADR-DSN. M.625 allows for only one possible layout for its lighting system making reference to CS-ADR-DSN.M.600630.

But it is not always possible to implement the proposed layout and even not always necessary.

In France, there are three others precision approach category I lighting systems, as follows:

1. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 720m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
2. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 420m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
3. no approach lighting system:

Given these arguments, it is not appropriate to provide only one layout for

precision approach category I lighting system in this CS.

2. Justification and proposed text / comment

This comment is critical.

This comment is linked to DGAC's comment on ICAO notes and attachments that shall be in GM rather than in CS.

The following specifications are not binding in France, are only in notes or in a attachment to ICAO Annex 14 Volume1 and are written as a guidance materials since there are just possibilities (e.g. use of "can" and "advisable"):

- Paragraphs (a)(2) and (b)(2) of CS-ADR-DSN.M.625 (ICAO notes)
- Paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 (ICAO Attachments)
- Paragraph (c)(3) of CS-ADR-DSN.M.630 (ICAO Attachments)
- paragraph (l) (6) of CS-ADR-DSN.M.635 (ICAO notes)
- Figure M-2, which is not referenced in the CS (ICAO Attachments)
- Figure M-3, which is just an explanation on how the lights characteristics have been determined in ICAO Annex 14 transcribed in chapter U of the CS (ICAO Attachments).

As confirmed by IACO, appendixes of an Annex have the same status as the corresponding provisions of the Annex, whereas attachments are only guidance materials.

Besides:

- paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 are respectively duplicated in paragraphs (a)(1) and (a)(2) of GM-ADR-DSN.M.625
- paragraph (c)(3) of CS-ADR-DSN.M.630 is already duplicated in GM-ADR-DSN.M.630
- paragraph (l) (6) of CS-ADR-DSN.M.635 is already duplicated in GM-ADR-DSN.M.635
- Figure M-2 and figure M-3 are already in GM respectively as Figure GM-M-2 and Figure GM-M-4.

DGAC proposes to **move these specifications to GM**.

Editorial improvements in CS-ADR-DSN.M.625

* In paragraphs (c) and (d), references are erroneous: they should respectively refer to CS-ADR-DSN.M.630 and CS-ADR-DSN.M.635.

* In CS-ADR-DSN.M.625, the numbering becomes erroneous from (e) crossbar lights (which should be (f)) to (k) (which should be (l)).

Editorial improvements in CS-ADR-DSN.M.630

* First sentence is a duplication of paragraph (c) of CS-ADR-DSN.M.625 without the "*where physically practicable*". It is essential to avoid any confusion to delete this sentence from CS-ADR-DSN.M.630.

* In paragraph (b)(2) the reference to "*as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance*" shall be replaced by "*in CS-ADR-DSN.S.895*" as maintenance objectives are not specified in Part OPS because the serviceability level results from design, manufacturing and maintenance.

* In paragraph (b)(2), the sentence "*The barrettes should be at least 4 m in length*" should be moved to paragraph (b)(3) in order to be consistent with the wording of ICAO Annex 14 volume1 Standards 5.3.4.15 and 16.

* Paragraph (c) should be consolidated with paragraph (b) for consistency.

Thus CS-ADR-DSN.M.630 — (c) (1) and (2) should be renumbered as (b) (7) and (8).

* In paragraph (c) (1) “*this Regulation*” should be replaced by “(b)(1)(ii) or (b)(2)(ii)” for consistency with CS-ADR-DSN.M.630 — (b) (4) and Annex 14 Recommendation 5.3.4.17.

* In paragraph (c) (2) “*this Regulation*” should be replaced by (b)(7) (which corresponds to actual paragraph (c)(1) but the aforementioned re-numbering is taken into account).

Editorial improvements in CS-ADR-DSN.M.635

* In paragraph (a) references to Figure M-4, 10.4.7 and Figure M-4-A should respectively be replaced by Figure M-4A, CS-ADR-DSN.S.895 and Figure M-4B.

* In paragraph (h) “*specified as maintenance objective*” should be replaced by “*specified in CS-ADR-DSN.S.895*” as the serviceability level results from design, manufacturing and maintenance.

* In paragraph (j) “*specified as maintenance objective*” should be replaced by “*specified in CS-ADR-DSN.S.895*”.

Book I

CS-ADR-DSN.M.625 — Approach lighting systems, general and applicability

“(a) Non-instrument runway

~~(1) Where physically practicable, a simple approach lighting system as specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-instrument runway where the code number is 3 or 4 and intended for use at night, except when the runway is used only in conditions of good visibility, and sufficient guidance is provided by other visual aids.~~

~~(2) A simple approach lighting system can also provide visual guidance by day.~~

(b) Non-precision approach runway

~~(1) Where physically practicable, a simple approach lighting system specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-precision approach runway, except when the runway is used only in conditions of good visibility or sufficient guidance is provided by other visual aids.~~

~~(2) It is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system.~~

(c) Precision approach runway category I

Where physically practicable, a precision approach category I lighting system as specified in CS-ADR-DSN.M.600 630 should be provided to serve a precision approach runway category I.

(d) Precision approach runway categories II and III

A precision approach category II and III lighting system as specified in CS-ADR-DSN. M.605 635 should be provided to serve a precision approach runway category II or III.

(e) Simple approach lighting system

[...]

~~(ii) The specifications in this document provide for the basic characteristics for simple approach lighting systems. For certain aspects of these systems, some latitude is permitted, for example, in the spacing between centre line lights and crossbars. The simple approach lighting patterns that have been generally adopted are shown in Figure M-1.~~

~~(iii) The approach lighting configuration is to be provided irrespective of the location of the threshold, i.e. whether the threshold is at the extremity of the runway or displaced from the runway extremity. In both cases, the approach lighting system should extend up to the threshold. However, in the case of a~~

~~displaced threshold, inset lights are used from the runway extremity up to the threshold to obtain the specified configuration. These inset lights are designed to satisfy the structural requirements specified in this Regulation and the chromaticity and characteristics specified in CS-ADR-DSN.U.930 and CS-ADRDSN.U.940.~~

~~(e) (f) Crossbar lights:
[...]"~~

CS-ADR-DSN. M.630 – Precision approach category I lighting system

~~"A precision approach category I lighting system as specified in this Regulation should be provided to serve a precision approach runway category I.~~

~~[...] (b) Characteristics:~~

~~[...] (2) Where the serviceability level of the approach lights specified as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance in CS-ADR-DSN.S.895 can be demonstrated, each centre line light position should consist of either:~~

~~[...] The barrettes should be at least 4 m in length.~~

~~(3) The barrettes should be at least 4 m in length. When barrettes are composed of lights approximating to point sources, the lights should be uniformly spaced at intervals of not more than 1.5 m.~~

~~[...] (c) Characteristics:~~

~~(1) (7) If the centre line consists of barrettes as described in this Regulation paragraphs (b)(1)(ii) or (b)(2)(ii), each barrette [...]~~

~~(2) (8) Each capacitor discharge light as described in this Regulation paragraph (b)(7) should [...]~~

~~(3) The flight path envelopes used in the design of these lights are given in Figure M-3.~~

~~[...]"~~

Figure M-2 Precision approach category I lighting systems

Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations

CS-ADR-DSN.M.635 – Precision approach category II and III lighting system

~~"(a) [...] one at 150 m and one at 300 m from the threshold, all as shown in Figure M-4 Figure M-4A. Where the serviceability level of the approach lights specified as maintenance objectives in 10.4.7 CS-ADR-DSN.S.895 can be demonstrated, the system may have two side rows of lights, extending 240 m from the threshold, and two crossbars, one at 150 m and one at 300 m from the threshold, all as shown in Figure M-4A Figure M-4B.~~

~~[...]~~

~~(h) The centre line of a precision approach category II and III lighting system for the first 300 m from the threshold should consist of barrettes showing variable white, except that, where the threshold is displaced 300 m or more, the centre line may consist of single light sources showing variable white. Where the serviceability level of the approach lights specified as maintenance objectives in CS-ADR-DSN.S.895 can be demonstrated, the centre line of a precision approach category II and III lighting system for the first 300 m from the threshold may consist of either:~~

~~[...]~~

~~(j) Where the serviceability level of the approach lights specified as maintenance objectives in CS-ADR-DSN.S.895 can be demonstrated, beyond 300 m from the threshold each centre line light position may consist of either:~~

~~[...]~~

~~(l) If the centre line beyond 300 m from the threshold consists of barrettes as described in (i)(1) and (j)(1) above, each barrette beyond 300 m should be~~

supplemented by a capacitor discharge light, except where such lighting is considered unnecessary taking into account the characteristics of the system and the nature of the meteorological conditions.

[...]

~~(6) The flight path envelopes used in the design of these lights are given in Figure M-3.~~

[...]"

Book II

Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights

GM-ADR-DSN.M.625 – Approach lighting systems, general and applicability

"(a) Non-instrument runway: a simple approach lighting system can also provide visual guidance by day.

(b) Non-precision approach runway: it is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system

(ac) Types and characteristics

[...]"

GM-ADR-DSN.M.630 – Precision approach category I lighting system

"[...]

(a c) Vertical tolerances:

[...]

(d) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

GM-ADR-DSN.M.635 – Precision approach category II and III lighting system

"[...]

(h) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

response

Noted

Partially Agreed: Incorrect references will be amended. Paragraphs (a)(2) and (b)(2) will be moved to GM.

Not Agreed: Remaining proposals.

comment

2093

comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

lot of repetition of CS's, rewrite the complete Section 1 on ALS

response

Noted

comment

2104

comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

requires compatible norms for SALS and ALS for non-precision approach runways.

response	<i>Noted</i>
comment	2486 comment by: AENA - Aeropuertos Españoles y Navegación Aérea <p><i>"(a) Non-instrument runway: a simple approach lighting system can also provide visual guidance by day.</i></p> <p><i>(b) Non-precision approach runway: it is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system</i></p> <p><i>(ac) Types and characteristics</i></p> <p><i>[...]"</i></p>
response	<i>Accepted</i>

CS-ADR – Book 2 – Figure GM-M-1 Simple approach lighting system

p. 261

comment	2093 ❖ comment by: Airport St. Gallen-Altenrhein - ACH/LSZR lot of repetition of CS's, rewrite the complete Section 1 on ALS
response	<i>Noted</i>
comment	2104 ❖ comment by: Airport St. Gallen-Altenrhein - ACH/LSZR requires compatible norms for SALS and ALS for non-precision approach runways.
response	<i>Noted</i>

CS-ADR – Book 2 – Figure GM-M-2 Precision approach category I lighting system

p. 262

comment	1771 ❖ comment by: DGAC Direction Générale de l'aviation civile <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> CS-ADR - Book 1 – CS-ADR-DSN. M.625 – Approach lighting systems,
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- general and applicability (p80-82)
- CS-ADR - Book 1 - CS-ADR-DSN. M.630 — Precision approach category I lighting system (p84-85)
- CS-ADR - Book 1 - Figure M-2 Precision approach category I lighting systems (p85)
- CS-ADR - Book 1 - Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations (p86)
- CS-ADR - Book 1 - CS-ADR-DSN.M.635 — Precision approach category II and III lighting system (p87-88)
- CS-ADR - Book 2 - GM-ADR-DSN.M.625 — Approach lighting systems, general and applicability (p256-257)
- CS-ADR - Book 2 - Figure GM-M-2 Precision approach category I lighting systems (p262)
- CS-ADR - Book 2 - Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights (p263)
- CS-ADR - Book 2 - GM-ADR-DSN.M.630 — Precision approach category I lighting system (p265-267)

2. General comment

For precision approach category I runways, paragraph (c) of CS-ADR-DSN. M.625 allows for only one possible layout for its lighting system making reference to CS-ADR-DSN.M.600630.

But it is not always possible to implement the proposed layout and even not always necessary.

In France, there are three others precision approach category I lighting systems, as follows:

1. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 720m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
2. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 420m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
3. no approach lighting system:

Given these arguments, it is not appropriate to provide only one layout for precision approach category I lighting system in this CS.

2. Justification and proposed text / comment

This comment is critical.

This comment is linked to DGAC's comment on ICAO notes and attachments that shall be in GM rather than in CS.

The following specifications are not binding in France, are only in notes or in a attachment to ICAO Annex 14 Volume1 and are written as a guidance materials since there are just possibilities (e.g. use of "can" and "advisable"):

- Paragraphs (a)(2) and (b)(2) of CS-ADR-DSN.M.625 (ICAO notes)
- Paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 (ICAO Attachments)
- Paragraph (c)(3) of CS-ADR-DSN.M.630 (ICAO Attachments)
- paragraph (l) (6) of CS-ADR-DSN.M.635 (ICAO notes)
- Figure M-2, which is not referenced in the CS (ICAO Attachments)
- Figure M-3, which is just an explanation on how the lights characteristics have been determined in ICAO Annex 14 transcribed in chapter U of the CS (ICAO Attachments).

As confirmed by IACO, appendixes of an Annex have the same status as the corresponding provisions of the Annex, whereas attachments are only guidance materials.

Besides:

- paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 are respectively duplicated in paragraphs (a)(1) and (a)(2) of GM-ADR-DSN.M.625
- paragraph (c)(3) of CS-ADR-DSN.M.630 is already duplicated in GM-ADR-DSN.M.630
- paragraph (l) (6) of CS-ADR-DSN.M.635 is already duplicated in GM-ADR-DSN.M.635
- Figure M-2 and figure M-3 are already in GM respectively as Figure GM-M-2 and Figure GM-M-4.

DGAC proposes to **move these specifications to GM.**

Editorial improvements in CS-ADR-DSN.M.625

* In paragraphs (c) and (d), references are erroneous: they should respectively refer to CS-ADR-DSN.M.630 and CS-ADR-DSN.M.635.

* In CS-ADR-DSN.M.625, the numbering becomes erroneous from (e) crossbar lights (which should be (f)) to (k) (which should be (l)).

Editorial improvements in CS-ADR-DSN.M.630

* First sentence is a duplication of paragraph (c) of CS-ADR-DSN.M.625 without the "*where physically practicable*". It is essential to avoid any confusion to delete this sentence from CS-ADR-DSN.M.630.

* In paragraph (b)(2) the reference to "*as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance*" shall be replaced by "*in CS-ADR-DSN.S.895*" as maintenance objectives are not specified in Part OPS because the serviceability level results from design, manufacturing and maintenance.

* In paragraph (b)(2), the sentence "*The barrettes should be at least 4 m in length*" should be moved to paragraph (b)(3) in order to be consistent with the wording of ICAO Annex 14 volume1 Standards 5.3.4.15 and 16.

* Paragraph (c) should be consolidated with paragraph (b) for consistency. Thus CS-ADR-DSN.M.630 – (c) (1) and (2) should be renumbered as (b) (7) and (8).

* In paragraph (c) (1) "*this Regulation*" should be replaced by "*(b)(1)(ii) or (b)(2)(ii)*" for consistency with CS-ADR-DSN.M.630 – (b) (4) and Annex 14 Recommendation 5.3.4.17.

* In paragraph (c) (2) "*this Regulation*" should be replaced by **(b)(7)** (which corresponds to actual paragraph (c)(1) but the aforementioned re-numbering is taken into account).

Editorial improvements in CS-ADR-DSN.M.635

* In paragraph (a) references to Figure M-4, 10.4.7 and Figure M-4-A should respectively be replaced by Figure M-4A, CS-ADR-DSN.S.895 and Figure M-4B.

* In paragraph (h) "specified as maintenance objective" should be replaced by "specified in CS-ADR-DSN.S.895" as the serviceability level results from design, manufacturing and maintenance.

* In paragraph (j) "specified as maintenance objective" should be replaced by "specified in CS-ADR-DSN.S.895."

Book I**CS-ADR-DSN.M.625 – Approach lighting systems, general and applicability**

"(a) Non-instrument runway

~~(1) Where physically practicable, a simple approach lighting system as specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-instrument runway where the code number is 3 or 4 and intended for use at night, except when the runway is used only in conditions of good visibility, and sufficient guidance is provided by other visual aids.~~

~~(2) A simple approach lighting system can also provide visual guidance by day.~~

(b) Non-precision approach runway

~~(1) Where physically practicable, a simple approach lighting system specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-precision approach runway, except when the runway is used only in conditions of good visibility or sufficient guidance is provided by other visual aids.~~

~~(2) It is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system.~~

(c) Precision approach runway category I

Where physically practicable, a precision approach category I lighting system as specified in CS-ADR-DSN.M.600 **630** should be provided to serve a precision approach runway category I.

(d) Precision approach runway categories II and III

A precision approach category II and III lighting system as specified in CS-ADR-DSN. M.605 **635** should be provided to serve a precision approach runway category II or III.

(e) Simple approach lighting system

[...]

~~(ii) The specifications in this document provide for the basic characteristics for simple approach lighting systems. For certain aspects of these systems, some latitude is permitted, for example, in the spacing between centre line lights and crossbars. The simple approach lighting patterns that have been generally adopted are shown in Figure M-1.~~

~~(iii) The approach lighting configuration is to be provided irrespective of the location of the threshold, i.e. whether the threshold is at the extremity of the runway or displaced from the runway extremity. In both cases, the approach lighting system should extend up to the threshold. However, in the case of a displaced threshold, inset lights are used from the runway extremity up to the threshold to obtain the specified configuration. These inset lights are designed to satisfy the structural requirements specified in this Regulation and the chromaticity and characteristics specified in CS-ADR-DSN.U.930 and CS-ADR-DSN. U.940.~~

(e) **(f)** Crossbar lights:

[...]"

CS-ADR-DSN. M.630 – Precision approach category I lighting system

~~"A precision approach category I lighting system as specified in this Regulation should be provided to serve a precision approach runway category I.~~

~~[...] (b) Characteristics:~~

~~[...] (2) Where the serviceability level of the approach lights specified as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance in CS-ADR-DSN.S.895 can be demonstrated, each centre line light position should consist of either:~~

~~[...] The barrettes should be at least 4 m in length.~~

~~(3) The barrettes should be at least 4 m in length. When barrettes are composed of lights approximating to point sources, the lights should be uniformly spaced at intervals of not more than 1.5 m.~~

~~[...] (c) Characteristics:~~

~~(1) (7) If the centre line consists of barrettes as described in this Regulation paragraphs (b)(1)(ii) or (b)(2)(ii), each barrette [...]~~

~~(2) (8) Each capacitor discharge light as described in this Regulation paragraph (b)(7) should [...]~~

~~(3) The flight path envelopes used in the design of these lights are given in Figure M-3.~~

~~[...]"~~

~~**Figure M-2 Precision approach category I lighting systems**~~

~~**Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations**~~

CS-ADR-DSN.M.635 – Precision approach category II and III lighting system

"(a) [...] one at 150 m and one at 300 m from the threshold, all as shown in Figure M-4 ~~Figure M-4A~~. Where the serviceability level of the approach lights specified as maintenance objectives in ~~10.4.7~~ CS-ADR-DSN.S.895 can be demonstrated, the system may have two side rows of lights, extending 240 m from the threshold, and two crossbars, one at 150 m and one at 300 m from the threshold, all as shown in ~~Figure M-4A~~ ~~Figure M-4B~~.

[...]

(h) The centre line of a precision approach category II and III lighting system for the first 300 m from the threshold should consist of barrettes showing variable white, except that, where the threshold is displaced 300 m or more, the centre line may consist of single light sources showing variable white. Where the serviceability level of the approach lights specified as maintenance objectives in CS-ADR-DSN.S.895 can be demonstrated, the centre line of a precision approach category II and III lighting system for the first 300 m from the threshold may consist of either:

[...]

(j) Where the serviceability level of the approach lights specified as maintenance objectives in CS-ADR-DSN.S.895 can be demonstrated, beyond 300 m from the threshold each centre line light position may consist of either:

[...]

(l) If the centre line beyond 300 m from the threshold consists of barrettes as described in (i)(1) and (j)(1) above, each barrette beyond 300 m should be supplemented by a capacitor discharge light, except where such lighting is considered unnecessary taking into account the characteristics of the system and the nature of the meteorological conditions.

[...]

~~(6) The flight path envelopes used in the design of these lights are given in Figure M-3.~~

~~[...]"~~

Book II

Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights
GM-ADR-DSN.M.625 — Approach lighting systems, general and applicability

"(a) Non-instrument runway: a simple approach lighting system can also provide visual guidance by day.

(b) Non-precision approach runway: it is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system

(ac) Types and characteristics

[...]"

GM-ADR-DSN.M.630 — Precision approach category I lighting system

"[...]

(a c) Vertical tolerances:

[...]

(d) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

GM-ADR-DSN.M.635 — Precision approach category II and III lighting system

"[...]

(h) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

response *Accepted*

Figure GM-M-2 has been deleted.

comment 2093 ❖ comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

lot of repetition of CS's, rewrite the complete Section 1 on ALS

response *Noted*

comment 2104 ❖ comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

requires compatible norms for SALS and ALS for non-precision approach runways.

response *Noted*

comment 1771 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN. M.625 — Approach lighting systems, general and applicability (p80-82)
- CS-ADR - Book 1 - CS-ADR-DSN. M.630 — Precision approach category I lighting system (p84-85)
- CS-ADR - Book 1 - Figure M-2 Precision approach category I lighting systems (p85)
- CS-ADR - Book 1 - Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations (p86)
- CS-ADR - Book 1 - CS-ADR-DSN.M.635 — Precision approach category II and III lighting system (p87-88)
- CS-ADR - Book 2 - GM-ADR-DSN.M.625 — Approach lighting systems, general and applicability (p256-257)
- CS-ADR - Book 2 - Figure GM-M-2 Precision approach category I lighting systems (p262)
- CS-ADR - Book 2 - Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights (p263)
- CS-ADR - Book 2 - GM-ADR-DSN.M.630 — Precision approach category I lighting system (p265-267)

2. General comment

For precision approach category I runways, paragraph (c) of CS-ADR-DSN. M.625 allows for only one possible layout for its lighting system making reference to CS-ADR-DSN.M.600~~630~~.

But it is not always possible to implement the proposed layout and even not always necessary.

In France, there are three others precision approach category I lighting systems, as follows:

1. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 720m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
2. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 420m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
3. no approach lighting system:

Given these arguments, it is not appropriate to provide only one layout for precision approach category I lighting system in this CS.

2. Justification and proposed text / comment

This comment is critical.

This comment is linked to DGAC's comment on ICAO notes and attachments

that shall be in GM rather than in CS.

The following specifications are not binding in France, are only in notes or in a attachment to ICAO Annex 14 Volume1 and are written as a guidance materials since there are just possibilities (e.g. use of "can" and "advisable"):

- Paragraphs (a)(2) and (b)(2) of CS-ADR-DSN.M.625 (ICAO notes)
- Paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 (ICAO Attachments)
- Paragraph (c)(3) of CS-ADR-DSN.M.630 (ICAO Attachments)
- paragraph (l) (6) of CS-ADR-DSN.M.635 (ICAO notes)
- Figure M-2, which is not referenced in the CS (ICAO Attachments)
- Figure M-3, which is just an explanation on how the lights characteristics have been determined in ICAO Annex 14 transcribed in chapter U of the CS (ICAO Attachments).

As confirmed by IACO, appendixes of an Annex have the same status as the corresponding provisions of the Annex, whereas attachments are only guidance materials.

Besides:

- paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 are respectively duplicated in paragraphs (a)(1) and (a)(2) of GM-ADR-DSN.M.625
- paragraph (c)(3) of CS-ADR-DSN.M.630 is already duplicated in GM-ADR-DSN.M.630
- paragraph (l) (6) of CS-ADR-DSN.M.635 is already duplicated in GM-ADR-DSN.M.635
- Figure M-2 and figure M-3 are already in GM respectively as Figure GM-M-2 and Figure GM-M-4.

DGAC proposes to **move these specifications to GM.**

Editorial improvements in CS-ADR-DSN.M.625

* In paragraphs (c) and (d), references are erroneous: they should respectively refer to CS-ADR-DSN.M.630 and CS-ADR-DSN.M.635.

* In CS-ADR-DSN.M.625, the numbering becomes erroneous from (e) crossbar lights (which should be (f)) to (k) (which should be (l)).

Editorial improvements in CS-ADR-DSN.M.630

* First sentence is a duplication of paragraph (c) of CS-ADR-DSN.M.625 without the "*where physically practicable*". It is essential to avoid any confusion to delete this sentence from CS-ADR-DSN.M.630.

* In paragraph (b)(2) the reference to "*as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance*" shall be replaced by "*in CS-ADR-DSN.S.895*" as maintenance objectives are not specified in Part OPS because the serviceability level results from design, manufacturing and maintenance.

* In paragraph (b)(2), the sentence "*The barrettes should be at least 4 m in length*" should be moved to paragraph (b)(3) in order to be consistent with the wording of ICAO Annex 14 volume1 Standards 5.3.4.15 and 16.

* Paragraph (c) should be consolidated with paragraph (b) for consistency. Thus CS-ADR-DSN.M.630 – (c) (1) and (2) should be renumbered as (b) (7) and (8).

* In paragraph (c) (1) "*this Regulation*" should be replaced by "*(b)(1)(ii) or (b)(2)(ii)*" for consistency with CS-ADR-DSN.M.630 – (b) (4) and Annex 14 Recommendation 5.3.4.17.

* In paragraph (c) (2) "*this Regulation*" should be replaced by **(b)(7)** (which

corresponds to actual paragraph (c)(1) but the aforementioned re-numbering is taken into account).

Editorial improvements in CS-ADR-DSN.M.635

* In paragraph (a) references to Figure M-4, 10.4.7 and Figure M-4-A should respectively be replaced by Figure M-4A, CS-ADR-DSN.S.895 and Figure M-4B.

* In paragraph (h) "*specified as maintenance objective*" should be replaced by "*specified in CS-ADR-DSN.S.895*" as the serviceability level results from design, manufacturing and maintenance.

* In paragraph (j) "*specified as maintenance objective*" should be replaced by "*specified in CS-ADR-DSN.S.895*".

Book I

CS-ADR-DSN.M.625 – Approach lighting systems, general and applicability

"(a) Non-instrument runway

~~(1) Where physically practicable, a simple approach lighting system as specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-instrument runway where the code number is 3 or 4 and intended for use at night, except when the runway is used only in conditions of good visibility, and sufficient guidance is provided by other visual aids.~~

~~(2) A simple approach lighting system can also provide visual guidance by day.~~

(b) Non-precision approach runway

~~(1) Where physically practicable, a simple approach lighting system specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-precision approach runway, except when the runway is used only in conditions of good visibility or sufficient guidance is provided by other visual aids.~~

~~(2) It is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system.~~

(c) Precision approach runway category I

~~Where physically practicable, a precision approach category I lighting system as specified in CS-ADR-DSN.M.600 630 should be provided to serve a precision approach runway category I.~~

(d) Precision approach runway categories II and III

~~A precision approach category II and III lighting system as specified in CS-ADR-DSN. M.605 635 should be provided to serve a precision approach runway category II or III.~~

(e) Simple approach lighting system

~~[...]~~

~~(ii) The specifications in this document provide for the basic characteristics for simple approach lighting systems. For certain aspects of these systems, some latitude is permitted, for example, in the spacing between centre line lights and crossbars. The simple approach lighting patterns that have been generally adopted are shown in Figure M-1.~~

~~(iii) The approach lighting configuration is to be provided irrespective of the location of the threshold, i.e. whether the threshold is at the extremity of the runway or displaced from the runway extremity. In both cases, the approach lighting system should extend up to the threshold. However, in the case of a displaced threshold, inset lights are used from the runway extremity up to the threshold to obtain the specified configuration. These inset lights are designed to satisfy the structural requirements specified in this Regulation and the chromaticity and characteristics specified in CS-ADR-DSN.U.930 and CS-ADR-DSN. U.940.~~

~~(e) (f) Crossbar lights:~~

[...]"

CS-ADR-DSN. M.630 — Precision approach category I lighting system

~~"A precision approach category I lighting system as specified in this Regulation should be provided to serve a precision approach runway category I.~~

[...] (b) Characteristics:

[...] (2) ~~Where the serviceability level of the approach lights specified as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance in CS-ADR-DSN.S.895 can~~ be demonstrated, each centre line light position should consist of either:

[...] ~~The barrettes should be at least 4 m in length.~~

(3) ~~The barrettes should be at least 4 m in length.~~ When barrettes are composed of lights approximating to point sources, the lights should be uniformly spaced at intervals of not more than 1.5 m.

[...] (c) Characteristics:

(1) (7) ~~If the centre line consists of barrettes as described in this Regulation paragraphs (b)(1)(ii) or (b)(2)(ii), each barrette [...]~~

(2) (8) ~~Each capacitor discharge light as described in this Regulation paragraph (b)(7) should [...]~~

(3) ~~The flight path envelopes used in the design of these lights are given in Figure M-3.~~

[...]"

Figure M-2 Precision approach category I lighting systems

Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations

CS-ADR-DSN.M.635 — Precision approach category II and III lighting system

"(a) [...] one at 150 m and one at 300 m from the threshold, all as shown in Figure M-4 ~~Figure M-4A~~. Where the serviceability level of the approach lights specified as maintenance objectives in ~~10.4.7~~ CS-ADR-DSN.S.895 can be demonstrated, the system may have two side rows of lights, extending 240 m from the threshold, and two crossbars, one at 150 m and one at 300 m from the threshold, all as shown in ~~Figure M-4A~~ ~~Figure M-4B~~.

[...]

(h) The centre line of a precision approach category II and III lighting system for the first 300 m from the threshold should consist of barrettes showing variable white, except that, where the threshold is displaced 300 m or more, the centre line may consist of single light sources showing variable white. Where the serviceability level of the approach lights specified as maintenance objectives in CS-ADR-DSN.S.895 can be demonstrated, the centre line of a precision approach category II and III lighting system for the first 300 m from the threshold may consist of either:

[...]

(j) Where the serviceability level of the approach lights specified as maintenance objectives in CS-ADR-DSN.S.895 can be demonstrated, beyond 300 m from the threshold each centre line light position may consist of either:

[...]

(l) If the centre line beyond 300 m from the threshold consists of barrettes as described in (i)(1) and (j)(1) above, each barrette beyond 300 m should be supplemented by a capacitor discharge light, except where such lighting is considered unnecessary taking into account the characteristics of the system and the nature of the meteorological conditions.

[...]

(6) ~~The flight path envelopes used in the design of these lights are given in Figure M-3.~~

[...]"

Book II

Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights

GM-ADR-DSN.M.625 – Approach lighting systems, general and applicability

"(a) Non-instrument runway: a simple approach lighting system can also provide visual guidance by day.

(b) Non-precision approach runway: it is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system

(ac) Types and characteristics

[...]"

GM-ADR-DSN.M.630 – Precision approach category I lighting system

"[...]

(a c) Vertical tolerances:

[...]

(d) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

GM-ADR-DSN.M.635 – Precision approach category II and III lighting system

"[...]

(h) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

response *Accepted*

Figure M-3 is deleted from the CS. Figure GM-M-4 is in GM.

comment 2093 ❖ comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

lot of repition of CS's, rewrite the complete Section 1 on ALS

response *Noted*

comment 2104 ❖ comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

requires compatable norms for SALS and ALS for non-precision approach runways.

response *Noted*

CS-ADR – Book 2 – Figure GM-M-5A Inner 300 m approach and runway lighting for precision approach runways, categories II and III

p. 264

comment	2093 ❖	comment by: Airport St. Gallen-Altenrhein - ACH/LSZR
	lot of repetition of CS's, rewrite the complete Section 1 on ALS	
response	Noted	

comment	2104 ❖	comment by: Airport St. Gallen-Altenrhein - ACH/LSZR
	requires compatible norms for SALS and ALS for non-precision approach runways.	
response	Noted	

CS-ADR – Book 2 – Figure GM-M-5B Inner 300 m approach and runway lighting for precision approach runways, categories II and III, where the serviceability levels of the lights specified as maintenance objectives in Chapter 10 can be demonstrated

p. 265

comment	2093 ❖	comment by: Airport St. Gallen-Altenrhein - ACH/LSZR
	lot of repetition of CS's, rewrite the complete Section 1 on ALS	
response	Noted	

comment	2104 ❖	comment by: Airport St. Gallen-Altenrhein - ACH/LSZR
	requires compatible norms for SALS and ALS for non-precision approach runways.	
response	Noted	

CS-ADR – Book 2 – GM-ADR-DSN.M.630 – Precision approach category I lighting system

p. 265-267

comment	<p>132 comment by: <i>MWEBWV Ministerium für Wirtschaft, Energie, Bauen, Wohnen und Verkehr des Landes Nordrhein-Westfalen</i></p> <p>Comment to a) 3)</p> <p>Why divergence to the ICAO? "1300 m" instead of 1350 m?</p>
response	<p><i>Accepted</i></p> <p>It will be amended to read 1 350 m.</p>

comment	<p>1771 ❖ comment by: <i>DGAC Direction Générale de l'aviation civile</i></p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 – CS-ADR-DSN. M.625 — Approach lighting systems, general and applicability (p80-82) • CS-ADR - Book 1 – CS-ADR-DSN. M.630 — Precision approach category I lighting system (p84-85) • CS-ADR - Book 1 - Figure M-2 Precision approach category I lighting systems (p85) • CS-ADR - Book 1 - Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations (p86) • CS-ADR - Book 1 - CS-ADR-DSN.M.635 — Precision approach category II and III lighting system (p87-88) • CS-ADR - Book 2 – GM-ADR-DSN.M.625 — Approach lighting systems, general and applicability (p256-257) • CS-ADR - Book 2 - Figure GM-M-2 Precision approach category I lighting systems (p262) • CS-ADR - Book 2 - Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights (p263) • CS-ADR - Book 2 – GM-ADR-DSN.M.630 — Precision approach category I lighting system (p265-267) <p><u>2. General comment</u></p> <p>For precision approach category I runways, paragraph (c) of CS-ADR-DSN. M.625 allows for only one possible layout for its lighting system making reference to CS-ADR-DSN.M.600630.</p> <p>But it is not always possible to implement the proposed layout and even not always necessary.</p> <p>In France, <u>there are three others</u> precision approach category I lighting systems, as follows:</p> <ol style="list-style-type: none"> 1. simplified approach lighting system: <ul style="list-style-type: none"> ○ row of lights on the extended centre line of the runway over a distance of 720m from the runway threshold, longitudinally spaced of 60m, row of one light large; ○ two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
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2. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 420m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
3. no approach lighting system:

Given these arguments, it is not appropriate to provide only one layout for precision approach category I lighting system in this CS.

2. Justification and proposed text / comment

This comment is critical.

This comment is linked to DGAC's comment on ICAO notes and attachments that shall be in GM rather than in CS.

The following specifications are not binding in France, are only in notes or in a attachment to ICAO Annex 14 Volume1 and are written as a guidance materials since there are just possibilities (e.g. use of "can" and "advisable"):

- Paragraphs (a)(2) and (b)(2) of CS-ADR-DSN.M.625 (ICAO notes)
- Paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 (ICAO Attachments)
- Paragraph (c)(3) of CS-ADR-DSN.M.630 (ICAO Attachments)
- paragraph (l) (6) of CS-ADR-DSN.M.635 (ICAO notes)
- Figure M-2, which is not referenced in the CS (ICAO Attachments)
- Figure M-3, which is just an explanation on how the lights characteristics have been determined in ICAO Annex 14 transcribed in chapter U of the CS (ICAO Attachments).

As confirmed by IACO, appendixes of an Annex have the same status as the corresponding provisions of the Annex, whereas attachments are only guidance materials.

Besides:

- paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 are respectively duplicated in paragraphs (a)(1) and (a)(2) of GM-ADR-DSN.M.625
- paragraph (c)(3) of CS-ADR-DSN.M.630 is already duplicated in GM-ADR-DSN.M.630
- paragraph (l) (6) of CS-ADR-DSN.M.635 is already duplicated in GM-ADR-DSN.M.635
- Figure M-2 and figure M-3 are already in GM respectively as Figure GM-M-2 and Figure GM-M-4.

DGAC proposes to **move these specifications to GM**.

Editorial improvements in CS-ADR-DSN.M.625

* In paragraphs (c) and (d), references are erroneous: they should respectively refer to CS-ADR-DSN.M.630 and CS-ADR-DSN.M.635.

* In CS-ADR-DSN.M.625, the numbering becomes erroneous from (e) crossbar lights (which should be (f)) to (k) (which should be (l)).

Editorial improvements in CS-ADR-DSN.M.630

* First sentence is a duplication of paragraph (c) of CS-ADR-DSN.M.625 without the "*where physically practicable*". It is essential to avoid any confusion to delete this sentence from CS-ADR-DSN.M.630.

* In paragraph (b)(2) the reference to "as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance" shall be replaced by "in CS-ADR-DSN.S.895" as maintenance objectives are not specified in Part OPS because the serviceability level results from design, manufacturing and maintenance.

* In paragraph (b)(2), the sentence "The barrettes should be at least 4 m in length" should be moved to paragraph (b)(3) in order to be consistent with the wording of ICAO Annex 14 volume1 Standards 5.3.4.15 and 16.

* Paragraph (c) should be consolidated with paragraph (b) for consistency. Thus CS-ADR-DSN.M.630 – (c) (1) and (2) should be renumbered as (b) (7) and (8).

* In paragraph (c) (1) "this Regulation" should be replaced by "(b)(1)(ii) or (b)(2)(ii)" for consistency with CS-ADR-DSN.M.630 – (b) (4) and Annex 14 Recommendation 5.3.4.17.

* In paragraph (c) (2) "this Regulation" should be replaced by (b)(7) (which corresponds to actual paragraph (c)(1) but the aforementioned re-numbering is taken into account).

Editorial improvements in CS-ADR-DSN.M.635

* In paragraph (a) references to Figure M-4, 10.4.7 and Figure M-4-A should respectively be replaced by Figure M-4A, CS-ADR-DSN.S.895 and Figure M-4B.

* In paragraph (h) "specified as maintenance objective" should be replaced by "specified in CS-ADR-DSN.S.895" as the serviceability level results from design, manufacturing and maintenance.

* In paragraph (j) "specified as maintenance objective" should be replaced by "specified in CS-ADR-DSN.S.895".

Book I

CS-ADR-DSN.M.625 – Approach lighting systems, general and applicability

"(a) Non-instrument runway

~~(1) Where physically practicable, a simple approach lighting system as specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-instrument runway where the code number is 3 or 4 and intended for use at night, except when the runway is used only in conditions of good visibility, and sufficient guidance is provided by other visual aids.~~

~~(2) A simple approach lighting system can also provide visual guidance by day.~~

(b) Non-precision approach runway

~~(1) Where physically practicable, a simple approach lighting system specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-precision approach runway, except when the runway is used only in conditions of good visibility or sufficient guidance is provided by other visual aids.~~

~~(2) It is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system.~~

(c) Precision approach runway category I

Where physically practicable, a precision approach category I lighting system as specified in CS-ADR-DSN.M.600 630 should be provided to serve a precision approach runway category I.

(d) Precision approach runway categories II and III

A precision approach category II and III lighting system as specified in CS-ADR-DSN. M.605 635 should be provided to serve a precision approach runway category II or III.

(e) Simple approach lighting system

[...]

~~(ii) The specifications in this document provide for the basic characteristics for simple approach lighting systems. For certain aspects of these systems, some latitude is permitted, for example, in the spacing between centre line lights and crossbars. The simple approach lighting patterns that have been generally adopted are shown in Figure M-1.~~

~~(iii) The approach lighting configuration is to be provided irrespective of the location of the threshold, i.e. whether the threshold is at the extremity of the runway or displaced from the runway extremity. In both cases, the approach lighting system should extend up to the threshold. However, in the case of a displaced threshold, inset lights are used from the runway extremity up to the threshold to obtain the specified configuration. These inset lights are designed to satisfy the structural requirements specified in this Regulation and the chromaticity and characteristics specified in CS-ADR-DSN.U.930 and CS-ADR-DSN.U.940.~~

~~(e) (f) Crossbar lights:
[...]"~~

CS-ADR-DSN. M.630 – Precision approach category I lighting system

~~"A precision approach category I lighting system as specified in this Regulation should be provided to serve a precision approach runway category I.~~

~~[...] (b) Characteristics:~~

~~[...] (2) Where the serviceability level of the approach lights specified as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance in CS-ADR-DSN.S.895 can be demonstrated, each centre line light position should consist of either:~~

~~[...]The barrettes should be at least 4 m in length.~~

~~(3)The barrettes should be at least 4 m in length. When barrettes are composed of lights approximating to point sources, the lights should be uniformly spaced at intervals of not more than 1.5 m.~~

~~[...](c) Characteristics:~~

~~(1) (7) If the centre line consists of barrettes as described in this Regulation paragraphs (b)(1)(ii) or (b)(2)(ii), each barrette [...]~~

~~(2) (8) Each capacitor discharge light as described in this Regulation paragraph (b)(7) should [...]~~

~~(3) The flight path envelopes used in the design of these lights are given in Figure M-3.~~

~~[...]"~~

Figure M-2 Precision approach category I lighting systems

Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations

CS-ADR-DSN.M.635 – Precision approach category II and III lighting system

~~"(a) [...]one at 150 m and one at 300 m from the threshold, all as shown in Figure M-4 Figure M-4A. Where the serviceability level of the approach lights specified as maintenance objectives in 10.4.7 CS-ADR-DSN.S.895 can be demonstrated, the system may have two side rows of lights, extending 240 m from the threshold, and two crossbars, one at 150 m and one at 300 m from the threshold, all as shown in Figure M-4A Figure M-4B.~~

~~[...]~~

~~(h) The centre line of a precision approach category II and III lighting system for the first 300 m from the threshold should consist of barrettes showing variable white, except that, where the threshold is displaced 300 m or more, the centre line may consist of single light sources showing variable white. Where the serviceability level of the approach lights specified as maintenance objectives in CS-ADR-DSN.S.895 can be demonstrated, the centre line of a~~

precision approach category II and III lighting system for the first 300 m from the threshold may consist of either:

[...]

(j) Where the serviceability level of the approach lights specified as ~~maintenance objectives~~ in CS-ADR-DSN.S.895 can be demonstrated, beyond 300 m from the threshold each centre line light position may consist of either:

[...]

(l) If the centre line beyond 300 m from the threshold consists of barrettes as described in (i)(1) and (j)(1) above, each barrette beyond 300 m should be supplemented by a capacitor discharge light, except where such lighting is considered unnecessary taking into account the characteristics of the system and the nature of the meteorological conditions.

[...]

~~(6) The flight path envelopes used in the design of these lights are given in Figure M-3.~~

[...]"

Book II

Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights

GM-ADR-DSN.M.625 – Approach lighting systems, general and applicability

"(a) Non-instrument runway: a simple approach lighting system can also provide visual guidance by day.

(b) Non-precision approach runway: it is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system

(ac) Types and characteristics

[...]"

GM-ADR-DSN.M.630 – Precision approach category I lighting system

"[...]

(a c) Vertical tolerances:

[...]

(d) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

GM-ADR-DSN.M.635 – Precision approach category II and III lighting system

"[...]

(h) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

response

Accepted

Agreed: The first sentence will be deleted.

Partially Agreed: (b)(2) will be amended with ICAO text and referenced to CS S.895.

Agreed: move the 4-metre barrette length reference to (b)(3).

Not Agreed: Consolidation of paragraphs (b) and (c).

Partially Agreed: The words 'this Regulation' will be replaced with the appropriate NPA reference.

comment	2093 ❖	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	lot of repetition of CS's, rewrite the complete Section 1 on ALS	
response	<i>Noted</i>	
comment	2487	comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	<p>"[...] (a c) Vertical tolerances: [...] (d) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."</p>	
response	<i>Accepted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.M.635 – Precision approach category II and III lighting system	p. 267-268
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comment	1771 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>
	<p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN. M.625 — Approach lighting systems, general and applicability (p80-82) • CS-ADR - Book 1 - CS-ADR-DSN. M.630 — Precision approach category I lighting system (p84-85) • CS-ADR - Book 1 - Figure M-2 Precision approach category I lighting systems (p85) • CS-ADR - Book 1 - Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations (p86) • CS-ADR - Book 1 - CS-ADR-DSN.M.635 — Precision approach category II and III lighting system (p87-88) • CS-ADR - Book 2 - GM-ADR-DSN.M.625 — Approach lighting systems, general and applicability (p256-257) • CS-ADR - Book 2 - Figure GM-M-2 Precision approach category I lighting systems (p262) • CS-ADR - Book 2 - Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights (p263) • CS-ADR - Book 2 - GM-ADR-DSN.M.630 — Precision approach category I lighting system (p265-267) <p><u>2. General comment</u></p> <p>For precision approach category I runways, paragraph (c) of CS-ADR-DSN. M.625 allows for only one possible layout for its lighting system making</p>	

reference to CS-ADR-DSN.M.600630.

But it is not always possible to implement the proposed layout and even not always necessary.

In France, there are three others precision approach category I lighting systems, as follows:

1. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 720m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
2. simplified approach lighting system:
 - row of lights on the extended centre line of the runway over a distance of 420m from the runway threshold, longitudinally spaced of 60m, row of one light large;
 - two crossbars lights of two lights large, at a distance of 60m and 300m from the runway threshold;
3. no approach lighting system:

Given these arguments, it is not appropriate to provide only one layout for precision approach category I lighting system in this CS.

2. Justification and proposed text / comment

This comment is critical.

This comment is linked to DGAC's comment on ICAO notes and attachments that shall be in GM rather than in CS.

The following specifications are not binding in France, are only in notes or in a attachment to ICAO Annex 14 Volume1 and are written as a guidance materials since there are just possibilities (e.g. use of "can" and "advisable"):

- Paragraphs (a)(2) and (b)(2) of CS-ADR-DSN.M.625 (ICAO notes)
- Paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 (ICAO Attachments)
- Paragraph (c)(3) of CS-ADR-DSN.M.630 (ICAO Attachments)
- paragraph (l) (6) of CS-ADR-DSN.M.635 (ICAO notes)
- Figure M-2, which is not referenced in the CS (ICAO Attachments)
- Figure M-3, which is just an explanation on how the lights characteristics have been determined in ICAO Annex 14 transcribed in chapter U of the CS (ICAO Attachments).

As confirmed by IACO, appendixes of an Annex have the same status as the corresponding provisions of the Annex, whereas attachments are only guidance materials.

Besides:

- paragraphs (e)(1)(ii) and (iii) of CS-ADR-DSN.M.625 are respectively duplicated in paragraphs (a)(1) and (a)(2) of GM-ADR-DSN.M.625
- paragraph (c)(3) of CS-ADR-DSN.M.630 is already duplicated in GM-ADR-DSN.M.630
- paragraph (l) (6) of CS-ADR-DSN.M.635 is already duplicated in GM-ADR-DSN.M.635
- Figure M-2 and figure M-3 are already in GM respectively as Figure GM-

M-2 and Figure GM-M-4.

DGAC proposes to **move these specifications to GM.**

Editorial improvements in CS-ADR-DSN.M.625

* In paragraphs (c) and (d), references are erroneous: they should respectively refer to CS-ADR-DSN.M.630 and CS-ADR-DSN.M.635.

* In CS-ADR-DSN.M.625, the numbering becomes erroneous from (e) crossbar lights (which should be (f)) to (k) (which should be (l)).

Editorial improvements in CS-ADR-DSN.M.630

* First sentence is a duplication of paragraph (c) of CS-ADR-DSN.M.625 without the "where physically practicable". It is essential to avoid any confusion to delete this sentence from CS-ADR-DSN.M.630.

* In paragraph (b)(2) the reference to "as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance" shall be replaced by "in CS-ADR-DSN.S.895" as maintenance objectives are not specified in Part OPS because the serviceability level results from design, manufacturing and maintenance.

* In paragraph (b)(2), the sentence "The barrettes should be at least 4 m in length" should be moved to paragraph (b)(3) in order to be consistent with the wording of ICAO Annex 14 volume1 Standards 5.3.4.15 and 16.

* Paragraph (c) should be consolidated with paragraph (b) for consistency. Thus CS-ADR-DSN.M.630 — (c) (1) and (2) should be renumbered as (b) (7) and (8).

* In paragraph (c) (1) "this Regulation" should be replaced by "(b)(1)(ii) or (b)(2)(ii)" for consistency with CS-ADR-DSN.M.630 — (b) (4) and Annex 14 Recommendation 5.3.4.17.

* In paragraph (c) (2) "this Regulation" should be replaced by (b)(7) (which corresponds to actual paragraph (c)(1) but the aforementioned re-numbering is taken into account).

Editorial improvements in CS-ADR-DSN.M.635

* In paragraph (a) references to Figure M-4, 10.4.7 and Figure M-4-A should respectively be replaced by Figure M-4A, CS-ADR-DSN.S.895 and Figure M-4B.

* In paragraph (h) "specified as maintenance objective" should be replaced by "specified in CS-ADR-DSN.S.895" as the serviceability level results from design, manufacturing and maintenance.

* In paragraph (j) "specified as maintenance objective" should be replaced by "specified in CS-ADR-DSN.S.895".

Book I

CS-ADR-DSN.M.625 — Approach lighting systems, general and applicability

"(a) Non-instrument runway

~~(1)~~ Where physically practicable, a simple approach lighting system as specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-instrument runway where the code number is 3 or 4 and intended for use at night, except when the runway is used only in conditions of good visibility, and sufficient guidance is provided by other visual aids.

~~(2) A simple approach lighting system can also provide visual guidance by day.~~

(b) Non-precision approach runway

~~(1)~~ Where physically practicable, a simple approach lighting system specified in paragraph (c) (Simple approach lighting system) below should be provided to serve a non-precision approach runway, except when the runway is used only in conditions of good visibility or sufficient guidance is provided by other visual

aids.

~~(2) It is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system.~~

(c) Precision approach runway category I

Where physically practicable, a precision approach category I lighting system as specified in CS-ADR-DSN.M.600 **630** should be provided to serve a precision approach runway category I.

(d) Precision approach runway categories II and III

A precision approach category II and III lighting system as specified in CS-ADR-DSN. M.605 **635** should be provided to serve a precision approach runway category II or III.

(e) Simple approach lighting system

[...]

~~(ii) The specifications in this document provide for the basic characteristics for simple approach lighting systems. For certain aspects of these systems, some latitude is permitted, for example, in the spacing between centre line lights and crossbars. The simple approach lighting patterns that have been generally adopted are shown in Figure M-1.~~

~~(iii) The approach lighting configuration is to be provided irrespective of the location of the threshold, i.e. whether the threshold is at the extremity of the runway or displaced from the runway extremity. In both cases, the approach lighting system should extend up to the threshold. However, in the case of a displaced threshold, inset lights are used from the runway extremity up to the threshold to obtain the specified configuration. These inset lights are designed to satisfy the structural requirements specified in this Regulation and the chromaticity and characteristics specified in CS-ADR-DSN.U.930 and CS-ADR-DSN. U.940.~~

(e) (f) Crossbar lights:

[...]"

CS-ADR-DSN. M.630 – Precision approach category I lighting system

"A precision approach category I lighting system as specified in this Regulation should be provided to serve a precision approach runway category I:

[...] (b) Characteristics:

[...] (2) Where the serviceability level of the approach lights specified as a maintenance objective in the requirements for aerodrome data, operations, services and maintenance in CS-ADR-DSN.S.895 can be demonstrated, each centre line light position should consist of either:

[...]The barrettes should be at least 4 m in length.

(3)The barrettes should be at least 4 m in length. When barrettes are composed of lights approximating to point sources, the lights should be uniformly spaced at intervals of not more than 1.5 m.

[...](c) Characteristics:

(1) (7) If the centre line consists of barrettes as described in this Regulation paragraphs (b)(1)(ii) or (b)(2)(ii), each barrette [...]

(2) (8) Each capacitor discharge light as described in this Regulation paragraph (b)(7) should [...]

(3) The flight path envelopes used in the design of these lights are given in Figure M-3.

[...]"

Figure M-2 Precision approach category I lighting systems

Figure M-3 Flight path envelopes to be used for lighting design for category I, II and III operations

CS-ADR-DSN.M.635 – Precision approach category II and III lighting

system

"(a) [...] one at 150 m and one at 300 m from the threshold, all as shown in ~~Figure M-4~~ Figure M-4A. Where the serviceability level of the approach lights specified as maintenance objectives in ~~10.4.7 CS-ADR-DSN.S.895~~ can be demonstrated, the system may have two side rows of lights, extending 240 m from the threshold, and two crossbars, one at 150 m and one at 300 m from the threshold, all as shown in ~~Figure M-4A~~ Figure M-4B.

[...]

(h) The centre line of a precision approach category II and III lighting system for the first 300 m from the threshold should consist of barrettes showing variable white, except that, where the threshold is displaced 300 m or more, the centre line may consist of single light sources showing variable white. Where the serviceability level of the approach lights specified as ~~maintenance objectives~~ in CS-ADR-DSN.S.895 can be demonstrated, the centre line of a precision approach category II and III lighting system for the first 300 m from the threshold may consist of either:

[...]

(j) Where the serviceability level of the approach lights specified as ~~maintenance objectives~~ in CS-ADR-DSN.S.895 can be demonstrated, beyond 300 m from the threshold each centre line light position may consist of either:

[...]

(l) If the centre line beyond 300 m from the threshold consists of barrettes as described in (i)(1) and (j)(1) above, each barrette beyond 300 m should be supplemented by a capacitor discharge light, except where such lighting is considered unnecessary taking into account the characteristics of the system and the nature of the meteorological conditions.

[...]

~~(6) The flight path envelopes used in the design of these lights are given in Figure M-3.~~

[...]"

Book II**Figure GM-M-4 Flight path envelopes to be used for lighting design for category I, II and III operations - Centre line lights****GM-ADR-DSN.M.625 — Approach lighting systems, general and applicability**

"(a) Non-instrument runway: a simple approach lighting system can also provide visual guidance by day.

(b) Non-precision approach runway: it is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system

(ac) Types and characteristics

[...]"

GM-ADR-DSN.M.630 — Precision approach category I lighting system

"[...]

(a c) Vertical tolerances:

[...]

(d) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

GM-ADR-DSN.M.635 — Precision approach category II and III lighting system

"[...]

(h) The flight path envelopes used in the design of these lights are given in Figure GM-M-4."

response	<i>Accepted</i>
comment	2093 ❖ comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i> lot of repetition of CS's, rewrite the complete Section 1 on ALS
response	<i>Noted</i>
comment	2488 comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i> “[...] (h) The flight path envelopes used in the design of these lights are given in Figure GM-M-4.”
response	<i>Accepted</i>

CS-ADR – Book 2 – GM-ADR-DSN.M.640 – Visual approach slope indicator systems: general

p. 268-269

comment	1454 ❖ comment by: <i>DGAC Direction Générale de l'aviation civile</i> <u>1. Affected paragraphs</u> <ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN.M.640 — Visual approach slope indicator systems: general (p91) • CS-ADR - Book 2 - GM-ADR-DSN.M.640 — Visual approach slope indicator systems: general (p268-269) <u>2. Justification and proposed text / comment</u> * Paragraph (a)(1) The safety issue of the requirement in paragraph (a)(1) is not known and no critical safety issue related to the absence of a visual approach slope indicator system on precision approach have been notified until now. Thus this is not binding in France and there is not systemically a visual approach slope indicator system on French precision approach runways. Implementing such systems on every precision approach runways would generate huge cost without any identified safety value. Moreover, as there is not identified safety issue, it is not possible to make an ELOS. Finally, paragraph (b) of the GM-ADR-DSN.M.640 supports completely that statement as it is written that “5.3.5.1 (b) to (e) of Chapter 5 may be used as a general guide”. The ICAO reference should be updated to fit NPA: the corresponding paragraphs in the NPA are in paragraph (a) of CS-ADR-DSN.M.640. This shows well that it is guidance material and not a certification
---------	--

specification.

It is essential to remove paragraph (a)(1).

* Paragraph (e)

Paragraph (e) of this CS does not suit to a certification specification. Indeed, for changes and works, studies are systematically performed and mitigation measures undertaken. One of these measures may be to provide for a PAPI, but it is not always needed. This specification is really meant to be in guidance material.

Thus the proposed modification:

CS-ADR-DSN.M.640 – Visual approach slope indicator systems: general

"(a) A visual approach slope indicator system should be provided to serve the approach to a runway whether or not the runway is served by other visual approach aids or by non-visual aids, where one or more of the following conditions exist:

~~(1) the runway is used by turbojet or other aeroplanes with similar approach guidance requirements;~~

~~(2) the pilot [...]~~

~~(e) Where a runway threshold is temporarily displaced from the normal position and one or more of the conditions specified in paragraph (a) above exist, a PAPI should be provided except that where the code number is 1 or 2 either an APAPI may be provided."~~

GM-ADR-DSN.M.640 – Visual approach slope indicator systems: general

"[...] (b) With respect to the seriousness of the hazard, the order given in the application specifications for a visual approach slope indicator system, ~~5.3.5.1 (b) to (e) of Chapter 5,~~ in paragraph (a) of CS-ADR-DSN.M.640 may be used as a general guide. These may be summarised as:

[...]

~~(d) Priority should may be given to runways used by turbojet aeroplanes or other aeroplanes with similar approach guidance requirements.~~

~~(e) Where a runway threshold is temporarily displaced from the normal position and one or more of the conditions specified in paragraph (a) of CS-ADR-DSN.M.640 exist, a PAPI may be provided except that where the code number is 1 or 2 either an APAPI may be provided."~~

response

Noted

Not Agreed: (a)(1) is part of an ICAO standard and remains in the CS.

Agreed: GM M.640 will be amended to reflect the NPA reference.

Agreed: Paragraph (e) will be deleted as it is an operational consideration.

comment

2093 ❖

comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

lot of repition of CS's, rewrite the complete Section 1 on ALS

response

Noted

comment

2562

comment by: AENA - Aeropuertos Españoles y Navegación Aérea

GM-ADR-DSN.M.640 — Visual approach slope indicator systems: general

"[...] (b) With respect to the seriousness of the hazard, the order given in the application specifications for a visual approach slope indicator system, ~~5.3.5.1 (b) to (e) of Chapter 5~~, in paragraph (a) of CS-ADR-DSN.M.640 may be used as a general guide. These may be summarised as:

[...]

(d) Priority ~~should~~ may be given to runways used by turbojet aeroplanes or other aeroplanes with similar approach guidance requirements.

(e) Where a runway threshold is temporarily displaced from the normal position and one or more of the conditions specified in paragraph (a) of CS-ADR-DSN.M.640 exist, a PAPI may be provided except that where the code number is 1 or 2 either an APAPI may be provided."

response Partially accepted

Reference will be amended to NPA CS M.640. Paragraph (e) will be added (from CS).

CS-ADR — Book 2 — GM-ADR-DSN.M.645 — PAPI and APAPI: general

p. 269

comment 1312 comment by: Federal Office of Civil Aviation, FOCA, Switzerland

There is no content: Please remove title or provide content.

response Not accepted

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2090 comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

titles should be removed

response Not accepted

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — CS-ADR-DSN.M.650 — Approach slope and elevation setting of light units (for PAPI and APAPI)

p. 269

comment 1314 comment by: Federal Office of Civil Aviation, FOCA, Switzerland

	There is no content: Please remove title or provide content.
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.
comment	2089 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — CS-ADR-DSN.M.655 — Obstacle protection surface for PAPI and APAPI

p. 269

comment	1316 comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	There is no content: Please remove title or provide content.
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.
comment	2088 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — CS-ADR-DSN.M.660 — Circling guidance lights

p. 269

comment	1317 comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment

2087

comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response

Not accepted

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.M.665 — Runway lead-in lighting systems p. 269

comment

1318

comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response

Not accepted

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment

2086

comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response

Not accepted

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.M.670 — Runway threshold identification lights p. 269

comment

1319

comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response

Not accepted

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2085 comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR – Book 2 – GM-ADR-DSN.M.675 – Runway edge lights

p. 269

comment 1320 comment by: Federal Office of Civil Aviation, FOCA, Switzerland

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2084 comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR – Book 2 – GM-ADR-DSN.M.680 – Runway threshold and wing bar lights

p. 269

comment 1321 comment by: Federal Office of Civil Aviation, FOCA, Switzerland

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment	2083	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

CS-ADR – Book 2 – GM-ADR-DSN.M.690 – Runway centre line lights

p. 270

comment	2563	comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	GM-ADR-DSN.M.690 – Runway centre line lights	
	<p><i>"(1) Runway centre line lights may be provided on a precision approach runway category I, when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m.</i></p> <p><i>(2) Runway centre line lights may be provided on a runway intended to be used for take-off with an operating minimum of an RVR of the order of 400 m or higher when used by aeroplanes with a very high take-off speed, where the width between the runway edge lights is greater than 50 m.</i></p> <p><i>(3) Where it is not practicable to locate them along the centre line, the lights may be uniformly offset to the same side of the runway centre line by not more than 60 cm."</i></p>	
response	<i>Accepted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.M.700 – Rapid exit taxiway indicator lights

p. 270

comment	2576	comment by: <i>AENA - Aeropuertos Españoles y Navegación Aérea</i>
	<p>Annex 14 Volume 1 Recommendation 5.3.14.1, which is transposed in the first sentence of CS-ADR-DSN.M.700, and which specifies under which conditions implementation of Rapid Exit Taxiway Indicator Lights (RETILs) should be considered, duplicates the specification contained in Annex 14 Volume 1 Standard 5.3.16.1 reminded hereafter:</p> <p><i>"5.3.16.1 Taxiway centre line lights shall be provided on an exit taxiway, taxiway, de-icing/anti-icing facility and apron intended for use in runway visual range conditions less than a value of 350 m in such a manner as to provide continuous guidance between the runway centre line and aircraft stands, except that these lights need not be provided where the traffic density is light and taxiway edge lights and centre line marking provide adequate guidance."</i></p> <p>Need for additional information on the distance to go to the nearest rapid exit taxiway may be considered to increase the efficiency of the runway and aircraft</p>	

operations where traffic density is heavy as indicated in Annex 14-Volume 1 - Note to 5.3.14, reminded hereafter:

"5.3.14 Rapid exit taxiway indicator lights

Note.— The purpose of rapid exit taxiway indicator lights (RETILs) is to provide pilots with distance-to-go information to the nearest rapid exit taxiway on the runway, to enhance situational awareness in low visibility conditions and enable pilots to apply braking action for more efficient roll-out and runway exit speeds. [...]"

This information may be provided by other means such as on-board moving maps or the Brake-to-Vacate devices used on modern aeroplanes.

Indeed it is not a safety requirement as sufficient guidance for a safe exit is provided by CS-ADR-DSN.M.710 (which transposes Annex 14 Volume 1 - Standard 5.3.16 on Taxiway Centre Line Lights).

Therefore **It is proposed to move CS-ADR-DSN.M.700 as complementary guidance in GM-ADR-DSN.M.710 in a new paragraph (c).**

response *Not accepted*

CS-ADR — Book 2 — GM-ADR-DSN.M.705 — Stopway lights

p. 270

comment 1324 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2082 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 3104 comment by: *Fraport AG*

CS ADR DSN — BOOK 2 Chapter M
 GM-ADR-DSN.M.705
 GM-ADR-DSN.M.715
 GM-ADR-DSN.M.720
 GM-ADR-DSN.M.725
 GM-ADR-DSN.M.730
 GM-ADR-DSN.M.735

GM-ADR-DSN.M.740
 GM-ADR-DSN.M.760
 GM-ADR-DSN.M.765
 GM-ADR-DSN.M.770

Editorial

GM-ADR-DSN.M.705 — Stopway lights
 GM-ADR-DSN.M.715 — Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways
 GM-ADR-DSN.M.720 — Taxiway edge lights
 GM-ADR-DSN.M.725 — Runway turn pad lights
 GM-ADR-DSN.M.730 — Stop bar lights
 GM-ADR-DSN.M.735 — Intermediate holding position lights
 GM-ADR-DSN.M.740 — De-icing/anti-icing facility exit lights
 GM-ADR-DSN.M.760 — Advanced visual docking guidance system
 GM-ADR-DSN.M.765 — Aircraft stand manoeuvring guidance lights
 GM-ADR-DSN.M.770 — Road-holding position light

Provide rationale for each requirement

Fraport
 Missing the rationale

AG

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.M.710 — Taxiway centre line lights

p. 270

comment 238

comment by: *Flughafen Düsseldorf GmbH*

b) Der Anwendungsbereich für Rollbahnmittellinienfeuer ist in ICAO detaillierter beschrieben als in EASA. Damit keinerlei Missverständnisse auftreten, ist der Text gemäß ICAO anzupassen.

response *Accepted*

comment 1384 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR-DSN.M.700-Rapid exit taxiway indicator lights (Book III, page 108-109)
- GM-ADR-DSN.M.710 — Taxiway centre line lights (p270)

2. Justification and proposed text / comment

Annex 14 Volume 1 Recommendation 5.3.14.1, which is transposed in the first sentence of CS-ADR-DSN.M.700, and which specifies under which conditions implementation of Rapid Exit Taxiway Indicator Lights (RETILs) should be considered, duplicates the specification contained in Annex 14 Volume 1 Standard 5.3.16.1 reminded hereafter:

"5.3.16.1 Taxiway centre line lights shall be provided on an exit taxiway, taxiway, de-icing/anti-icing facility and apron intended for use in runway visual range conditions less than a value of 350 m in such a manner as to provide continuous guidance between the runway centre line and aircraft stands, except that these lights need not be provided where the traffic density is light and taxiway edge lights and centre line marking provide adequate guidance."

Need for additional information on the distance to go to the nearest rapid exit taxiway may be considered to increase the efficiency of the runway and aircraft operations where traffic density is heavy as indicated in Annex 14-Volume 1 - Note to 5.3.14, reminded hereafter:

"5.3.14 Rapid exit taxiway indicator lights

Note.— The purpose of rapid exit taxiway indicator lights (RETILs) is to provide pilots with distance-to-go information to the nearest rapid exit taxiway on the runway, to enhance situational awareness in low visibility conditions and enable pilots to apply braking action for more efficient roll-out and runway exit speeds. [...]"

This information may be provided by other means such as on-board moving maps or the Brake-to-Vacate devices used on modern aeroplanes.

Indeed it is not a safety requirement as sufficient guidance for a safe exit is provided by CS-ADR-DSN.M.710 (which transposes Annex 14 Volume 1 - Standard 5.3.16 on Taxiway Centre Line Lights).

Therefore **DGAC proposes to move CS-ADR-DSN.M.700 as complementary guidance in GM-ADR-DSN.M.710 in a new paragraph (c).**

response

Not accepted

The rapid exit taxiway indicator lights serve a different purpose than that of the centre line lights and should not be used for them.

comment

1467 ❖

comment by: *DGAC Direction Générale de l'aviation civile*

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.M.710 - Taxiway centre line lights (p110)
- CS-ADR - Book 2 - GM-ADR-DSN.M.710 - Taxiway centre line lights (p270)

2. Justification and proposed text / comment

Paragraph (a)(2) of this CS is not binding in France because its relevance for safety is not known, there has been no safety issue until now on this point and implementing it generates huge costs without any added safety value.

Besides, it is only an ICAO recommendation in Annex 14 volume 1 and it is not detailed enough.

Note: In the CS, paragraph (b)(4), we understand that the cross-reference is not about the figure U-11, but about the figure U-16 which deals with taxi lane centre line, because the narrow beam runway centre line lights cannot be on

the exit taxiway.

CS-ADR-DSN.M.710 – Taxiway centre line lights

"(a) *Applicability:*

~~[...] (2) Taxiway centre line lights should be provided on a taxiway intended for use at night in runway visual range conditions of 350 m or greater, and particularly on complex taxiway intersections and exit taxiways, except that these lights need not be provided where the traffic density is light and taxiway edge lights and centre line marking provide adequate guidance.~~

~~[...]"~~

GM-ADR-DSN.M.710 – Taxiway centre line lights

"(a) Taxiway centre line lights may be provided on a taxiway intended for use at night in runway visual range conditions of 350 m or greater, and particularly on complex taxiway intersections and exit taxiways, except that these lights need not be provided where the traffic density is light and taxiway edge lights and centre line marking provide adequate guidance.

~~(a)~~ (b) In the case where taxiway centre line lights are provided and where there may be a need to delineate the edges of a taxiway, e.g. on a rapid exit taxiway, narrow taxiway or in snow conditions, this may be done with taxiway edge lights or markers. Care is necessary to limit the light distribution of green lights on or near a runway so as to avoid possible confusion with threshold lights.

~~(b)~~ (c) The term 'continuous guidance' is not intended to require that taxiway centre line lighting is provided onto aircraft stands. Instead, it is intended that centre line lighting be provided on taxiways leading to aircraft stands or other apron areas, from which visual cues or other means exist to enable aircrew to manoeuvre the aircraft onto a stand or other parking area."

response

Not accepted

The proposed text amendment will interrupt the continuity of the whole CS; therefore, it will remain in the CS.

comment

2399

comment by: MWEBWV Ministerium für Wirtschaft, Energie, Bauen, Wohnen und Verkehr des Landes Nordrhein-Westfalen

b) The range of application for taxiway centre line lights is described in ICAO more detailed than in EASA.
So due to avoid misunderstandings, the wording is to be adapted according to ICAO.

response

Accepted

The ICAO Annex 14 text regarding applicability of the taxiway centre line lights will be added to the CS (not GM).

comment

2566

comment by: AENA - Aeropuertos Españoles y Navegación Aérea

GM-ADR-DSN.M.710 – Taxiway centre line lights

"(a) Taxiway centre line lights may be provided on a taxiway intended for use at

night in runway visual range conditions of 350 m or greater, and particularly on complex taxiway intersections and exit taxiways, except that these lights need not be provided where the traffic density is light and taxiway edge lights and centre line marking provide adequate guidance.

(a) (b) In the case where taxiway centre line lights are provided and where there may be a need to delineate the edges of a taxiway, e.g. on a rapid exit taxiway, narrow taxiway or in snow conditions, this may be done with taxiway edge lights or markers. Care is necessary to limit the light distribution of green lights on or near a runway so as to avoid possible confusion with threshold lights.

(b) (c) The term 'continuous guidance' is not intended to require that taxiway centre line lighting is provided onto aircraft stands. Instead, it is intended that centre line lighting be provided on taxiways leading to aircraft stands or other apron areas, from which visual cues or other means exist to enable aircrew to manoeuvre the aircraft onto a stand or other parking area."

response *Not accepted*

The proposed text amendment will interrupt the continuity of the whole CS; therefore, it will remain in the CS.

comment 2926

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.M.710	Taxiway centre line lights
Proposition/commentaire	<p>(a) (2) (3) et (4) Il convient de transférer ces dispositions en Guidance Materials.</p> <p>(a) (4) Il convient d'apporter également la modification suivante: « Taxiway centre line lights should may be provided in all visibility conditions on a runway forming part of a standard taxi-route where specified as components of an advanced surface movement guidance and control system. »</p> <p>(b) (4) Nous comprenons qu'il ne s'agit pas du renvoi à la figure U-11 mais plutôt à la figure U-16 (taxiway centre line) car les feux d'axe de piste à faisceau étroit ne peuvent pas convenir sur une voie de sortie rapide de piste, qui est courbe ; ce qui amènerait une perte vision du cheminement par le pilote.</p>
Justification	Les dispositions (a) (2) (3) et (4) n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.
Traduction de courtoisie	(a) (2) (3) et (4) It is appropriate to transfer these provisions to GM because they are only good practices and not normative references so they should be in GM and not in CS.

	<p>(a) (4) It is also appropriate to modify in the following way : « Taxiway centre line lights should may be provided in all visibility conditions on a runway forming part of a standard taxi-route where specified as components of an advanced surface movement guidance and control system. »</p> <p>(b) (4) We understand that the cross-reference is not about the figure U-11 but about the figure U-16 (taxiway centre line) because the narrow beam runway centre line lights is not suitable for rapid exit taxiway, because it would lead to a loss of vision of the track by the pilot.</p>
<p>response</p> <p><i>Not accepted</i></p> <p>The proposed text amendment will interrupt the continuity of the whole CS; therefore, it will remain in the CS.</p>	

CS-ADR – Book 2 – GM-ADR-DSN.M.715 – Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

p. 271

<p>comment</p>	<p>203 comment by: CAA Austria - Ministry of Transport</p> <p>Missing text or delete title</p>
<p>response</p>	<p><i>Not accepted</i></p> <p>GM title and number will be retained for continuity. The words 'intentionally blank' will be inserted.</p>
<p>comment</p>	<p>1325 comment by: Federal Office of Civil Aviation, FOCA, Switzerland</p> <p>There is no content: Please remove title or provide content.</p>
<p>response</p>	<p><i>Not accepted</i></p> <p>Numbering is for continuity. The words 'intentionally blank' will be inserted.</p>

comment 1773 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.M.715 - Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways (p111-113)
- CS-ADR - Book 2 – GM-ADR-DSN.M.715 - Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways (p271)

2. Justification and proposed text / comment

It is proposed to keep in the CS the purpose of the specification which is to provide a clear indication of the route and to move the remaining to GM. Indeed, this specification comes from an ICAO recommendation in Annex 14 volume 1. This recommendation has most likely been taken into account during the design and the construction of currently existing aerodromes, but:

- in France, it is not binding and is considered as guidance material,
- for this reason, it has not been verified since the design of these aerodromes,
- systematically verifying that it is effective on aerodromes, as required in order to deliver a certificate, would generate huge costs without any added safety value, since no safety issue related to it has been observed until now.

Thus the purpose is kept in the CS and the rest of the content is move to GM using "may" instead of "should", as follows:

CS-ADR-DSN.M.715 - Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

~~"(a) Taxiway centre line lights on taxiways:~~

~~(1) Taxiway centre line lights on a straight section of a taxiway should be spaced at longitudinal intervals such that a clear indication of the route is provided of not more than 30 m, except that:~~

~~(i) intervals less than 30 m should be provided on short straight sections;~~

~~(ii) on a taxiway intended for use in RVR conditions of less than a value of 350 m, the longitudinal spacing should not exceed 15 m.~~

~~(2) Taxiway centre line lights on a taxiway curve should continue from the straight portion of the taxiway at a constant distance from the outside edge of the taxiway curve. The lights should be spaced at intervals such that a clear indication of the curve is provided.~~

~~(3) On a taxiway intended for use in RVR conditions of less than a value of 350 m, the lights on a curve should not exceed spacing of 15 m and on a curve of less than 400 m radius the lights should be spaced at intervals of not greater than 7.5 m. This spacing should extend for 60 m before and after the curve.~~

~~(b) Taxiway centre line lights on rapid exit taxiways:~~

~~(1) Taxiway centre line lights on a rapid exit taxiway should commence at a point at least 60 m before the beginning of the taxiway centre line curve and continue beyond the end of the curve to a point on the centre line of the taxiway where an aeroplane can be expected to reach normal taxiing speed, as shown in Figure M-10. The lights on that portion parallel to the runway centre line should always be at least 60 cm from any row of runway centre line lights, as shown in Figure M-10.~~

~~(2) The lights should be spaced at longitudinal intervals of not more than 15 m.~~

~~(c) Taxiway centre line lights on other exit taxiways:~~

~~(1) Taxiway centre line lights on exit taxiways other than rapid exit taxiways should commence at the point where the taxiway centre line marking begins to curve from the runway centre line, and follow the curved taxiway centre line marking at least to the point where the marking leaves the runway. The first light should be at least 60 cm from any row of runway centre line lights, as shown in Figure M-8, Arrangement of runway threshold and runway end lights.~~

~~(2) The lights should be spaced at longitudinal intervals of not more than 7.5 m.~~

~~(d) Taxiway centre line lights on runways:~~

~~Taxiway centre line lights on a runway forming part of a standard taxi-route and intended for taxiing in runway visual range conditions less than a value of 350 m should be spaced at longitudinal intervals not exceeding 15 m.~~

~~Figure M-11~~

~~(e) Positioning of Taxiway centre line lights on taxiway:~~

~~(1) The spacing on a particular section of taxiway centre line lighting, (straight or curved section), should be such that a clear indication of the taxiway centre line is provided, particularly on a curved section.~~

~~(2) Where a taxiway is only intended for use in RVR conditions of 350 m or greater, the spacing of taxiway centre line lights on curves should not exceed the table below:~~

~~Curve radius Light spacing~~

~~up to 400 m 7.5 m~~

~~401 m to 899 m 15 m~~

~~900 m or greater 30 m~~

~~(f) Taxiway centre line lights on straight sections of taxiways:~~

~~Larger intervals not exceeding 60 m may be used where, because of the prevailing meteorological conditions, adequate guidance is provided by such spacing.~~

~~(g) Taxiway centre line lights on rapid exit taxiways:~~

~~Where runway centre line lights are not provided, a greater interval not exceeding 30 m may be used."~~

GM-ADR-DSN.M.715 - Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

"(a) Taxiway centre line lights on taxiways:

(1) Taxiway centre line lights on a straight section of a taxiway may be spaced at longitudinal intervals of not more than 30 m, except that:

(i) intervals less than 30 m may be provided on short straight sections;

(ii) on a taxiway intended for use in RVR conditions of less than a value of 350 m, the longitudinal spacing may not exceed 15 m.

(2) Taxiway centre line lights on a taxiway curve may continue from the straight portion of the taxiway at a constant distance from the outside edge of the taxiway curve. The lights may be spaced at intervals such that a clear indication of the curve is provided.

(3) On a taxiway intended for use in RVR conditions of less than a value of 350 m, the lights on a curve may not exceed spacing of 15 m and on a curve of less than 400 m radius the lights may be spaced at intervals of not greater than 7.5 m. This spacing may extend for 60 m before and after the curve.

(b) Taxiway centre line lights on rapid exit taxiways:

(1) Taxiway centre line lights on a rapid exit taxiway may commence at a point at least 60 m before the beginning of the taxiway centre line curve and continue beyond the end of the curve to a point on the centre line of the taxiway where an aeroplane can be expected to reach normal taxiing speed, as shown in Figure M-10. The lights on that portion parallel to the runway centre line may always be at least 60 cm from any row of runway centre line lights, as shown in Figure M-10.

(2) The lights may be spaced at longitudinal intervals of not more than 15 m.

(c) Taxiway centre line lights on other exit taxiways:

(1) Taxiway centre line lights on exit taxiways other than rapid exit taxiways may commence at the point where the taxiway centre line marking begins to curve from the runway centre line, and follow the curved taxiway centre line marking at least to the point where the marking leaves the runway. The first light may be at least 60 cm from any row of runway centre line lights, as shown in Figure M-8, Arrangement of runway threshold and runway end lights.

(2) The lights may be spaced at longitudinal intervals of not more than 7.5 m.

(d) Taxiway centre line lights on runways:
 Taxiway centre line lights on a runway forming part of a standard taxi-route and intended for taxiing in runway visual range conditions less than a value of 350 m may be spaced at longitudinal intervals not exceeding 15 m.
 Figure M-11

(e) Positioning of Taxiway centre line lights on taxiway:

(1) The spacing on a particular section of taxiway centre line lighting, (straight or curved section), may be such that a clear indication of the taxiway centre line is provided, particularly on a curved section.

(2) Where a taxiway is only intended for use in RVR conditions of 350 m or greater, the spacing of taxiway centre line lights on curves may not exceed the table below:

Curve radius	Light spacing
up to 400 m	7.5 m
401 m to 899 m	15 m
900 m or greater	30 m

(f) Taxiway centre line lights on straight sections of taxiways:
 Larger intervals not exceeding 60 m may be used where, because of the prevailing meteorological conditions, adequate guidance is provided by such spacing.

(g) Taxiway centre line lights on rapid exit taxiways:
 Where runway centre line lights are not provided, a greater interval not exceeding 30 m may be used."

response

Partially accepted

Objectives on some CSs will be added among applicability and characteristics. The proposed text in comment has explanatory meaning and not a CS requirement. The spacing will remain in the CS as this is dimension and relevant to visibility conditions. CSs M.710 and M.715 allow adequate level of flexibility. The lights composition at existing taxiways could remain without change with ELOS, SC or DAAD. Defining the taxi route is an operational issue.

comment

2081

comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

titles should be removed

response

Not accepted

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2489

comment by: AENA - Aeropuertos Españoles y Navegación Aérea

"(a) Taxiway centre line lights on taxiways:

(1) Taxiway centre line lights on a straight section of a taxiway may be spaced at longitudinal intervals of not more than 30 m, except that:

(i) intervals less than 30 m may be provided on short straight sections;

(ii) on a taxiway intended for use in RVR conditions of less than a value of 350 m, the longitudinal spacing may not exceed 15 m.

(2) Taxiway centre line lights on a taxiway curve may continue from the straight portion of the taxiway at a constant distance from the outside edge of the taxiway curve. The lights may be spaced at intervals such that a clear indication of the curve is provided.

(3) On a taxiway intended for use in RVR conditions of less than a value of 350 m, the lights on a curve may not exceed spacing of 15 m and on a curve of less than 400 m radius the lights may be spaced at intervals of not greater than 7.5 m. This spacing may extend for 60 m before and after the curve.

(b) Taxiway centre line lights on rapid exit taxiways:

(1) Taxiway centre line lights on a rapid exit taxiway may commence at a point at least 60 m before the beginning of the taxiway centre line curve and continue beyond the end of the curve to a point on the centre line of the taxiway where an aeroplane can be expected to reach normal taxiing speed, as shown in Figure M-10. The lights on that portion parallel to the runway centre line may always be at least 60 cm from any row of runway centre line lights, as shown in Figure M-10.

(2) The lights may be spaced at longitudinal intervals of not more than 15 m.

(c) Taxiway centre line lights on other exit taxiways:

(1) Taxiway centre line lights on exit taxiways other than rapid exit taxiways may commence at the point where the taxiway centre line marking begins to curve from the runway centre line, and follow the curved taxiway centre line marking at least to the point where the marking leaves the runway. The first light may be at least 60 cm from any row of runway centre line lights, as shown in Figure M-8, Arrangement of runway threshold and runway end lights.

(2) The lights may be spaced at longitudinal intervals of not more than 7.5 m.

(d) Taxiway centre line lights on runways:

Taxiway centre line lights on a runway forming part of a standard taxi-route and intended for taxiing in runway visual range conditions less than a value of 350 m may be spaced at longitudinal intervals not exceeding 15 m.

Figure M-11

(e) Positioning of Taxiway centre line lights on taxiway:

(1) The spacing on a particular section of taxiway centre line lighting, (straight or curved section), may be such that a clear indication of the taxiway centre line is provided, particularly on a curved section.

(2) Where a taxiway is only intended for use in RVR conditions of 350 m or greater, the spacing of taxiway centre line lights on curves may not exceed the table below:

Curve radius Light spacing

up to 400 m 7.5 m

401 m to 899 m 15 m

900 m or greater 30 m

(f) Taxiway centre line lights on straight sections of taxiways:

Larger intervals not exceeding 60 m may be used where, because of the prevailing meteorological conditions, adequate guidance is provided by such spacing.

(g) Taxiway centre line lights on rapid exit taxiways:

Where runway centre line lights are not provided, a greater interval not exceeding 30 m may be used."

response *Noted*

It is not clear from the comment what is intended by highlighting the CS text. This text will remain in the CS.

comment 3104 ❖

comment by: *Fraport AG*

CS ADR DSN — BOOK 2 Chapter M

GM-ADR-DSN.M.705

GM-ADR-DSN.M.715

GM-ADR-DSN.M.720

GM-ADR-DSN.M.725

GM-ADR-DSN.M.730

GM-ADR-DSN.M.735

GM-ADR-DSN.M.740

GM-ADR-DSN.M.760

GM-ADR-DSN.M.765

GM-ADR-DSN.M.770

Editorial

GM-ADR-DSN.M.705 — Stopway lights

GM-ADR-DSN.M.715 — Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

GM-ADR-DSN.M.720 — Taxiway edge lights

GM-ADR-DSN.M.725 — Runway turn pad lights

GM-ADR-DSN.M.730 — Stop bar lights

GM-ADR-DSN.M.735 — Intermediate holding position lights

GM-ADR-DSN.M.740 — De-icing/anti-icing facility exit lights

GM-ADR-DSN.M.760 — Advanced visual docking guidance system

GM-ADR-DSN.M.765 — Aircraft stand manoeuvring guidance lights

GM-ADR-DSN.M.770 — Road-holding position light

Provide rationale for each requirement

Fraport AG

Missing the rationale

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.M.720 — Taxiway edge lights

p. 271

comment 198

comment by: *CAA Austria - Ministry of Transport*

response	<p>Missing text or delete title</p> <p><i>Not accepted</i></p> <p>Numbering is for continuity. The words 'intentionally blank' will be inserted.</p>
comment	<p>1327 comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i></p> <p>There is no content: Please remove title or provide content.</p>
response	<p><i>Not accepted</i></p> <p>Numbering is for continuity. The words 'intentionally blank' will be inserted.</p>
comment	<p>2078 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>titles should be removed</p>
response	<p><i>Not accepted</i></p> <p>Numbering is for continuity. The words 'intentionally blank' will be inserted.</p>
comment	<p>3104 ❖ comment by: <i>Fraport AG</i></p> <p>CS ADR DSN — BOOK 2 Chapter M GM-ADR-DSN.M.705 GM-ADR-DSN.M.715 GM-ADR-DSN.M.720 GM-ADR-DSN.M.725 GM-ADR-DSN.M.730 GM-ADR-DSN.M.735 GM-ADR-DSN.M.740 GM-ADR-DSN.M.760 GM-ADR-DSN.M.765 GM-ADR-DSN.M.770</p> <p>Editorial</p> <p>GM-ADR-DSN.M.705 — Stopway lights GM-ADR-DSN.M.715 — Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways GM-ADR-DSN.M.720 — Taxiway edge lights GM-ADR-DSN.M.725 — Runway turn pad lights GM-ADR-DSN.M.730 — Stop bar lights GM-ADR-DSN.M.735 — Intermediate holding position lights GM-ADR-DSN.M.740 — De-icing/anti-icing facility exit lights GM-ADR-DSN.M.760 — Advanced visual docking guidance system GM-ADR-DSN.M.765 — Aircraft stand manoeuvring guidance lights</p>

	GM-ADR-DSN.M.770 — Road-holding position light
	Provide rationale for each requirement
	Fraport AG Missing the rationale
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.M.725 — Runway turn pad lights

p. 271

comment	199	comment by: CAA Austria - Ministry of Transport
	Missing text or delete title	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

comment	1329	comment by: Federal Office of Civil Aviation, FOCA, Switzerland
	There is no content: Please remove title or provide content.	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

comment	2077	comment by: Airport St. Gallen-Altenrhein - ACH/LSZR
	titles should be removed	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

comment	3104 ❖	comment by: Fraport AG
	CS ADR DSN — BOOK 2 Chapter M GM-ADR-DSN.M.705 GM-ADR-DSN.M.715	

GM-ADR-DSN.M.720
 GM-ADR-DSN.M.725
 GM-ADR-DSN.M.730
 GM-ADR-DSN.M.735
 GM-ADR-DSN.M.740
 GM-ADR-DSN.M.760
 GM-ADR-DSN.M.765
 GM-ADR-DSN.M.770

Editorial

GM-ADR-DSN.M.705 — Stopway lights
 GM-ADR-DSN.M.715 — Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways
 GM-ADR-DSN.M.720 — Taxiway edge lights
 GM-ADR-DSN.M.725 — Runway turn pad lights
 GM-ADR-DSN.M.730 — Stop bar lights
 GM-ADR-DSN.M.735 — Intermediate holding position lights
 GM-ADR-DSN.M.740 — De-icing/anti-icing facility exit lights
 GM-ADR-DSN.M.760 — Advanced visual docking guidance system
 GM-ADR-DSN.M.765 — Aircraft stand manoeuvring guidance lights
 GM-ADR-DSN.M.770 — Road-holding position light

Provide rationale for each requirement

Fraport AG
 Missing the rationale

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.M.730 — Stop bar lights

p. 271

comment 200 comment by: CAA Austria - Ministry of Transport

Missing text or delete title

response *Noted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 1331 comment by: Federal Office of Civil Aviation, FOCA, Switzerland

There is no content: Please remove title or provide content.

response *Noted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment

1766 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 – CS-ADR-DSN.M.730 - Stop bar lights (p116-117)
- CS-ADR - Book 2 - GM-ADR-DSN.M.730 – Stop bar lights (p271)

2. Justification and proposed text / comment

It is appropriate to transfer this provision to GM. Indeed, experience has proven that there is a high risk of dazzling the pilots by the use of such lights. However, it is possible to provide several additional "normal" lights (instead of providing high intensity lights).

CS-ADR-DSN.M.730 – Stop bar lights

~~"[...] (8) Where a wide beam fixture is required, the intensity in red light and beam spreads of stop bar lights should be in accordance with the specifications in CS-ADR DSN.U.940, Figure U-21 or U-23.~~

~~[...]"~~

GM-ADR-DSN.M.730 – Stop bar lights

"Where a wide beam fixture is required, the intensity in red light and beam spreads of stop bar lights should be in accordance with the specifications in CS-ADR DSN.U.940, Figure U-21 or U-23."

response

Noted

It is appropriate to retain this detail in the CS as there are design specifications. If operationally required, other solutions are available using the flexibility allowed by ELOS.

comment

2076

comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

titles should be removed

response

Not accepted

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment

3104 ❖

comment by: Fraport AG

CS ADR DSN — BOOK 2 Chapter M
 GM-ADR-DSN.M.705
 GM-ADR-DSN.M.715
 GM-ADR-DSN.M.720
 GM-ADR-DSN.M.725
 GM-ADR-DSN.M.730

GM-ADR-DSN.M.735
 GM-ADR-DSN.M.740
 GM-ADR-DSN.M.760
 GM-ADR-DSN.M.765
 GM-ADR-DSN.M.770

Editorial

GM-ADR-DSN.M.705 — Stopway lights
 GM-ADR-DSN.M.715 — Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways
 GM-ADR-DSN.M.720 — Taxiway edge lights
 GM-ADR-DSN.M.725 — Runway turn pad lights
 GM-ADR-DSN.M.730 — Stop bar lights
 GM-ADR-DSN.M.735 — Intermediate holding position lights
 GM-ADR-DSN.M.740 — De-icing/anti-icing facility exit lights
 GM-ADR-DSN.M.760 — Advanced visual docking guidance system
 GM-ADR-DSN.M.765 — Aircraft stand manoeuvring guidance lights
 GM-ADR-DSN.M.770 — Road-holding position light

Provide rationale for each requirement

Fraport AG
 Missing the rationale

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.M.735 — Intermediate holding position lights

p. 271

comment 201 comment by: CAA Austria - Ministry of Transport

Missing text or delete title

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 1332 comment by: Federal Office of Civil Aviation, FOCA, Switzerland

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment	2075	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

comment	3104 ❖	comment by: <i>Fraport AG</i>
	<p>CS ADR DSN — BOOK 2 Chapter M</p> <p>GM-ADR-DSN.M.705 GM-ADR-DSN.M.715 GM-ADR-DSN.M.720 GM-ADR-DSN.M.725 GM-ADR-DSN.M.730 GM-ADR-DSN.M.735 GM-ADR-DSN.M.740 GM-ADR-DSN.M.760 GM-ADR-DSN.M.765 GM-ADR-DSN.M.770</p> <p>Editorial</p> <p>GM-ADR-DSN.M.705 — Stopway lights GM-ADR-DSN.M.715 — Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways GM-ADR-DSN.M.720 — Taxiway edge lights GM-ADR-DSN.M.725 — Runway turn pad lights GM-ADR-DSN.M.730 — Stop bar lights GM-ADR-DSN.M.735 — Intermediate holding position lights GM-ADR-DSN.M.740 — De-icing/anti-icing facility exit lights GM-ADR-DSN.M.760 — Advanced visual docking guidance system GM-ADR-DSN.M.765 — Aircraft stand manoeuvring guidance lights GM-ADR-DSN.M.770 — Road-holding position light</p> <p>Provide rationale for each requirement</p> <p>Fraport AG Missing the rationale</p>	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

comment 202 comment by: *CAA Austria - Ministry of Transport*

Missing text or delete title

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 1333 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2073 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 3104 ❖ comment by: *Fraport AG*

CS ADR DSN — BOOK 2 Chapter M

GM-ADR-DSN.M.705

GM-ADR-DSN.M.715

GM-ADR-DSN.M.720

GM-ADR-DSN.M.725

GM-ADR-DSN.M.730

GM-ADR-DSN.M.735

GM-ADR-DSN.M.740

GM-ADR-DSN.M.760

GM-ADR-DSN.M.765

GM-ADR-DSN.M.770

Editorial

GM-ADR-DSN.M.705 — Stopway lights

GM-ADR-DSN.M.715 — Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways

GM-ADR-DSN.M.720 — Taxiway edge lights

GM-ADR-DSN.M.725 — Runway turn pad lights

GM-ADR-DSN.M.730 — Stop bar lights
 GM-ADR-DSN.M.735 — Intermediate holding position lights
 GM-ADR-DSN.M.740 — De-icing/anti-icing facility exit lights
 GM-ADR-DSN.M.760 — Advanced visual docking guidance system
 GM-ADR-DSN.M.765 — Aircraft stand manoeuvring guidance lights
 GM-ADR-DSN.M.770 — Road-holding position light

Provide rationale for each requirement

Fraport AG
 Missing the rationale

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.M.750 — Apron floodlighting

p. 271

comment

1833 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.M.750 — Apron floodlighting (p120-121)
- CS-ADR - Book 2 - GM-ADR-DSN.M.750 — Apron floodlighting (p271)

2. Justification and proposed text / comment

This CS, and in particular its paragraphs (b) and (c)(2), is not in the French national regulation because this point has to be dealt with on a case by case basis because solutions differ depending on the situation. Besides, it is in recommendations in ICAO Annex 14 volume 1.

When delivering the certificate, justifying for each case the difference, even if there have been safety studies performed, will generate huge cost without any added safety value.

But most of all, it is essential to indicate the objective of such apron floodlighting, in order to be able to perform the given case by case studies, which is to help the pilot to find his way on this area to the aircraft parking position.

It is proposed to add the objective in the CS and to move paragraphs (b) and (c)(2) to GM.

CS-ADR-DSN.M.750 — Apron floodlighting

"(a) Applicability:

Apron floodlighting should be provided on an apron, on a de-icing/anti-icing facility and on a designated isolated aircraft parking position intended to be used at night in order to help the pilot to find his way on this area to the aircraft parking position.

(b) Location:

Apron floodlights should be located so as to provide adequate illumination on all apron service areas, with a minimum of glare to pilots of aircraft in flight and

~~on the ground, aerodrome and apron controllers, and personnel on the apron. The arrangement and aiming of floodlights should be such that an aircraft stand receives light from two or more directions to minimise shadows.~~

~~(c) Characteristics:~~

~~(1) The spectral distribution of apron floodlights should be such that the colours used for aircraft marking connected with routine servicing, and for surface and obstacle marking, can be correctly identified.~~

~~(2) The average illuminance should be at least the following:~~

~~(i) Aircraft stand:~~

~~(A) horizontal illuminance — 20 lux with a uniformity ratio (average to minimum) of not more than 4 to 1; and~~

~~(B) vertical illuminance — 20 lux at a height of 2 m above the apron in relevant directions.~~

~~(ii) Other apron areas:~~

~~horizontal illuminance — 50 % of the average illuminance on the aircraft stands with a uniformity ratio (average to minimum) of not more than 4 to 1."~~

GM-ADR-DSN.M.750 – Apron floodlighting

"(a) Where a de-icing/anti-icing facility is located in close proximity to the runway and permanent floodlighting could be confusing to pilots, other means of illumination of the facility may be required.

(b) Location:

Apron floodlights may be located so as to provide adequate illumination on all apron service areas, with a minimum of glare to pilots of aircraft in flight and on the ground, aerodrome and apron controllers, and personnel on the apron. The arrangement and aiming of floodlights may be such that an aircraft stand receives light from two or more directions to minimise shadows.

(c) Characteristics:

(2) The average illuminance should be at least the following:

(i) Aircraft stand:

(A) horizontal illuminance — 20 lux with a uniformity ratio (average to minimum) of not more than 4 to 1; and

(B) vertical illuminance — 20 lux at a height of 2 m above the apron in relevant directions.

(ii) Other apron areas:

horizontal illuminance — 50 % of the average illuminance on the aircraft stands with a uniformity ratio (average to minimum) of not more than 4 to 1."

response Partially accepted

Objectives on some CSs will be added among applicability and characteristics. The text in (b) will be reviewed. The text in (c)(2) is design requirement; therefore, it will remain as CS.

comment 2927

comment by: ACA - Aéroports de la Côte d'Azur - NCE/LFMN

Référence: CS-ADR-DSN.M.750

Apron floodlighting

Proposition/commentaire

Il convient d'ajouter au (a): "L'objectif de l'éclairage de l'aire de stationnement est de permettre au pilote de mieux se repérer sur cette aire afin de trouver son chemin vers son poste de stationnement ".

	<p>(b) Il convient de transférer cette disposition en Guidance Materials.</p> <p>(c) (2) Il convient de transférer cette disposition en Guidance Materials car elle est trop précise.</p>
Justification	<p>Les dispositions (b) et (c) (2) n'étant que des règles de l'art et non des références normatives dans l'Annexe 14 de l'OACI, elles ont leur place en GM et non en CS.</p> <p>Il est important au (a) de connaître l'objectif de cet éclairage des aires de stationnement pour qu'il n'y ait pas de confusion avec d'autres fonctions que doivent remplir d'autres sources d'éclairage notamment autour de l'avion lors de l'avitaillement.</p>
Traduction de courtoisie	<p>(a) It is appropriate to add in (a): « the purpose of apron lighting is to help the pilot to find his way on this area to its stand. » It is important to know the purpose of apron lighting so that there is no confusion with other functions that other lighting sources have to carry out notably around the aircraft on its stand during fuelling.</p> <p>(b) It is appropriate to transfer this provision to GM.</p> <p>(c) (2) It is appropriate to transfer this provision to GM because it is too precise.</p> <p>(b) and (c) (2) are just good practices and not normative references so they must be in GM and not in CS.</p>
response	<p><i>Partially accepted</i></p> <p>Objectives on some CSs will be added among applicability and characteristics. The text in (b) will be reviewed. The text in (c)(2) is design requirement; therefore, it will remain as CS.</p>

comment 1141 ❖

comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS-ADR - Book 1 - CS-ADR-DSN.M.760 — Advanced visual docking guidance system (p122-124)
- CS-ADR - Book 2 - GM-ADR-DSN.M.760 — Advanced visual docking guidance system (p272)

2. Justification and proposed text / comment

Paragraphs (a)(2), (a)(6), (a)(7), (b)(2), (c)(4)(i), (c)(4)(iii): these specifications are only notes in section 5.3.25 of Annex14 Volume 1 and provide for guidance only on advanced visual docking guidance systems. They are not binding in France. It is essential to move them to guidance material GM-ADR-DSN.M.760.

Moreover, there are erroneous figures in columns 1 and 5 of table M-3, and in paragraph (c)(4) there is some duplication:

- the end is already in (c)(5),
- (ii) is already in (c)(6),
- (iv) and (v) are already in (c)(7),
- (vi) is already in (c)(8),
- (vii) is already in (c)(9),
- (viii) is already in (c)(10).

Thus the following modifications:

CS-ADR-DSN.M.760 — Advanced visual docking guidance system

"(a) Application:

~~[...](2) Advanced visual docking guidance systems should provide docking guidance information in three stages: the acquisition of the aircraft by the system, the azimuth alignment of the aircraft, and the stopping position information.~~

~~[...](6) The use of the Advanced visual docking guidance systems in conditions such as weather, visibility, and background lighting both by day and night would need to be specified.~~

~~(7) Care is required in both the design and on-site installation of the system to ensure that glare, reflection of sunlight, or other light in the vicinity, does not degrade the clarity and conspicuity of the visual cues provided by the system.~~

~~[...]~~

(b) Location:

~~[...](2) Usually the pilot-in-command is responsible for the docking of the aircraft. However, in some circumstances, another person could be responsible and this person may be the driver of a vehicle that is towing the aircraft.~~

~~[...]~~

(c) Characteristics:

~~[...](4) The information on displacement of the aircraft relative to the stand centre line and distance to the stopping position, when displayed, should be provided with the accuracy specified in Table M-3 Symbols and graphics used to depict guidance information should be intuitively representative of the type of information provided.~~

~~(i) The use of colour needs to be appropriate and should follow signal convention, i.e. red, yellow and green mean hazard, caution and normal/correct conditions, respectively. The effects of colour contrasts also needs to be considered.~~

~~(ii) Information on the lateral displacement of the aircraft relative to the stand centre line should be provided at least 25 m prior to the stop position.~~

- ~~(iii) The indication of the distance of the aircraft from the stop position may be colour coded and presented at a rate and distance proportional to the actual closure rate and distance of the aircraft approaching the stop point.~~
- ~~(iv) Continuous closure distance and closure rate shall be provided from at least 15 m prior to the stop position.~~
- ~~(v) Where provided, closure distance displayed in numerals should be provided in metre integers to the stop position and displayed to 1 decimal place at least 3 m prior to the stop position.~~
- ~~(vi) Throughout the docking manoeuvre, an appropriate means should be provided on the Advanced visual docking guidance system to indicate the need to bring the aircraft to an immediate halt. In such an event, which includes a failure of the system, no other information shall be displayed.~~
- ~~(vii) Provision to initiate an immediate halt to the docking procedure should be made available to personnel responsible for the operational safety of the stand.~~
- ~~(viii) The word 'STOP' in red characters should be displayed when an immediate cessation of the docking manoeuvre is required.~~
- (5) Symbols and graphics used to depict guidance information should be intuitively representative of the type of information provided.
- (6) Information on the lateral displacement of the aircraft relative to the stand centre line should be provided at least 25 m prior to the stop position.
- (7) Continuous closure distance and closure rate should be provided from at least 15 m prior to the stop position. Where provided, closure distance displayed in numerals should be provided in metre integers to the stop position and displayed to 1 decimal place at least 3 m prior to the stop position.
- (8) Throughout the docking manoeuvre, an appropriate means should be provided on the A-VDGS to indicate the need to bring the aircraft to an immediate halt. In such an event, which includes a failure of the A-VDGS, no other information should be displayed.
- (9) Provision to initiate an immediate halt to the docking procedure should be made available to personnel responsible for the operational safety of the stand.
- (10) The word 'stop' in red characters should be displayed when an immediate cessation of the docking manoeuvre is required.

Guidance information	Maximum deviation at stop position (stop area)	Maximum deviation at 9 m from stop position	Maximum deviation at 15 m from stop position	Maximum deviation at 25 m from stop position
Azimuth		[...]		±500 mm
Distance	±500 mm		[...]	

Table M-3 [...]

"

GM-ADR-DSN.M.760 — Advanced visual docking guidance system

(a) Application:

- (1) Advanced visual docking guidance systems may provide docking guidance information in three stages: the acquisition of the aircraft by the system, the azimuth alignment of the aircraft, and the stopping position information.
- (2) The use of the Advanced visual docking guidance systems in conditions such as weather, visibility, and background lighting both by day and night would need to be specified.
- (3) Care is required in both the design and on-site installation of the system to ensure that glare, reflection of sunlight, or other light in the vicinity, does not degrade the clarity and conspicuity of the visual cues provided by the system.
- (b) Location: Usually the pilot-in-command is responsible for the docking of the aircraft. However, in some circumstances, another person could be responsible and this person may be the driver of a vehicle that is towing the aircraft.

(c) Characteristics:

(1) The use of colour needs to be appropriate and should follow signal convention, i.e. red, yellow and green mean hazard, caution and normal/correct conditions, respectively. The effect of colour contrasts also needs to be considered.

(2) The indication of the distance of the aircraft from the stop position may be colour-coded and presented at a rate and distance proportional to the actual closure rate and distance of the aircraft approaching the stop point."

response *Partially accepted*

The CS is composed mainly of ICAO standards. ICAO recommendations are kept in the CS for consistency and information purposes.
Redundant text will be deleted, and the CS text will be reviewed.
Table M-3 will be reviewed, and the distance will read: +/- 500 mm.

comment 1335 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2069 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2546 comment by: *AENA - Aeropuertos Españoles y Navegación Aérea*

GM-ADR-DSN.M.760 – Advanced visual docking guidance system

"(a)Application:

(1) Advanced visual docking guidance systems may provide docking guidance information in three stages: the acquisition of the aircraft by the system, the azimuth alignment of the aircraft, and the stopping position information.

(2) The use of the Advanced visual docking guidance systems in conditions such as weather, visibility, and background lighting both by day and night would need to be specified.

(3) Care is required in both the design and on-site installation of the system to ensure that glare, reflection of sunlight, or other light in the vicinity, does not degrade the clarity and conspicuity of the visual cues provided by the system.

(b) Location: Usually the pilot-in-command is responsible for the docking of the aircraft. However, in some circumstances, another person could be responsible and this person may be the driver of a vehicle that is towing the aircraft.

(c) Characteristics:

(1) The use of colour needs to be appropriate and should follow signal convention, i.e. red, yellow and green mean hazard, caution and normal/correct conditions, respectively. The effect of colour contrasts also needs to be considered.

(2) The indication of the distance of the aircraft from the stop position may be colour-coded and presented at a rate and distance proportional to the actual closure rate and distance of the aircraft approaching the stop point."

response *Partially accepted*

The CS is composed mainly of ICAO standards. ICAO recommendations are kept in the CS for consistency and information purposes.

Redundant text has been deleted, and the CS text has been reviewed.

comment *3104* ❖

comment by: *Fraport AG*

CS ADR DSN — BOOK 2 Chapter M

GM-ADR-DSN.M.705
 GM-ADR-DSN.M.715
 GM-ADR-DSN.M.720
 GM-ADR-DSN.M.725
 GM-ADR-DSN.M.730
 GM-ADR-DSN.M.735
 GM-ADR-DSN.M.740
 GM-ADR-DSN.M.760
 GM-ADR-DSN.M.765
 GM-ADR-DSN.M.770

Editorial

GM-ADR-DSN.M.705 — Stopway lights
 GM-ADR-DSN.M.715 — Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways
 GM-ADR-DSN.M.720 — Taxiway edge lights
 GM-ADR-DSN.M.725 — Runway turn pad lights
 GM-ADR-DSN.M.730 — Stop bar lights
 GM-ADR-DSN.M.735 — Intermediate holding position lights
 GM-ADR-DSN.M.740 — De-icing/anti-icing facility exit lights
 GM-ADR-DSN.M.760 — Advanced visual docking guidance system
 GM-ADR-DSN.M.765 — Aircraft stand manoeuvring guidance lights
 GM-ADR-DSN.M.770 — Road-holding position light

	Provide rationale for each requirement
	Fraport AG Missing the rationale
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.

**CS-ADR – Book 2 – GM-ADR-DSN.M.765 – Aircraft stand manoeuvring
guidance lights**

p. 272

comment	1336	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	There is no content: Please remove title or provide content.	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

comment	2070	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

comment	3104 ❖	comment by: <i>Fraport AG</i>
	CS ADR DSN – BOOK 2 Chapter M GM-ADR-DSN.M.705 GM-ADR-DSN.M.715 GM-ADR-DSN.M.720 GM-ADR-DSN.M.725 GM-ADR-DSN.M.730 GM-ADR-DSN.M.735 GM-ADR-DSN.M.740 GM-ADR-DSN.M.760 GM-ADR-DSN.M.765 GM-ADR-DSN.M.770	
	Editorial	
	GM-ADR-DSN.M.705 – Stopway lights	

GM-ADR-DSN.M.715 — Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways
 GM-ADR-DSN.M.720 — Taxiway edge lights
 GM-ADR-DSN.M.725 — Runway turn pad lights
 GM-ADR-DSN.M.730 — Stop bar lights
 GM-ADR-DSN.M.735 — Intermediate holding position lights
 GM-ADR-DSN.M.740 — De-icing/anti-icing facility exit lights
 GM-ADR-DSN.M.760 — Advanced visual docking guidance system
 GM-ADR-DSN.M.765 — Aircraft stand manoeuvring guidance lights
 GM-ADR-DSN.M.770 — Road-holding position light

Provide rationale for each requirement

Fraport AG
 Missing the rationale

response *Not accepted*

The numbering is for continuity: text "intentionally blank" will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.M.770 — Road-holding position light

p. 272

comment 1337 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2071 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 3104 ❖ comment by: *Fraport AG*

CS ADR DSN — BOOK 2 Chapter M

GM-ADR-DSN.M.705

GM-ADR-DSN.M.715

GM-ADR-DSN.M.720

GM-ADR-DSN.M.725

GM-ADR-DSN.M.730
 GM-ADR-DSN.M.735
 GM-ADR-DSN.M.740
 GM-ADR-DSN.M.760
 GM-ADR-DSN.M.765
 GM-ADR-DSN.M.770

Editorial

GM-ADR-DSN.M.705 — Stopway lights
 GM-ADR-DSN.M.715 — Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways
 GM-ADR-DSN.M.720 — Taxiway edge lights
 GM-ADR-DSN.M.725 — Runway turn pad lights
 GM-ADR-DSN.M.730 — Stop bar lights
 GM-ADR-DSN.M.735 — Intermediate holding position lights
 GM-ADR-DSN.M.740 — De-icing/anti-icing facility exit lights
 GM-ADR-DSN.M.760 — Advanced visual docking guidance system
 GM-ADR-DSN.M.765 — Aircraft stand manoeuvring guidance lights
 GM-ADR-DSN.M.770 — Road-holding position light

Provide rationale for each requirement

Fraport
 Missing the rationale

AG

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.N.775 — General

p. 273

comment 3105

comment by: *Fraport AG*

CS ADR DSN — BOOK 2 Chapter N, Appendix 4
 GM-ADR-DSN.N.790
 GM-ADR-DSN.N.795
 GM-ADR-DSN.N.800

Editorial

GM-ADR-DSN.N.790 — VOR aerodrome checkpoint sign
 GM-ADR-DSN.N.795 — Aircraft stand identification signs
 GM-ADR-DSN.N.800 — Road-holding position sign

Provide rationale for each requirement

Fraport AG
 Missing the rationale

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR – Book 2 – GM-ADR-DSN.N.780 – Mandatory instruction signs

p. 273

comment 105

comment by: *Manchester Airport plc*

At Table 5-31 on page 274, it is not entirely clear what mandatory signage is to be used at holding position which is used for all modes of operation, both visual and Precision, including CAT II and III. In such cases, where there is only a single holding position, a simple sign as shown in the bottom picture, would be the best solution.

response *Noted*

The figure will be updated with EASA references.

In the case where a single runway holding position is used for all types of approach (or take-off), the greater distance should be used, i.e. dimension 'Y'. The top illustration in the figure should therefore be the same as the three examples on the lower left of the figure. The illustration are not well drawn because the left examples should line up with the Cat II/III on the right at distance 'Y' from the centre line.

CS-ADR – Book 2 – GM-ADR-DSN.N.785 – Information signs

p. 273

comment 41

comment by: *ACI EUROPE - Airports Council International*

rewrite completely with EASA references! Do not simply "copy & paste" from ICAO, especially since references are mentioned which do not exist in this Book B III

response *Accepted*

comment 195

comment by: *CAA Austria - Ministry of Transport*

Rewrite completely with EASA references. Copy & Paste from ICAO does not work, especially since references are mentioned which do not exist in the EASA documents

response *Accepted*

comment *604* comment by: *Cologne/Bonn Airport*
 Table should be adopted to NPA references

response *Accepted*

comment *626* comment by: *Avinor*
 GM.ADR.DSN.N.785. Rewrite with EASA references, not with ICAO references which do not exist in this Book B III.

response *Accepted*

comment *812* comment by: *Munich Airport International*
 rewrite completely with EASA references! Do not simply "copy & paste" from ICAO, especially since references are mentioned which do not exist in this Book B III

response *Accepted*

comment *1340* comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*
 The figure below deals with mandatory instruction signs, and not with information signs. Please add appropriate figure or modify the text. The reference copied from ICAO, please update numbering of the figures.

response *Accepted*

comment *1344* comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*
 Refers to GM.ADR.DSN.N.790 to 800 (unable to place comments to those articles with CRT): There is no content: Please remove title or provide content.

response *Partially accepted*
 The numbering of GM will remain for continuity. The words 'intentionally blank' will be added.

comment	1707	comment by: <i>ECA - European Cockpit Association</i>
	Move this table to the previous article, GM-ADR-DSN.N.780 as paragraph (b) if needed.	
	Justification:	
	The first figure, replicating ICAO's figure 5-31 are examples of mandatory instruction signs. Mixing of this guidance material might provoke confusion because of the title of the article. Therefore, the table should be in ADR-DSN.N.780 on mandatory instruction signs.	
response	<i>Accepted</i>	

comment	1848	comment by: <i>Geneva International Airport (ROMIG)</i>
	Rewrite completely with EASA references. "Copy & Paste" from ICAO does not work, especially since references are mentioned which do not exist in the EASA documents	
response	<i>Accepted</i>	

comment	2065	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	no EASA references. "Copy & Paste" from ICAO does not work, especially since references are mentioned which do not exist in the EASA documents	
response	<i>Accepted</i>	

comment	2092	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	deals with mandatory instruction signs, not with information signs.	
response	<i>Accepted</i>	

comment	3036	comment by: <i>ADV -German Airports Association</i>
	GM.ADR.DSN.N.785 rewrite completely with EASA references! Do not simply "copy & paste" from ICAO, especially since references are mentioned which do not exist in this Book B III	

response	<i>Accepted</i>	
comment	3071	comment by: <i>MST / STR - Stuttgart Airport</i>
	GM.ADR.DSN.N.785 rewrite completely with EASA references! Do not simply "copy & paste" from ICAO, especially since references are mentioned which do not exist in this Book B III	
response	<i>Accepted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.P.805 – General

p. 281

comment	191	comment by: <i>CAA Austria - Ministry of Transport</i>
	Missing text or delete title	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	
comment	1345	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	There is no content: Please remove title or provide content.	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	
comment	2057	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	titles should be removed	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	
comment	3106	comment by: <i>Fraport AG</i>

	<p>CS ADR DSN — BOOK 2 Chapter P GM-ADR-DSN.P.805 GM-ADR-DSN.P.810 GM-ADR-DSN.P.815 GM-ADR-DSN.P.830 GM-ADR-DSN.P.835</p> <p>Editorial</p> <p>GM-ADR-DSN.P.805 — General GM-ADR-DSN.P.810 — Unpaved runway edge markers GM-ADR-DSN.P.815 — Stopway edge markers GM-ADR-DSN.P.830 — Taxiway centre line markers GM-ADR-DSN.P.835 — Unpaved taxiway edge markers</p> <p>Provide rationale for each requirement</p> <p>Fraport AG Missing the rationale</p>
response	<p><i>Not accepted</i></p> <p>Numbering is for continuity. The words 'intentionally blank' will be inserted.</p>

CS-ADR — Book 2 — GM-ADR-DSN.P.810 — Unpaved runway edge markers	p. 281
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comment	<p>192 comment by: <i>CAA Austria - Ministry of Transport</i></p> <p>Missing text or delete title</p>
response	<p><i>Not accepted</i></p> <p>Numbering is for continuity. The words 'intentionally blank' will be inserted.</p>
comment	<p>1346 comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i></p> <p>There is no content: Please remove title or provide content.</p>
response	<p><i>Not accepted</i></p> <p>Numbering is for continuity. The words 'intentionally blank' will be inserted.</p>
comment	<p>2049 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>titles should be removed</p>

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 3106 ❖

comment by: *Fraport AG*

CS ADR DSN — BOOK 2 Chapter P
 GM-ADR-DSN.P.805
 GM-ADR-DSN.P.810
 GM-ADR-DSN.P.815
 GM-ADR-DSN.P.830
 GM-ADR-DSN.P.835

Editorial

GM-ADR-DSN.P.805 — General
 GM-ADR-DSN.P.810 — Unpaved runway edge markers
 GM-ADR-DSN.P.815 — Stopway edge markers
 GM-ADR-DSN.P.830 — Taxiway centre line markers
 GM-ADR-DSN.P.835 — Unpaved taxiway edge markers

Provide rationale for each requirement

Fraport AG
 Missing the rationale

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.P.815 — Stopway edge markers

p. 281

comment 193

comment by: *CAA Austria - Ministry of Transport*

Missing text or delete title

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 1347

comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 2048

comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment 3106 ❖

comment by: *Fraport AG*

CS ADR DSN — BOOK 2 Chapter P
GM-ADR-DSN.P.805
GM-ADR-DSN.P.810
GM-ADR-DSN.P.815
GM-ADR-DSN.P.830
GM-ADR-DSN.P.835

Editorial

GM-ADR-DSN.P.805 — General
GM-ADR-DSN.P.810 — Unpaved runway edge markers
GM-ADR-DSN.P.815 — Stopway edge markers
GM-ADR-DSN.P.830 — Taxiway centre line markers
GM-ADR-DSN.P.835 — Unpaved taxiway edge markers

Provide rationale for each requirement

Fraport AG
Missing the rationale

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.P.820 — Edge markers for snow-covered runways

p. 281

comment 194

comment by: *CAA Austria - Ministry of Transport*

Are their alternative measures, or only runway lights. Runway edge lights are mentioned?

response	<p><i>Noted</i></p> <p>Paragraph (c) of this ICAO text will be moved to GM.</p>
comment	<p>1350 comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i></p> <p>The formulation of the article lacks an indication fr possible markers. The article should be more complete or removed.</p>
response	<p><i>Noted</i></p>
comment	<p>2047 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>no indication for possible markers, poorly formulated, correct or remove it</p>
response	<p><i>Noted</i></p> <p>Paragraph (c) of this ICAO text will be moved to GM.</p>
comment	<p>2175 ❖ comment by: <i>DGAC Direction Générale de l'aviation civile</i></p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 - CS-ADR-DSN.P.820 — Edge markers for snow-covered runways (p144) • CS-ADR - Book 2 - GM-ADR-DSN.P.820 — Edge markers for snow-covered runways (p281) <p><u>2. Justification and proposed text / comment</u></p> <p>Accepting non frangible objects such as trees as edge markers is totally inappropriate with regard to the specifications on objects on aerodrome infrastructures.</p> <p>Despite the limited use of this CS in European aerodromes, this CS could be used as an argument from aerodrome operators to justify the presence of other types of non frangible obstacles in the runway strips. It is proposed to remove this CS and corresponding GM.</p> <p><u>CS-ADR-DSN.P.820 — Edge markers for snow covered runways</u></p> <p><i>"(a) Applicability: Edge markers for snow covered runways should be used to indicate the usable limits of a snow covered runway when the limits are not otherwise indicated.</i></p> <p><i>(b) Location: Edge markers for snow covered runways should be placed along the sides of the usable runway at intervals of not more than 100 m. Sufficient markers should be placed across the threshold and end of the usable runway.</i></p> <p><i>(c) Characteristics: Edge markers for snow covered runways should consist of conspicuous objects such as evergreen trees about 1.5 m high, or light weight markers."</i></p>

~~**GM-ADR-DSN.P.820 — Edge markers for snow covered runways**~~
~~"Runway lights could be used to indicate the limits."~~

response *Partially accepted*

Paragraph (c) of this ICAO text will be moved to GM.

CS-ADR — Book 2 — GM-ADR-DSN.P.830 — Taxiway centre line markers

p. 282

comment *1351* comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

There is no content: Please remove title or provide content.

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment *2043* comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

titles should be removed

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment *3106* ❖ comment by: *Fraport AG*

CS ADR DSN — BOOK 2 Chapter P

GM-ADR-DSN.P.805

GM-ADR-DSN.P.810

GM-ADR-DSN.P.815

GM-ADR-DSN.P.830

GM-ADR-DSN.P.835

Editorial

GM-ADR-DSN.P.805 — General

GM-ADR-DSN.P.810 — Unpaved runway edge markers

GM-ADR-DSN.P.815 — Stopway edge markers

GM-ADR-DSN.P.830 — Taxiway centre line markers

GM-ADR-DSN.P.835 — Unpaved taxiway edge markers

Provide rationale for each requirement

	Fraport AG Missing the rationale
response	<i>Not accepted</i> The numbering is for continuity: text "intentionally blank" will be inserted.

CS-ADR — Book 2 — GM-ADR-DSN.P.835 — Unpaved taxiway edge markers	p. 282
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comment	1352 comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i> There is no content: Please remove title or provide content.
response	<i>Not accepted</i> Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment	2041 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i> titles should be removed
response	<i>Not accepted</i> Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment	3106 ❖ comment by: <i>Fraport AG</i> CS ADR DSN — BOOK 2 Chapter P GM-ADR-DSN.P.805 GM-ADR-DSN.P.810 GM-ADR-DSN.P.815 GM-ADR-DSN.P.830 GM-ADR-DSN.P.835 Editorial GM-ADR-DSN.P.805 — General GM-ADR-DSN.P.810 — Unpaved runway edge markers GM-ADR-DSN.P.815 — Stopway edge markers GM-ADR-DSN.P.830 — Taxiway centre line markers GM-ADR-DSN.P.835 — Unpaved taxiway edge markers Provide rationale for each requirement Fraport AG
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	Missing the rationale
response	<i>Not accepted</i>
	Numbering is for continuity. The words 'intentionally blank' will be inserted.

CS-ADR – Book 2 – GM-ADR-DSN.Q.840 – Objects to be marked and/or lighted

p. 283

comment	1359	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
		The ICAO reference should not be used in the GM. The title of table GM-Q-1 should be changed.
response		<i>Accepted</i>

CS-ADR – Book 2 – GM-ADR-DSN.Q.845 – Marking of objects

p. 283

comment	338	comment by: <i>Brussels Airport - BRU/EBBR</i>
		The text to be lined up with Annex 14. The words 'red or yellowish' were omitted.
		In NPA 2011-20 B.II AMC-ADR-OPS.B.080(b) "Marking and lighting of vehicles and other mobile objects" it says : 'When mobile objects are marked by colour, a single conspicuous colour, preferably <u>green</u> for emergency vehicles and yellow for service vehicles should be used'. The corresponding Annex 14 recommendation 6.2.6 says : "preferably red or yellowish green".
		In the Certification Specifications (CS-ADR-DSN.Q.845 – Marking of Objects) nothing is mentioned about the colour of mobile obstacles. But there is in the corresponding Guidance Material : GM-ADR-DSN.Q.845 – Marking of objects (d) : "A single colour, preferably red or yellowish green for emergency vehicles and yellow for service vehicles, is generally used." Here the words red or yellowish are not forgotten, but the word 'conspicuous' is omitted here.
		Suggested text for AMC-ADR-OPS.B.080(b) and also for GM-ADR-DSN.Q.845(d) : "A single <u>conspicuous</u> colour, preferably <u>red or yellowish green</u> for emergency vehicles and yellow for service vehicles, is generally used."
response		<i>Noted</i>
		Marking and lighting of mobile objects is an operational consideration and is

covered by an AMC.

comment 1095 comment by: *Belgian CAA*

It would be better to keep the ICAO wording: "conspicuous" colour.

response *Noted*

comment 1357 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

The ICAO reference should not be used in the GM. The title of table GM-Q-1 should be changed.

response *Accepted*

CS-ADR – Book 2 – Table GM-Q-1 Obstacle marking band widths

p. 283

comment 1355 comment by: *Federal Office of Civil Aviation, FOCA, Switzerland*

The ICAO reference should not be used in the GM. The title of table GM-Q-1 should be changed.

response *Accepted*

comment 2039 comment by: *Airport St. Gallen-Altenrhein - ACH/LSZR*

the title of Table GM-Q-1 needs to be changed

response *Accepted*

CS-ADR – Book 2 – GM-ADR-DSN.Q.850 – Lighting of objects

p. 284

comment 1641 comment by: *Aéroport de Marseille - MRS/LFML*

(b) (2) and (3)
(c) (5) and (11)

	<p>Table Q-1 It is appropriate to transfer these provisions to GM. They are just good practices and not normative references so they must be in GM and not in CS.</p>
response	<p><i>Not accepted</i></p> <p>The ICAO requirement for the lighting of obstacles is intended to reduce hazards to aircraft by indicating the presence of obstacles. The presence of objects which must be lighted is an ICAO standard. The CS text specifies how this should be achieved.</p>
comment	<p>2036 comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i></p> <p>titles of all the tables in this chapter need to be changed</p>
response	<p><i>Accepted</i></p>

CS-ADR – Book 2 – GM-ADR-DSN.Q.850 – Lighting of objects -(d)
Guidance Material on how a combination of low, medium, and/or high-intensity lights on obstacles should be displayed is given in the following
Figures: p. 284-292

comment	<p>1362 comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i></p> <p>The ICAO reference should not be used in the GM. The titles of all tables in this chapter should be changed.</p>
response	<p><i>Accepted</i></p>

CS-ADR – Book 2 – GM-ADR-DSN.R.855 – Closed runways and taxiways, or parts thereof p. 293

comment	<p>3107 comment by: <i>Fraport AG</i></p> <p>GM-ADR-DSN.R.855</p> <p>Editorial</p> <p>GM-ADR-DSN.R.855 – Closed runways and taxiways, or parts thereof</p>
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	Provide rationale for each requirement	
	Fraport Missing the rationale	AG
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

CS-ADR – Book 2 – GM-ADR-DSN.S.895 – Serviceability levels

p. 297

comment	2692	comment by: <i>Infratil Airports Europe Ltd</i>
	Page No: 297	
	Paragraph No: CS-ADR-DSN.S.895 (1)(a)	
	Comment An additional statement should be added that where a valid lighting lighting pattern remains, eg 1 interleaved circuit of a 5 bar approach is unserviceable resulting in only 50% of the lights being serviceable, the service is downgraded but can remain in operational use, provided an appropriate NOTAM is issued, eg 'Approach Lights Downgraded – valid 5 bar pattern remains	
response	<i>Noted</i>	
	This is an operational consideration.	

CS-ADR – Book 2 – GM-ADR-DSN.T.900 – Emergency and service access roads

p. 298-299

comment	420	comment by: <i>BAA Glasgow</i>
	(9) These access points to be of a suitable size to accommodate the passage of the largest RFFS vehicle in the areordomes fleet.	
response	<i>Accepted</i>	

CS-ADR – Book 2 – GM-ADR-DSN.T.905 – Fire stations

p. 299

comment	<p>336 comment by: <i>Icelandic Civil Aviation Administration</i></p> <p>No text in GM-ADR-DSN.T.905(?).</p>
response	<p><i>Noted</i></p> <p>Numbering is for continuity. The words 'intentionally blank' will be inserted.</p>
comment	<p>2339 ❖ comment by: <i>DGAC Direction Générale de l'aviation civile</i></p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS ADR DSN – Book 1 — CS-ADR-DSN.B.090 — Surface of runways (p15) • CS ADR DSN – Book 2 - GM-ADR-DSN.T.905 — Fire stations (p299) <p><u>2. Justification and proposed text / comment</u></p> <p>It is appropriate to move these provisions to GM, except for the operational objective (i.e. achieving the response time) that shall remain in the CS. Indeed, there are several possibilities to comply with the response time: it can be by the providing of fire stations, by the pre positioning of vehicles or by the construction of emergency roads.</p> <p><u>The installation of several fire stations is thus only a possible solution to comply with the objective and thus it is essential to move it to GM.</u></p> <p>CS-ADR-DSN.T.905 – Fire stations</p> <p><i>"Fire stations, including satellite fire stations where necessary, should be so located on the aerodrome as to achieve the response time.</i></p> <p><i>(a) All rescue and fire-fighting vehicles should normally be housed in a fire station. Satellite fire stations should be provided whenever the response time cannot be achieved from a single fire station.</i></p> <p><i>(b) The fire station should be located so that the access for rescue and fire-fighting vehicles into the runway area is direct and clear, requiring a minimum number of turns.</i></p> <p><i>(c) The fire station, and any satellite fire stations, should be located outside taxiway and runway strips and not infringe obstacle limitation surfaces."</i></p> <p>GM-ADR-DSN.T.905 – Fire stations</p> <p><i>"(a) All rescue and fire-fighting vehicles should normally be housed in a fire station. Satellite fire stations should be provided whenever the response time cannot be achieved from a single fire station.</i></p> <p><i>(b) The fire station should be located so that the access for rescue and fire-fighting vehicles into the runway area is direct and clear, requiring a minimum number of turns.</i></p> <p><i>(c) The fire station, and any satellite fire stations, should be located outside taxiway and runway strips and not infringe obstacle limitation surfaces."</i></p>
response	<p><i>Not accepted</i></p> <p>The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature; therefore, it is not included in the CS.</p>

comment	2373	comment by: Pau Pyrénées Airport - PUF/LFBP
	It is appropriate to transfer these provisions to GM. Only the respect of the response time must be in GM	
response	<i>Not accepted</i>	
	The CS allows flexibility for alternative designs. Response time is an operational objective, not a design feature; therefore, it is not included in the CS.	

comment	2574	comment by: AENA - Aeropuertos Españoles y Navegación Aérea
	<p>GM-ADR-DSN.T.905 – Fire stations</p> <p><i>“(a) All rescue and fire-fighting vehicles should normally be housed in a fire station. Satellite fire stations should be provided whenever the response time cannot be achieved from a single fire station.</i></p> <p><i>(b) The fire station should be located so that the access for rescue and fire-fighting vehicles into the runway area is direct and clear, requiring a minimum number of turns.</i></p> <p><i>(c) The fire station, and any satellite fire stations, should be located outside taxiway and runway strips and not infringe obstacle limitation surfaces.”</i></p>	
response	<i>Not accepted</i>	
	The CS allows flexibility for alternative designs.	

comment	3108	comment by: Fraport AG
	<p>GM-ADR-DSN.T.905</p> <p>Editorial</p> <p>GM-ADR-DSN.T.905 – Fire stations</p> <p>Provide rationale for each requirement</p> <p>Fraport AG Missing the rationale</p>	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words ‘intentionally blank’ will be inserted.	

comment	42	comment by: <i>ACI EUROPE - Airports Council International</i>
	should be changed to a "GM" since it is not as "CS"	
response	<i>Partially accepted</i>	
	Paragraph (a) will be moved to GM.	
comment	123	comment by: <i>Swedavia AB - Swedish airports (currently 11 airports)</i>
	Rename para to GM.	
response	<i>Partially accepted</i>	
	Paragraph (a) will be moved to GM.	
comment	190	comment by: <i>CAA Austria - Ministry of Transport</i>
	Should be changed to a GM not as CS	
response	<i>Partially accepted</i>	
	Paragraph (a) will be moved to GM.	
comment	627	comment by: <i>Avinor</i>
	CS.ADR.DSN.T.910. Should be chaged to a "GM" not as "CS".	
response	<i>Partially accepted</i>	
	Paragraph (a) will be moved to GM.	
comment	813	comment by: <i>Munich Airport International</i>
	should be changed to a "GM" not as "CS"	
response	<i>Partially accepted</i>	
	Paragraph (a) will be moved to GM.	
comment	1862 ❖	comment by: <i>DGAC Direction Générale de l'aviation civile</i>

1. Affected paragraphs

- CS ADR DSN – Book 1 – CS-ADR-DSN.T.910 – Equipment frangibility requirements (p167)
- CS ADR DSN – Book 2 – **CSGM**-ADR-DSN.T.910 – Equipment frangibility requirements (p299)
- CS-ADR - Book 1 - CS-ADR-DSN.A.002 – Definitions (p4-9)

2. Justification and proposed text / comment

The first sentence is already in the definition of frangibility in CS-ADR-DSN.A.002 – Definitions: *"the ability of an object to retain its structural integrity and stiffness up to a specified maximum load but when subject to a load greater than specified or struck by an aircraft will break, distort or yield in a manner designed to present minimum hazard to an aircraft."*

The following is more guidance and may not be applicable to all kind of visual aids. Moreover this comes from an ICAO Manual.

It is proposed to move the CS to GM as follows:

CS-ADR-DSN.T.910 – Equipment frangibility requirements

~~"(a) Equipment and supports required to be frangible should be designed and constructed so that they will break, distort or yield in the event that they are accidentally impacted by an aircraft. The design materials selected should preclude any tendency for the components, including the electrical conductors, etc., to 'wrap around' the colliding aircraft or any part of it.~~

~~(b) Frangible structures should be designed to withstand the static and operational wind or jet blast loads with a suitable factor of safety, but should break, distort or yield readily when subjected to the sudden collision forces of a 3 000 kg aircraft airborne and travelling at 140 km/h (75 kt) or moving on the ground at 50 km/h (27 kt)."~~

CSGM-ADR-DSN.T.910 – Equipment frangibility requirements

"(a) The design materials selected may preclude any tendency for the components, including the electrical conductors, etc., to 'wrap around' the colliding aircraft or any part of it.

(b) Frangible structures may be designed to withstand the static and operational wind or jet blast loads with a suitable factor of safety, but may break, distort or yield readily when subjected to the sudden collision forces of a 3 000 kg aircraft airborne and travelling at 140 km/h (75 kt) or moving on the ground at 50 km/h (27 kt).

Note – Guidance on design for frangibility is contained in the Aerodrome Design Manual (ICAO, Doc 9157, Part 6)."

response *Partially accepted*

CS-ADR-DSN.T.910: Paragraph (a) has been moved to GM. Paragraph (b) will be retained in the CS.

comment 2010

comment by: Airport St. Gallen-Altenrhein - ACH/LSZR

Suggest changing to a "GM" instead of a "CS"

response *Partially accepted*

Paragraph (a) will be moved to GM.

comment 2568 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

CSGM-ADR-DSN.T.910 – Equipment frangibility requirements

“(a) The design materials selected may preclude any tendency for the components, including the electrical conductors, etc., to ‘wrap around’ the colliding aircraft or any part of it.

(b) Frangible structures may be designed to withstand the static and operational wind or jet blast loads with a suitable factor of safety, but may break, distort or yield readily when subjected to the sudden collision forces of a 3 000 kg aircraft airborne and travelling at 140 km/h (75 kt) or moving on the ground at 50 km/h (27 kt).

Note — Guidance on design for frangibility is contained in the Aerodrome Design Manual (ICAO, Doc 9157, Part 6).”

response Partially accepted

Paragraph (a) will be moved to GM.

CS-ADR – Book 2 – GM-ADR-DSN.T.915 – Siting of equipment and installations on operational areas

p. 299

comment 2194 ❖ comment by: DGAC Direction Générale de l'aviation civile

1. Affected paragraphs

- CS ADR DSN – Book 1 – CS-ADR-DSN.T.915 – Siting of equipment and installations on operational areas (p167-168)
- CS ADR DSN – Book 2 – GM-ADR-DSN.T.915 – Siting of equipment and installations on operational areas (

2. Justification and proposed text / comment

* Paragraph (c)(1) is derived from ICAO standard §9.9.2 in Annex 14 Volume 1, but extends it with ICAO recommendation §9.9.4. However all navigation aids cannot be frangible on the non graded part of the runway strip such as the shelter of glide path antenna. Applying this CS would impact all precision approaches, without any possible alternative solution and it is essential to be able to install the shelter of glide path antenna on the non graded runway strip. It is thus essential to put in CS only the content of ICAO standard §9.9.2 and to move the content of ICAO recommendation §9.9.4 in GM.

* Paragraph (c)(2) of CS-ADR-DSN.T.915 is derived from ICAO standards § 9.9.5 and § 9.9.6 which only apply to precision approaches. In France, a thorough and costly work has been performed with ANSP to ensure compliance with this standard for precision approaches only. To extend this standard to all approaches would generate very high costs. It is proposed to restrict the CS to precision approaches only.

* Paragraph (d) is not binding in France because it is not applicable for several

equipment, such as air navigation or meteorological antennas. Besides, it is derived from ICAO recommendation 9.9.8. It is essential to move it into GM.

Editorial improvements:

* Compliance with paragraph (a) cannot be proven and the specifications for siting are ruled by CSs related to obstacles (chapter J) as truly specified in paragraph (d) of the corresponding GM, hence the specification should be deleted and the following paragraphs renumbered.

* In paragraph (b)(2) "if it would endanger an aircraft" duplicates "endangering an aircraft" in paragraph (b). One of the two should be deleted and it would be better to revert to the original Annex 14 volume 1 Standard 9.9.1 text.

Therefore DGAC proposes:

CS-ADR-DSN.T.915 – Siting of equipment and installations on operational areas

~~"(a) Equipment and installations should be sited as far away from the runway and taxiway centre lines as practicable.~~

~~(ba) Unless its function requires it to be there for air navigation or for aircraft safety purposes, no equipment or installation endangering an aircraft should be located:~~

~~(1) on a runway strip, a runway end safety area, a taxiway, strip or within the following distances specified in column (11) of Table D-1 contained in CS-ADR-DSN.D.260, if it would endanger an aircraft;~~

~~[...]~~

~~(eb) Any equipment or installation required for air navigation or for aircraft safety purposes should be frangible and mounted as low as possible, if located:~~

~~(1) on a runway strip;~~

~~(2) for precision approach, within 240 m from the end of the strip and:~~

~~(i) within 60 m of the extended runway centre line where the code number is 3 or 4;~~

~~(ii) within 45 m of the extended runway centre line where the code number is 1 or 2.~~

~~(3) on a runway end safety area;~~

~~(4) on a taxiway strip;~~

~~(5) on a clearway endangering if it would endanger an aircraft in the air;~~

~~[...]~~

~~(d) Any equipment or installation required for air navigation or for aircraft safety purposes that is an obstacle of operational significance in accordance with CS-ADR-DSN.J.470, CS-ADR-DSN.J.475, CS-ADR-DSN.J.480 or CS-ADR-DSN.J.485 should be frangible and mounted as low as possible.~~

GM-ADR-DSN.T.915 – Siting of equipment and installations on operational areas

~~"(a) Any equipment or installation required for air navigation or for aircraft safety purposes may be frangible and mounted as low as possible, if located:~~

~~(1) on a runway strip;~~

~~(2) within 240 m from the end of the strip and:~~

~~(i) within 60 m of the extended runway centre line where the code number is 3 or 4;~~

~~(ii) within 45 m of the extended runway centre line where the code number is 1 or 2.~~

~~(b) Any equipment or installation required for air navigation or for aircraft safety purposes that is an obstacle of operational significance in accordance with CS-ADR-DSN.J.470, CS-ADR-DSN.J.475, CS-ADR-DSN.J.480 or CS-ADR-DSN.J.485 may be frangible and mounted as low as possible.~~

~~(a)~~ (c) The design of light fixtures and their supporting structures, light units of visual approach slope indicators, signs and markers is specified in CS-ADR-DSN.M.615, CS-ADRDSN.M.640, CS-ADR-DSN.N.775 and Book 1 Chapter P, respectively.
[...]"

response Noted

Annex 14 text has replaced the previous NPA text.

comment 2570 comment by: AENA - Aeropuertos Españoles y Navegación Aérea

GM-ADR-DSN.T.915 — Siting of equipment and installations on operational areas

"(a) Any equipment or installation required for air navigation or for aircraft safety purposes may be frangible and mounted as low as possible, if located:

(1) on a runway strip;

(2) within 240 m from the end of the strip and:

(i) within 60 m of the extended runway centre line where the code number is 3 or 4;

(ii) within 45 m of the extended runway centre line where the code number is 1 or 2.

(b) Any equipment or installation required for air navigation or for aircraft safety purposes that is an obstacle of operational significance in accordance with CS-ADR-DSN.J.470, CS ADR-DSN.J.475, CS-ADR-DSN.J.480 or CS-ADR-DSN.J.485 may be frangible and mounted as low as possible.

~~(a)~~ (c) The design of light fixtures and their supporting structures, light units of visual approach slope indicators, signs and markers is specified in CS-ADR-DSN.M.615, CS-ADRDSN.M.640, CS-ADR-DSN.N.775 and Book 1 Chapter P, respectively.
[...]"

response Noted

Annex 14 text has replaced the previous NPA text.

CS-ADR — Book 2 — GM-ADR-DSN.T.920 — Fencing

p. 299-300

comment 71 comment by: Danish Transport Authority

GM-ADR-DSN.T920 (page 299-300)

EDITORIAL: Recommend to change the wording "security" with "safety" to avoid any confusion.

response Noted

This reflects ICAO wording and is included for guidance in GM.

comment	188	comment by: <i>CAA Norway</i>
	GM-ADR-DSN.T.920 (b) on page 299.300: We suggest to reconsider the word security. This regulation should not cover security related items.	
response	<i>Noted</i>	
	This reflects ICAO wording and is included for guidance in GM.	
comment	388	comment by: <i>Estonian CAA</i>
	GM-ADR-DSN.T.920 (b) on page 299.300: We suggest to reconsider the word security. This regulation should not cover security related items.	
response	<i>Noted</i>	
	This reflects ICAO wording and is included for guidance in GM.	
comment	683	comment by: <i>Finnish Transport Safety Agency</i>
	GM-ADR-DSN.T.920 (b) on page 299.300: We suggest to reconsider the word security. This regulation should not cover security related items.	
response	<i>Noted</i>	
	This reflects ICAO wording and is included for guidance in GM.	
comment	1223	comment by: <i>Swedish Transport Agency</i>
	GM-ADR-DSN.T.920 (b) on page 299.300: We suggest to reconsider the word security. This regulation should not cover security related items.	
response	<i>Noted</i>	
	This reflects ICAO wording and is included for guidance in GM.	
comment	2615	comment by: <i>Danish Transport Authority</i>
	GM-ADR-DSN.T.920 (b) on page 299.300: We suggest to reconsider the word security. This regulation should not cover security related items.	
response	<i>Noted</i>	

This reflects ICAO wording and is included for guidance in GM.

comment	2803	comment by: <i>ECA - European Cockpit Association</i>
	<p>Add to (a) as follows: This fence should be a minimum of 2.5 metres high, topped by 3 strands of barbed wire, making the total height of the barrier 3 metres. The fence should be made of material impervious to penetration by both animals and people.</p> <p>Justification: Reference: IFALPA policy, paragraph 9.10.1</p>	
response	<i>Noted</i>	
	Guidance will be included in GM.	

CS-ADR – Book 2 – GM-ADR-DSN.U.925 – General

p. 301

comment	1364	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	There is no content: Please remove title or provide content.	
response	<i>Noted</i>	
	GM numbering is included for continuity. Where there is no content, the words 'intentionally blank' will be inserted.	
comment	2008	comment by: <i>Airport St. Gallen-Altenrhein - ACH/LSZR</i>
	Titles should be removed, resp. the whole Chapter U	
response	<i>Noted</i>	
	GM numbering is included for continuity. Where there is no content, the words 'intentionally blank' will be inserted.	
comment	3109	comment by: <i>Fraport AG</i>
	CS ADR DSN — BOOK 2 Chapter U GM-ADR-DSN.U.925 GM-ADR-DSN.U.930 GM-ADR-DSN.U.935 GM-ADR-DSN.U.940	

	<p>Editorial</p> <p>GM-ADR-DSN.U.925 — General GM-ADR-DSN.U.930 — Colours for aeronautical ground lights GM-ADR-DSN.U.935 — Colours for markings, signs and panels GM-ADR-DSN.U.940 — Aeronautical ground light characteristics</p> <p>Provide rationale for each requirement</p> <p>Fraport AG Missing the rationale</p>
response	<p><i>Not accepted</i></p> <p>Numbering is for continuity. The words 'intentionally blank' will be inserted.</p>

CS-ADR — Book 2 — GM-ADR-DSN.U.930 — Colours for aeronautical ground lights	p. 301
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comment	<p>1365 comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i></p> <p>There is no content: Please remove title or provide content.</p>
response	<p><i>Noted</i></p> <p>GM numbering is included for continuity. Where there is no content, the words 'intentionally blank' will be inserted.</p>
comment	<p>2179 ❖ comment by: <i>DGAC Direction Générale de l'aviation civile</i></p> <p><u>1. Affected paragraphs</u></p> <ul style="list-style-type: none"> • CS-ADR - Book 1 – CS-ADR-DSN.U.930 Colours for aeronautical ground lights (p170) • CS-ADR - Book 2 - GM-ADR-DSN.U.930 — Colours for aeronautical ground lights (p301) <p><u>2. Justification and proposed text / comment</u></p> <p>Paragraph (b) of this CS deals with a <u>seldom</u> case: visual runways without intensity adjustments or pilots with defective colour vision. It is very difficult to conform to it because that means a specific light has to be created for that purpose, in particular visual runway threshold lights, since <u>no equipment exists today to comply with it</u>. The case is today dealt with on a case by case basis. Besides, it is related an ICAO recommendation in Annex 14 Volume 1. It is essential to move paragraph (b) to GM:</p>

CS-ADR-DSN.U.930 Colours for aeronautical ground lights

~~"[...] (b) Where dimming is not required, or where observers with defective colour vision must be able to determine the colour of the light, green signals should be within the following boundaries:~~

~~(1) Yellow boundary $y = 0.726 - 0.726x$~~

~~(2) White boundary $x = 0.650y$~~

~~(3) Blue boundary $y = 0.390 - 0.171x$~~

~~"[...]"~~

GM-ADR-DSN.U.930 Colours for aeronautical ground lights

"Where dimming is not required, or where observers with defective colour vision must be able to determine the colour of the light, green signals may be within the following boundaries:

(1) Yellow boundary $y = 0.726 - 0.726x$

(2) White boundary $x = 0.650y$

(3) Blue boundary $y = 0.390 - 0.171x$ "

response *Partially accepted*

Paragraph (b) will be moved to GM.

comment 3109 ❖

comment by: *Fraport AG*

CS ADR DSN — BOOK 2 Chapter U

GM-ADR-DSN.U.925

GM-ADR-DSN.U.930

GM-ADR-DSN.U.935

GM-ADR-DSN.U.940

Editorial

GM-ADR-DSN.U.925 — General

GM-ADR-DSN.U.930 — Colours for aeronautical ground lights

GM-ADR-DSN.U.935 — Colours for markings, signs and panels

GM-ADR-DSN.U.940 — Aeronautical ground light characteristics

Provide rationale for each requirement

Fraport AG

Missing the rationale

response *Not accepted*

Numbering is for continuity. The words 'intentionally blank' will be inserted.

comment	1366	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	There is no content: Please remove title or provide content.	
response	<i>Noted</i>	
	GM numbering is included for continuity. Where there is no content, the words 'intentionally blank' will be inserted.	

comment	3109 ❖	comment by: <i>Fraport AG</i>
	<p>CS ADR DSN — BOOK 2 Chapter U GM-ADR-DSN.U.925 GM-ADR-DSN.U.930 GM-ADR-DSN.U.935 GM-ADR-DSN.U.940</p> <p>Editorial</p> <p>GM-ADR-DSN.U.925 — General GM-ADR-DSN.U.930 — Colours for aeronautical ground lights GM-ADR-DSN.U.935 — Colours for markings, signs and panels GM-ADR-DSN.U.940 — Aeronautical ground light characteristics</p> <p>Provide rationale for each requirement</p> <p>Fraport AG Missing the rationale</p>	
response	<i>Not accepted</i>	
	Numbering is for continuity. The words 'intentionally blank' will be inserted.	

CS-ADR — Book 2 — GM-ADR-DSN.U.940 — Aeronautical ground light characteristics

p. 301

comment	1368	comment by: <i>Federal Office of Civil Aviation, FOCA, Switzerland</i>
	There is no content: Please remove title or provide content.	
response	<i>Noted</i>	
	GM numbering is included for continuity. Where there is no content, the words 'intentionally blank' will be inserted.	

comment

3109 ❖

comment by: *Fraport AG*

CS ADR DSN — BOOK 2 Chapter U

GM-ADR-DSN.U.925

GM-ADR-DSN.U.930

GM-ADR-DSN.U.935

GM-ADR-DSN.U.940

Editorial

GM-ADR-DSN.U.925 — General

GM-ADR-DSN.U.930 — Colours for aeronautical ground lights

GM-ADR-DSN.U.935 — Colours for markings, signs and panels

GM-ADR-DSN.U.940 — Aeronautical ground light characteristics

Provide rationale for each requirement

Fraport AG

Missing the rationale

response

Not accepted

Numbering is for continuity. The words 'intentionally blank' will be inserted.

Appendix A – Attachments

 [UAF NPA 2011-20 \(B.I-III\) Com gal 1Fi.pdf](#)
Attachment #1 to comment [#438](#)

 [UAF NPA 2011-20 \(B.I-III\) Com gal 2Fi.pdf](#)
Attachment #2 to comment [#439](#)

 [UAF NPA 2011-20 \(B.I-III\) Com gal 3Fi.pdf](#)
Attachment #3 to comment [#440](#)

 [UAF NPA 2011-20 \(B.I-III\) Com gal 4Fi.pdf](#)
Attachment #4 to comment [#441](#)

 [UAF NPA 2011-20 \(B.I-III\) Com gal 5Fi.pdf](#)
Attachment #5 to comment [#442](#)

 [UAF NPA 2011-20 \(B.I-III\) Com gal 6Fi.pdf](#)
Attachment #6 to comment [#443](#)

 [UAF NPA 2011-20 \(B.I-III\) Com gal 7Fi.pdf](#)
Attachment #7 to comment [#444](#)

 [UAF NPA 2011-20 \(B.III\) Com gal 10Fi.pdf](#)
Attachment #8 to comment [#445](#)

 [UAF NPA 2011-20 \(B.I et III\) Com gal 11Fi.pdf](#)

Attachment #9 to comment [#446](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002.pdf](#)

Attachment #10 to comment [#455](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 aerodrome equipment.pdf](#)

Attachment #11 to comment [#456](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 cleared and graded area.pdf](#)

Attachment #12 to comment [#457](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 clearway.pdf](#)

Attachment #13 to comment [#458](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 frangible object.pdf](#)

Attachment #14 to comment [#459](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 non-instrument runway.pdf](#)

Attachment #15 to comment [#460](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 runway end safety area Fi.pdf](#)

Attachment #16 to comment [#461](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 runway strip.pdf](#)

Attachment #17 to comment [#462](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.F.370.pdf](#)

Attachment #18 to comment [#522](#)

 [EAP NPA 2011-20 \(B.III\) CS-ADR-DSN.F.370.pdf](#)

Attachment #19 to comment [#1468](#)

 [ADB M NPA 2011-20 B.I-III Com gal 1Fi.pdf](#)

Attachment #20 to comment [#1491](#)

 [ADB M NPA 2011-20 B.I et III Com gal 11Fi.pdf](#)

Attachment #21 to comment [#1494](#)

 [UAF NPA 2011-20 \(B.I-III\) Com gal 1Fi.pdf](#)

Attachment #22 to comment [#1960](#)

 [UAF NPA 2011-20 \(B.III\) Com gal 10Fi.pdf](#)

Attachment #23 to comment [#1971](#)

 [NPA 2011-20 B.III Com gal 10Fi.pdf](#)

Attachment #24 to comment [#2412](#)

 [SEARD NPA 2011-20 B.I-III Com gal 1Fi.pdf](#)

Attachment #25 to comment [#2888](#)

 [SEARD NPA 2011-20 B.III Com gal 10Fi.pdf](#)

Attachment #26 to comment [#2889](#)

 [CRD NPA 2011-20-B3 CRD FRAPORT 20120430.pdf](#)

Attachment #27 to comment [#2959](#)

 [EAP-7.pdf](#)

Attachment #28 to comment [#3110](#)

 [SEARD NPA 2011-20 \(B.I-III\) Com gal 2.pdf](#)

Attachment #29 to comment [#3111](#)

 [SEARD NPA 2011-20 \(B.I-III\) Com gal 3.pdf](#)

Attachment #30 to comment [#3112](#)

 [SEARD NPA 2011-20 \(B.I-III\) Com gal 4.pdf](#)

Attachment #31 to comment [#3113](#)

 [SEARD NPA 2011-20 \(B.I-III\) Com gal 5.pdf](#)

Attachment #32 to comment [#3114](#)

 [SEARD NPA 2011-20 \(B.I-III\) Com gal 7.pdf](#)

Attachment #33 to comment [#3115](#)

 [SEARD NPA 2011-20 \(B.I et III\) Com gal 11.pdf](#)

Attachment #34 to comment [#3116](#)

 [SEARD NPA 2011-20 \(B.I-III\) Com gal 6.pdf](#)

Attachment #35 to comment [#3117](#)

 [ATB NPA 2011-20 \(B.III\) Com gal 10.pdf](#)

Attachment #36 to comment [#3118](#)

 [NPA 2011-20 \(B.I-III\) Com gal 1.pdf](#)

Attachment #37 to comment [#3128](#)

 [NPA 2011-20 \(B.I-III\) Com gal 2.pdf](#)

Attachment #38 to comment [#3129](#)

 [NPA 2011-20 \(B.I-III\) Com gal 3.pdf](#)

Attachment #39 to comment [#3130](#)

 [NPA 2011-20 \(B.I-III\) Com gal 4.pdf](#)

Attachment #40 to comment [#3131](#)

 [NPA 2011-20 \(B.I-III\) Com gal 5.pdf](#)

Attachment #41 to comment [#3132](#)

 [NPA 2011-20 \(B.I-III\) Com gal 6.pdf](#)

Attachment #42 to comment [#3133](#)

 [NPA 2011-20 \(B.I-III\) Com gal 7.pdf](#)

Attachment #43 to comment [#3134](#)

 [NPA 2011-20 \(B.I et III\) Com gal 11.pdf](#)

Attachment #44 to comment [#3135](#)

 [ADB - NPA 2011-20 \(B.I-III\) Com gal 2.pdf](#)

Attachment #45 to comment [#3136](#)

 [ADB - NPA 2011-20 \(B.I-III\) Com gal 3.pdf](#)

Attachment #46 to comment [#3137](#)

 [ADBM - NPA 2011-20 \(B.I-III\) Com gal 4.pdf](#)

Attachment #47 to comment [#3138](#)

 [ADBM - NPA 2011-20 \(B.I-III\) Com gal 5.pdf](#)

Attachment #48 to comment [#3139](#)

 [ADBM - NPA 2011-20 \(B.I-III\) Com gal 6.pdf](#)

Attachment #49 to comment [#3140](#)

 [ADBM - NPA 2011-20 \(B.I-III\) Com gal 7.pdf](#)

Attachment #50 to comment [#3141](#)

 [ADBM - NPA 2011-20 \(B.III\) Com gal 10.pdf](#)

Attachment #51 to comment [#3142](#)

 [UAF NPA 2011-20 \(B.I-III\) Com gal 2.pdf](#)

Attachment #52 to comment [#3149](#)

 [UAF NPA 2011-20 \(B.I-III\) Com gal 3.pdf](#)

Attachment #53 to comment [#3150](#)

 [UAF NPA 2011-20 \(B.I-III\) Com gal 4.pdf](#)

Attachment #54 to comment [#3151](#)

 [UAF NPA 2011-20 \(B.I-III\) Com gal 5.pdf](#)

Attachment #55 to comment [#3152](#)

 [UAF NPA 2011-20 \(B.I-III\) Com gal 6.pdf](#)

Attachment #56 to comment [#3153](#)

 [UAF NPA 2011-20 \(B.I-III\) Com gal 7.pdf](#)

Attachment #57 to comment [#3154](#)

 [UAF NPA 2011-20 \(B.I et III\) Com gal 11.pdf](#)

Attachment #58 to comment [#3155](#)

 [Comments on ADR-DSN final-STR Airport.pdf](#)

Attachment #59 to comment [#1031](#)

 [Comments on ADR-DSN final.pdf](#)

Attachment #60 to comment [#390](#)

 [ADBM NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002.pdf](#)

Attachment #61 to comment [#2631](#)

 [ADBM NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 cleared and graded area.pdf](#)

Attachment #62 to comment [#2634](#)

 [ADBM - NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 « aerodrome equipment.pdf](#)

Attachment #63 to comment [#3143](#)

 [ADBM NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 « clearway ».pdf](#)

Attachment #64 to comment [#3144](#)

 [ADBM NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 « runway strip ».pdf](#)

Attachment #65 to comment [#3145](#)

 [EAP NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 aerodrome equipment.pdf](#)

Attachment #66 to comment [#1079](#)

 [EAP NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 cleared and graded area.pdf](#)

Attachment #67 to comment [#1080](#)

 [EAP NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 clearway.pdf](#)

Attachment #68 to comment [#1082](#)

 [EAP NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 frangible object.pdf](#)

Attachment #69 to comment [#1083](#)

 [EAP NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 non-instrument runway.pdf](#)

Attachment #70 to comment [#1084](#)

 [EAP NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 runway end safety area Fi.pdf](#)

Attachment #71 to comment [#1085](#)

 [EAP NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 runway strip.pdf](#)

Attachment #72 to comment [#1087](#)

 [EAP NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002.pdf](#)

Attachment #73 to comment [#1088](#)

 [UAF NPA 2011-20 B.III CS-ADR-DSN.A.002 aerodrome equipment.pdf](#)

Attachment #74 to comment [#2019](#)

 [UAF NPA 2011-20 B.III CS-ADR-DSN.A.002.pdf](#)

Attachment #75 to comment [#2020](#)

 [NPA 2011-20 B III CS ADR DSN AERODROMES DESIGN - Flashing Lights.pdf](#)

Attachment #76 to comment [#2983](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 « cleared and graded area ».pdf](#)

Attachment #77 to comment [#3156](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 « clearway ».pdf](#)

Attachment #78 to comment [#3157](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 « frangible object ».pdf](#)

Attachment #79 to comment [#3158](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 « non-instrument runway ».pdf](#)

Attachment #80 to comment [#3159](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 « runway end safety area ».pdf](#)

Attachment #81 to comment [#3160](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.A.002 « runway strip ».pdf](#)

Attachment #82 to comment [#3161](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.B.050.pdf](#)

Attachment #83 to comment [#463](#)

 [EAP NPA 2011-20 \(B.III\) CS-ADR-DSN.B.050.pdf](#)

Attachment #84 to comment [#1411](#)

 [UAF NPA 2011-20 B.III CS-ADR-DSN.B.050.pdf](#)

Attachment #85 to comment [#1749](#)

 [ADBM NPA 2011-20 \(B.III\) CS-ADR-DSN.B.050.pdf](#)

Attachment #86 to comment [#2642](#)

 [UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.B.055.pdf](#)

Attachment #87 to comment [#464](#)

 [EAP NPA 2011-20 \(B.III\) CS-ADR-DSN.B.055.pdf](#)

Attachment #88 to comment [#1412](#)

 [UAF NPA 2011-20 B.III CS-ADR-DSN.B.055.pdf](#)

Attachment #89 to comment [#1842](#)

 [ADBM NPA 2011-20 \(B.III\) CS-ADR-DSN.B.055.pdf](#)

Attachment #90 to comment [#3146](#)

[UAF NPA 2011-20 \(B.III\) CS-ADR-DSN.B.060.pdf](#)

**COMMENT RESPONSE DOCUMENT (CRD)
TO NOTICE OF PROPOSED AMENDMENT (NPA) 2011-20 (B.III)**

*'Authority, Organisation and Operations Requirements for
Aerodromes'*

**CRD to NPA 2011-20 (B.III) – Draft Certification
Specifications**

RESULTING TEXT



**COMMENT RESPONSE DOCUMENT (CRD)
TO NOTICE OF PROPOSED AMENDMENT (NPA) 2011-20 (B.III)**

'Authority, Organisation and Operations Requirements for Aerodromes'

**(B.III) - NPA 2011-20 (B.III) – Draft Certification
Specifications**

CONTENTS**CS-ADR-DSN – AERODROMES DESIGN**

BOOK 1	4
CHAPTER A – GENERAL	4
CHAPTER B – RUNWAYS	12
CHAPTER C – RUNWAY END SAFETY AREA	23
CHAPTER D – TAXIWAYS	25
CHAPTER E – APRONS	33
CHAPTER F – ISOLATED AIRCRAFT PARKING POSITION	34
CHAPTER G – DE-ICING/ANTI-ICING FACILITIES	35
CHAPTER H – OBSTACLE LIMITATION SURFACES	37
CHAPTER J – OBSTACLE LIMITATION REQUIREMENTS	44
CHAPTER K – VISUAL AIDS FOR NAVIGATION (INDICATORS AND SIGNALLING DEVICES) ...	50
CHAPTER L – VISUAL AIDS FOR NAVIGATION (MARKINGS)	52
CHAPTER M – VISUAL AIDS FOR NAVIGATION (LIGHTS)	76
CHAPTER N – VISUAL AIDS FOR NAVIGATION (SIGNS)	122
CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)	146
CHAPTER Q – VISUAL AIDS FOR DENOTING OBSTACLES	148
CHAPTER R – VISUAL AIDS FOR DENOTING RESTRICTED USE AREAS	159
CHAPTER S – ELECTRICAL SYSTEMS	162
CHAPTER T – AERODROME OPERATIONAL SERVICES, EQUIPMENT AND INSTALLATION	169
CHAPTER U – COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS AND PANELS	172
BOOK 2	207
CHAPTER A – GENERAL	207
CHAPTER B – RUNWAYS	209
CHAPTER C – RUNWAY END SAFETY AREA	225
CHAPTER D – TAXIWAYS	230
CHAPTER E – APRONS	235
CHAPTER F – ISOLATED AIRCRAFT PARKING POSITION	237
CHAPTER G – DE-ICING/ANTI-ICING FACILITIES	238
CHAPTER H – OBSTACLE LIMITATION SURFACES	240
CHAPTER J – OBSTACLE LIMITATION REQUIREMENTS	244
CHAPTER K – VISUAL AIDS FOR NAVIGATION (INDICATORS AND SIGNALLING DEVICES) ..	246
CHAPTER L – VISUAL AIDS FOR NAVIGATION (MARKINGS)	248

CS ADR DSN – BOOK 1

TABLE OF CONTENTS

CHAPTER M – VISUAL AIDS FOR NAVIGATION (LIGHTS)	253
CHAPTER N – VISUAL AIDS FOR NAVIGATION (SIGNS)	266
CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)	267
CHAPTER R – VISUAL AIDS FOR DENOTING RESTRICTED USE AREAS	278
CHAPTER S – ELECTRICAL SYSTEMS	281
CHAPTER T – AERODROME OPERATIONAL SERVICES, EQUIPMENT AND INSTALLATION	283
CHAPTER U – COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS AND PANELS (APPENDIX 1)	286

BOOK 1

EASA CERTIFICATION SPECIFICATIONS FOR AERODROME DESIGN

CHAPTER A — GENERAL

CS ADR-DSN.A.001 Applicability

The design specifications in Books 1 and 2 are applicable to aerodromes falling within the scope of the Commission Regulation (EC) No 216/2008.

CS ADR-DSN.A.002 Definitions

For the purposes of Books 1 and 2, the following definitions should apply:

'Accuracy' means a degree of conformance between the estimated or measured value and the true value.

'Aerodrome' means a defined area (including any buildings, installations and equipment) on land or water or on a fixed offshore or floating structure intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

'Aerodrome beacon' means an aeronautical beacon used to indicate the location of an aerodrome from the air.

'Aerodrome elevation' means the elevation of the highest point of the landing area.

'Aerodrome equipment' means any equipment, apparatus, appurtenance, software or accessory that is used or intended to be used to contribute to the operation of aircraft at an aerodrome.

'Aerodrome identification sign' means a sign placed on an aerodrome to aid in identifying the aerodrome from the air.

'Aerodrome operator' means any legal or natural person, operating or proposing to operate one or more aerodromes.

'Aerodrome reference point' means the designated geographical location of an aerodrome.

'Aeronautical beacon' means an aeronautical ground light visible at all azimuths, either continuously or intermittently, to designate a particular point on the surface of the earth.

'Aeronautical ground light' means any light specially provided as an aid to air navigation, other than a light displayed on an aircraft.

'Aeroplane' means a power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight;

'Aeroplane reference field length' means the minimum field length required for take-off at maximum certificated take-off mass, sea level, standard atmospheric conditions, still air and zero runway slope, as shown in the appropriate aeroplane flight manual prescribed by the certificating authority or equivalent data from the aeroplane manufacturer. Field length means balanced field length for aeroplanes, if applicable, or take-off distance in other cases.

'Aircraft' means a machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

'Aircraft classification number (ACN)' means the number expressing the relative effect of an aircraft on a pavement for a specified standard subgrade category.

'Aircraft stand' means a designated area on an apron intended to be used for parking an aircraft.

'Apron' means a defined area intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking, or maintenance.

'Balked landing' means a landing manoeuvre that is unexpectedly discontinued at any point below the obstacle clearance altitude/height (OCA/H).

'Barrette' means three or more aeronautical ground lights closely spaced in a transverse line so that from a distance they appear as a short bar of light.

'Capacitor discharge light' means a lamp in which high-intensity flashes of extremely short duration are produced by the discharge of electricity at high voltage through a gas enclosed in a tube.

'Cleared and Graded Area (CGA)' means that part of the Runway Strip cleared of all obstacles, except for specified items and graded, intended to reduce the risk of damage to an aircraft running off the runway.

'Clearway' means a defined rectangular area on the ground or water under the control of the appropriate entity, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height.

'Critical Area' means an area of defined dimensions extending about the ground equipment of a precision instrument approach within which the presence of vehicles or aircraft will cause unacceptable disturbance of the guidance signals.

'Datum' means any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities (ISO 19104).

'Declared distances'

- 'Take-off run available (TORA)' means the length of runway declared available and suitable for the ground run of an aeroplane taking off.
- 'Take-off distance available (TODA)' means the length of the take-off run available plus the length of the clearway if provided.
- 'Accelerate-stop distance available (ASDA)' means the length of the take-off run available plus the length of the stopway if provided.
- 'Landing distance available (LDA)' means the length of runway which is declared available and suitable for the ground run of an aeroplane landing.

'De-icing/anti-icing facility' means a facility where frost, ice, or snow is removed (de-icing) from the aeroplane to provide clean surfaces, and/or where clean surfaces of the aeroplane receive protection (anti-icing) against the formation of frost or ice and accumulation of snow or slush for a limited period of time.

'De-icing/anti-icing pad' means an area comprising an inner area for the parking of an aeroplane to receive de-icing/anti-icing treatment and an outer area for the manoeuvring of two or more mobile de-icing/anti-icing equipment.

'Dependent parallel approaches' means simultaneous approaches to parallel or near-parallel instrument runways where radar separation minima between aircraft on adjacent extended runway centre lines are prescribed.

'Displaced threshold' means a threshold not located at the extremity of a runway.

'Fixed light' means a light having constant luminous intensity when observed from a fixed point.

'Frangibility' means the ability of an object to retain its structural integrity and stiffness up to a specified maximum load but when subject to a load greater than specified or struck by an aircraft will break, distort or yield in a manner designed to present minimum hazard to an aircraft.

'Frangible object' means an object of low mass designed to break, distort or yield on impact so as to present the minimum hazard to aircraft.

'Hazard beacon' means an aeronautical beacon used to designate a danger to air navigation.

'Holding bay' means a defined area where aircraft can be held, or bypassed to facilitate efficient surface movement of aircraft.

'Holdover time' means the estimated time during which the anti-icing fluid (treatment) will prevent the formation of ice and frost and the accumulation of snow on the protected (treated) surfaces of an aeroplane.

'Identification beacon' means an aeronautical beacon emitting a coded signal by means of which a particular point of reference can be identified.

'Independent parallel approaches' means simultaneous approaches to parallel or near-parallel instrument runways where radar separation minima between aircraft on adjacent extended runway centre lines are not prescribed.

'Independent parallel departures' means simultaneous departures from parallel or near-parallel instrument runways.

'Instrument runway' means one of the following types of runways intended for the operation of aircraft using instrument approach procedures:

1. Non-precision approach runway means an instrument runway served by visual aids and a non-visual aid providing at least directional guidance adequate for a straight-in approach.
2. Precision approach runway, category I means an instrument runway served by non-visual aids and visual aids intended for operations with a decision height not lower than 60 m (200 ft) and either a visibility not less than 800 m or a runway visual range not less than 550 m.
3. Precision approach runway, category II means an instrument runway served by non-visual aids and visual aids intended for operations with a decision height lower than 60 m (200 ft) but not lower than 30 m (100 ft) and a runway visual range not less than 300 m.
4. Precision approach runway, category III means an instrument runway served by non-visual aids and visual aids to and along the surface of the runway and:
 - A — intended for operations with a decision height lower than 30 m (100 ft), or no decision height and a runway visual range not less than 175 m;
 - B — intended for operations with a decision height lower than 15 m (50 ft), or no decision height and a runway visual range less than 175 m but not less than 50 m; and
 - C — intended for operations with no decision height and no runway visual range limitations.

'Intermediate holding position' means a designated position intended for traffic control at which taxiing aircraft and vehicles should stop and hold until further cleared to proceed when so instructed by the aerodrome control tower.

'Isolated Aircraft Parking Position' means an area suitable for the parking of an aircraft which is known or suspected to be the subject of unlawful interference, or for other reasons needs isolation from normal aerodrome activities.

'Landing area' means that part of a movement area intended for the landing or take-off of aircraft.

'Landing direction indicator' means a device to indicate visually the direction currently designated for landing and for take-off.

'Manoeuvring area' means that part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.

'Marker' means an object displayed above ground level in order to indicate an obstacle or delineate a boundary.

'Marking' means a symbol or group of symbols displayed on the surface of the movement area in order to convey aeronautical information.

'Movement area' means that part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron(s).

'Non-instrument runway' means a runway intended for the operation of aircraft using visual approach procedures.

'Obstacle' means all fixed (whether temporary or permanent) and mobile objects, or parts thereof, that:

- are located on an area intended for the surface movement of aircraft; or
- extend above a defined surface intended to protect aircraft in flight; or
- stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

'Obstacle free zone (OFZ)' means the airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes.

'Obstacle limitation surfaces' means a series of surfaces that define the limits to which objects may project into the airspace around aerodrome to be ideally maintained free from obstacles.

'Operator' means any legal or natural person, operating or proposing to operate one or more aircraft or one or more aerodromes.

'Paved runway' means a runway with a hard surface that is made up of engineered and manufactured materials bound together so it is durable and either flexible or rigid.

'Pavement classification number (PCN)' means a number expressing the bearing strength of a pavement for unrestricted operations.

'Precision approach runway', see 'instrument runway'.

'Primary runway(s)' means runway(s) used in preference to others whenever conditions permit.

'Road' means an established surface route on the movement area meant for the exclusive use of vehicles.

'Road-holding position' means a designated position at which vehicles may be required to hold.

'Runway' means a defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

'Runway end safety area (RESA)' means an area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway.

'Runway guard lights' means a light system intended to caution pilots or vehicle drivers that they are about to enter an active runway.

'Runway-holding position' means a designated position intended to protect a runway, an obstacle limitation surface, or an ILS/MLS critical/sensitive area at which taxiing aircraft and vehicles should stop and hold, unless otherwise authorised by the aerodrome control tower.

'Runway strip' means a defined area including the runway and stopway, if provided, intended:

- to reduce the risk of damage to aircraft running off a runway; and
- to protect aircraft flying over it during take-off or landing operations.

'Runway turn pad' means a defined area on a land aerodrome adjacent to a runway for the purpose of completing a 180-degree turn on a runway.

'Runway visual range (RVR)' means the range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line.

'Sensitive Area' means an area extending beyond the Critical Area where the parking and/or movement of aircraft or vehicles will affect the guidance signal to the extent that it may be rendered unacceptable to aircraft using the signal.

'Shoulder' means an area adjacent to the edge of a pavement so prepared as to provide a transition between the pavement and the adjacent surface.

'Sign':

- Fixed message sign means a sign presenting only one message;
- Variable message sign means a sign capable of presenting several predetermined messages or no message, as applicable.

'Signal area' means an area on an aerodrome used for the display of ground signals.

'**Slush**' means water-saturated snow which with a heel-and-toe slap-down motion against the ground will be displaced with a splatter; specific gravity: 0.5 up to 0.8.

'**Snow**' (on the ground):

- Dry snow means snow which can be blown if loose or, if compacted by hand, will fall apart again upon release; specific gravity: up to but not including 0.35.
- Wet snow means snow which, if compacted by hand, will stick together and tend to or form a snowball; specific gravity: 0.35 up to but not including 0.5.
- Compacted snow means snow which has been compressed into a solid mass that resists further compression and will hold together or break up into lumps if picked up; specific gravity: 0.5 and over.

'Stopway' means a defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off.

'Surface friction' means the resistance offered to the movement of one body past a surface with which it is in contact.

'Switch-over time (light)' means the time required for the actual intensity of a light measured in a given direction to fall from 50 % and recover to 50 % during a power supply changeover, when the light is being operated at intensities of 25 % or above.

'Take-off runway' means a runway intended for take-off only.

'Taxiway' means a defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including:

- Aircraft stand taxilane means a portion of an apron designated as a taxiway and intended to provide access to aircraft stands only;
- Apron taxiway means a portion of a taxiway system located on an apron and intended to provide a through taxi-route across the apron;
- Rapid exit taxiway means a taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimising runway occupancy times.

'Taxiway intersection' means a junction of two or more taxiways.

'Taxiway strip' means an area including a taxiway intended to protect an aircraft operating on the taxiway and to reduce the risk of damage to an aircraft accidentally running off the taxiway.

'Threshold' means the beginning of that portion of the runway usable for landing.

'Touchdown zone' means the portion of a runway, beyond the threshold, where landing aeroplanes are intended to first contact the runway.

'Visual aids' means indicators and signaling devices, markings, lights, signs and markers or combinations thereof.

'Visual approach slope indicator system' means a system of lights arranged to provide visual descent guidance information during the approach to a runway.

CS ADR-DSN.A.005 Aerodrome reference code

- (a) An aerodrome reference code, consisting of a code number and letter which is selected for aerodrome planning purposes, should be determined in accordance with the characteristics of the aeroplane for which an aerodrome facility is intended.
- (b) The aerodrome reference code numbers and letters should have the meanings assigned to them in Table A-1.
- (c) The code number for element 1 should be determined from Table A-1, column 1, selecting the code number corresponding to the highest value of the aeroplane reference field lengths of the aeroplanes for which the runway is intended. The determination of the aeroplane reference field length is solely for the selection of a code number and is not intended to influence the actual runway length provided.
- (d) The code letter for element 2 should be determined from Table A-1, column 3, by selecting the code letter which corresponds to the greatest wingspan, or the greatest outer main gear wheel span whichever gives the more demanding code letter of the aeroplanes for which the facility is intended.

CODE ELEMENT ONE			CODE ELEMENT TWO	
Code Number	Aeroplane reference field length	Code Letter	Wing Span	Outer Main Gear Wheel Span ^a
1	Less than 800 m	A	Up to but not including 15 m	Up to but not including 4.5 m
2	800 m up to but not including 1 200 m	B	15 m up to but not including 24 m	4.5 m up to but not including 6 m
3	1 200 m up to but not including 1 800 m	C	24 m up to but not including 36 m	6 m up to but not including 9 m
4	1 800 m and over	D	36 m up to but not including 52 m	9 m up to but not including 14 m
		E	52 m up to but not including 65 m	9 m up to but not including 14 m
		F	65 m up to but not including 80 m	14 m up to but not including 16 m

^a Distance between the outside edges of the main gear wheels

Table A-1 Aerodrome reference code

CS ADR-DSN.A.010

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CHAPTER B — RUNWAYS**CS ADR-DSN.B.015 Number, siting and orientation of runways**

The number and orientation of runways at an aerodrome should be such that the usability of the aerodrome is optimised taking into account that safety is not compromised.

CS ADR-DSN.B.020 Choice of maximum permissible crosswind components**CS ADR-DSN.B.025 Data to be used**

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CS ADR-DSN.B.030 Runway threshold

- (a) A threshold should be provided on a runway.
- (b) A threshold needs not to be provided on a take-off runway.
- (c) A threshold should be located at the extremity of a runway unless operational considerations justify the choice of another location.
- (d) When it is necessary to displace a threshold, either permanently or temporarily, from its normal location, account should be taken of the various factors which may have a bearing on the location of the threshold.
- (e) When the threshold is displaced, the threshold location should be measured at the inner edge of the threshold marking (the transverse stripe across the runway).

CS ADR-DSN.B.035 Actual length of runway and declared distances

- (a) The length of a runway should provide declared distances adequate to meet the operational requirements for the aircraft which the runway is intended to serve.
- (b) The following distances should be calculated to the nearest metre for each runway:
 - (1) Take-off run available;
 - (2) Take-off distance available;
 - (3) Accelerate-stop distance available; and
 - (4) Landing distance available.
- (c) The length of the runway is measured from the start of the runway pavement or where a transverse stripe is provided, at the inner edge of the transverse stripe across the runway.

CS ADR-DSN.B.040 Runways with stopways or clearways

The length(s) of a stopway or clearway, where provided, should be of adequate distance to meet the operational requirements for the aircraft which the runway is intended to serve.

CS ADR-DSN.B.045 Width of runways

- (a) The width of a runway should be not less than the appropriate dimension specified in the Table B-1.

Code No	Code letter					
	A	B	C	D	E	F
1 ^a	18 m	18 m	23 m	—	—	—
2 ^a	23 m	23 m	30 m	—	—	—
3	30 m	30 m	30 m	45 m	—	—
4	—	—	45 m	45 m	45 m	60 m
^a The width of a precision approach runway should be not less than 30 m where the code number is 1 or 2.						
Table B-1. Width of runway						

- (b) The width of the runway should be measured at the outside edge of the runway side stripe marking where provided, or the edge of the runway.

CS ADR-DSN.B.050 Minimum distance between parallel non-instrument runways

- (a) Where parallel non-instrument runways are intended for simultaneous use, the minimum distance between their centre lines should be:
- (1) 210 m where the higher code number is 3 or 4;
 - (2) 150 m where the higher code number is 2; and
 - (3) 120 m where the higher code number is 1.

CS ADR-DSN.B.055 Minimum distance between parallel instrument runways

- (a) Where parallel instrument runways are intended for simultaneous use, the minimum distance between their centre lines should be:
- (1) 1 035 m for independent parallel approaches;
 - (2) 915 m for dependent parallel approaches;
 - (3) 760 m for independent parallel departures; and
 - (4) 760 m for segregated parallel operations.
- (b) except that: for segregated parallel operations the specified minimum distance:
- (1) should be decreased by 30 m for each 150 m that the arrival runway is staggered

toward the arriving aircraft, to a minimum of 300 m; and

- (2) should be increased by 30 m for each 150 m that the arrival runway is staggered away from the arriving aircraft.
- (c) other combinations of minimum distances should apply taking into account ATM and operational aspects.

CS ADR-DSN.B.060 Longitudinal slopes of runways

- (a) The safety objective of longitudinal runway slopes is to define maximum gradient values that should not interfere with the safe use of runway by an aircraft.
- (b) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length should not exceed:
 - (1) 1 % where the code number is 3 or 4; and
 - (2) 2 % where the code number is 1 or 2.
- (c) Along no portion of a runway should the longitudinal slope exceed:
 - (1) 1.25 % where the code number is 4, except that for the first and last quarter of the length of the runway where the longitudinal slope should not exceed 0.8 %;
 - (2) 1.5 % where the code number is 3, except that for the first and last quarter of the length of a precision approach runway category II or III where the longitudinal slope should not exceed 0.8 %; and
 - (3) 2 % where the code number is 1 or 2.

CS ADR-DSN.B.065 Longitudinal slope changes on runways

- (a) The safety objective of longitudinal runway slope changes is to define maximum gradient values that should not interfere with the safe use of runway by an aircraft.
- (b) Where slope changes cannot be avoided, a slope change between two consecutive slopes should not exceed:
 - (1) 1.5 % where the code number is 3 or 4; and
 - (2) 2 % where the code number is 1 or 2.
- (c) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:
 - (1) 0.1 % per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;
 - (2) 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and
 - (3) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

CS ADR-DSN.B.070 Sight distance for slopes on runways

- (a) The safety objective of runway sight distances is to define maximum gradient values that should not interfere with the safe use of runway by an aircraft.
- (b) Where slope changes on runways cannot be avoided, they should be such that there should be an unobstructed line of sight from:

- (1) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E, or F;
- (2) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and
- (3) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

CS ADR-DSN.B.075 Distance between slope changes on runways

Undulations or appreciable changes in slopes located close together along a runway should be avoided. The distance between the points of intersection of two successive curves should not be less than:

- (a) the sum of the absolute numerical values of the corresponding slope changes multiplied by the appropriate value as follows:
 - (1) 30 000 m where the code number is 4;
 - (2) 15 000 m where the code number is 3; and
 - (3) 5 000 m where the code number is 1 or 2; or
- (b) 45 m; whichever is greater.

CS ADR-DSN.B.080 Transverse slopes on runways

- (a) The safety objective of runway transverse slopes is to promote the most rapid drainage of water from the runway.
- (b) To promote the most rapid drainage of water, the runway surface should be cambered, except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage. The transverse slope should be:
 - (1) not less than 1 % and not more than 1.5 % where the code letter is C, D, E or F; and;
 - (2) not less than 1 % and not more than 2 % where the code letter is A or B;
 except at runway or taxiway intersections where flatter slopes may be necessary.
- (c) For a cambered surface, the transverse slope on each side of the centre line should be symmetrical.
- (d) The transverse slope should be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway where an even transition should be provided taking account of the need for adequate drainage.

CS ADR-DSN.B.085 Runway strength

The runway should be of sufficient strength to support normal operations of the most critical aeroplane without risk of damage either to the aeroplane or the runway.

CS ADR-DSN.B.090 Surface of runways

- (a) The surface of a runway should be constructed without irregularities that would result in loss in friction characteristics or otherwise adversely affect the take-off or landing of an aeroplane.
- (b) The surface of a paved runway should be constructed so as to provide good friction characteristics when the runway is wet.

- (c) The average surface texture depth of a new surface should be not less than 1.0 mm.
- (d) If the surface is grooved or scored, the grooves or scorings should be either perpendicular to the runway centre line or parallel to non-perpendicular transverse joints where applicable.

SECTION 1 — RUNWAY TURN PADS

CS ADR-DSN.B.095 Runway turn pads

- (a) The safety objective of the runway turn pad is to facilitate a safe 180-degree turn by aeroplanes on runway ends that are not served by a taxiway or taxiway turnaround.
- (b) Where the end of a runway is not served by a taxiway or a taxiway turnaround, a runway turn pad should be provided to facilitate a 180-degree turn of aeroplanes.
- (c) The design of a runway turn pad should be such that when the cockpit of the aeroplane for which the turn pad is intended remains over the turn pad marking, the clearance distance between any wheel of the aeroplane landing gear and the edge of the turn pad should be not less than that given by the following tabulation:

Code letter	Clearance
A	1.5 m
B	2.25 m
C	3 m if the turn pad is intended to be used by aeroplanes with a wheel base less than 18 m; or 4.5 m if the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m.
D	4.5 m
E	4.5 m
F	4.5 m

Note: Wheel base means the distance from the nose gear to the geometric centre of the main gear.

- (d) The runway turn pad should be located on either the left or right side of the runway and adjoining the runway pavement at both ends of the runway and at some intermediate locations where deemed necessary.
- (e) The intersection angle of the runway turn pad with the runway should not exceed 30 degrees.
- (f) The nose wheel steering angle to be used in the design of the runway turn pad should not exceed 45 degrees.
- (g) Where severe weather conditions and resultant lowering of surface friction characteristics prevail, a larger wheel-to-edge clearance of 6 m should be provided where the code letter is E or F.

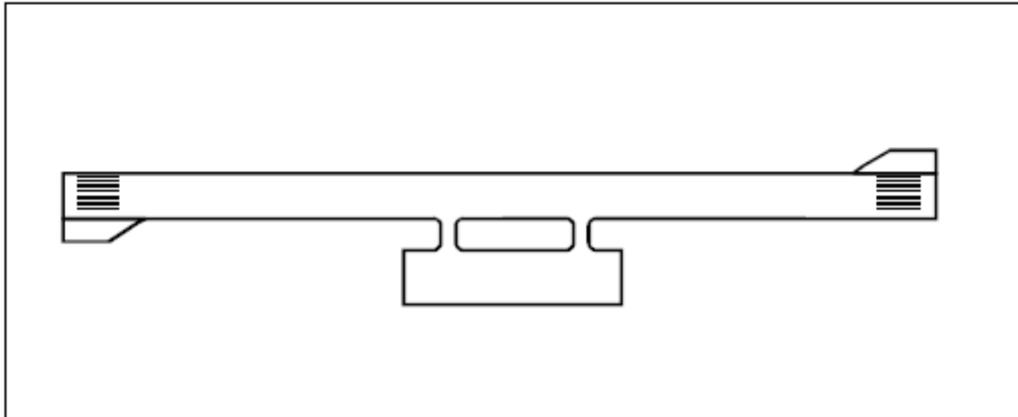


Figure B-1. Typical turn pad layout

CS ADR-DSN.B.100 Slopes on runway turn pads

The longitudinal and transverse slopes on a runway turn pad should be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface.

CS ADR-DSN.B.105 Strength of runway turn pads

The strength of a runway turn pad should be at least equal to that of the adjoining runway which it serves, due consideration being given to the fact that the turn pad should be subjected to slow-moving traffic making hard turns and consequent higher stresses on the pavement.

CS ADR-DSN.B.110 Surface of runway turn pads

- (a) The surface of a runway turn pad should not have surface irregularities that may cause damage to an aeroplane using the turn pad.
- (b) The surface of a runway turn pad should be constructed or resurfaced to provide friction characteristics compatible with the runway friction characteristics.

CS ADR-DSN.B.115 Width of shoulders for runway turn pads

The runway turn pads should be provided with shoulders of such width as is necessary to prevent surface erosion by the jet blast of the most demanding aeroplane for which the turn pad is intended and any possible foreign object damage to the aeroplane engines.

CS ADR-DSN.B.120 Strength of shoulders for runway turn pads

The strength of runway turn pad shoulders should be capable of withstanding the occasional passage of the most demanding aeroplane it is designed to serve without inducing structural damage to the aeroplane and to the supporting ground vehicles that may operate on the shoulder.

SECTION 2 – RUNWAY SHOULDERS

CS ADR-DSN.B.125 Runway shoulders

- (a) Runway shoulders should be provided for a runway where the code letter is D or E, and the runway width is less than 60 m.

- (b) Runway shoulders should be provided for a runway where the code letter is F.

CS ADR-DSN.B.130 Slopes on runway shoulders

- (a) The safety objective of runway shoulder transverse slopes is to promote the most rapid drainage of water from the runway and runway shoulder.
- (b) The surface of the paved shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %.

CS ADR-DSN.B.135 Width of runway shoulders

The runway shoulders should extend symmetrically on each side of the runway so that the overall width of the runway and its shoulders is not less than:

- (a) 60 m where the code letter is D or E; and
- (b) 75 m where the code letter is F.

CS ADR-DSN.B.140 Strength of runway shoulders

A runway shoulder should be prepared or constructed so as to be capable, in the event of an aeroplane running off the runway, of supporting the aeroplane without inducing structural damage to the aeroplane and of supporting ground vehicles which may operate on the shoulder.

CS ADR-DSN.B.145 Surface of runway shoulders

The surface of a runway shoulder should be prepared so as to resist erosion and prevent the ingestion of the surface material by aeroplane engines.

SECTION 3 — RUNWAY STRIP**CS ADR-DSN.B.150 Runway strip to be provided**

A runway and any associated stopways should be included in a strip

CS ADR-DSN.B.155 Length of runway strip

A strip should extend before the threshold and beyond the end of the runway or stopway for a distance of at least:

- (a) 60 m where the code number is 2, 3, or 4;
- (b) 60 m where the code number is 1 and the runway is an instrument one; and
- (c) 30 m where the code number is 1 and the runway is a non-instrument one.

CS ADR-DSN.B.160 Width of runway strip

- (a) The safety objective of the runway strip is to reduce the risk of damage to an aircraft running off the runway and to protect aircraft flying over it when taking-off or landing.
- (b) A strip including a precision approach runway should extend laterally to a distance of at least:
- (1) 150 m where the code number is 3 or 4; and
- (2) 75 m where the code number is 1 or 2; on each side of the centre line of the runway and its extended centre line throughout the length of the strip.

- (c) A strip including a non-precision approach runway should extend laterally to a distance of at least:
 - (1) 150 m where the code number is 3 or 4; and
 - (2) 75 m where the code number is 1 or 2; on each side of the centre line of the runway and its extended centre line throughout the length of the strip.
- (d) A strip including a non-instrument runway should extend on each side of the centre line of the runway and its extended centre line throughout the length of the strip, to a distance of at least:
 - (1) 75 m where the code number is 3 or 4;
 - (2) 40 m where the code number is 2; and
 - (3) 30 m where the code number is 1.

CS ADR-DSN.B.165 Objects on runway strips

- (a) An object situated on a runway strip which may endanger aeroplanes should be regarded as an obstacle and should, as far as practicable, be removed.
- (b) No fixed object, other than visual aids required for air navigation or for aeroplane safety purposes and satisfying the relevant frangibility requirement in Chapter T, should be permitted on a runway strip:
 - (1) within 77.5 m of the runway centre line of a precision approach runway category I, II or III where the code number is 4 and the code letter is F; or
 - (2) within 60 m of the runway centre line of a precision approach runway category I, II or III where the code number is 3 or 4; or
 - (3) within 45 m of the runway centre line of a precision approach runway category I where the code number is 1 or 2.
- (c) Within the Cleared and Graded area buried objects should be treated by provision of a ramp in order to eliminate vertical surfaces that could damage the aircraft under carriage.
- (d) No mobile object should be permitted on this part of the runway strip during the use of the runway for landing or take-off.

CS ADR-DSN.B.170 Non-precision approach and non-instrument runway strips

No fixed object, other than visual aids required for air navigation or for aeroplane safety purposes and satisfying the relevant frangibility requirement in CS ADR-DSN.T.910, should be permitted on a runway strip:

- (a) within 75 m of the runway centre line where the code number is 3 or 4, and;
- (b) within 45 m of the runway centre line where the code number is 2, and;

CS ADR-DSN.B.175 Grading of runway strips

- (a) That portion of a strip of an instrument runway within a distance of at least:
 - (1) 75 m where the code number is 3 or 4; and
 - (2) 40 m where the code number is 1 or 2;
 from the centre line of the runway and its extended centre line should provide a graded

area for aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway.

- (b) That portion of a strip of a non-instrument runway within a distance of at least:

- (1) 75 m where the code number is 3 or 4;
- (2) 40 m where the code number is 2; and
- (3) 30 m where the code number is 1;

from the centre line of the runway and its extended centre line should provide a graded area for aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway.

- (c) The surface of that portion of a strip that abuts a runway, shoulder, or stopway should be flush with the surface of the runway, shoulder, or stopway.
- (d) That portion of a strip to at least 30 m before a threshold should be prepared against blast erosion in order to protect a landing aeroplane from the danger of an exposed edge.

CS ADR-DSN.B.180 Longitudinal slopes on runway strips

- (a) The safety objective of longitudinal runway strip slope is to define maximum gradient values that should not interfere with the safe use of the runway strip by an aircraft.
- (b) A longitudinal slope along that portion of a strip to be graded should not exceed:
- (1) 1.5 % where the code number is 4;
 - (2) 1.75 % where the code number is 3; and
 - (3) 2 % where the code number is 1 or 2.
- (c) Longitudinal slope changes on that portion of a strip to be graded should be as gradual as practicable, and abrupt changes or sudden reversals of slopes should be avoided.

CS ADR-DSN.B.185 Transverse slopes on runway strips

- (a) Transverse slopes on that portion of a strip to be graded should be adequate to prevent the accumulation of water on the surface but should not exceed:
- (1) 2.5 % where the code number is 3 or 4; and
 - (2) 3 % where the code number is 1 or 2;
- except that to facilitate drainage from the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5 %.
- (b) The transverse slopes of any portion of a strip beyond that to be graded should not exceed an upward slope of 5 % as measured in the direction away from the runway.

CS ADR-DSN.B.190 Strength of runway strips

- (a) That portion of a strip of an instrument runway within a distance of at least:

- (1) 75 m where the code number is 3 or 4; and
- (2) 40 m where the code number is 1 or 2;

from the centre line of the runway and its extended centre line should be prepared or constructed so as to minimise hazards arising from differences in load-bearing capacity to aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway.

- (b) That portion of a strip containing a non-instrument runway within a distance of at least:
- (1) 75 m where the code number is 3 or 4;
 - (2) 40 m where the code number is 2; and
 - (3) 30 m where the code number is 1;

from the centre line of the runway and its extended centre line should be prepared or constructed so as to minimise hazards arising from differences in load-bearing capacity to aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway.

SECTION 4 — CLEARWAYS, STOPWAYS AND RADIO ALTIMETER OPERATING AREA

CS ADR-DSN.B.195 Clearways

- (a) The inclusion of detailed specifications for clearways in this section is not intended to imply that a clearway has to be provided.
- (b) Location of clearways:
The origin of a clearway should be at the end of the take-off run available.
- (c) Length of clearways
The length of a clearway should not exceed half the length of the take-off run available.
- (d) Width of clearways:
A clearway should extend laterally to a distance of at least 75 m on each side of the extended centre line of the runway.
- (e) Slopes on clearways:
The ground in a clearway should not project above a plane having an upward slope of 1.25 %, the lower limit of this plane being a horizontal line which:
- (1) is perpendicular to the vertical plane containing the runway centre line; and
 - (2) passes through a point located on the runway centre line at the end of the take-off run available.

CS ADR-DSN.B.200 Stopways

- (a) The inclusion of detailed specifications for stopways in this section is not intended to imply that a stopway has to be provided.
- (b) Width of stopways:
A stopway should have the same width as the runway with which it is associated.
- (c) Slopes on stopways:
Slopes and changes in slope on a stopway, and the transition from a runway to a stopway, should comply with the specifications of CS ADR-DSN.B.060 to CS ADR-DSN.B.080 for the runway with which the stopway is associated except that:
- (1) the limitation in CS ADR-DSN.B.060(b) of a 0.8 per cent slope for the first and last quarter of the length of a runway need not be applied to the stopway; and
 - (2) at the junction of the stopway and runway and along the stopway the maximum rate of slope change may be 0.3 per cent per 30 m (minimum radius of curvature of 10 000 m) for a runway where the code number is 3 or 4.

(d) Strength of stopways:

A stopway should be prepared or constructed so as to be capable, in the event of an abandoned take-off, of supporting the aeroplane which the stopway is intended to serve without inducing structural damage to the aeroplane.

(e) Surface of stopways:

The surface of a paved stopway should be constructed so as to provide a good coefficient of friction to be compatible with that of the associated runway when the stopway is wet.

CS ADR-DSN.B.205 Radio altimeter operating area

(a) A radio altimeter operating area should be established in the pre-threshold area of a precision approach runway.

(b) Length of the area:

A radio altimeter operating area should extend before the threshold for a distance of at least 300 m.

(c) Width of the area:

A radio altimeter operating area should extend laterally, on each side of the extended centre line of the runway, to a distance of 60 m, except that, when special circumstances so warrant, the distance may be reduced to no less than 30 m if an aeronautical study indicates that such reduction would not affect the safety of operations of aircraft.

CHAPTER C – RUNWAY END SAFETY AREA**CS ADR-DSN.C.210 Runway End Safety Areas**

- (a) The safety objective of the runway end safety area (RESA) is to minimise risks to aircraft and their occupants when an aeroplane overruns or undershoots a runway.
- (b) A runway end safety area should be provided at each end of a runway strip where:
 - (1) the code number is 3 or 4; and
 - (2) the code number is 1 or 2 and the runway is an instrument one.

CS ADR-DSN.C.215 Dimensions of runway end safety areas

- (a) Length of RESA

A runway end safety area should extend from the end of a runway strip to a distance of at least 90 m and, as far as practicable, extend to a distance of:

- (1) 240 m where the code number is 3 or 4 and
 - (2) 120 m where the code number is 1 or 2;
- (c) Notwithstanding the provisions in (a) above, the length of the runway end safety area may be reduced where an arresting system is installed, based on the design specifications of the system.
 - (d) Width of RESA

The width of a runway end safety area should be at least twice that of the associated runway and, wherever practicable, be equal to that of the graded portion of the associated runway strip.

CS ADR-DSN.C.220 Objects on runway end safety areas

No fixed object, other than equipment and installations required for air navigation or for aeroplane safety purposes and satisfying the relevant frangibility requirement CS ADR-DSN.T.910, should be permitted on a runway end safety area. The detailed requirements for siting objects on a RESA are in CS ADR-DSN.T.915.

CS ADR-DSN.C.225 Clearing and grading of runway end safety areas

A runway end safety area should provide a cleared and graded area for aeroplanes which the runway is intended to serve in the event of an aeroplane undershooting or overrunning the runway.

CS ADR-DSN.C.230 Slopes on runway end safety areas

- (a) Longitudinal slopes
 - (1) The slopes of a runway end safety area should be such that no part of the runway end safety area penetrates the approach or take-off climb surface.
 - (2) The longitudinal slopes of a runway end safety area should not exceed a downward slope of 5 %. Longitudinal slope changes should be as gradual as practicable, and abrupt changes or sudden reversals of slopes should be avoided.
- (b) Transverse slopes
 - (1) The transverse slopes of a runway end safety area should not exceed an upward or downward slope of 5 %. Transitions between differing slopes should be as gradual as practicable.

CS ADR-DSN.C.235 Strength of runway end safety areas

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CHAPTER D — TAXIWAYS**CS ADR-DSN.D.240 Taxiways general**

Unless otherwise indicated, the requirements in this Chapter are applicable to all types of taxiways.

- (a) The design of a taxiway should be such that, when the cockpit of the aeroplane for which the taxiway is intended, remains over the taxiway centre line markings, the clearance distance between the outer main wheel of the aeroplane and the edge of the taxiway should be not less than that given by the following tabulation:

Code letter	Clearance
A	1.5 m
B	2.25 m
C	3 m if the taxiway is intended to be used by aeroplanes with a wheel base less than 18 m; or 4.5 m if the taxiway is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m.
D	4.5 m
E	4.5 m
F	4.5 m

CS ADR-DSN.D.245 Width of taxiways

- (a) A straight portion of a taxiway should have a width of not less than that given by the following tabulation:

Code letter	Taxiway width
A	7.5 m
B	10.5 m
C	15 m if the taxiway is intended to be used by aeroplanes with a wheel base less than 18 m; or 18 m if the taxiway is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m
D	18 m if the taxiway is intended to be used by aeroplanes with an outer main gear wheel span of less than 9 m; or 23 m if the taxiway is intended to be used by aeroplanes with an outer main gear wheel span equal to or greater than 9 m.
E	23 m
F	25 m

CS ADR-DSN.D.250 Taxiways curves

- (a) Changes in direction of taxiways should be as few and small as possible. The radii of the curves should be compatible with the manoeuvring capability and normal taxiing speeds

of the aeroplanes for which the taxiway is intended.

- (b) The design of the curve should be such that when the cockpit of the aeroplane for which the taxiway is intended remains over the taxiway centre line markings, the clearance distance between the outer main wheels of the aeroplane and the edge of the taxiway should be not less than those specified in CS ADR-DSN.D.240.

CS ADR-DSN.D.255 Junction and intersection of taxiways

- (a) To facilitate the movement of aeroplanes, fillets should be provided at junctions and intersections of taxiways with runways, aprons, and other taxiways.
- (b) The design of the fillets should ensure that the minimum wheel clearances specified in CS ADR-DSN.D.240 are maintained when aeroplanes are manoeuvring through the junctions or intersections.

CS ADR-DSN.D.260 Taxiway minimum separation distance

- (a) The safety objective of minimum taxi separation distances is to allow safe use of taxiways and taxi lanes to prevent possible collision with other aeroplanes operating on adjacent runways or taxiways, or collision with adjacent objects.
- (b) The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object should not be less than the appropriate dimension specified in Table D-1.

	Distance between taxiway centre line and runway centre line (metres)								Taxiway centre line to taxiway centre line (metres)	Taxiway, other than aircraft stand taxilane, centre line to object (metres)	Aircraft stand taxilane centre line to object (metres)
	Instrument runways Code number				Non-instrument runways Code number						
Code letter	1	2	3	4	1	2	3	4			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
A	82.5	82.5	—	—	37.5	47.5	—	—	23.75	16.25	12
B	87	87	—	—	42	52	—	—	33.5	21.5	16.5
C	—	—	168	—	—	—	93		44	26	24.5
D	—	—	176	176	—	—	101	101	66.5	40.5	36
E	—	—	—	182.5	—	—	—	107.5	80	47.5	42.5
F	—	—	—	190	—	—	—	115	97.5	57.5	50.5

Table D-1. Taxiway minimum separation distances

CS ADR-DSN.D.265 Longitudinal slopes on taxiways

- (a) The safety objective of longitudinal taxiway slopes is to define maximum gradient values that should not interfere with the safe use of taxiways.
- (b) The longitudinal slope of a taxiway should not exceed:
 - (1) 1.5 % where the code letter is C, D, E, or F; and
 - (2) 3 % where the code letter is A or B.

CS ADR-DSN.D.270 Longitudinal slope changes on taxiways

- (a) The safety objective of longitudinal taxiway slope changes is to define maximum gradient values that should not interfere with the safe use of taxiways.
- (b) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface with a rate of change not exceeding:
 - (1) 1 % per 30 m (minimum radius of curvature of 3 000 m) where the code letter is C, D, E, or F; and
 - (2) 1 % per 25 m (minimum radius of curvature of 2 500 m) where the code letter is A or B.
- (c) Where slope changes in (b)(1) and (2) are not achieved and slopes on a taxiway cannot be avoided, the transition from one slope to another slope should be accomplished by a curved surface which should allow the safe operation of all aircraft in all weather conditions.

CS ADR-DSN.D.275 Sight distance of taxiways

- (a) The safety objective of sight distances is to define maximum gradient values that should not interfere with the safe use of taxiways.
- (b) Where a change in slope on a taxiway cannot be avoided, the change should be such that, from any point:
 - (1) 3 m above the taxiway, it should be possible to see the whole surface of the taxiway for a distance of at least 300 m from that point where the code letter is C, D, E, or F;
 - (2) 2 m above the taxiway, it should be possible to see the whole surface of the taxiway for a distance of at least 200 m from that point where the code letter is B; and
 - (3) 1.5 m above the taxiway, it should be possible to see the whole surface of the taxiway for a distance of at least 150 m from that point where the code letter is A.

CS ADR-DSN.D.280 Transverse slopes on taxiways

- (a) The safety objective of taxiway transverse slopes is to promote the most rapid drainage of water from the taxiway.
- (b) The transverse slopes of a taxiway should be sufficient to prevent the accumulation of water on the surface of the taxiway but should not exceed:
 - (1) 1.5 % where the code letter is C, D, E, or F; and
 - (2) 2 % where the code letter is A or B.

CS ADR-DSN.D.285 Strength of taxiways

The strength of a taxiway should be suitable for the aircraft that the taxiway is intended to serve.

CS ADR-DSN.D.290 Surface of taxiways

- (a) The surface of a taxiway should not have irregularities that cause damage to aeroplane structures.
- (b) The surface of a taxiway should be constructed or resurfaced so as to provide suitable surface friction characteristics.

CS ADR-DSN.D.295 Rapid exit taxiways

- (a) The safety objective of rapid exit taxiway is to facilitate safe rapid exit of aeroplanes from a runway.
- (b) A rapid exit taxiway should be designed with a radius of turn-off curve of at least:
 - (1) 550 m where the code number is 3 or 4; and
 - (2) 275 m where the code number is 1 or 2;to enable under wet conditions exit speeds of:
 - (i) 93 km/h where the code number is 3 or 4; and
 - (ii) 65 km/h where the code number is 1 or 2.
- (c) The radius of the fillet on the inside of the curve at a rapid exit taxiway should be sufficient to provide a widened taxiway throat in order to facilitate early recognition of the entrance and turn-off onto the taxiway.
- (d) A rapid exit taxiway should include a straight distance after the turn-off curve sufficient for an exiting aircraft to come to a full stop clear of any intersecting taxiway (Figure D-1).
- (e) The intersection angle of a rapid exit taxiway with the runway should not be greater than 45°, nor less than 25° and preferably should be 30°.

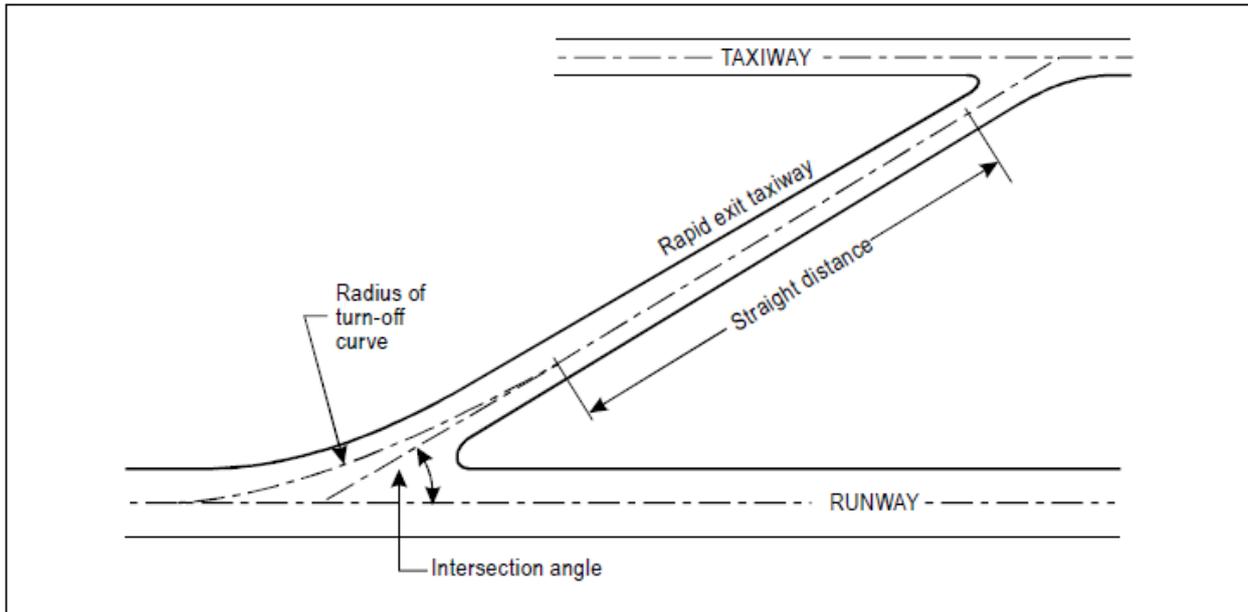


Figure D-1. Rapid exit taxiway

CS ADR-DSN.D.300 Taxiways on bridges

- (a) The width of that portion of a taxiway bridge capable of supporting aeroplanes, as measured perpendicularly to the taxiway centre line, should not be less than the width of the graded area of the strip provided for that taxiway unless a proven method of lateral restraint is provided which should not be hazardous for aeroplanes for which the taxiway is intended.
- (b) Access should be provided to allow rescue and firefighting vehicles to intervene in both directions within the specified response time to the largest aeroplane for which the taxiway bridge is intended.
- (c) A bridge should be constructed on a straight section of the taxiway with a straight section on both ends of the bridge to facilitate the alignment of aeroplanes approaching the bridge.

CS ADR-DSN.D.305 Taxiway shoulders

- (a) Straight portions of a taxiway where the code letter is C, D, E, or F should be provided with shoulders which extend symmetrically on each side of the taxiway so that the overall width of the taxiway and its shoulders on straight portions is not less than:
 - (1) 60 m where the code letter is F;
 - (2) 44 m where the code letter is E;
 - (3) 38 m where the code letter is D; and
 - (4) 25 m where the code letter is C.
- (b) On taxiway curves and on junctions or intersections where increased pavement is provided, the shoulder width should be not less than that on the adjacent straight portions of the taxiway.

- (c) When a taxiway is intended to be used by turbine-engined aeroplanes, the surface of the taxiway shoulder should be prepared so as to resist erosion and the ingestion of the surface material by aeroplane engines.

CS ADR-DSN.D.310 Taxiway Strip

A taxiway, other than an aircraft stand taxiway, should be included in a strip.

CS ADR-DSN.D.315 Width of taxiway strips

- (a) The safety objective of the width of taxiway strips is to allow safe use of taxiways in relation to adjacent objects.
- (b) A taxiway strip should extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table D-1, column 11.

CS ADR-DSN.D.320 Objects on taxiway strips

The taxiway strip should provide an area clear of objects which may endanger taxiing aeroplanes. The detailed requirements for siting objects on taxiway strips are in CS ADR-DSN.T.915.

CS ADR-DSN.D.325 Grading of taxiway strips

- (a) The safety objective of the grading of a taxiway strip is to reduce the risk of damage to an aircraft accidentally running off the taxiway.
- (b) The centre portion of a taxiway strip should provide a graded area to a distance from the centre line of the taxiway of at least:
- (1) 11 m where the code letter is A;
 - (2) 12.5 m where the code letter is B or C;
 - (3) 19 m where the code letter is D;
 - (4) 22 m where the code letter is E; and
 - (5) 30 m where the code letter is F.

CS ADR-DSN.D.330 Slopes on taxiway strips

- (a) The safety objective of longitudinal taxiway strip slopes, slope changes and sight distances is to define maximum gradient values that should not interfere with the safe use of the taxiway strip.
- (b) The surface of the strip should be flush at the edge of the taxiway or shoulder if provided, and the graded portion should not have an upward transverse slope exceeding:
- (1) 2.5 % for strips where the code letter is C, D, E, or F; and
 - (2) 3 % for strips of taxiways where the code letter is A or B;
- the upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward transverse slope should not exceed 5 % measured with reference to the horizontal.
- (c) The transverse slopes on any portion of a taxiway strip beyond that to be graded should not exceed an upward or downward slope of 5 % as measured in the direction away from the taxiway.

CS ADR-DSN.D.335 Holding bays, runway-holding positions, intermediate holding positions, and road-holding positions

- (a) Holding bay(s) or other bypasses of sufficient size and adequate construction should be provided where necessary, to make deviations in the departure sequence possible.
- (b) A runway-holding position or positions should be established:
 - (1) on the taxiway, if the location or alignment of the taxiway is such that a taxiing aircraft or vehicle can infringe an obstacle limitation surface or interfere with the operation of radio navigation aids;
 - (2) at the intersection of a taxiway and a runway; and
 - (3) at an intersection of a runway with another runway when the former runway is part of a standard taxi-route.
- (c) An intermediate holding position should be established on a taxiway at any point other than a runway-holding position where it is desirable to define a specific holding limit.
- (d) An emergency access road should be equipped with road holding positions at all intersections with runways and taxiways.
- (e) A road-holding position should be established at each intersection of a road with a runway.

CS ADR-DSN.D.340 Location of holding bays, runway-holding positions, intermediate holding positions, and road-holding positions

The distance between a holding bay, runway-holding position established at a taxiway/runway intersection or road-holding position and the centre line of a runway should be in accordance with Table D-2 and such that a holding aircraft or vehicle should not interfere with the operation of radio navigation aids.

- (a) At elevations greater than 700 m the distance of 90 m specified in Table D-2 for a precision approach runway code number 4 should be increased as follows:
 - (1) up to an elevation of 2 000 m; 1 m for every 100 m in excess of 700 m;
 - (2) elevation in excess of 2 000 m and up to 4 000 m; 13 m plus 1.5 m for every 100 m in excess of 2 000 m; and
 - (3) elevation in excess of 4 000 m and up to 5 000 m; 43 m plus 2 m for every 100 m in excess of 4 000 m.

Type of runway	Code number			
	1	2	3	4
Non-instrument	30 m	40 m	75 m	75 m
Non-precision approach	40 m	40 m	75 m	75 m
Precision approach category I	60 m ^b	60 m ^b	90 m ^{a,b}	90 m ^{a,b,c}
Precision approach categories II and III	—	—	90 m ^{a,b}	90 m ^{a,b,c}
Take-off runway	30 m	40 m	75 m	75 m

a. If a holding bay, runway-holding position, or road-holding position is at a lower elevation compared to the threshold, the distance may be decreased 5 m for every metre the bay or holding position is lower than the threshold, contingent upon not infringing the inner transitional surface.

b. This distance may need to be increased to avoid interference with radio navigation aids, particularly the glide path and localiser facilities (see CS ADR-DSN.D.340).

Note 1.— The distance of 90 m for code number 3 or 4 is based on an aircraft with a tail height of 20 m, a distance from the nose to the highest part of the tail of 52.7 m and a nose height of 10 m holding at an angle of 45° or more with respect to the runway centre line, being clear of the obstacle free zone and not accountable for the calculation of OCA/H.

Note 2.— The distance of 60 m for code number 2 is based on an aircraft with a tail height of 8 m, a distance from the nose to the highest part of the tail of 24.6 m and a nose height of 5.2 m holding at an angle of 45° or more with respect to the runway centre line, being clear of the obstacle free zone.

c. Where the code letter is F, this distance should be 107.5 m.

Note.— The distance of 107.5 m for code number 4 where the code letter is F is based on an aircraft with a tail height of 24 m, a distance from the nose to the highest part of the tail of 62.2 m and a nose height of 10 m holding at an angle of 45° or more with respect to the runway centre line, being clear of the obstacle free zone.

Table D-2 — Minimum distance from the runway centre line to a holding bay, runway-holding point, or road-holding position

CHAPTER E — APRONS**CS ADR-DSN.E.345 General**

Aprons should be provided to permit the safe loading and off-loading of passengers, cargo, or mail as well as the servicing of aircraft without interfering with the aerodrome traffic.

CS ADR-DSN.E.350 Size of aprons

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CS ADR-DSN.E.355 Strength of aprons

Each part of an apron should be capable of withstanding the traffic of the aircraft it is intended to serve, due consideration being given to the fact that some portions of the apron should be subjected to a higher density of traffic and, as a result of slow moving or stationary aircraft, to higher stresses than a runway.

CS ADR-DSN.E.360 Slopes on aprons

- (a) Slopes on an apron should be sufficient to prevent accumulation of water on the surface of the apron but should be kept to the minimum required to facilitate effective drainage.
- (b) On an aircraft stand the maximum slope should not exceed 1 % in any direction.

CS ADR-DSN.E.365 Clearance distances on aircraft stands

- (a) The safety objective of clearance distances on aircraft stands is to provide safe separation between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects.
- (b) An aircraft stand should provide the following minimum clearances between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects:

Code Letter	Clearance
A	3 m
B	3 m
C	4.5 m
D	7.5 m
E	7.5 m
F	7.5 m

- (c) The minimum clearance distance for code letters D, E and F can be reduced:

- (1) for height limited objects,

- (2) if the stand is restricted for aircraft with specific dimensions,

- (3) in the following locations (for aircraft using a taxi-in, push-back procedure only):

- (i) between the terminal (including passenger loading bridges) and the nose of an aircraft; and

- (ii) over a portion of the stand provided with azimuth guidance by a visual docking guidance system.

CHAPTER F – ISOLATED AIRCRAFT PARKING POSITION

CS ADR-DSN.F.370 Isolated aircraft parking position

(a) The safety objective of the isolated aircraft parking position is to provide safe separation between aircraft that need isolation and other aerodrome activities.

(b) General

An isolated aircraft parking position should be designated by the aerodrome operator for parking of aircraft that needs isolation from normal aerodrome activities.

(c) Location

The isolated aircraft parking position should be located at the maximum distance practicable and in any case never less than 100 m from other parking positions, buildings, or public areas, etc.

CHAPTER G – DE-ICING/ANTI-ICING FACILITIES**CS ADR-DSN.G.375 General**

Aeroplane de-icing/anti-icing facilities should be provided at an aerodrome where icing conditions are expected to occur.

CS ADR-DSN.G.380 Location

- (a) De-icing/anti-icing facilities should be provided either at aircraft stands or at specified remote areas.
- (b) The de-icing/anti-icing facilities should be located to be clear of the obstacle limitation surfaces to not cause interference to the radio navigation aids and be clearly visible from the air traffic control tower for clearing the treated aeroplane.

CS ADR-DSN.G.385 Size of de-icing/anti-icing pads

- (a) The safety objective of the de-icing/anti-icing pad dimensions is to allow safe positioning of aircraft for de-icing/anti-icing, including sufficient room for the safe movement of de-icing vehicles around the aircraft.
- (b) The size of a de-icing/anti-icing pad should be equal to the parking area required by the most demanding aeroplane in a given category with at least 3.8 m clear paved area all around the aeroplane for the movement of the de-icing/anti-icing vehicles.

CS ADR-DSN.G.390 Slopes on de-icing/anti-icing pads

The de-icing/anti-icing pads should be provided with suitable slopes:

- (a) to ensure satisfactory drainage of the area;
- (b) to permit collection of all excess de-icing/anti-icing fluid running off an aeroplane; and
- (c) not to hinder the movement of aircraft on or off the pad.

CS ADR-DSN.G.395 Strength of de-icing/anti-icing pads

The de-icing/anti-icing pad should be capable of withstanding the traffic of the aircraft it is intended to serve.

CS ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

- (a) The safety objective of the clearance distances on a de-icing/anti-icing pad is to provide safe separation between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects.
- (b) A de-icing/anti-icing pad should provide the following minimum clearances between an aircraft using the stand and any adjacent building, aircraft on another stand and other objects:

Code Letter	Clearance
A	3.8 m
B	3.8 m
C	4.5 m
D	7.5 m

E 7.5 m

F 7.5 m

- (c) If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table D-1, column (12) should be provided.
- (d) Where the de-icing/anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table D-1, column (11) should be provided (see Figure G-1).

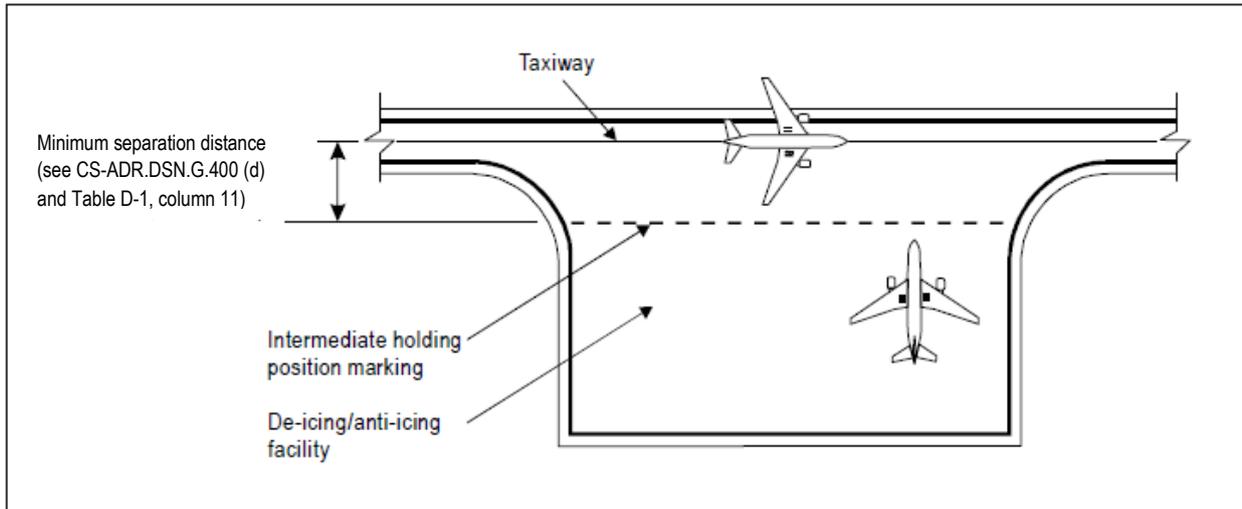


Figure G-1. Minimum separation distance on a de-icing/anti-icing facility

CHAPTER H – OBSTACLE LIMITATION SURFACES**CS ADR-DSN.H.405 Applicability**

The purpose of the obstacle limitation surfaces is to define the airspace around aerodromes to be maintained free from obstacles so as to permit the intended aeroplane operations at the aerodromes to be conducted safely.

CS ADR-DSN.H.410 Outer horizontal surface

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CS ADR-DSN.H.415 Conical surface

- (a) Applicability: To facilitate safe visual manoeuvring in the vicinity of the aerodrome.
- (b) Description: A surface sloping upwards and outwards from the periphery of the inner horizontal surface.
- (c) Characteristics: The limits of the conical surface should comprise:
 - (1) a lower edge coincident with the periphery of the inner horizontal surface; and
 - (2) an upper edge located at a specified height above the inner horizontal surface.
- (d) The slope of the conical surface should be measured in a vertical plane perpendicular to the periphery of the inner horizontal surface.

CS ADR-DSN.H.420 Inner horizontal surface

- (a) Applicability: The purpose of the inner horizontal surface is to protect airspace for visual manoeuvring prior to landing.
- (b) Description: A surface located in a horizontal plane above an aerodrome and its environs.
- (c) Characteristics: The outer limits of the inner horizontal surface are defined by circular arcs centred on the geometric centre of the runway or on the intersection of the extended RWY centre line with the end of the RWY strip joined tangentially by straight lines (Figure H-1).
- (d) The height of the inner horizontal surface should be measured above an established elevation datum. The elevation datum used for the height of the inner horizontal surface should be:
 - (1) the elevation of the highest point of the lowest threshold of the related runway; or
 - (2) the elevation of the highest point of the highest threshold of the related runway; or
 - (3) the elevation of the highest point of the runway; or
 - (4) the aerodrome elevation.

CS ADR-DSN.H.425 Approach surface

- (a) Applicability: The purpose of the approach surface is to protect an aircraft during the final approach to the runway by defining the area that should be kept free from obstacles to protect an aeroplane in the final phase of the approach-to-land manoeuvre.
- (b) Description: An inclined plane or combination of planes preceding the threshold.
- (c) Characteristics. The limits of the approach surface should comprise:

CS ADR DSN – BOOK 1

CHAPTER H – OBSTACLE LIMITATION SURFACES

- (1) an inner edge of specified length, horizontal and perpendicular to the extended centre line of the runway, and located at a specified distance before the threshold;
- (2) two sides originating at the ends of the inner edge and diverging uniformly at a specified rate from the extended centre line of the runway; and
- (3) an outer edge parallel to the inner edge.

The above surfaces should be varied when lateral offset, offset or curved approaches are utilised, specifically, two sides originating at the ends of the inner edge and diverging uniformly at a specified rate from the extended centre line of the lateral offset, offset or curved ground track.

- (d) The elevation of the inner edge should be equal to the elevation of the mid-point of the threshold.
- (e) The slope(s) of the approach surface should be measured in the vertical plane containing the centre line of the runway and should continue containing the centre line of any lateral offset or curved ground track.

CS ADR-DSN.H.430 Transitional surface

- (a) Applicability: The purpose of the transitional surface is to define the limit of the area available for buildings, other structures or natural obstructions, such as trees.
- (b) Description: A complex surface along the side of the strip and part of the side of the approach surface that slopes upwards and outwards to the inner horizontal surface.
- (c) Characteristics: The limits of a transitional surface should comprise:
 - (1) a lower edge beginning at the intersection of the side of the approach surface with the inner horizontal surface and extending down the side of the approach surface to the inner edge of the approach surface and from there along the length of the strip parallel to the runway centre line; and
 - (2) an upper edge located in the plane of the inner horizontal surface.
- (d) The elevation of a point on the lower edge should be:
 - (1) along the side of the approach surface – equal to the elevation of the approach surface at that point; and
 - (2) along the strip – equal to the elevation of the nearest point on the centre line of the runway or its extension.
- (e) The slope of the transitional surface should be measured in a vertical plane at right angles to the centre line of the runway.

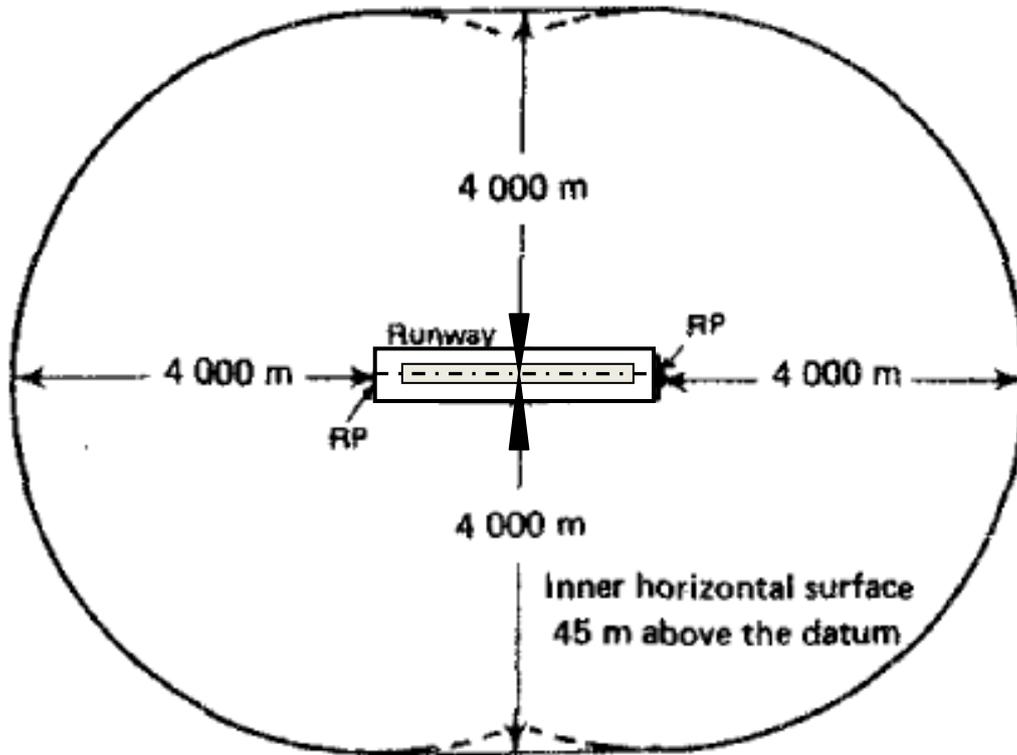


Figure H-1. Inner horizontal surface where the runway is code 4

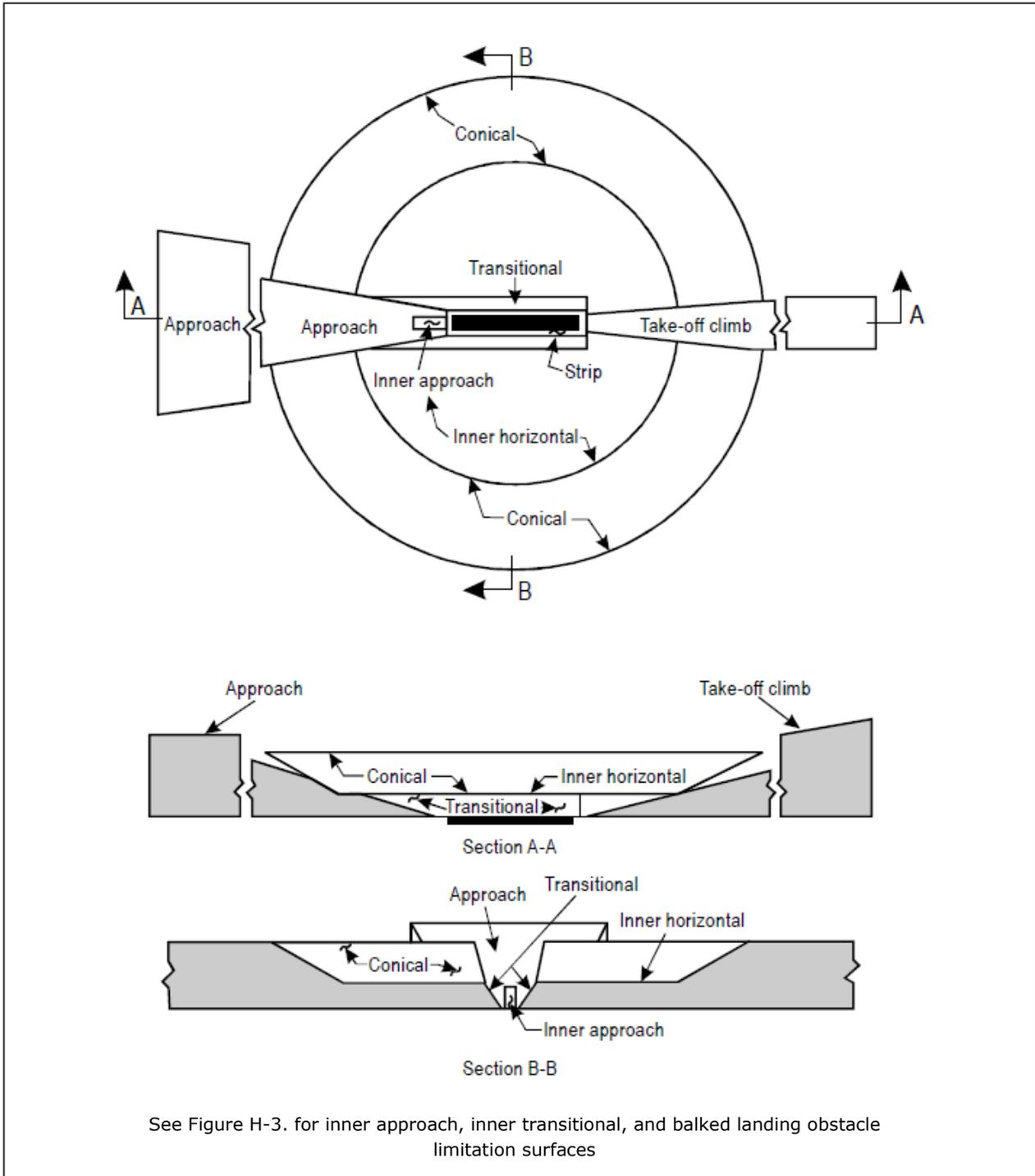


Figure H-2. Obstacle limitation surfaces

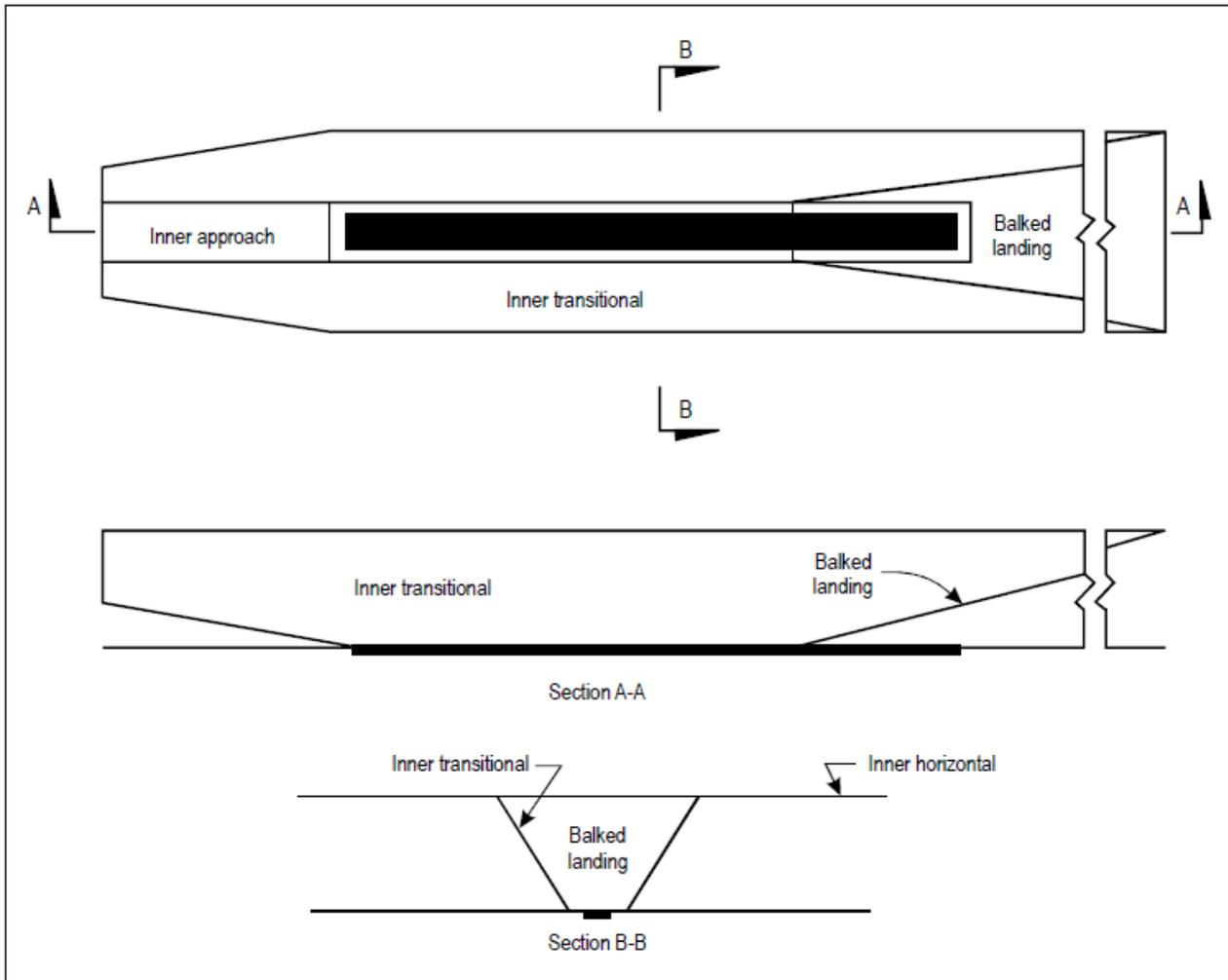


Figure H-3. Inner approach, inner transitional, and balked landing obstacle limitation surfaces

CS ADR-DSN.H.435 Take-off climb surface

- (a) Applicability: The purpose of the take-off climb surface is to protect an aircraft on take-off and during climb-out.
- (b) Description: An inclined plane or other specified surface beyond the end of a runway or clearway.
- (c) Characteristics: The limits of the take-off climb surface should comprise:
- (1) an inner edge horizontal and perpendicular to the centre line of the runway, and located either at a specified distance beyond the end of the runway, or at the end of the clearway when such is provided, and its length exceeds the specified distance;
 - (2) two sides originating at the ends of the inner edge, diverging uniformly at a specified rate from the take-off track to a specified final width and continuing thereafter at that width for the remainder of the length of the take-off climb surface; and
 - (3) an outer edge horizontal and perpendicular to the specified take-off track.

CS ADR DSN — BOOK 1

CHAPTER H — OBSTACLE LIMITATION SURFACES

- (d) The elevation of the inner edge should be equal to the highest point on the extended runway centre line between the end of the runway and the inner edge, except that when a clearway is provided, the elevation should be equal to the highest point on the ground on the centre line of the clearway.
- (e) In the case of a straight take-off flight path, the slope of the take-off climb surface should be measured in the vertical plane containing the centre line of the runway.
- (f) In the case of a take-off flight path involving a turn, the take-off climb surface should be a complex surface containing the horizontal normal to its centre line, and the slope of the centre line should be the same as that for a straight take-off flight path.

CS ADR-DSN.H.440 Slewed take-off climb surface

Intentionally blank

CS ADR-DSN.H.445 Obstacle Free Zone (OFZ)

- (a) An OFZ is intended to protect aeroplanes from fixed and mobile obstacles during Category I, II, or III operations when approaches are continued below decision height, and during any subsequent missed approach or balked landing with all engines operating normally. It is not intended to supplant the requirement of other surfaces or areas where these are more demanding.
- (b) The OFZ is made up of the following obstacle limitation surfaces:
 - (1) inner approach surface;
 - (2) inner transitional surfaces; and
 - (3) balked landing surface.

CS ADR-DSN.H.450 Inner approach surface

- (a) Applicability: The purpose of the inner approach surface is to protect final precision approaches.
- (b) Description: A rectangular portion of the approach surface immediately preceding the threshold.
- (c) Characteristics: The limits of the inner approach surface should comprise:
 - (1) an inner edge coincident with the location of the inner edge of the approach surface but of its own specified length;
 - (2) two sides originating at the ends of the inner edge and extending parallel to the vertical plane containing the centre line of the runway; and
 - (3) an outer edge parallel to the inner edge.

CS ADR-DSN.H.455 Inner transitional surface

- (a) Applicability: The purpose of the inner transitional surface is to protect aeroplanes during precision approaches and balked landing.
- (b) Description: A surface similar to the transitional surface but closer to the runway.
- (c) Characteristics: The limits of an inner transitional surface should comprise:
 - (1) a lower edge beginning at the end of the inner approach surface and extending down the side of the inner approach surface to the inner edge of that surface, from

there along the strip parallel to the runway centre line to the inner edge of the balked landing surface, and from there up the side of the balked landing surface to the point where the side intersects the inner horizontal surface; and

- (2) an upper edge located in the plane of the inner horizontal surface.
- (d) The elevation of a point on the lower edge should be:
 - (1) along the side of the inner approach surface and balked landing surface — equal to the elevation of the particular surface at that point; and
 - (2) along the strip — equal to the elevation of the nearest point on the centre line of the runway or its extension.
- (e) The slope of the inner transitional surface should be measured in a vertical plane at right angles to the centre line of the runway.

CS ADR-DSN.H.460 Balked landing surface

- (a) Applicability: The purpose of the balked landing surface is to protect balked landing.
- (b) Description: An inclined plane located at a specified distance after the threshold, extending between the inner transitional surfaces.
- (c) Characteristics: The limits of the balked landing surface should comprise:
 - (1) an inner edge horizontal and perpendicular to the centre line of the runway and located at a specified distance after the threshold;
 - (2) two sides originating at the ends of the inner edge and diverging uniformly at a specified rate from the vertical plane containing the centre line of the runway; and
 - (3) an outer edge parallel to the inner edge and located in the plane of the inner horizontal surface.
- (d) The elevation of the inner edge should be equal to the elevation of the runway centre line at the location of the inner edge.
- (e) The slope of the balked landing surface should be measured in the vertical plane containing the centre line of the runway.

CHAPTER J — OBSTACLE LIMITATION REQUIREMENTS**CS ADR-DSN.J.465 General**

Obstacle limitation requirements should be distinguished between:

- (a) non-instrument runways;
- (b) non-precision approach runways;
- (c) precision approach runways; and
- (d) runways meant for take-off.

CS ADR-DSN.J.470 Non-instrument runways

- (a) The following obstacle limitation surfaces should be established for a non-instrument runway:
 - (1) conical surface;
 - (2) inner horizontal surface;
 - (3) approach surface; and
 - (4) transitional surfaces.
- (b) The heights and slopes of the surfaces should not be greater than, and their other dimensions not less than, those specified in Table J-1.
- (c) New objects or extensions of existing objects should not be permitted above an approach or transitional surface except when the new object or extension would be shielded by an existing immovable object.
- (d) New objects or extensions of existing objects should not be permitted above the conical surface or inner horizontal surface except when the object would be shielded by an existing immovable object, or after aeronautical study, it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.
- (e) Existing objects above any of the conical surface, inner horizontal surface, approach surface and transitional surfaces should, as far as practicable, be removed except when the object is shielded by an existing immovable object, or after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.
- (f) In considering proposed construction, account should be taken of the possible future development of an instrument runway and consequent requirement for more stringent obstacle limitation surfaces.

CS ADR-DSN.J.475 Non-precision approach runways

- (a) The following obstacle limitation surfaces should be established for a non-precision approach runway:
 - (1) conical surface;
 - (2) inner horizontal surface;
 - (3) approach surface; and
 - (4) transitional surfaces.

- (b) The heights and slopes of the surfaces should not be greater than, and their other dimensions not less than, those specified in Table J-1, except in the case of the horizontal section of the approach surface (see paragraph (c) below).
- (c) The approach surface should be horizontal beyond the point at which the 2.5 % slope intersects:
 - (1) a horizontal plane 150 m above the threshold elevation; or
 - (2) the horizontal plane passing through the top of any object that governs the obstacle clearance altitude/height (OCA/H);
 whichever is the higher.
- (d) New objects or extensions of existing objects should not be permitted above an approach surface within 3 000 m of the inner edge or above a transitional surface except when the new object or extension would be shielded by an existing immovable object.
- (e) New objects or extensions of existing objects should not be permitted above the approach surface beyond 3 000 m from the inner edge, the conical surface or inner horizontal surface except when the object would be shielded by an existing immovable object, or after an aeronautical study, it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.
- (f) Existing objects above any of the surfaces required by paragraph (a) should as far as practicable be removed except when the object would be shielded by an existing immovable object, or after aeronautical study, it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

CS ADR-DSN.J.480 Precision approach runways

- (a) The following obstacle limitation surfaces should be established for a precision approach runway category I:
 - (1) conical surface;
 - (2) inner horizontal surface;
 - (3) approach surface; and
 - (4) transitional surfaces.
- (b) The following obstacle limitation surfaces should be established for a precision approach runway category II or III:
 - (1) conical surface;
 - (2) inner horizontal surface;
 - (3) approach surface and inner approach surface;
 - (4) transitional surfaces and inner transitional surfaces; and
 - (5) balked landing surface.
- (c) The heights and slopes of the surfaces should not be greater than, and their other dimensions not less than, those specified in Table ADR-DSN-J-1, except in the case of the horizontal section of the approach surface in paragraph (e) below.
- (d) The approach surface should be horizontal beyond the point at which the 2.5 % slope intersects:

CS ADR DSN — BOOK 1

CHAPTER J — OBSTACLE LIMITATION REQUIREMENTS

- (1) a horizontal plane 150 m above the threshold elevation; or
- (2) the horizontal plane passing through the top of any object that governs the obstacle clearance limit;

whichever is the higher.

- (e) Fixed objects should not be permitted above the inner approach surface, the inner transitional surface or the balked landing surface, except for frangible objects which because of their function should be located on the strip. Mobile objects should not be permitted above these surfaces during the use of the runway for landing.
- (f) New objects or extensions of existing objects should not be permitted above an approach surface or a transitional surface except when the new object or extension would be shielded by an existing immovable object.
- (g) New objects or extensions of existing objects should not be permitted above the conical surface and the inner horizontal surface except when an object would be shielded by an existing immovable object, or after aeronautical study, it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.
- (h) Existing objects above an approach surface, a transitional surface, the conical surface and inner horizontal surface should, as far as practicable, be removed except when an object would be shielded by an existing immovable object, or after aeronautical study, it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

CS ADR-DSN.J.485 Runways meant for take-off

- (a) The safety objective of the take-off climb surface slopes and dimensions is to allow safe take-off operations by defining the limits above which new obstacles should not be permitted unless shielded by an existing immovable object.
- (b) A take-off climb surface should be established for a runway meant for take-off.
- (c) The dimensions of the surface should be not less than the dimensions specified in Table J-2, except that a lesser length may be adopted for the take-off climb surface where such lesser length would be consistent with procedural measures adopted to govern the outward flight of aeroplanes.
- (d) New objects or extensions of existing objects should not be permitted above a take-off climb surface except when the new object or extension would be shielded by an existing immovable object.
- (e) Existing objects that extend above a take-off climb surface should as far as practicable be removed except when an object is shielded by an existing immovable object, or after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

CS ADR-DSN.J.486 Other objects

- (a) Objects which do not project through the approach surface but which would nevertheless adversely affect the optimum siting or performance of visual or non-visual aids should, as far as practicable, be removed.
- (b) Anything which may, after aeronautical study, endanger aeroplanes on the movement area or in the air within the limits of the inner horizontal and conical surfaces should be regarded as an obstacle and should be removed in so far as practicable

RUNWAY CLASSIFICATION										
Surface and dimensions ^a	Non-instrument Code number				Non-precision approach Code number			Precision approach category		
	1	2	3	4	1,2	3	4	I Code number	II or III Code number	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
CONICAL										
Slope	5 %	5 %	5 %	5 %	5 %	5 %	5 %	5 %	5 %	5 %
Height	35 m	55 m	75 m	100 m	60 m	75 m	100 m	60 m	100 m	100 m
INNER HORIZONTAL										
Height	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m	45 m
Radius	2 000 m	2 500 m	4 000 m	4 000 m	3 500 m	4 000 m	4 000 m	3 500 m	4 000 m	4 000 m
INNER APPROACH										
Width	-	-	-	-	-	-	-	90 m	120 m ^e	120 m ^e
Distance from threshold	-	-	-	-	-	-	-	60 m	60 m	60 m
Length	-	-	-	-	-	-	-	900 m	900 m	900 m
Slope	-	-	-	-	-	-	-	2.5 %	2 %	2 %
APPROACH										
Length of inner edge	60 m	80 m	150 m	150 m	150 m	300 m	300 m	150 m	300 m	300 m
Distance from threshold	30 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m
Divergence (each side)	10 %	10 %	10 %	10 %	15 %	15 %	15 %	15 %	15 %	15 %
First section										
Length	1 600 m	2 500 m	3 000 m	3 000 m	2 500 m	3 000 m	3 000 m	3 000 m	3 000 m	3 000 m
Slope	5 %	4 %	3.33 %	2.5 %	3.33 %	2 %	2 %	2.5 %	2 %	2 %
Second section										

CS ADR DSN — BOOK 1

CHAPTER J — OBSTACLE LIMITATION REQUIREMENTS

Length	-	-	-	-	-	3 600 m ^b	3 600 m ^b	12 000 m	3 600 m ^b	3 600 m ^b
Slope	-	-	-	-	-	2.5 %	2.5 %	3 %	2.5 %	2.5 %
Horizontal section										
Length	-	-	-	-	-	8 400 m ^b	8 400 m ^b	-	8 400 m ^b	8 400 m ^b
Total length	-	-	-	-	-	15 000 m	15 000 m	15 000 m	15 000 m	15 000 m
TRANSITIONAL										
Slope	20 %	20 %	14.3 %	14.3 %	20 %	14.3 %	14.3 %	14.3 %	14.3 %	14.3 %
INNER TRANSITIONAL										
Slope	-	-	-	-	-	-	-	40 %	33.3 %	33.3 %
BALKED LANDING SURFACE										
Length of inner edge	-	-	-	-	-	-	-	90 m	120 m ^e	120 m ^e
Distance from threshold	-	-	-	-	-	-	-	c	1 800 m ^d	1 800 m ^d
Divergence (each side)	-	-	-	-	-	-	-	10 %	10 %	10 %
Slope	-	-	-	-	-	-	-	4 %	3.33 %	3.33 %

a. All dimensions are measured horizontally unless specified otherwise.

b. Variable length (CS ADR-DSN.J.475 (c) or CS ADR-DSN.J.480 (e)).

c. Distance to the end of strip.

d. Or end of runway whichever is less.

e. Where the code letter is F, the width is increased to 155 m.

Table J-1. Dimensions and slopes of obstacle limitation surfaces — Approach runways

RUNWAYS MEANT FOR TAKE-OFF			
	Code number		
Surface and dimensions ^a	1	2	3 or 4
(1)	(2)	(3)	(4)
TAKE-OFF CLIMB			
Length of inner edge	60 m	80 m	180 m
Distance from runway end ^b	30 m ^e	60 m ^e	60 m
Divergence (each side)	10 %	10 %	12.5 %
Final width	380 m	580 m	1 200 m 1 800 m ^c
Length	1 600 m	2 500 m	15 000 m
Slope	5 %	4 %	2 % ^d
<p>a. All dimensions are measured horizontally unless specified otherwise.</p> <p>b. The take-off climb surface starts at the end of the clearway if the clearway length exceeds the specified distance.</p> <p>c. 1 800 m when the intended track includes changes of heading greater than 15° for operations conducted in IMC, VMC by night.</p> <p>d. See CS ADR-DSN.J.485 (c) and (e).</p> <p>e. Where clearway is provided the length of the inner edge should be 150 m.</p>			
Table J-2 Dimensions and slopes of obstacle limitation surfaces			

CHAPTER K — VISUAL AIDS FOR NAVIGATION (INDICATORS AND SIGNALLING DEVICES)**CS ADR-DSN.K.490 Wind direction indicator**

(a) An aerodrome should be equipped with a sufficient number of wind direction indicators in order to provide wind information to the pilot during approach and take-off.

(b) Location:

Each wind direction indicator should be located so that at least one wind direction indicator is visible from aircraft in flight, during approach or on the movement area before take-off, and in such a way as to be free from the effects of air disturbances caused by nearby objects.

(c) Characteristics:

(1) Each wind direction indicator should be in the form of a truncated cone made of fabric and should have a length of not less than 3.6 m and a diameter, at the larger end, of not less than 0.9 m.

(2) It should be constructed so that it gives a clear indication of the direction of the surface wind and a general indication of the wind speed.

(3) The colour or colours should be so selected as to make the wind direction indicator clearly visible and understandable from a height of at least 300 m. Having regard to background:

(i) where practicable, a single colour should be used; and

(ii) where a combination of two colours is required to give adequate conspicuity against changing backgrounds, they should preferably be orange and white, red and white, or black and white, and should be arranged in five alternate bands, the first and last bands being the darker colour.

(d) Night conditions:

Provision should be made for illuminating a sufficient number of wind indicators at an aerodrome intended for use at night.

CS ADR-DSN.K.495 Landing direction indicator

(a) Location: Where provided, a landing direction indicator should be located in a conspicuous place on the aerodrome.

(b) Characteristics:

(1) The landing direction indicator should be in the form of a 'T'.

(2) The shape and minimum dimensions of a landing 'T' should be as shown in Figure K-1.

(3) The colour of the landing 'T' should be either white or orange, the choice being dependent on the colour that contrasts best with the background against which the indicator should be viewed.

(4) Where used at night, the landing 'T' should either be illuminated or outlined by white lights.

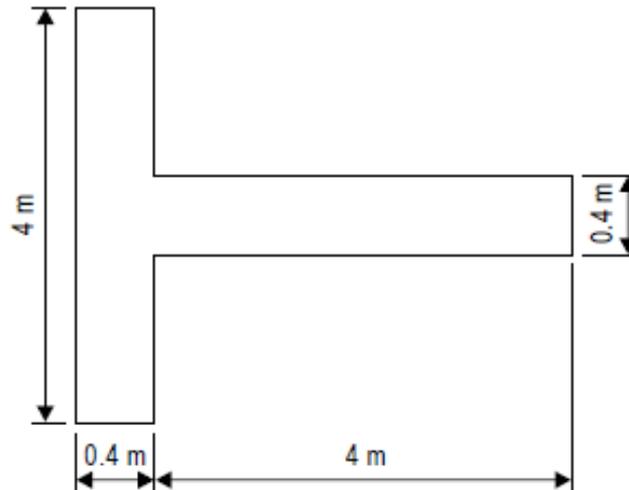


Figure K-1. Landing direction indicator

CS ADR-DSN.K.500 Signalling lamp

- (a) A signalling lamp should be provided at a controlled aerodrome in the aerodrome control tower.
- (b) Characteristics:
- (1) A signalling lamp should be capable of producing red, green and white signals, and of:
 - (i) being aimed manually at any target as required; and
 - (ii) giving a signal in any one colour followed by a signal in either of the two other colours.
 - (2) When selecting the green light, use should be made of the restricted boundary of green as specified in Book 1 Chapter U.
 - (3) The beam spread should be not less than 1° or greater than 3°, with negligible light beyond 3°. When the signalling lamp is intended for use in the daytime, the intensity of the coloured light should be not less than 6 000 cd.

CS ADR-DSN.K.505 Signal panels and signal area

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CS ADR-DSN.K.510 Location of signal panels and signal area

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CS ADR-DSN.K.515 Characteristics of signal panels and signal area

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CHAPTER L — VISUAL AIDS FOR NAVIGATION (MARKINGS)**CS ADR-DSN.L.520 General — Colour and conspicuity**

Markings should be of a conspicuous colour and contrast with the surface on which they are laid.

- (a) Runway markings should be white.
- (b) Markings for taxiways, runway turn pads, and aircraft stands should be yellow.
- (c) Apron safety lines should be of a conspicuous colour which should contrast with that used for aircraft stand markings.
- (d) When it is operationally necessary to apply temporary runway or taxiway markings, those markings should comply with the relevant CS.

CS ADR-DSN.L.525 Runway designation marking

- (a) Applicability: A runway designation marking should be provided at the thresholds of a runway.
- (b) Location and positioning: A runway designation marking should be located at a threshold as shown in Figure L-1 as appropriate.
- (c) Characteristics:
 - (1) A runway designation marking should consist of a two-digit number and on parallel runways should be supplemented with a letter.
 - (i) On a single runway, dual parallel runways and triple parallel runways, the two-digit number should be the whole number nearest the one-tenth of the magnetic North when viewed from the direction of approach.
 - (2) On four or more parallel runways, one set of adjacent runways should be numbered to the nearest one-tenth magnetic azimuth and the other set of adjacent runways numbered to the next nearest one-tenth of the magnetic azimuth. When this rule gives a single digit number, it should be preceded by a zero.

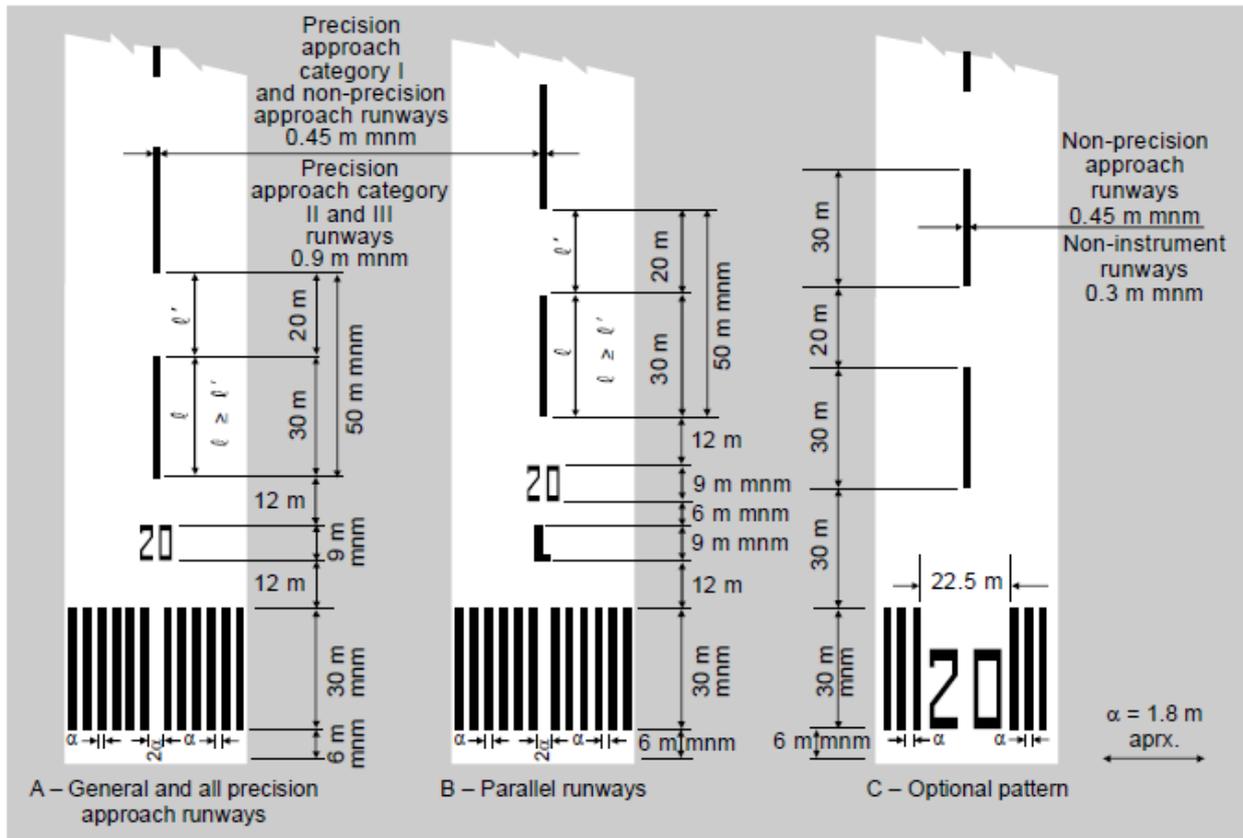


Figure L-1 Runway designation, centre line and threshold markings

- (3) In the case of parallel runways, each runway designation number should be supplemented by a letter as follows, in the order shown from left to right when viewed from the direction of approach:
- (i) for two parallel runways: 'L' 'R';
 - (ii) for three parallel runways: 'L' 'C' 'R';
 - (iii) for four parallel runways: 'L' 'R' 'L' 'R';
 - (iv) for five parallel runways: 'L' 'C' 'R' 'L' 'R' or 'L' 'R' 'L' 'C' 'R'; and
 - (v) for six parallel runways: 'L' 'C' 'R' 'L' 'C' 'R'.
- (4) The numbers and letters should be in the form and proportion shown in Figure L-2. The dimensions should be not less than those shown in Figure L-2. Where the numbers are incorporated in the threshold marking, larger dimensions should be used in order to fill adequately the gap between the stripes of the threshold marking.

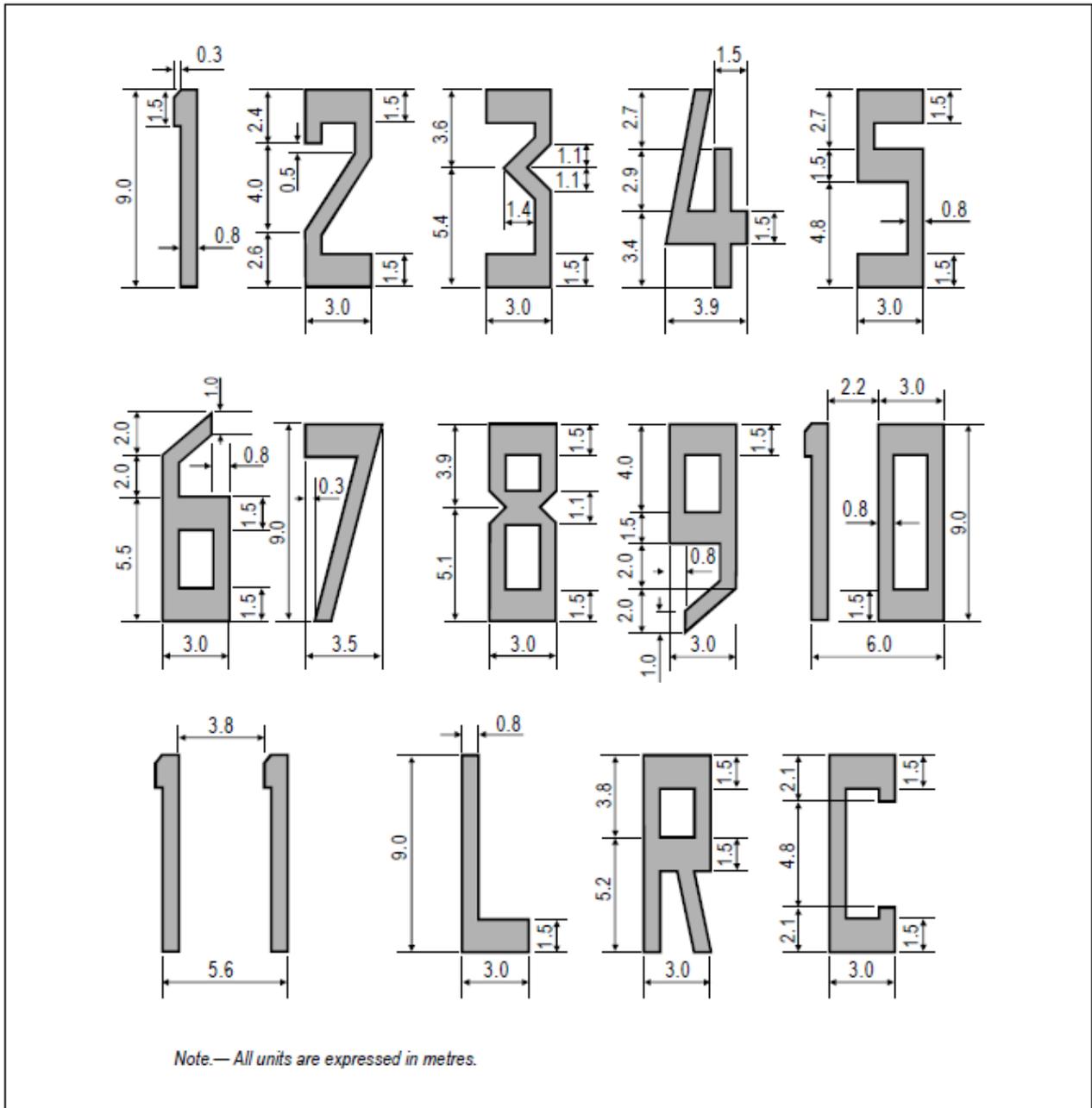


Figure L-2. Form and proportions of numbers and letters for runway designation markings

CS ADR-DSN.L.530 Runway centre line marking

- (a) Applicability: A runway centre line marking should be provided on a paved runway.
- (b) Location: A runway centre line marking should be located along the centre line of the runway between the runway designation marking as shown in Figure L-1, except when interrupted as given in CS ADR-DSN.L.560.
- (c) Characteristics:
- (1) A runway centre line marking should consist of a line of uniformly spaced stripes and gaps. The length of a stripe plus a gap should be not less than 50 m or more than 75 m. The length of each stripe should be at least equal to the length of the gap or 30 m, whichever is greater.
 - (2) The width of the stripes should be not less than:
 - (i) 0.90 m on precision approach category II and III runways;
 - (ii) 0.45 m on non-precision approach runways where the code number is 3 or 4, and precision approach category I runways; and
 - (iii) 0.30 m on non-precision approach runways where the code number is 1 or 2, and on non-instrument runways.

CS ADR-DSN.L.535 Threshold marking

- (a) Applicability and location: A threshold marking should be provided at the threshold of a runway.
- (b) Characteristics:
- (1) The stripes of the threshold marking should commence 6 m from the threshold.
 - (2) A runway threshold marking should consist of a pattern of longitudinal stripes of uniform dimensions disposed symmetrically about the centre line of a runway as shown in Figure L-1(A) and L-1(B) for a runway width of 45 m. The number of stripes should be in accordance with the runway width as follows:

Runway width	Number of stripes
18 m	4
23 m	6
30 m	8
45 m	12
60 m	16

except that on non-precision approach and non-instrument runways 45 m or greater in width, they may be as shown in Figure L-1(C).
 - (3) The stripes should extend laterally to within 3 m of the edge of a runway or to a distance of 27 m on either side of a runway centre line, whichever results in the smaller lateral distance.
 - (4) Where a runway designation marking is placed within a threshold marking, there should be a minimum of three stripes on each side of the centre line of the runway.
 - (5) Where a runway designation marking is placed above a threshold marking, the stripes should be continued across the runway. The stripes should be at least 30 m long and approximately 1.80 m wide with spacings of approximately 1.80 m between them. Where the stripes are continued across a runway, a double spacing

CS ADR-DSN.L.540 Aiming point marking

(a) Applicability:

An aiming point marking should be provided at each approach end of an instrument runway where the code number is 2, 3, or 4.

(b) Characteristics. The aiming point marking should commence no closer to the threshold than the distance indicated in the appropriate column of Table L-1, except that, on a runway equipped with a PAPI system, the beginning of the marking should be coincident with the visual approach slope origin.

Location and dimensions	Landing distance available			
	Less than 800 m	800 m up to but not including 1 200 m	1 200 m up to but not including 2 400 m	2 400 m and above
(1)	(2)	(3)	(4)	(5)
Distance from threshold to beginning of marking ^a	150 m	250 m	300 m	400 m
Length of stripe ^b	30-45 m	30-45 m	45-60 m	45-60 m
Width of stripe	4 m	6 m	6-10 m ^c	6-10 m ^c
Lateral spacing between inner sides of stripes	6 m ^d	9 m ^d	18-22.5 m	18-22.5 m

- a Where a PAPI system is provided for the runway, the beginning of the marking should be coincident with the visual approach slope origin.
- b Where greater dimensions of the specified ranges are intended to be used where increased conspicuity is required.
- c Where lateral spacing may be varied within these limits to minimise the contamination of the marking by rubber deposits.
- d These figures were deduced by reference to the outer main gear wheel span which is element 2 of the aerodrome reference code

Table L-1. Location and dimensions of aiming point marking

CS ADR DSN – BOOK 1

CHAPTER L – VISUAL AIDS FOR NAVIGATION (MARKINGS)

- (1) An aiming point marking should consist of two conspicuous stripes. The dimensions of the stripes and the lateral spacing between their inner sides should be in accordance with the provisions of the appropriate column of Table L-1.

CS ADR-DSN.L.545 Touchdown zone marking

(a) Applicability:

- (1) A touchdown zone marking should be provided in the touchdown zone of a paved precision approach runway where the code number is 2, 3, or 4.
- (2) A touchdown zone marking should be provided in the touchdown zone of a paved non-precision approach or non-instrument runway where the code number is 3 or 4 and additional conspicuity of the touchdown zone is desirable.

- (d) Location: A touchdown zone marking should consist of pairs of rectangular markings symmetrically disposed about the runway centre line with the number of such pairs related to the landing distance available and, where the marking is to be displayed at both the approach directions of a runway, the distance between the thresholds, as follows:

Landing distance available or the distance between thresholds	Pair(s) of markings
less than 900 m	1
900 m up to but not including 1 200 m	2
1 200 m up to but not including 1 500 m	3
1 500 m up to but not including 2 400 m	4
2 400 m or more	6

(e) Characteristics:

- (1) A touchdown zone marking should conform to the patterns shown in Figure L-4. For the pattern shown in Figure L-4(A), the markings should be not less than 22.5 m long and 3 m wide. For the pattern shown in Figure L-4(B), each stripe of each marking should be not less than 22.5 m long and 1.8 m wide with spacing of 1.5 m between adjacent stripes.
- (2) The lateral spacing between the inner sides of the rectangles should be equal to that of the aiming point marking where provided. Where an aiming point marking is not provided, the lateral spacing between the inner sides of the rectangles should correspond to the lateral spacing specified for the aiming point marking in Table L-1 (columns 2, 3, 4, or 5, as appropriate). The pairs of markings should be provided at longitudinal spacings of 150 m beginning from the threshold except that where pairs of touchdown zone markings are coincident with or located within 50 m of an aiming point, marking should be deleted from the pattern.
- (3) On a non-precision approach runway where the code number is 2, an additional pair of touchdown zone marking stripes should be provided 150 m beyond the beginning of the aiming point marking.

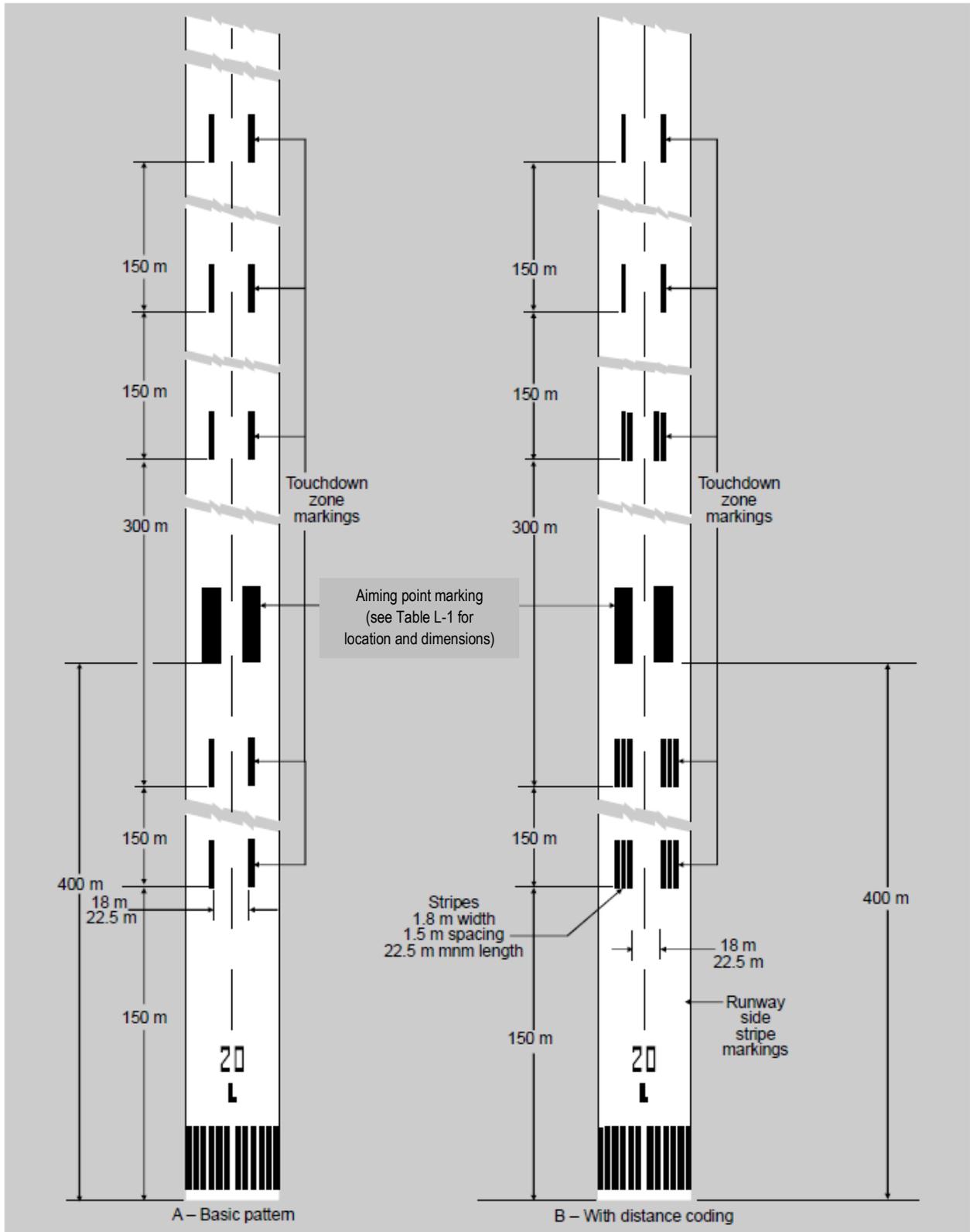


Figure L-4. Aiming point and touchdown zone markings (illustrated for a runway with a length of 2 400 m or more)

CS ADR-DSN.L.550 Runway side stripe marking

- (a) Applicability:
- (1) A runway side stripe marking should be provided between the thresholds of a runway where there is a lack of contrast between the runway edges and the shoulders or the surrounding terrain.
 - (2) A runway side stripe marking should be provided on a precision approach runway irrespective of the contrast between the runway edges and the shoulders or the surrounding terrain.
- (b) Location and characteristics:
- (1) A runway side stripe marking should consist of two stripes, one placed along each edge of the runway with the outer edge of each stripe approximately on the edge of the runway, except that, where the runway is greater than 60 m in width, the stripes should be located 30 m from the runway centre line.
 - (2) Where a runway turn pad is provided, the runway side stripe marking should be continued between the runway and the runway turn pad.
 - (3) A runway side stripe should have an overall width of at least 0.9 m on runways 30 m or more in width and at least 0.45 m on narrower runways.

CS ADR-DSN.L.555 Taxiway centre line marking

- (a) Applicability:
- (1) Taxiway centre line marking should be provided on a taxiway, de-icing/anti-icing facility and apron in such a way as to provide continuous guidance between the runway centre line and aircraft stands.
 - (2) Taxiway centre line marking should be provided on a runway when the runway is part of a standard taxi-route and where the taxiway centre line is not coincident with the runway centre line.
- (b) Characteristics:
- (1) On a straight section of a taxiway, the taxiway centre line marking should be located along the taxiway centre line.
 - (2) On a taxiway curve, the marking should continue from the straight portion of the taxiway at a constant distance from the outside edge of the curve.
 - (3) At an intersection of a taxiway with a runway, where the taxiway serves as an exit from the runway, the taxiway centre line marking should be curved into the runway centre line marking as shown in Figure L-5. The taxiway centre line marking should be extended parallel to the runway centre line marking for a distance of at least 60 m beyond the point of tangency where the code number is 3 or 4, and for a distance of at least 30 m where the code number is 1 or 2.
 - (4) Where taxiway centre line marking is provided in accordance with (a) 2 above, the marking should be located on the centre line of the designated taxiway.
 - (5) A taxiway centre line marking should be at least 15 cm in width and continuous in length except where it intersects with a runway-holding position marking or an intermediate holding position marking as shown in Figure L-5. Taxiway markings (shown with basic runway markings).

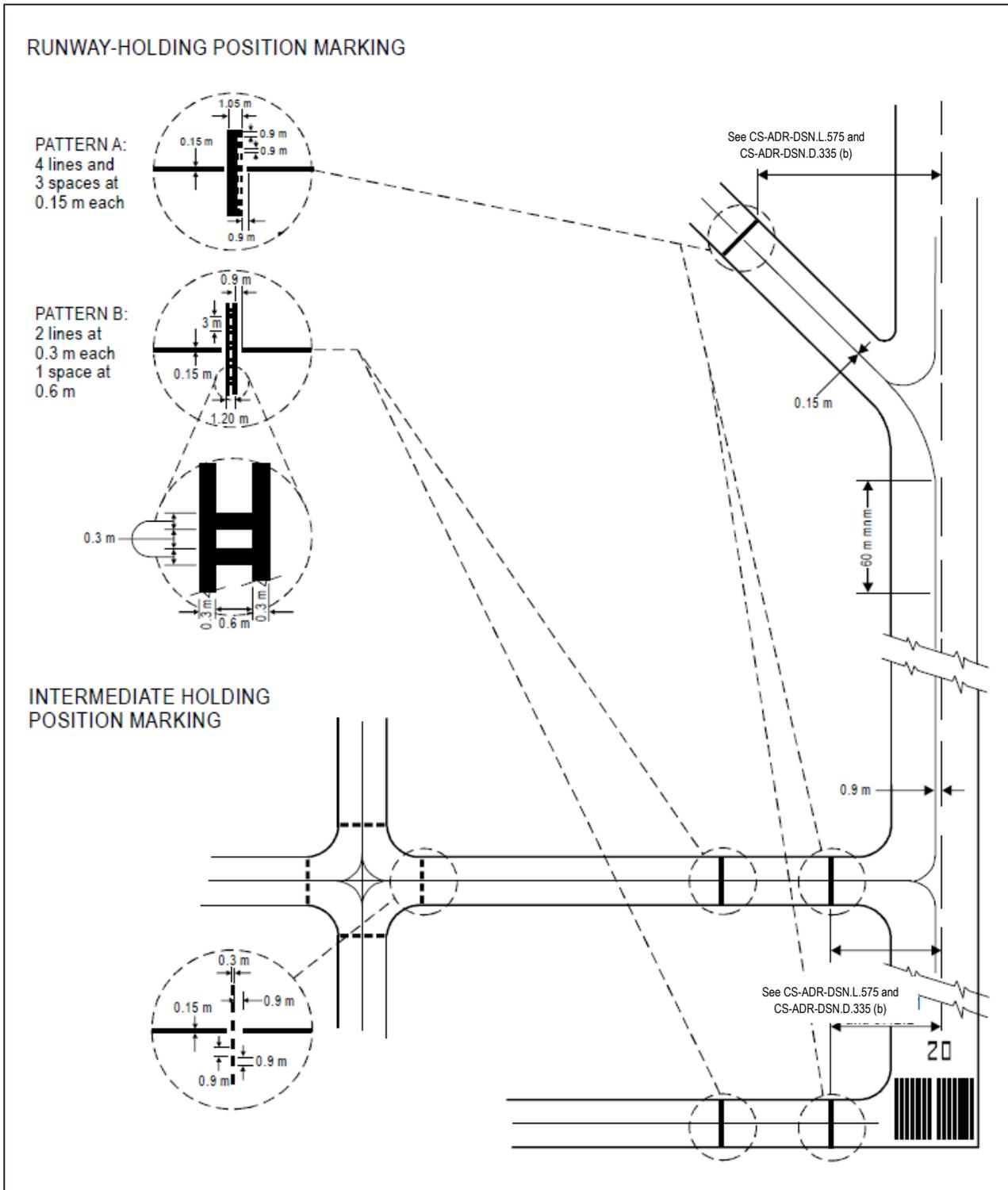


Figure L-5. Taxiway markings (shown with basic runway markings)

CS ADR-DSN.L.560 Interruption of runway markings

- (a) At an intersection of two (or more) runways, the markings of the more important runway, except for the runway side stripe marking, should be displayed and the markings of the other runway(s) should be interrupted. The runway side stripe marking

of the more important runway should be either continued across the intersection or interrupted.

- (b) The order of importance of runways for the display of runway markings should be as follows:
 - (1) precision approach runway;
 - (2) non-precision approach runway; and
 - (3) non-instrument runway.
- (c) At an intersection of a runway and taxiway the markings of the runway should be displayed and the markings of the taxiway interrupted, except that runway side stripe markings should be either continued across the intersection or interrupted.

CS ADR-DSN.L.565 Runway turn pad marking

- (a) **Applicability:** Where a runway turn pad is provided, a runway turn pad marking should be provided for continuous guidance to enable an aeroplane to complete a 180-degree turn and align with the runway centre line.
- (b) **Characteristics:**
 - (1) The runway turn pad marking should be curved from the runway centre line into the turn pad. The radius of the curve should be compatible with the manoeuvring capability and normal taxiing speeds of the aeroplanes for which the runway turn pad is intended.
 - (2) The intersection angle of the runway turn pad marking with the runway centre line should not be greater than 30 degrees.
 - (3) The runway turn pad marking should be extended parallel to the runway centre line marking for a distance of at least 60 m beyond the point of tangency where the code number is 3 or 4, and for a distance of at least 30 m where the code number is 1 or 2.
 - (4) A runway turn pad marking should guide the aeroplane in such a way as to allow a straight portion of taxiing before the point where a 180-degree turn is to be made. The straight portion of the runway turn pad marking should be parallel to the outer edge of the runway turn pad.
 - (5) The design of the curve allowing the aeroplane to negotiate a 180-degree turn should be based on a nose wheel steering angle not exceeding 45 degrees.
 - (6) The design of the turn pad marking should be such that when the cockpit of the aeroplane remains over the runway turn pad marking, the clearance distance between any wheel of the aeroplane landing gear and the edge of the runway turn pad should be not less than those specified in the following tabulation:

Code letter	Clearance
A	1.5 m
B	2.25 m
C	3 m if the turn pad is intended to be used by aeroplanes with a wheel base less than 18 m
	4.5 m if the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m

D	4.5 m
E	4.5 m
F	4.5 m

- (7) A runway turn pad marking should be at least 15 cm in width and continuous in length.

CS ADR-DSN.L.570 Enhanced taxiway centre line marking

- (a) An enhanced taxiway centre line marking should extend from the runway holding position Pattern A (as defined in Figure L-5. Taxiway markings) to a distance of up to 45 m (a minimum of three (3) dashed lines) in the direction of travel away from the runway or to the next runway holding position if within 45 m distance.
- (b) Characteristics: Enhanced taxiway centre line marking should be as shown in Figure L-6.

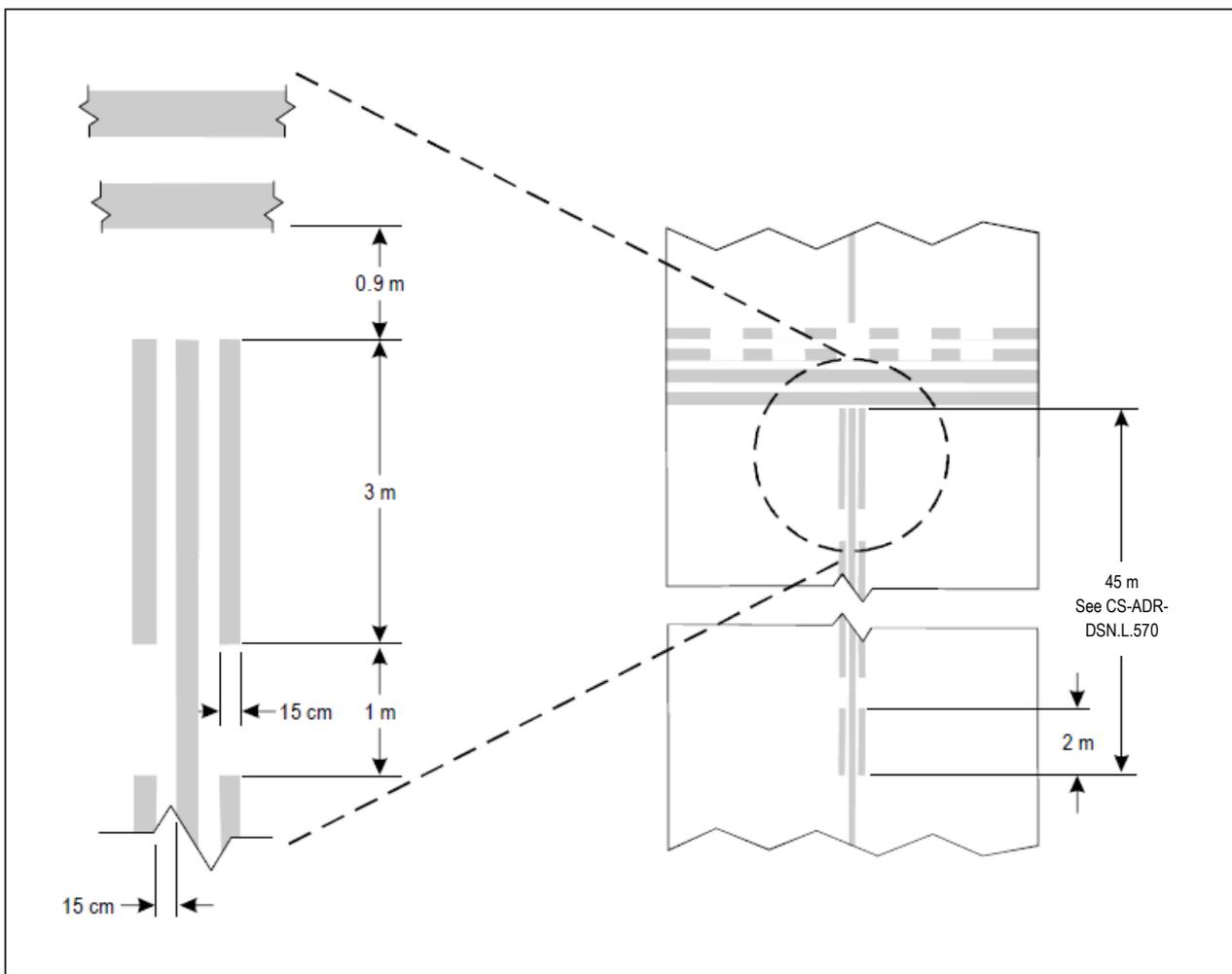


Figure L-6. Enhanced taxiway centre line marking

CS ADR-DSN.L.575 Runway-holding position marking

A runway-holding position marking should be displayed along a runway-holding position.

(a) Characteristics:

- (1) At an intersection of a taxiway and a non-instrument, non-precision approach or take-off runway, the runway-holding position marking should be as shown in Figure L-7, pattern A.
- (2) Where a single runway-holding position is provided at an intersection of a taxiway and a precision approach category I, II or III runway, the runway-holding position marking should be as shown in Figure L-7, pattern A.
- (3) Where two or three runway-holding positions are provided at such an intersection, the runway-holding position marking closer (closest) to the runway should be as shown in Figure L-7, pattern A, and the markings farther from the runway should be as shown in Figure L-7, pattern B.
- (4) The runway-holding position marking displayed at a runway-holding position established in accordance with CS ADR-DSN.L.605(b)(1), or (2) should be as shown in Figure L-7, pattern A.
- (5) Where increased conspicuity of the runway-holding position is required, the runway-holding position marking should be as shown in Figure L-7, pattern A or pattern B, as appropriate.
- (6) Where a pattern B runway-holding position marking is located on an area where it would exceed 60 m in length, the term 'CAT II' or 'CAT III' as appropriate should be marked on the surface at the ends of the runway-holding position marking and at equal intervals of 45 m maximum between successive marks. The letters should be not less than 1.8 m high and should be placed not more than 0.9 m beyond the holding position marking.
- (7) The runway-holding position marking displayed at a runway/runway intersection should be perpendicular to the centre line of the runway forming part of the standard taxi-route. The pattern of the marking should be as shown in Figure L-7, pattern A.

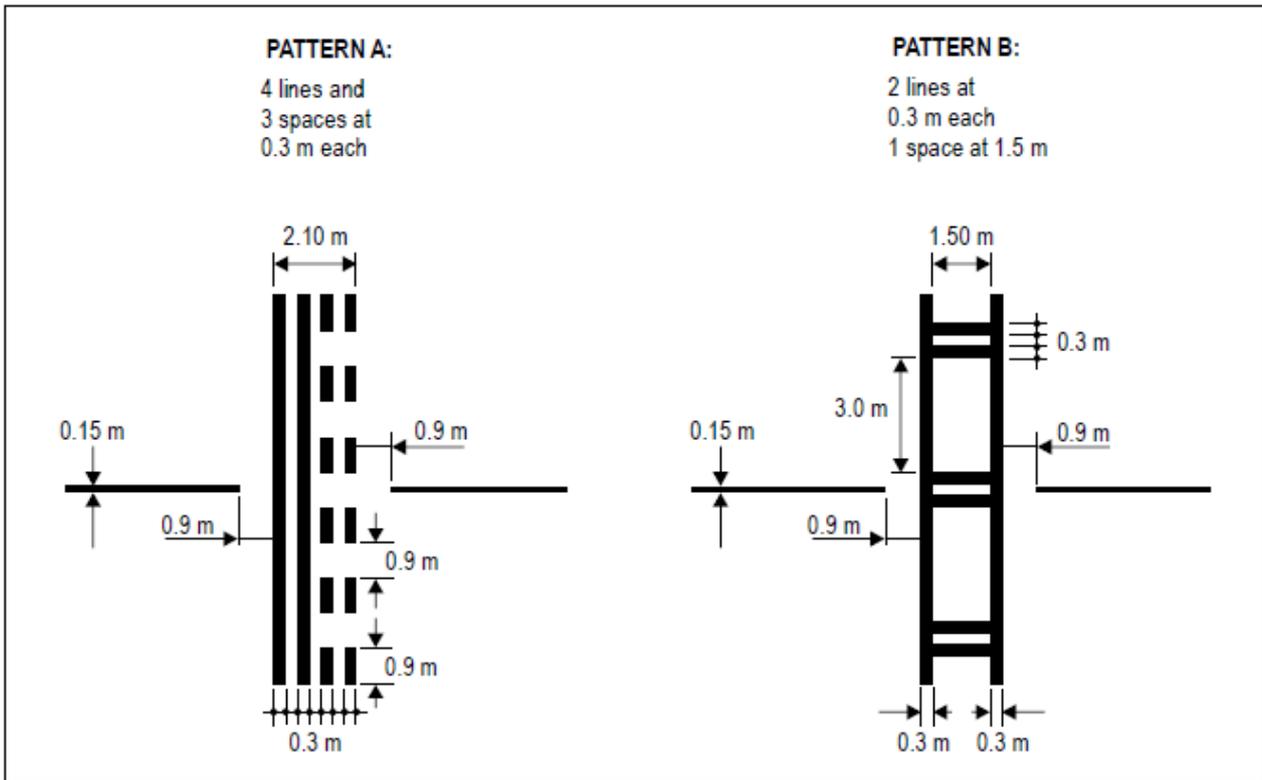


Figure L-7. Runway-holding position markings

CS ADR-DSN.L.580 Intermediate holding position marking

(a) Applicability:

- (1) An intermediate holding position marking should be displayed along an intermediate holding position.
- (2) An intermediate holding position marking should be displayed at the exit boundary of a remote de-icing/anti-icing facility adjoining a taxiway.

(b) Location:

- (1) Where an intermediate holding position marking is displayed at an intersection of two taxiways, it should be located across the taxiway at sufficient distance from the near edge of the intersecting taxiway to ensure safe clearance between taxiing aircraft. It should be coincident with a stop bar or intermediate holding position lights where provided.
- (2) The distance between an intermediate holding position marking at the exit boundary of a remote de-icing/anti-icing facility and the centre line of the adjoining taxiway should not be less than the dimension specified in the table below.

Code letter	Distance (metres)
A	16.25
B	21.5
C	26

D	40.5
E	47.5
F	57.5

- (c) Characteristics: An intermediate holding position marking should consist of a single broken line as shown in Figure L-5.

CS ADR-DSN.L.585 VOR aerodrome checkpoint marking

- (a) When a VOR aerodrome check-point is established, it should be indicated by a VOR aerodrome check-point marking and sign.
- (b) Location: A VOR aerodrome check-point marking should be centred on the spot at which an aircraft is to be parked to receive the correct VOR signal.
- (c) Characteristics:
- (1) A VOR aerodrome check-point marking should consist of a circle 6 m in diameter and have a line width of 15 cm (see Figure L-8(A)).
 - (2) When it is preferable for an aircraft to be aligned in a specific direction, a line should be provided that passes through the centre of the circle on the desired azimuth. The line should extend 6 m outside the circle in the desired direction of heading and terminate in an arrowhead. The width of the line should be 15 cm (see Figure L-8(B)).
 - (3) A VOR aerodrome check-point marking should differ from the colour used for the taxiway markings and when applicable from a contrasting viewpoint, be white in colour.

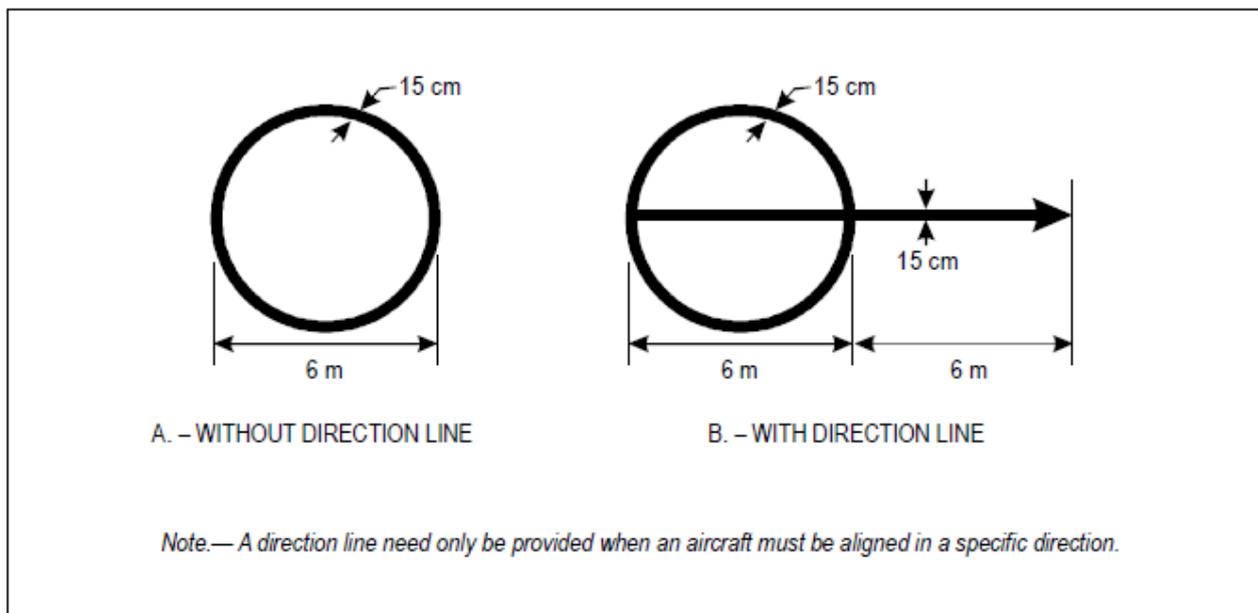


Figure L-8. VOR check-point markings

CS ADR-DSN.L.590 Aircraft stand marking

- (a) **Applicability:** Aircraft stand markings should be provided for designated parking positions on an apron and on a de-icing/anti-icing facility.
- (b) **General characteristics:** Aircraft stand markings should include such elements as stand identification, lead-in line, turn bar, turning line, alignment bar, stop line and lead-out line as are required by the parking configuration and to complement other parking aids.
- (c) **Stand identification:**
 - (1) A stand identification (letter and/or number) should be included in the lead-in line a short distance after the beginning of the lead-in line. The height of the identification should be adequate to be readable from the cockpit of aircraft using the stand.
 - (i) Identification of the aircraft for which each set of markings is intended, should be added to the stand identification where two sets of aircraft stand markings are superimposed on each other in order to permit more flexible use of the apron and safety would be impaired if the wrong marking was followed.
- (d) **Lead-in, turning, and lead-out lines:**
 - (1) Lead-in, turning, and lead-out lines should, as far as practicable, be continuous in length and have a width of not less than 15 cm. Where one or more sets of stand markings are superimposed on a stand marking, the lines should be continuous for the most demanding aircraft and broken for other aircraft.
 - (2) The curved portions of lead-in, turning, and lead-out lines should have radii appropriate to the most demanding aircraft type for which the markings are intended.
 - (3) Where it is intended that an aircraft proceeds in one direction only, arrows pointing in the direction to be followed should be added as part of the lead-in and lead-out lines.
- (e) **Alignment bar:** An alignment bar should be placed so as to be coincident with the extended centre line of the aircraft in the specified parking position and visible to the pilot during the final part of the parking manoeuvre. It should have a width of not less than 15 cm.
- (f) **Turn bar and stop line:**
 - (1) A turn bar should be located at right angles to the lead-in line, abeam the left pilot position at the point of initiation of any intended turn. It should have a length and width of not less than 6 m and 15 cm respectively, and include an arrowhead to indicate the direction of turn.
 - (2) A stop line should be located at right angles to the alignment bar, abeam the left pilot position at the intended point of stop. It should have a length and width of not less than 6 m and 15 cm respectively.
 - (3) If more than one turn bar and/or stop line is required, they should be designated for the appropriate aircraft types.

CS ADR-DSN.L.595 Apron safety lines

- (a) **Applicability:** Apron safety lines should be provided on an apron as required by the parking configurations and ground facilities.
- (b) **Location:** Apron safety lines should be located so as to define the areas intended for use by ground vehicles and other aircraft servicing equipment to provide safe separation from aircraft.

(c) Characteristics:

- (1) Apron safety lines should include such elements as wing tip clearance lines and service road boundary lines as required by the parking configurations and ground facilities.
- (2) Apron safety lines should be of a conspicuous colour which should contrast with that used for aircraft stand markings.
- (3) An apron safety line should be continuous in length and at least 10 cm in width.

CS ADR-DSN.L.600 Road-holding position marking

(a) Applicability: A road-holding position marking should be provided at all road entrances to a runway.

(b) Location:

- (1) The road-holding position marking should be located across the road at the holding position.
- (2) Where a road intersects a taxiway, a road holding position marking should be located across the road at the appropriate distance to ensure vehicles remain clear of the taxiway strip.

(c) Characteristics:

- (1) The road-holding position marking should be in accordance with the local road traffic regulations.
- (2) The road marking at the intersection of a road with a taxiway should be in accordance with the local road traffic regulations for a yield right of way.

CS ADR-DSN.L.605 Mandatory instruction marking

(a) Applicability:

- (1) Where a mandatory instruction sign in accordance with CS ADR-DSN.N.780 is not installed, a mandatory instruction marking should be provided on the surface of the pavement.
- (2) On taxiways exceeding 60 m in width, or to assist in the prevention of a runway incursion, a mandatory instruction sign should be supplemented by a mandatory instruction marking.

(b) Location:

- (1) The mandatory instruction marking on taxiways, where the code letter is A, B, C, or D, should be located across the taxiway equally placed about the taxiway centre line and on the holding side of the runway-holding position marking as shown in Figure L-9(A). The distance between the nearest edge of the marking and the runway-holding position marking or the taxiway centre line marking should be not less than 1 m.
- (2) The mandatory instruction marking on taxiways where the code letter is E or F, should be located on the both sides of the taxiway centre line marking and on the holding side of the runway-holding position marking as shown in Figure L-9(B). The distance between the nearest edge of the marking and the runway-holding position marking, or the taxiway centre line marking should be not less than 1 m.

(c) Characteristics:

- (1) A mandatory instruction marking should consist of an inscription in white on a red background. Except for a NO ENTRY marking, the inscription should provide information identical to that of the associated mandatory instruction sign.
- (2) A NO ENTRY marking should consist of an inscription in white reading NO ENTRY on a red background.
- (3) Where there is insufficient contrast between the marking and the pavement surface, the mandatory instruction marking should include an appropriate border, preferably white or black.
- (4) The character height should be 4 m for inscriptions where the code letter is C, D, E, or F, and at least 2 m where the code letter is A or B. The inscription should be in the form and proportions shown in Figures L-12A to L-12E.
- (5) The background should be rectangular and extend a minimum of 0.5 m laterally and vertically beyond the extremities of the inscription.

CS ADR-DSN.L.610 Information marking

- (a) Applicability: Where an information sign in accordance with CS ADR-DSN.N.785 is not installed, an information marking should be displayed on the surface of the pavement.
- (b) Characteristics:
 - (1) An information marking should consist of:
 - (i) an inscription in yellow upon a black background when it replaces or supplements a location sign; and
 - (ii) an inscription in black upon a yellow background when it replaces or supplements a direction or destination sign.
 - (2) Where there is insufficient contrast between the marking background and the pavement surface, the marking should include:
 - (i) a black border where the inscriptions are in black; and
 - (ii) a yellow border where the inscriptions are in yellow.
 - (3) The character height should be as for mandatory instruction markings.

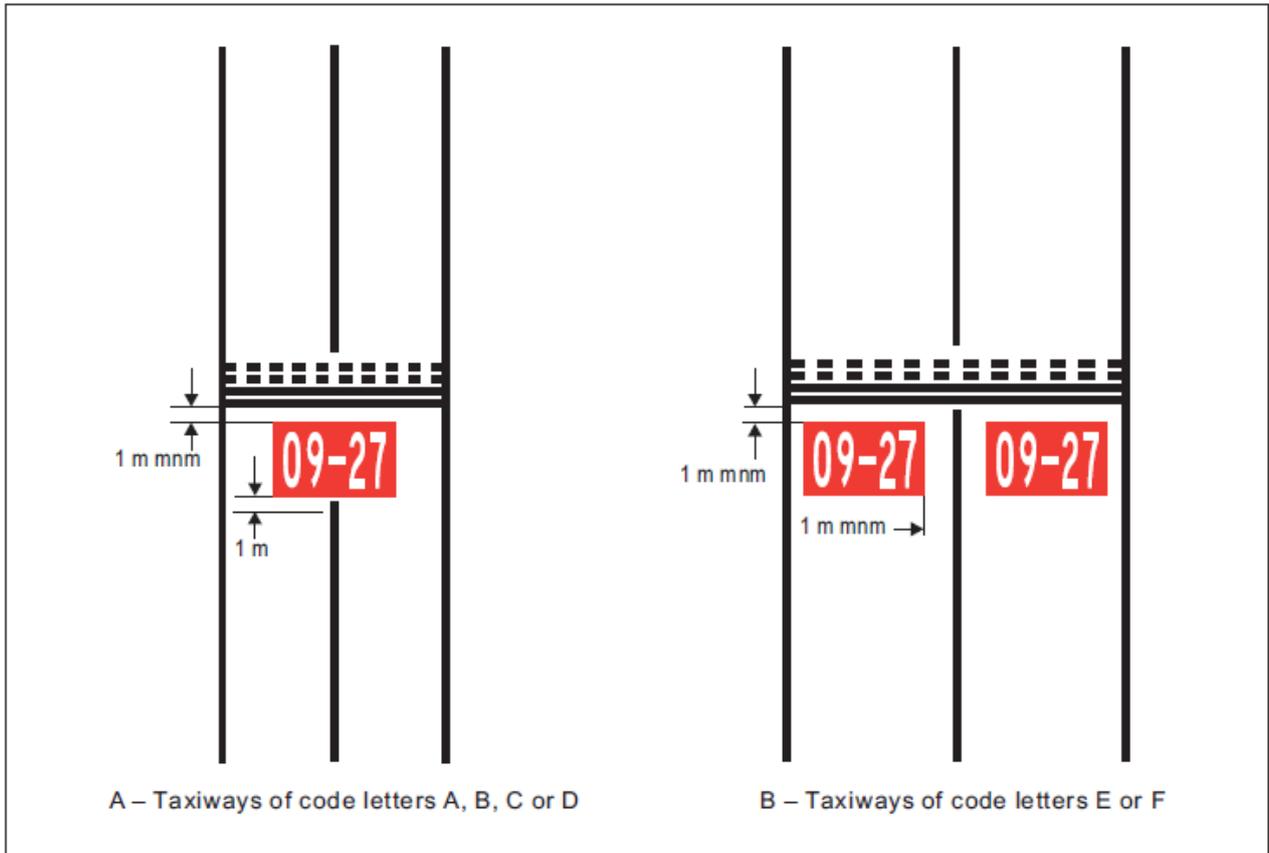


Figure L-9. Mandatory instruction marking

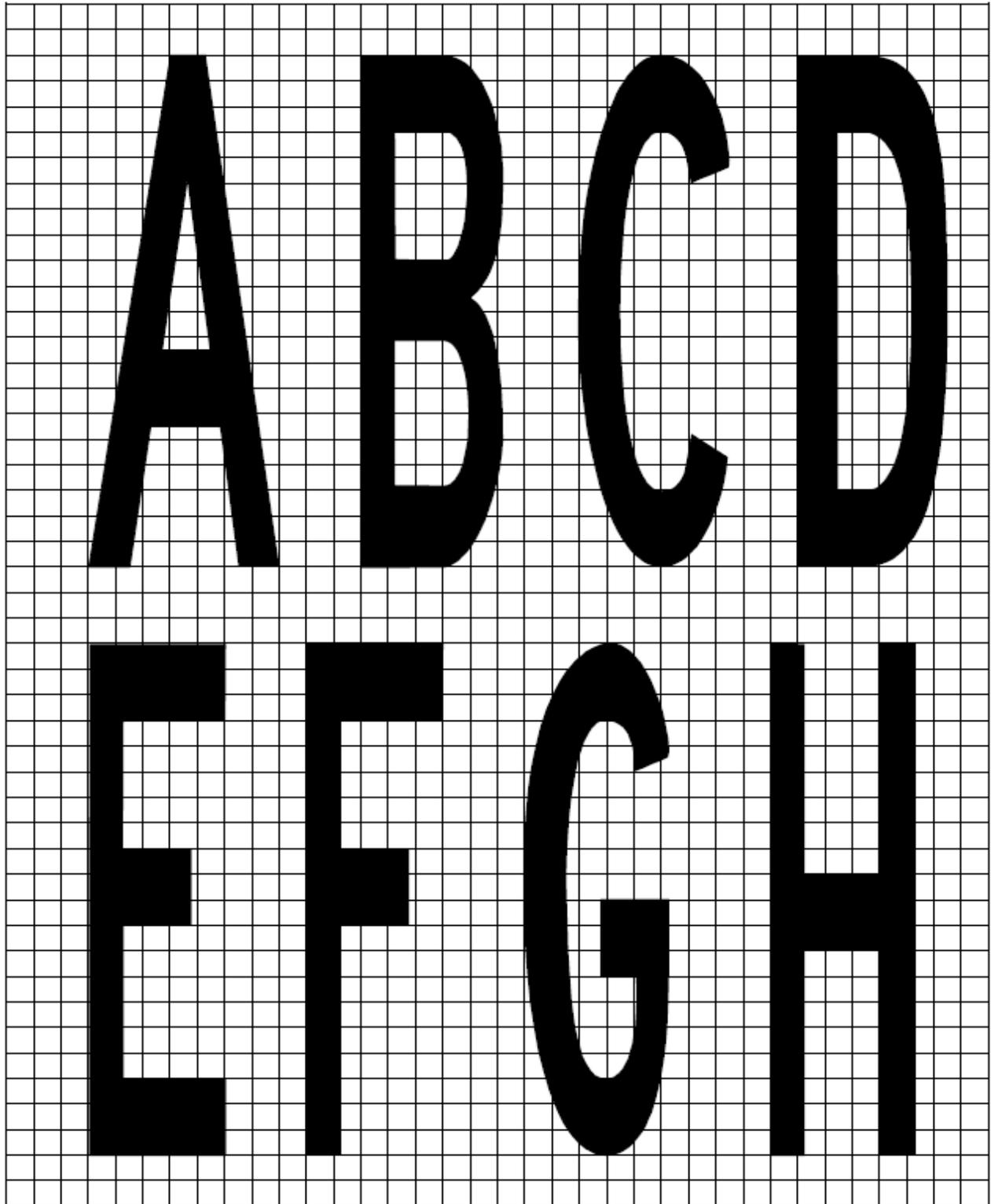


Figure L-10A. Mandatory instruction marking inscription form and proportions

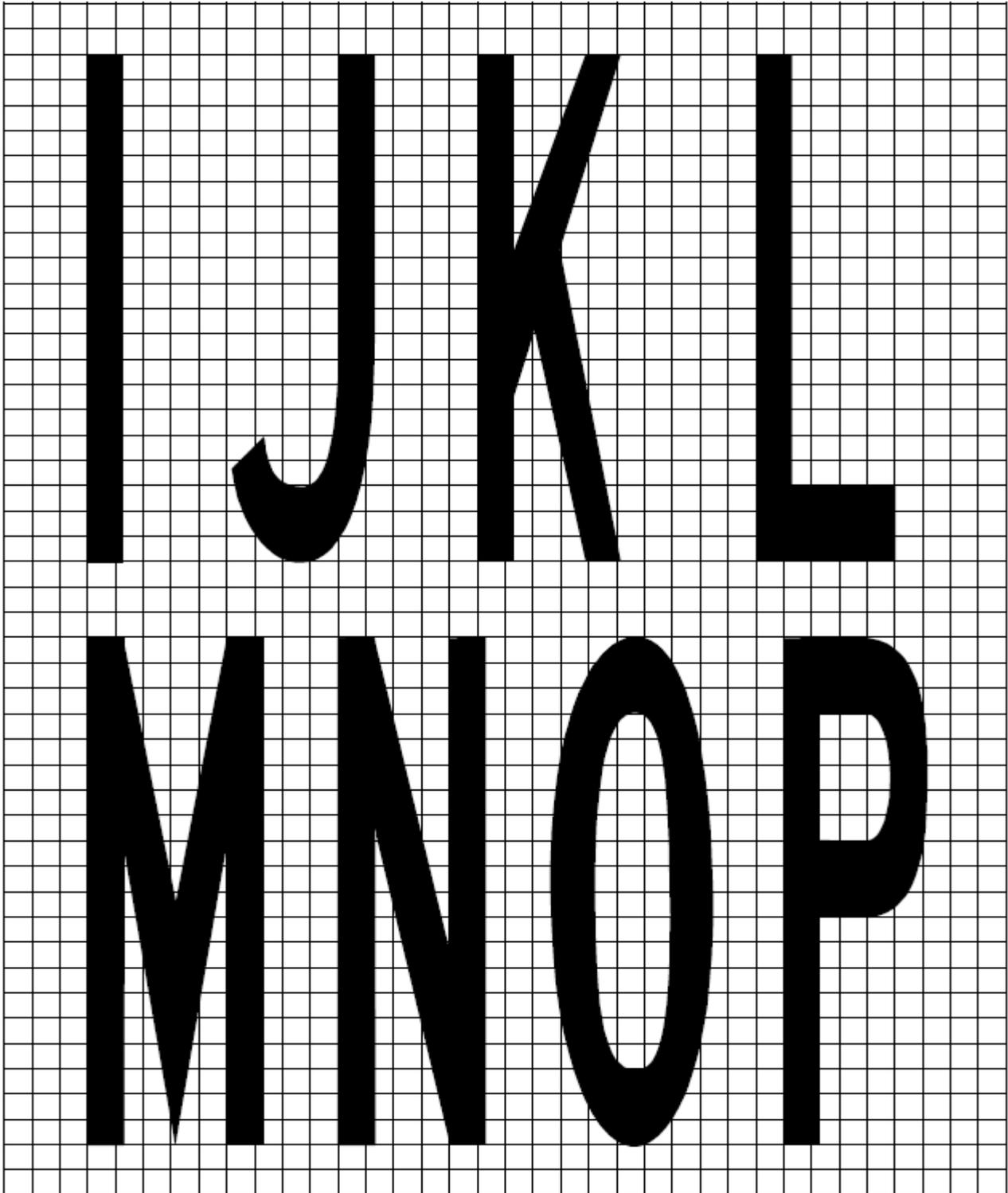


Figure L-10B. Mandatory instruction marking inscription form and proportions

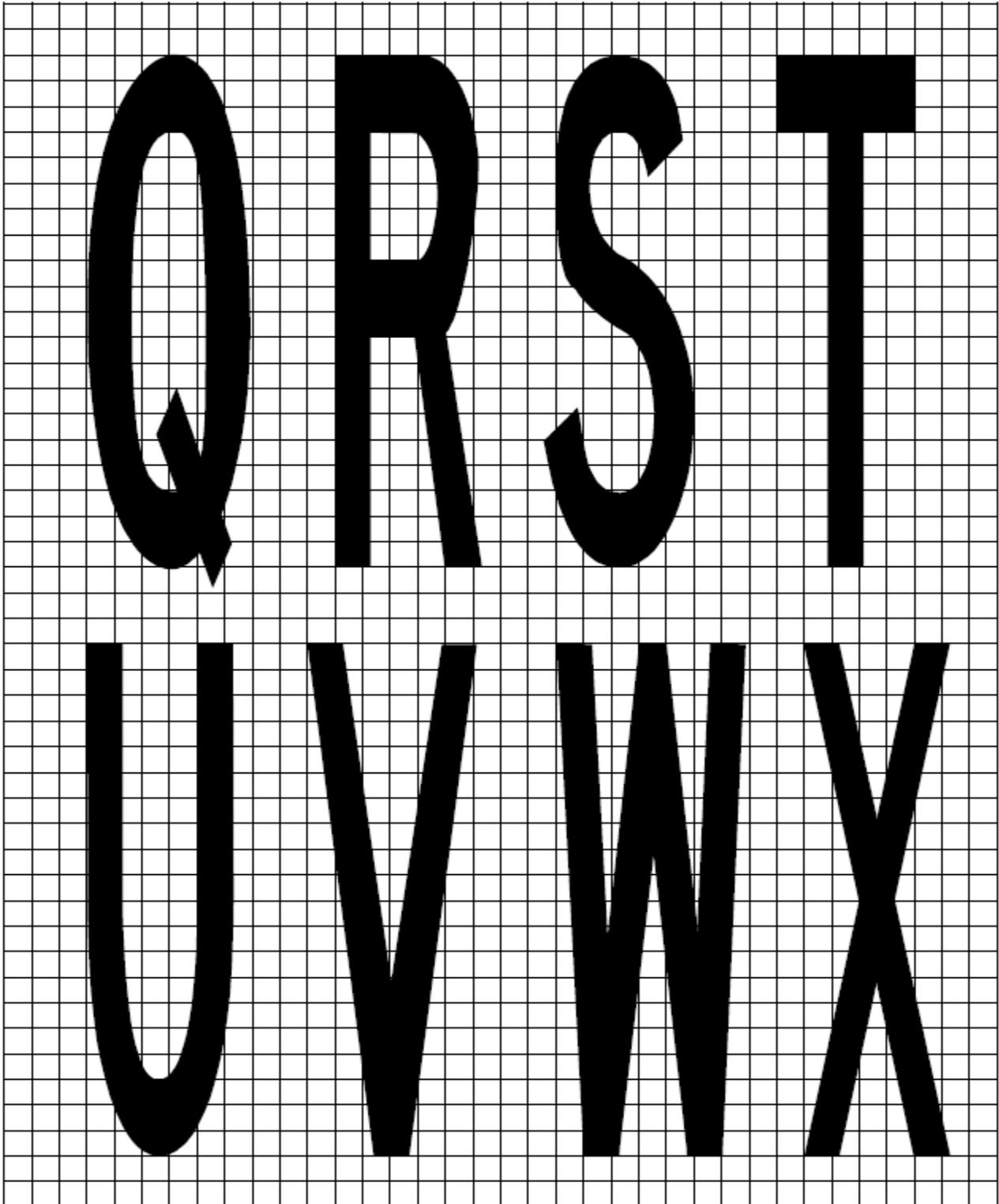


Figure L-10C. Mandatory instruction marking inscription form and proportions

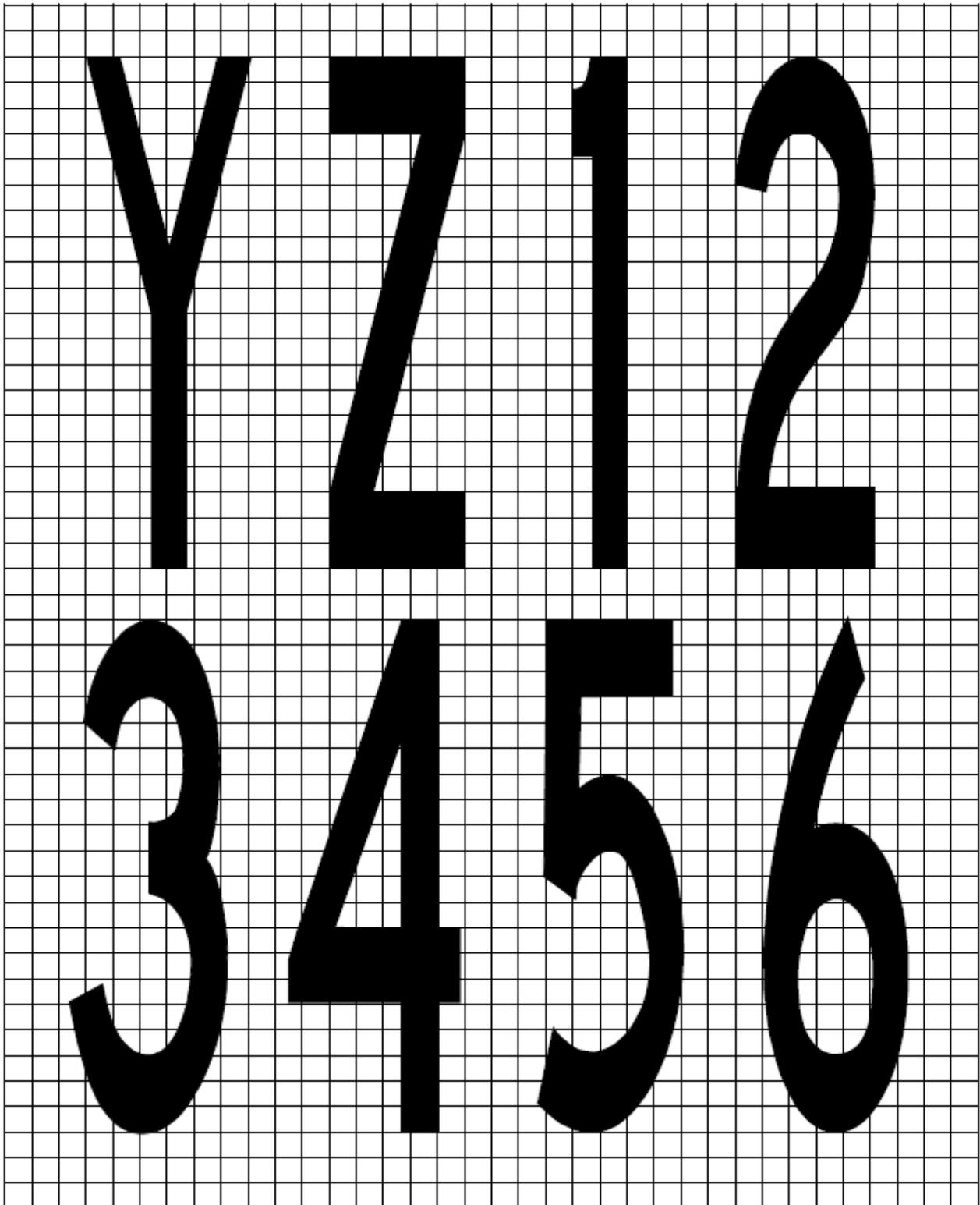


Figure L-10D. Mandatory instruction marking inscription form and proportions

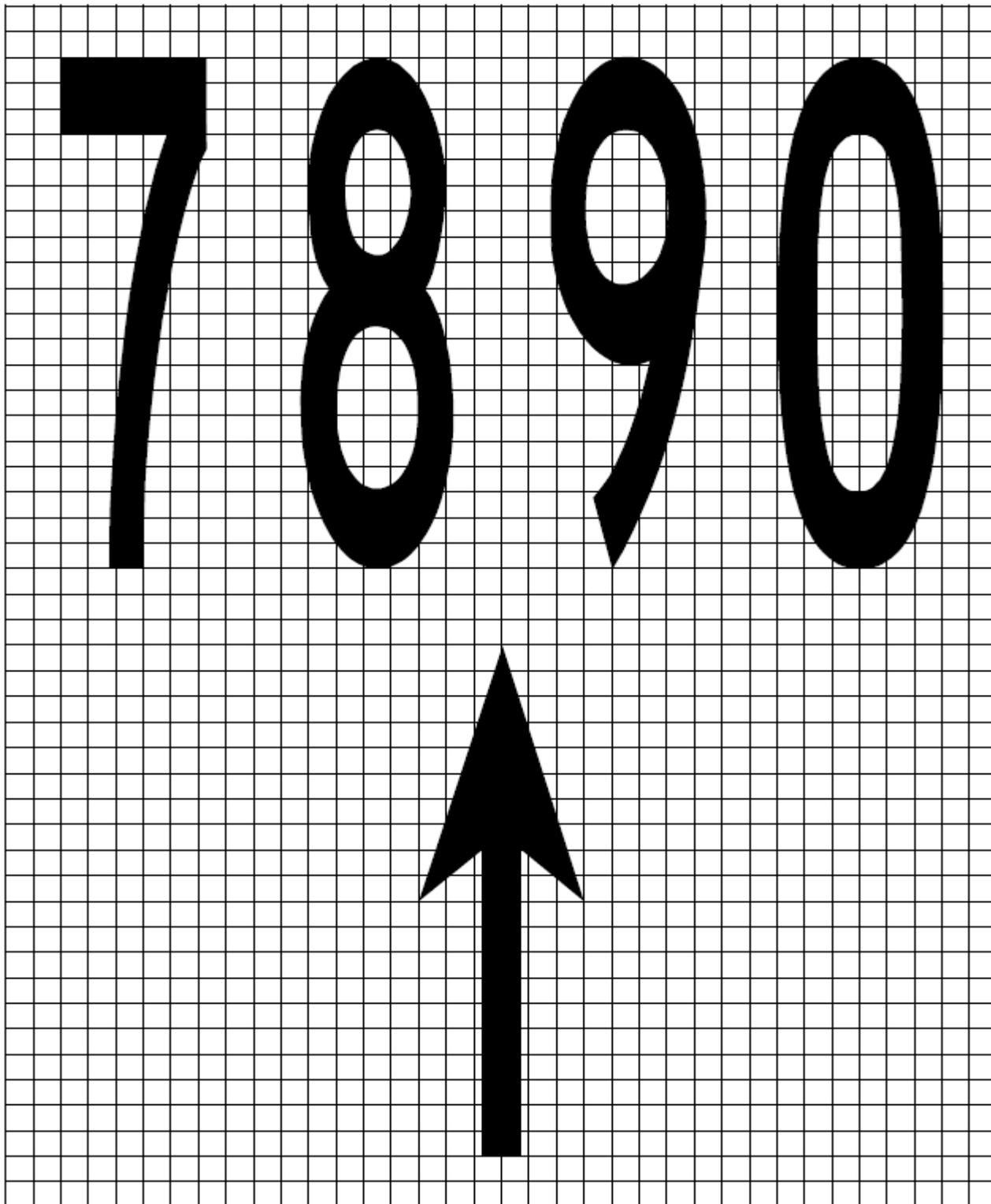


Figure L-10E. Mandatory instruction marking inscription form and proportions

CHAPTER M — VISUAL AIDS FOR NAVIGATION (LIGHTS)**CS ADR-DSN.M.615 General**

(a) Elevated approach lights:

- (1) Elevated approach lights and their supporting structures should be frangible except that, in that portion of the approach lighting system beyond 300 m from the threshold:
 - (1) where the height of a supporting structure exceeds 12 m, the frangibility requirement should apply to the top 12 m only; and
 - (2) where a supporting structure is surrounded by non-frangible objects, only that part of the structure that extends above the surrounding objects should be frangible.
- (2) When an approach light fixture or supporting structure is not in itself sufficiently conspicuous, it should be suitably marked.

(b) Elevated lights:

Elevated runway, stopway, and taxiway lights should be frangible. Their height should be sufficiently low to preserve clearance for propellers and for the engine pods of jet aircraft.

(c) Surface lights:

- (1) Light fixtures inset in the surface of runways, stopways, taxiways, and aprons should be so designed and fitted as to withstand being run over by the wheels of an aircraft without damage either to the aircraft or to the lights themselves.
- (2) The temperature produced by conduction or radiation at the interface between an installed inset light and an aircraft tire should not exceed 160°C during a 10-minute period of exposure.

(d) Light intensity and control:

- (1) Whatever the light sources that are used in aerodrome lighting, they should be in accordance with general specifications included in Books 1 & 2 for aerodrome ground lighting characteristics.
- (2) The intensity of runway lighting should be adequate for the minimum conditions of visibility and ambient light in which use of the runway is intended, and compatible with that of the nearest section of the approach lighting system when provided.
- (3) Where a high-intensity lighting system is provided, a suitable intensity control should be incorporated to allow for adjustment of the light intensity to meet the prevailing conditions. Separate intensity controls or other suitable methods should be provided to ensure that the following systems when installed, can be operated at compatible intensities:
 - (i) approach lighting system;
 - (ii) runway edge lights;
 - (iii) runway threshold lights;
 - (iv) runway end lights;
 - (v) runway centre line lights;

CS ADR DSN – BOOK 1

CHAPTER M – VISUAL AIDS FOR NAVIGATION (LIGHTS)

- (vi) runway touchdown zone lights; and
 - (vii) taxiway centre line lights.
- (4) On the perimeter of and within the ellipse defining the main beam in CS ADR-DSN.U.940, the maximum light intensity value should not be greater than three times the minimum light intensity value measured in accordance with CS ADR-DSN.U.940.

On the perimeter of and within the rectangle defining the main beam in CS ADR-DSN.U.940, the maximum light intensity value should not be greater than three times the minimum light intensity value measured in accordance with CS ADR-DSN.U.940.

CS ADR-DSN.M.620 Aeronautical beacons

(a) General

- (1) When operationally necessary as when non-precision and/or non-instrument operations are in use, an aerodrome beacon or identification beacon should be provided at each aerodrome intended for use at night.
- (2) The operational requirement should be determined having regard to the requirements of the air traffic using the aerodrome, the conspicuity of the aerodrome features in relation to its surroundings, and the installation of other visual and non-visual aids useful in locating the aerodrome.

(b) Aerodrome beacon

(1) Applicability

An aerodrome beacon should be provided at an aerodrome intended for use at night if aircraft navigate predominantly by visual means and one or more of the following conditions exist:

- (i) reduced visibilities are frequent; or
- (ii) it is difficult to locate the aerodrome from the air due to surrounding lights or terrain.

(2) Location

- (i) The aerodrome beacon should be located on or adjacent to the aerodrome in an area of low ambient background lighting.
- (ii) The location of the beacon should be such that the beacon is not shielded by objects in significant directions and does not dazzle a pilot approaching to land.

(3) Characteristics

- (i) The aerodrome beacon should show either coloured flashes alternating with white flashes or white flashes only.
- (ii) The frequency of total flashes should be from 20 to 30 per minute.
- (iii) The light from the beacon should show at all angles of azimuth. The vertical light distribution should extend upwards from an elevation of not more than 1° to an elevation sufficient to provide guidance at the maximum elevation at which the beacon is intended to be used, and the effective intensity of the flash should be not less than 2 000 cd.

CS ADR DSN — BOOK 1

CHAPTER M — VISUAL AIDS FOR NAVIGATION (LIGHTS)

- (iv) At locations where a high ambient background lighting level cannot be avoided, the effective intensity of the flash should be required to be increased by a factor up to a value of 10.
- (c) Identification beacon
 - (1) Applicability

An identification beacon should be provided at an aerodrome which is intended for use at night and cannot be easily identified from the air by other means.
 - (2) Location
 - (i) The identification beacon should be located on the aerodrome in an area of low ambient background lighting.
 - (ii) The location of the beacon should be such that the beacon is not shielded by objects in significant directions and does not dazzle a pilot approaching to land.
 - (3) Characteristics
 - (i) An identification beacon at a land aerodrome should show at all angles of azimuth. The vertical light distribution should extend upwards from an elevation of not more than 1° to an elevation sufficient to provide guidance at the maximum elevation at which the beacon is intended to be used, and the effective intensity of the flash should be not less than 2 000 cd.
 - (ii) At locations where a high ambient background lighting level cannot be avoided, the effective intensity of the flash should be required to be increased by a factor up to a value of 10.
 - (iii) An identification beacon should show flashing-green.
 - (iv) The identification characters should be transmitted in the International Morse Code.
 - (v) The speed of transmission should be between six and eight words per minute, the corresponding range of duration of the Morse dots being from 0.15 to 0.2 seconds per dot.

SECTION 1 — APPROACH LIGHTING SYSTEMS**CS ADR-DSN.M.625 Approach lighting systems, general and applicability**

- (a) The safety objective of the approach lighting system is to provide visual guidance for alignment and roll, and limited distance-to-go information to enable safe approach to a runway.
- (b) Non-instrument runway

Where physically practicable, a simple approach lighting system as specified in CS ADR-DSN.M.626 should be provided to serve a non-instrument runway where the code number is 3 or 4, and intended for use at night, except when the runway is used only in conditions of good visibility, and sufficient guidance is provided by other visual aids.
- (c) Non-precision approach runway

Where physically practicable, a simple approach lighting system specified in CS ADR-DSN.M.626 should be provided to serve a non-precision approach runway, except when

the runway is used only in conditions of good visibility or sufficient guidance is provided by other visual aids.

(d) Precision approach runway category I

Where physically practicable, a precision approach category I lighting system as specified in CS ADR-DSN.M.630 should be provided to serve a precision approach runway category I.

(e) Precision approach runway categories II and III

A precision approach category II and III lighting system as specified in CS ADR-DSN.M.635 should be provided to serve a precision approach runway category II or III.

CS ADR-DSN.M.626 Simple approach lighting systems

(a) Location and composition:

- (1) A simple approach lighting system should consist of a row of lights on the extended centre line of the runway extending whenever possible, over a distance of not less than 420 m from the threshold with a row of lights forming a crossbar 18 m or 30 m in length at a distance of 300 m from the threshold.
- (2) The specifications in Books 1 & 2 provide for the basic characteristics for simple approach lighting systems are shown in Figure M-1. For certain aspects of these systems, some latitude is permitted, for example, in the spacing between centre line lights and crossbars.
- (3) The approach lighting configuration is to be provided irrespective of the location of the threshold, i.e. whether the threshold is at the extremity of the runway or displaced from the runway extremity. In both cases, the approach lighting system should extend up to the threshold. However, in the case of a displaced threshold, inset lights are used from the runway extremity up to the threshold to obtain the specified configuration. These inset lights are designed to satisfy the structural requirements specified in CS ADR.DSN.M.615(c)(2) and the chromaticity and characteristics specified in CS ADR-DSN.U.930 and CS ADR-DSN.U.940.

(b) Crossbar lights:

- (1) The lights forming the crossbar should be as close as practicable in a horizontal straight line at right angles to, and bisected by, the line of the centre line lights.
- (2) The lights of the crossbar should be spaced so as to produce a linear effect, except that, when a crossbar of 30 m is used, gaps may be left on each side of the centre line. These gaps should be kept to a minimum to meet local requirements, and each should not exceed 6 m.
- (3) Spacings for the crossbar lights between 1 m and 4 m are in use. Gaps on each side of the centre line may improve directional guidance when approaches are made with a lateral error, and facilitate the movement of rescue and firefighting vehicles.

(c) Centre line lights:

- (1) The lights forming the centre line should be placed at longitudinal intervals of 60 m, except that when it is desired to improve the guidance, an interval of 30 m may be used.
- (2) The innermost light should be located either 60 m or 30 m from the threshold, depending on the longitudinal interval selected for the centre line lights. If it is not physically possible to provide a centre line extending for a distance of 420 m from

the threshold, it should be extended to 300 m so as to include the crossbar. If this is not possible, the centre line lights should be extended as far as practicable, and each centre line light should then consist of a barrette at least 3 m in length. Subject to the approach system having a crossbar at 300 m from the threshold, an additional crossbar may be provided at 150 m from the threshold.

- (3) The system should lie as nearly as practicable in the horizontal plane passing through the threshold, provided that:
- (i) no object other than an ILS or MLS azimuth antenna should protrude through the plane of the approach lights within a distance of 60 m from the centre line of the system; and
 - (ii) no light other than a light located within the central part of a crossbar or a centre line barrette, excluding their extremities, should be screened from an approaching aircraft.

Any ILS or MLS azimuth antenna protruding through the plane of the lights should be treated as an obstacle, and marked and lighted accordingly as specified in the requirements for obstacle marking and lighting.

(d) Characteristics:

- (1) The lights of a simple approach lighting system should be fixed lights and the colour of the lights should be such as to ensure that the system is readily distinguishable from other aeronautical ground lights, and from extraneous lighting if present, but should be preferably fixed lights showing variable white. Each centre line light should consist of either:
- (i) a single source; or
 - (ii) a barrette at least 3 m in length.

- (d) It may be advisable to use barrettes 4 m in length if it is anticipated that the simple approach lighting system should be developed into a precision approach lighting system.
- (e) Where provided for a non-instrument runway, the lights should show at all angles in azimuth necessary to a pilot on base leg and final approach. The intensity of the lights should be adequate for all conditions of visibility and ambient light for which the system has been provided.
- (f) Where provided for a non-precision approach runway, the lights should show at all angles in azimuth necessary to the pilot of an aircraft which on final approach does not deviate by an abnormal amount from the path defined by the non-visual aid. The lights should be designed to provide guidance during both day and night in the most adverse conditions of visibility and ambient light for which it is intended that the system should remain usable.

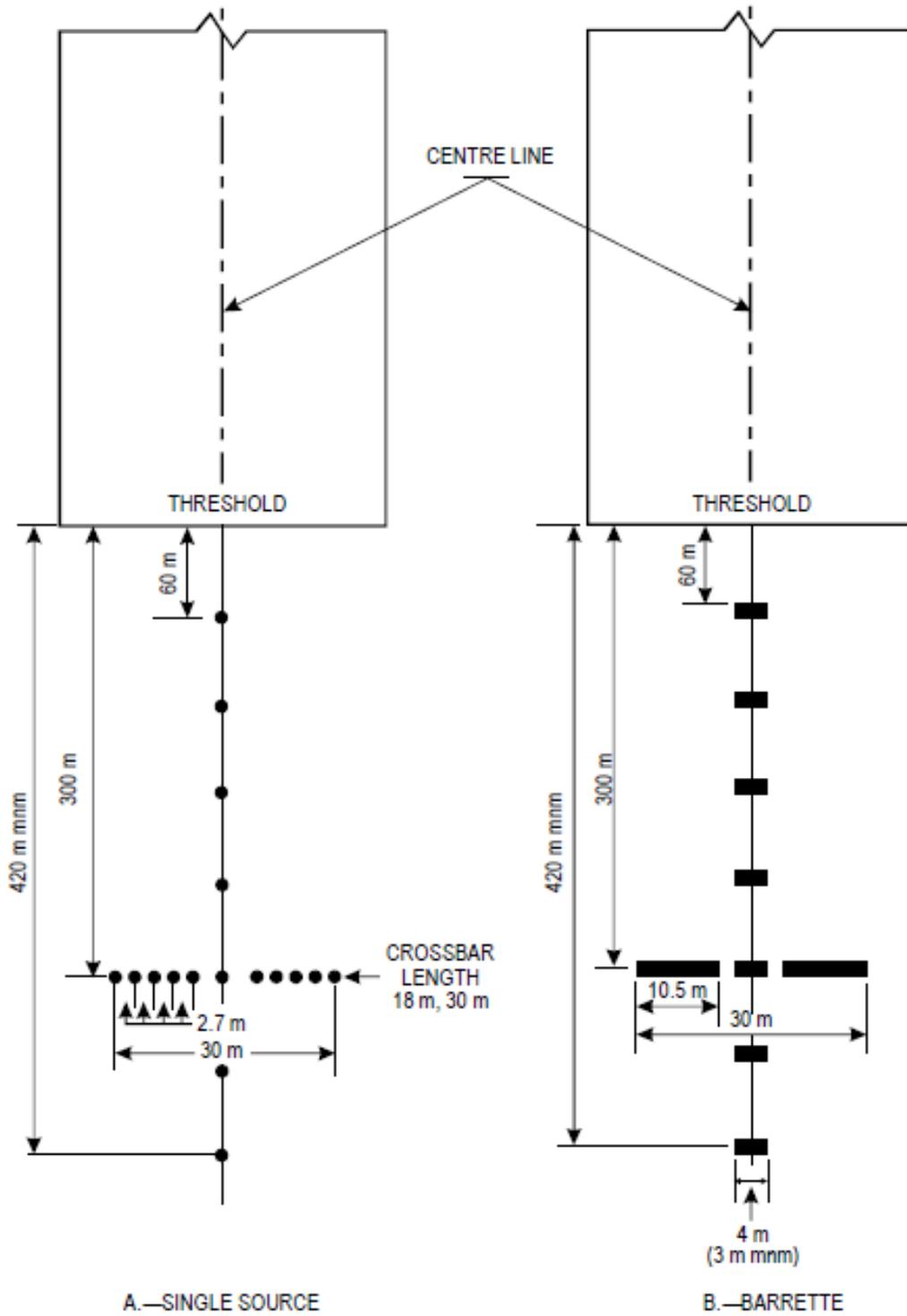


Figure M-1. Simple approach lighting systems

CS ADR-DSN.M.630 Precision approach category I lighting system

- (a) The safety objective of the approach lighting system is to provide visual guidance for alignment and roll, and limited distance-to-go information to enable safe approach to a runway.
- (b) Location and composition
- (1) General: A precision approach category I lighting system should consist of a row of lights on the extended centre line of the runway extending wherever possible, over a distance of 900 m from the runway threshold with a row of lights forming a crossbar 30 m in length at a distance of 300 m from the runway threshold.
 - (2) Crossbar lights: The lights forming the crossbar should be as close as practicable in a horizontal straight line at right angles to, and bisected by, the line of the centre line lights. The lights of the crossbar should be spaced so as to produce a linear effect, except that gaps may be left on each side of the centre line. These gaps should be kept to a minimum to meet local requirements and each should not exceed 6 m.
 - (3) Centre line lights: The lights forming the centre line should be placed at longitudinal intervals of 30 m with the innermost light located 30 m from the threshold.
 - (4) The system should lie as nearly as practicable in the horizontal plane passing through the threshold, provided that:
 - (i) no object other than an ILS or MLS azimuth antenna should protrude through the plane of the approach lights within a distance of 60 m from the centre line of the system; and
 - (ii) no light other than a light located within the central part of a crossbar or a centre line barrette (not their extremities) should be screened from an approaching aircraft.
 - (iii) Any ILS or MLS azimuth antenna protruding through the plane of the lights should be treated as an obstacle and marked and lighted accordingly.
- (c) Characteristics:
- (1) The centre line and crossbar lights of a precision approach category I lighting system should be fixed lights showing variable white. Each centre line light position should consist of either:
 - (i) a single light source in the innermost 300 m of the centre line, two light sources in the central 300 m of the centre line, and three light sources in the outer 300 m of the centre line to provide distance information; or
 - (ii) a barrette.
 - (2) Where the serviceability level of the approach lights specified as a maintenance objective in CS ADR-DSN.S.895 can be demonstrated, each centre line light position should consist of either:
 - (i) a single light source; or
 - (ii) a barrette.

When barrettes are composed of lights approximating to point sources, the lights should be uniformly spaced at intervals of not more than 1.5 m. The barrettes should be at least 4 m in length.
 - (3) If the centre line consists of lights as described in M.630(c)(1)(i) or M.630(c)(2)(i) above, additional crossbars of lights to the crossbar provided at 300 m from the

threshold should be provided at 150 m, 450 m, 600 m and 750 m from the threshold. The lights forming each crossbar should be as nearly as practicable in a horizontal straight line at right angles to, and bisected by, the line of the centre line lights. The lights should be spaced so as to produce a linear effect, except that gaps may be left on each side of the centre line. These gaps should be kept to a minimum to meet local requirements and each should not exceed 6 m.

- (4) Where the additional crossbars are incorporated in the system, the outer ends of the crossbars should lie on two straight lines that either are parallel to the line of the centre line lights or converge to meet the runway centre line 300 m upwind from threshold.
- (5) The chromaticity and characteristics of lights should be in accordance with the specifications of CS ADR-DSN.U.930 and CS ADR-DSN.U.940.
- (6) If the centre line consists of barrettes as described in M.630(c)(1)(ii) or M.630(c)(2)(ii), each barrette should be supplemented by a capacitor discharge light, except where such lighting is considered unnecessary taking into account the characteristics of the system, and the nature of the meteorological conditions.
- (7) Each capacitor discharge light as described in M.630(c)(6) should be flashed twice a second in sequence, beginning with the outermost light and progressing toward the threshold to the innermost light of the system. The design of the electrical circuit should be such that these lights can be operated independently of the other lights of the approach lighting system.

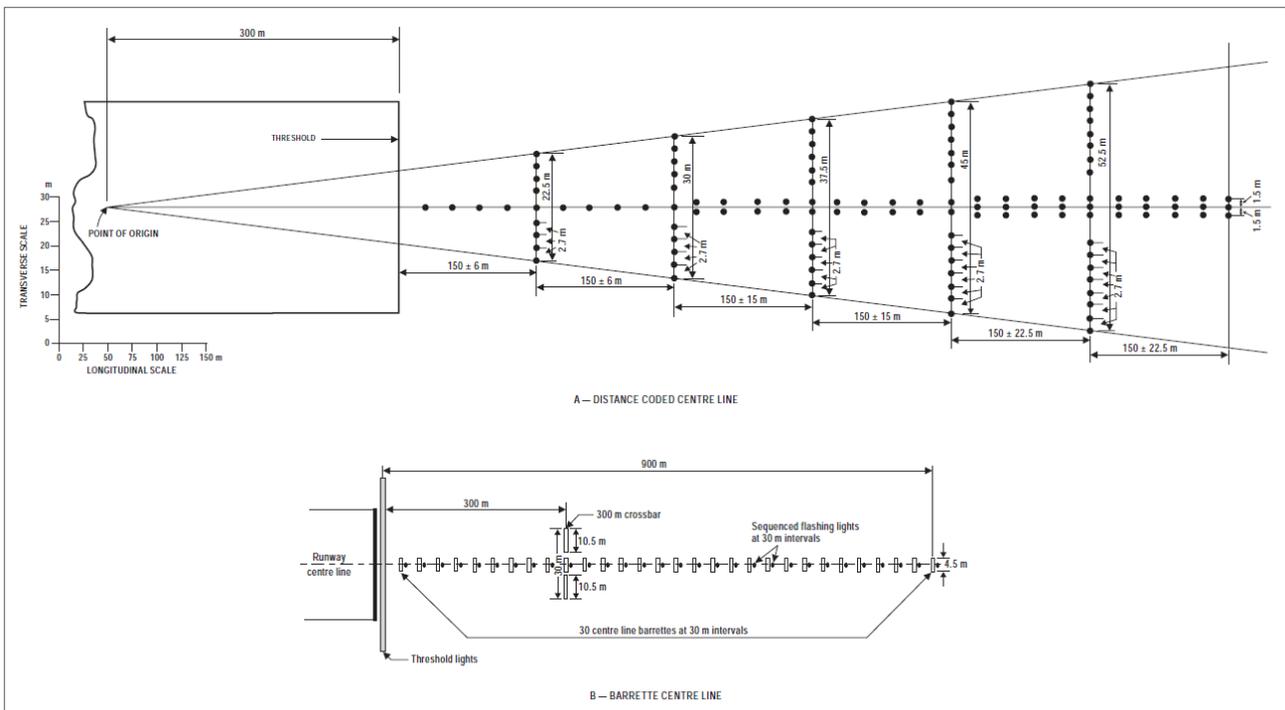


Figure M-2. Precision approach category I lighting systems

CS ADR-DSN.M.635 Precision approach category II and III lighting system

(a) Location and composition:

- (1) The approach lighting system should consist of a row of lights on the extended centre line of the runway, extending wherever possible, over a distance of 900 m from the runway threshold. In addition, the system should have two side rows of lights, extending 270 m from the threshold, and two crossbars, one at 150 m and one at 300 m from the threshold, all as shown in Figure M-3A. Where the serviceability level of the approach lights specified as maintenance objectives in CS ADR-DSN.S.895 can be demonstrated, the system may have two side rows of lights extending 240 m from the threshold, and two crossbars, one at 150 m, and one at 300 m from the threshold, all as shown in Figure M-3B.
- (2) The lights forming the centre line should be placed at longitudinal intervals of 30 m with the innermost lights located 30 m from the threshold.
- (3) The lights forming the side rows should be placed on each side of the centre line, at a longitudinal spacing equal to that of the centre line lights and with the first light located 30 m from the threshold. Where the serviceability level of the approach lights specified as maintenance objectives can be demonstrated, lights forming the side rows may be placed on each side of the centre line, at a longitudinal spacing of 60 m with the first light located 60 m from the threshold. The lateral spacing (or gauge) between the innermost lights of the side rows should be not less than 18 m nor more than 22.5 m, and preferably 18 m, but in any event should be equal to that of the touchdown zone lights.
- (4) The crossbar provided at 150 m from the threshold should fill in the gaps between the centre line and side row lights.
- (5) The crossbar provided at 300 m from the threshold should extend on both sides of the centre line lights to a distance of 15 m from the centre line.
- (6) If the centre line beyond a distance of 300 m from the threshold consists of lights as described in M.635(b)(2)(ii) and M.635(b)(2)(ii) below, additional crossbars of lights should be provided at 450 m, 600 m and 750 m from the threshold. Where the additional crossbars described are incorporated in the system, the outer ends of these crossbars should lie on two straight lines that either are parallel to the centre line or converge to meet the runway centre line 300 m from the threshold.
- (7) The system should lie as nearly as practicable in the horizontal plane passing through the threshold, provided that:
 - (i) no object other than an ILS or MLS azimuth antenna should protrude through the plane of the approach lights within a distance of 60 m from the centre line of the system; and
 - (ii) no light other than a light located within the central part of a crossbar or a centre line barrette (not their extremities) should be screened from an approaching aircraft.
 - (iii) Any ILS or MLS azimuth antenna protruding through the plane of the lights should be treated as an obstacle and marked and lighted accordingly.

(b) Characteristics:

- (1) The centre line of a precision approach category II and III lighting system for the first 300 m from the threshold should consist of barrettes showing variable white, except that where the threshold is displaced 300 m or more, the centre line may consist of single light sources showing variable white. Where the serviceability level of the approach lights specified in CS ADR.DSN.S.895 can be demonstrated, the centre line of a precision approach category II and III lighting system for the first 300 m from the threshold may consist of:

CS ADR DSN — BOOK 1

CHAPTER M — VISUAL AIDS FOR NAVIGATION (LIGHTS)

- (i) barrettes where the centre line beyond 300 m from the threshold consists of barrettes as described in M.635(b)(3)(i);
 - (ii) alternate single light sources and barrettes, where the centre line beyond 300 m from the threshold consists of single light sources as described in M.635(b)(3)(ii) below, with the innermost single light source located 30 m and the innermost barrette located 60 m from the threshold; or
 - (iii) single light sources where the threshold is displaced 300 m or more;
all of which should show variable white.
- (2) Beyond 300 m from the threshold each centre line light position should consist of either:
- (i) a barrette as used on the inner 300 m; or
 - (ii) two light sources in the central 300 m of the centre line, and three light sources in the outer 300 m of the centre line;
all of which should show variable white.
- (3) Where the serviceability level of the approach lights in CS ADR.DSN.S.895 as maintenance objectives can be demonstrated beyond 300 m from the threshold, each centre line light position may consist of either:
- (i) a barrette; or
 - (ii) a single light source;
all of which should show variable white.
- (4) The barrettes should be at least 4 m in length. When barrettes are composed of lights approximating to point sources, the lights should be uniformly spaced at intervals of not more than 1.5 m.
- (5) If the centre line beyond 300 m from the threshold consists of barrettes as described in M.635(b)(2)(i) and M.635(b)(3)(i), each barrette beyond 300 m should be supplemented by a capacitor discharge light, except where such lighting is considered unnecessary taking into account the characteristics of the system and the nature of the meteorological conditions.
- (6) Each capacitor discharge light should be flashed twice a second in sequence, beginning with the outermost light and progressing toward the threshold to the innermost light of the system. The design of the electrical circuit should be such that these lights can be operated independently of the other lights of the approach lighting system.
- (7) The side row should consist of barrettes showing red. The length of a side row barrette and the spacing of its lights should be equal to those of the touchdown zone light barrettes.
- (8) The lights forming the crossbars should be fixed lights showing variable white. The lights should be uniformly spaced at intervals of not more than 2.7 m.
- (9) The intensity of the red lights should be compatible with the intensity of the white lights.
- (10) The lights should be in accordance with the specifications of CS ADR-DSN.U.940, Figures U-5 and U-6.

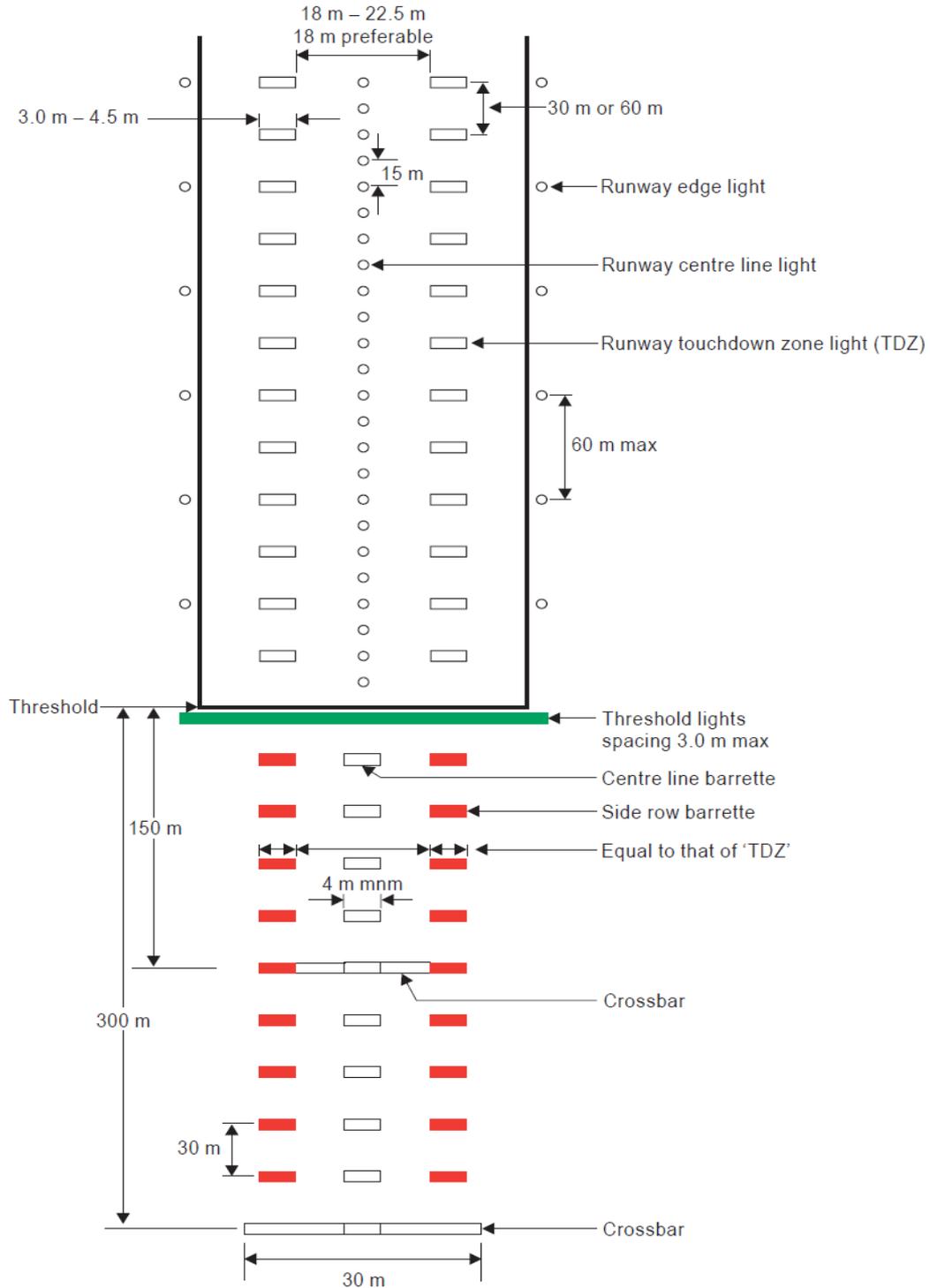


Figure M-3A. Inner 300 m approach and runway lighting for precision approach runways, categories II and III

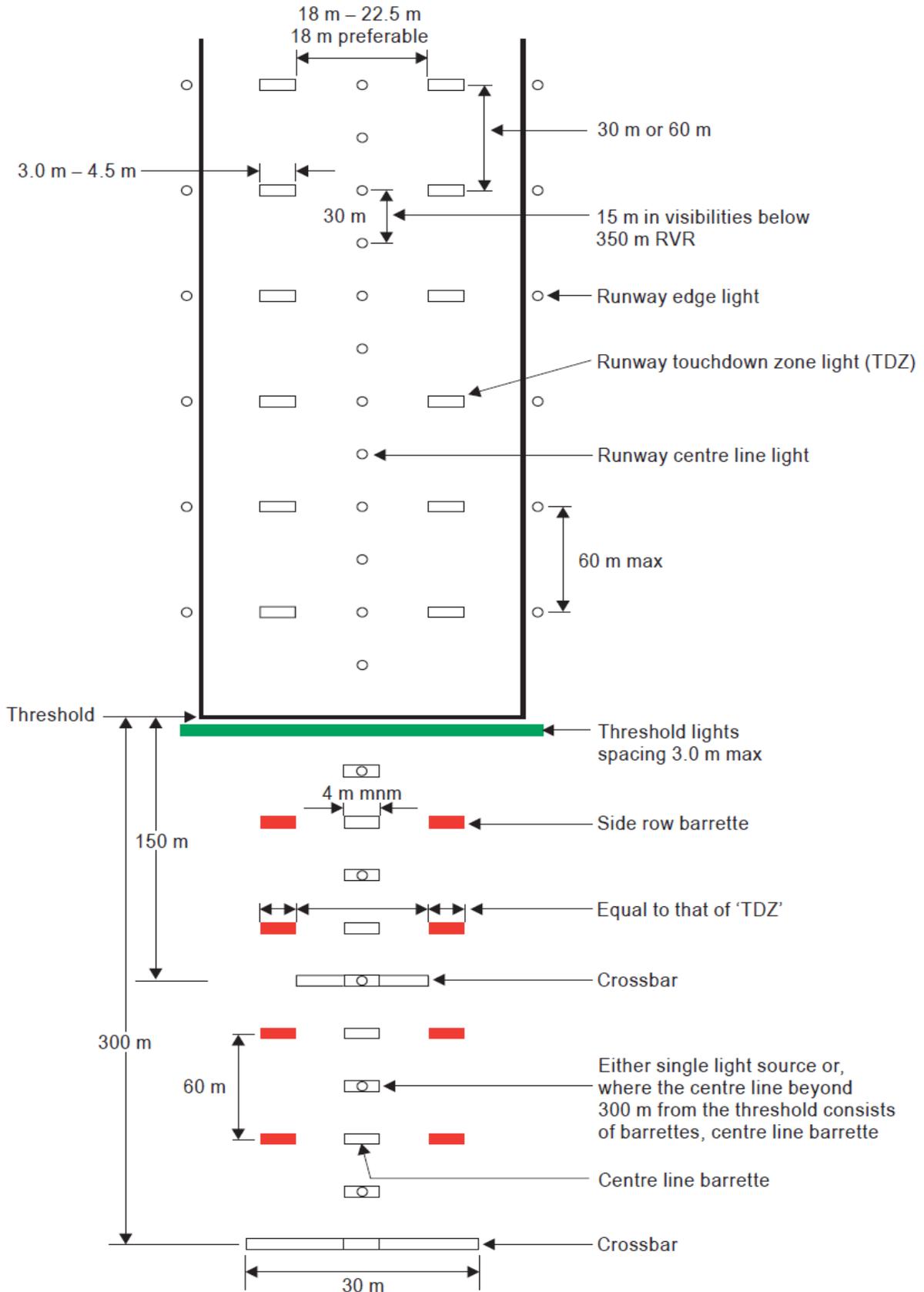


Figure M-3B. Inner 300 m approach and runway lighting for precision approach runways,

categories II and III

SECTION 2 — VISUAL APPROACH SLOPE INDICATOR SYSTEMS

CS ADR-DSN.M.640 Visual approach slope indicator systems

The safety objective of visual approach slope indicators is to provide information on the approach angle necessary to maintain a safe height over obstacles and threshold.

- (a) A visual approach slope indicator system should be provided to serve the approach to a runway whether or not the runway is served by other visual approach aids or by non-visual aids where one or more of the following conditions exist:
- (1) the runway is used by turbojet or other aeroplanes with similar approach guidance requirements;
 - (2) the pilot of any type of aeroplane may have difficulty in judging the approach due to:
 - (i) inadequate visual guidance such as is experienced during an approach over water or featureless terrain by day or in the absence of sufficient extraneous lights in the approach area by night; or
 - (ii) misleading information such as is produced by deceptive surrounding terrain or runway slopes.
 - (3) the presence of objects in the approach area may involve serious hazard if an aeroplane descends below the normal approach path, particularly if there are no non-visual or other visual aids to give warning of such objects;
 - (4) physical conditions at either end of the runway present a serious hazard in the event of an aeroplane undershooting or overrunning the runway; and
 - (5) terrain or prevalent meteorological conditions are such that the aeroplane may be subjected to unusual turbulence during approach.
- (b) The standard visual approach slope indicator systems should consist of PAPI and APAPI systems conforming to the specifications contained in Books 1 & 2 as shown in Figure M-4.
- (c) PAPI should be provided where the code number is 3 or 4 when one or more of the conditions specified in paragraph (a) above exist.
- (d) PAPI or APAPI should be provided where the code number is 1 or 2 when one or more of the conditions specified in paragraph (a) above exist.

CS ADR-DSN.M.645 PAPI and APAPI

- (a) A PAPI or APAPI should be provided as specified in Books 1 & 2.
- (b) Definition and positioning:

The PAPI system should consist of a wing bar of 4 sharp transition multi-lamp (or paired single lamp) units equally spaced. The system should be located on the left side of the runway unless it is physically impracticable to do so. Where a runway is used by aircraft requiring visual roll guidance which is not provided by other external means, then a second wing bar may be provided on the opposite side of the runway for PAPI or APAPI.

CS ADR DSN — BOOK 1

CHAPTER M — VISUAL AIDS FOR NAVIGATION (LIGHTS)

- (1) The APAPI system should consist of a wing bar of 2 sharp transition multi-lamp (or paired single lamp) units. The system should be located on the left side of the runway unless it is physically impracticable to do so.
 - (2) The wing bar of a PAPI should be constructed and arranged in such a manner that a pilot making an approach should:
 - (i) when on or close to the approach slope, see the two units nearest the runway as red and the two units farthest from the runway as white;
 - (ii) when above the approach slope, see the one unit nearest the runway as red and the three units farthest from the runway as white; and when further above the approach slope, see all the units as white; and
 - (iii) when below the approach slope, see the three units nearest the runway as red and the unit farthest from the runway as white; and when further below the approach slope, see all the units as red.
 - (3) The wing bar of an APAPI should be constructed and arranged in such a manner that a pilot making an approach should:
 - (i) when on or close to the approach slope, see the unit nearer the runway as red and the unit farther from the runway as white;
 - (ii) when above the approach slope, see both the units as white; and
 - (iii) when below the approach slope, see both the units as red.
 - (4) The light units should be located as in the basic configuration illustrated in Figure M-4, subject to the installation tolerances given below. The units forming a wing bar should be mounted so as to appear to the pilot of an approaching aeroplane to be substantially in a horizontal line. The light units should be mounted as low as possible and should be frangible.
- (c) Characteristics:
- (1) The system should be suitable for both day and night operations.
 - (2) Colour:
 - (i) The colour transition from red to white in the vertical plane should be such as to appear to an observer, at a distance of not less than 300 m, to occur within a vertical angle of not more than 3'.
 - (ii) At full intensity the red light should have a Y coordinate not exceeding 0.320.
 - (3) Intensity:
 - (i) The light intensity distribution of the light units should be as shown in CS ADR-DSN.U.940.
 - (ii) Suitable intensity control should be provided so as to allow adjustment to meet the prevailing conditions and to avoid dazzling the pilot during approach and landing.
 - (4) Light orientation: Each light unit should be capable of adjustment in elevation so that the lower limit of the white part of the beam may be fixed at any desired angle of elevation between 1°30' and at least 4°30' above the horizontal.
 - (5) Other characteristics: The light units should be so designed that deposits of condensation, snow, ice, dirt, or other contaminants, on optically transmitting or reflecting surfaces should interfere to the least possible extent with the light signals and should not affect the contrast between the red and white signals and the elevation of the transition sector.

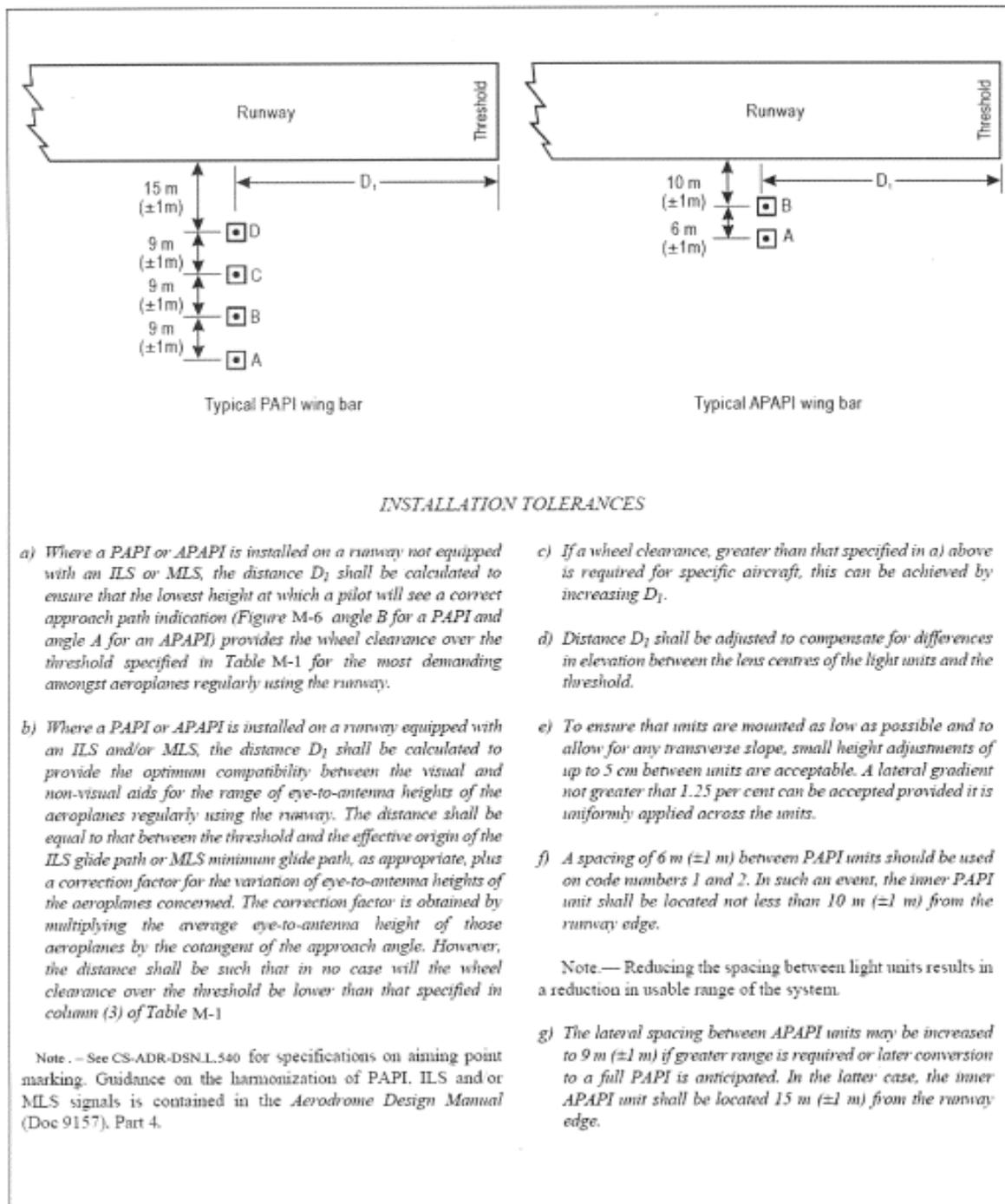


Figure M-4. Siting of PAPI and APAPI

CS ADR-DSN.M.650 Approach slope and elevation setting of light units

(a) Approach slope:

- (1) The approach slope as defined in Figure M-5, should be used by the aeroplanes in the approach.

- (2) When the runway is equipped with an ILS and/or MLS, the siting and the angle of elevation of the light units should be such that the visual approach slope conforms as closely as possible with the glide path of the ILS and/or the minimum glide path of the MLS, as appropriate.
- (b) Elevation setting of light units
- (1) The angle of elevation settings of the light units in a PAPI wing bar should be such that, during an approach, the pilot of an aeroplane observing a signal of one white and three reds should clear all objects in the approach area by a safe margin.
 - (2) The angle of elevation settings of the light units in an APAPI wing bar should be such that, during an approach, the pilot of an aeroplane observing the lowest on-slope signal, i.e. one white and one red, should clear all objects in the approach area by a safe margin.
 - (3) The azimuth spread of the light beam should be suitably restricted where an object located outside the obstacle protection surface of the PAPI or APAPI system but within the lateral limits of its light beam, is found to extend above the plane of the obstacle protection surface and an aeronautical study indicates that the object could adversely affect the safety of operations. The extent of the restriction should be such that the object remains outside the confines of the light beam.
 - (4) Where wing bars are installed on each side of the runway to provide roll guidance, corresponding units should be set at the same angle so that the signals of each wing bar change symmetrically at the same time.

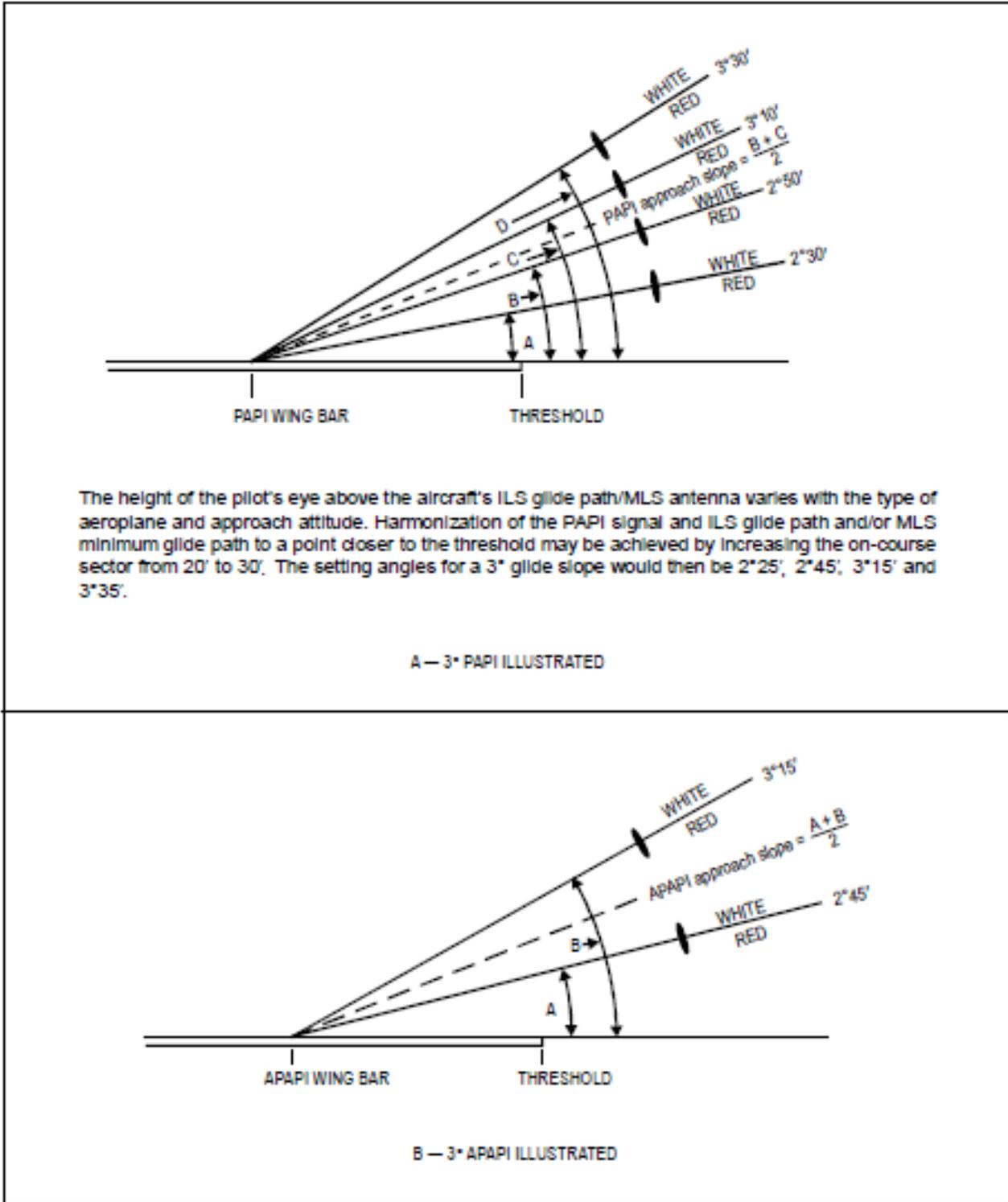


Figure M-5. Light beams and angle of elevation setting of PAPI and APAPI

CS ADR-DSN.M.655 Obstacle protection surface for PAPI and APAPI

(a) Applicability:

An obstacle protection surface should be established when it is intended to provide a visual approach slope indicator system.

(b) Characteristics:

The characteristics of the obstacle protection surface, i.e. origin, divergence, length, and slope should correspond to those specified in the relevant column of Table M-2 and in Figure M-6.

(c) New objects or extensions of existing objects above a protection surface: New objects or extensions of existing objects should not be permitted above an obstacle protection surface except when the new object or extension would be shielded by an existing immovable object, or after aeronautical study, it is determined that the object would not adversely affect the safety of operations of aeroplanes.

(d) Where an aeronautical study indicates that an existing object extending above an obstacle protection surface could adversely affect the safety of operations of aeroplanes one or more of the following measures should be taken:

- (1) suitably raise the approach slope of the system;
- (2) reduce the azimuth spread of the system so that the object is outside the confines of the beam;
- (3) displace the axis of the system and its associated obstacle protection surface by no more than 5°;
- (4) suitably displace the threshold; and
- (5) where (4) is found to be impracticable, suitably displace the system upwind of the threshold to provide an increase in threshold crossing height equal to the height of the object penetration.

Eye-to-wheel height of aeroplane in the approach configuration ^a	Desired wheel clearance (metres) ^{b, c}	Minimum wheel clearance (metres) ^d
(1)	(2)	(3)
up to but not including 3 m	6	3 ^e
3 m up to but not including 5 m	9	4
5 m up to but not including 8 m	9	5
8 m up to but not including 14 m	9	6

- a. In selecting the eye-to-wheel height group, only aeroplanes meant to use the system on a regular basis should be considered. The most demanding amongst such aeroplanes should determine the eye-to-wheel height group.
- b. Where practicable, the desired wheel clearances shown in column (2) should be provided.
- c. The wheel clearances in column (2) should be reduced to no less than those in column (3) where an aeronautical study indicates that such reduced wheel clearances are acceptable.
- d. When a reduced wheel clearance is provided at a displaced threshold, it should be ensured that the corresponding desired wheel clearance specified in column (2) should be available when an aeroplane at the top end of the eye-to-wheel height group chosen overflies the extremity of the runway.
- e. This wheel clearance should be reduced to 1.5 m on runways used mainly by light-weight non-turbo-jet aeroplanes.

Table M-1. PAPI and APAPI tolerances, wheel clearance over threshold for PAPI and APAPI (see Note (a) in Figure M-4)

Table M-2. Dimensions and slopes of the obstacle protection surface								
	Runway type/code number							
	Non-instrument				Instrument			
	Code number				Code number			
Surface dimensions	1	2	3	4	1	2	3	4
Length of inner edge	60 m	80 m	150 m	150 m	150 m	150 m	300 m	300 m
Distance from threshold	30 m	60 m	60 m	60 m	60 m	60 m	60 m	60 m
Divergence (each side)	10 %	10 %	10 %	10 %	15 %	15 %	15 %	15 %
Total length	7 500 m	7 500 m	15 000 m	15 000 m	7 500 m	7 500 m	15 000 m	15 000 m
a) PAPI ¹	—	A-0.57°	A-0.57°	A-0.57°	A-0.57°	A-0.57°	A-0.57°	A-0.57°
b) APAPI ¹	A-0.9°	A-0.9°	—	—	A-0.9°	A-0.9°	—	—
¹ Angles as indicated in Figure M-5.								

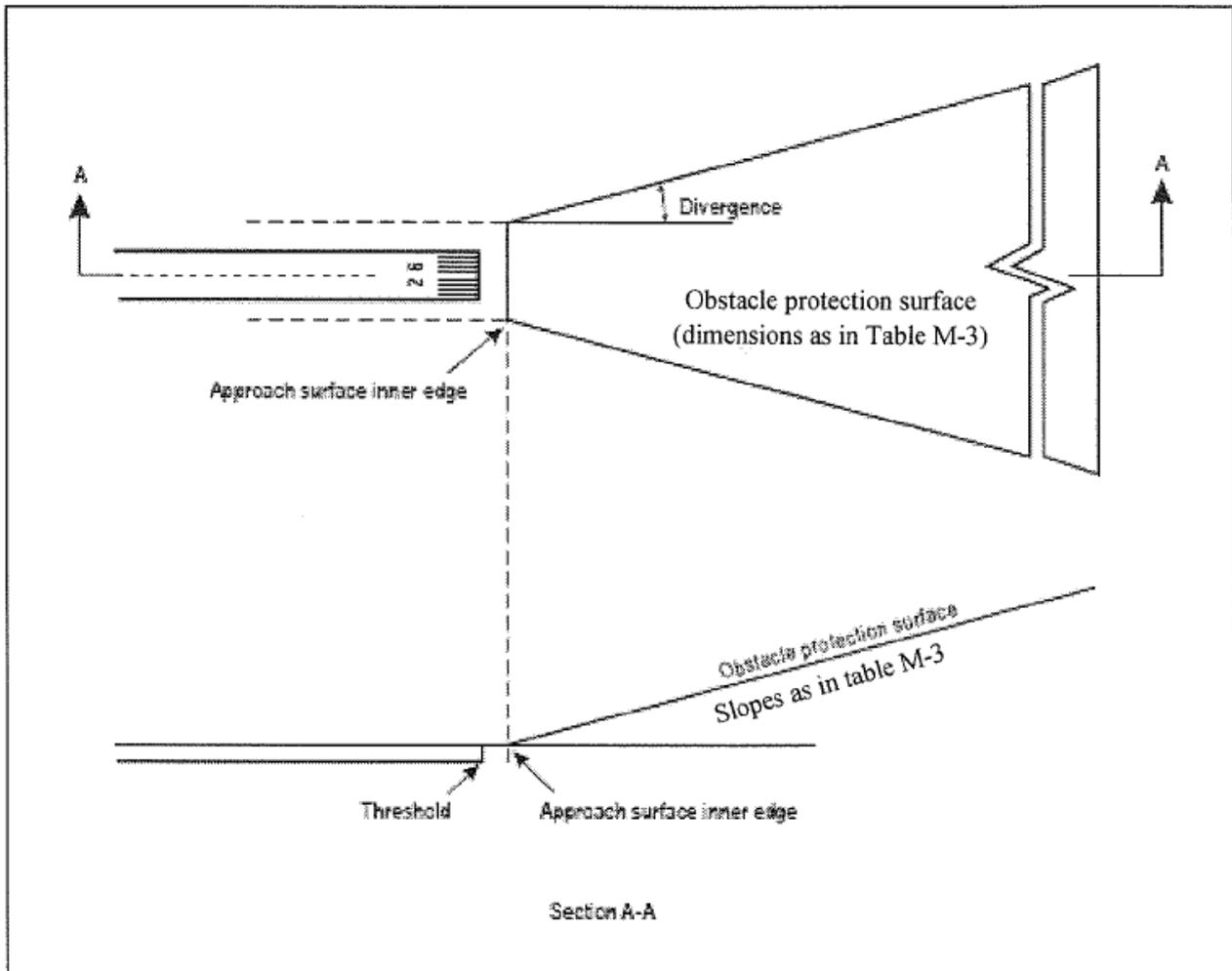


Figure M-6. Obstacle protection surface for visual approach slope indicator systems

CS ADR-DSN.M.660 Circling guidance lights

- (a) Applicability: Circling guidance lights should be provided when existing approach and runway lighting systems do not satisfactorily permit identification of the runway and/or approach area to a circling aircraft that are intending to carry out circling approaches.
- (b) Location and positioning:
- (1) The location and number of circling guidance lights should be adequate to enable a pilot, as appropriate, to:
 - (i) join the downwind leg or align and adjust the aircraft's track to the runway at a required distance from it and to distinguish the threshold in passing; and
 - (ii) keep in sight the runway threshold and/or other features which should make it possible to judge the turn on to base leg and final approach, taking into account the guidance provided by other visual aids.
 - (2) Circling guidance lights should consist of:
 - (i) lights indicating the extended centre line of the runway and/or parts of any approach lighting system; or

CS ADR DSN — BOOK 1

CHAPTER M — VISUAL AIDS FOR NAVIGATION (LIGHTS)

- (ii) lights indicating the position of the runway threshold; or
 - (iii) lights indicating the direction or location of the runway; or a combination of such lights as is appropriate to the runway under consideration.
- (c) Characteristics:
- (1) Circling guidance lights should be fixed or flashing lights of an intensity and beam spread adequate for the conditions of visibility and ambient light in which it is intended to make visual circling approaches. The flashing lights should be white, and the steady lights either white or gaseous discharge lights.
 - (2) The lights should be designed and be installed in such a manner that they should not dazzle or confuse a pilot when approaching to land, taking off, or taxiing.

SECTION 3 — RUNWAY & TAXIWAY LIGHTS**CS ADR-DSN.M.665 Runway lead-in lighting systems**

- (a) Applicability: A runway lead-in lighting system should be provided to avoid hazardous terrain.
- (b) Location and positioning
 - (1) A runway lead-in lighting system should consist of groups of lights positioned:
 - (i) so as to define the desired approach path. Runway lead-in lighting systems may be curved, straight, or a combination thereof; and
 - (ii) so that one group should be sighted from the preceding group.
 - (2) The interval between adjacent groups should not exceed approximately 1 600 m.
 - (3) A runway lead-in lighting system should extend from a point up to a point where the approach lighting system if provided, or the runway lighting system is in view.
 - (4) Each group of lights of a runway lead-in lighting system should consist of at least three flashing lights in a linear or cluster configuration. The system should be augmented by steady burning lights where such lights would assist in identifying the system.
- (c) Characteristics: The flashing lights should be white, and the steady burning lights should be gaseous discharge lights.

CS ADR-DSN.M.670 Runway threshold identification lights

- (a) Location and positioning: Where provided, runway threshold identification lights should be located symmetrically about the runway centre line, in line with the threshold and approximately 10 m outside each line of runway edge lights.
- (b) Characteristics: The lights should be visible only in the direction of approach to the runway.

CS ADR-DSN.M.675 Runway edge lights

- (a) Applicability:
- (1) Runway edge lights should be provided for a runway intended for use at night or for a precision approach runway intended for use by day or night.
 - (2) Runway edge lights should be provided on a runway intended for take-off with an operating minimum below an RVR of the order of 800 m by day.
- (b) Location and positioning:
- (1) Runway edge lights should be placed along the full length of the runway and should be in two parallel rows equidistant from the centre line.
 - (2) Runway edge lights should be placed along the edges of the area declared for use as the runway or outside the edges of the area at a distance of not more than 3 m.
 - (3) Where the width of the area which could be declared as runway, exceeds 60 m, the distance between the rows of lights should be determined taking into account the nature of the operations, the light distribution characteristics of the runway edge lights, and other visual aids serving the runway.
 - (4) The lights should be uniformly spaced in rows at intervals of not more than 60 m for an instrument runway, and at intervals of not more than 100 m for a non-instrument runway. The lights on opposite sides of the runway axis should be on lines at right angles to that axis. At intersections of runways, lights may be spaced irregularly or omitted, provided that adequate guidance remains available to the pilot.
- (c) Characteristics:
- (1) Runway edge lights should be fixed lights showing variable white, except that:
 - (i) in the case of a displaced threshold, the lights between the beginning of the runway and the displaced threshold should show red in the approach direction; and
 - (ii) a section of the lights 600 m or one-third of the runway length, whichever is the less, at the remote end of the runway from the end at which the take-off run is started, should show yellow.
 - (2) The runway edge lights should show at all angles in azimuth necessary to provide guidance to a pilot landing or taking off in either direction. When the runway edge lights are intended to provide circling guidance, they should show at all angles in azimuth.
- (d) In all angles of azimuth required in Books 1 & 2, runway edge lights should show at angles up to 15° above the horizontal with intensity adequate for the conditions of visibility and ambient light in which use of the runway for take-off or landing is intended. In any case, the intensity should be at least 50 cd except that at an aerodrome without extraneous lighting the intensity of the lights may be reduced to not less than 25 cd to avoid dazzling the pilot.
- (e) Runway edge lights on a precision approach runway should be in accordance with the specifications in CS ADR-DSN.U.940

CS ADR-DSN.M.680 Runway threshold and wing bar lights

- (a) Applicability of runway threshold: Runway threshold lights should be provided for a runway equipped with runway edge lights, except on a non-instrument or non-precision approach runway where the threshold is displaced and wing bar lights are provided.
- (b) Location and positioning of runway threshold:
- (1) When a threshold is at the extremity of a runway, the threshold lights should be placed in a row at right angles to the runway axis as near to the extremity of the runway as possible and, in any case, not more than 3 m outside the extremity.
 - (2) When a threshold is displaced from the extremity of a runway, threshold lights should be placed in a row at right angles to the runway axis at the displaced threshold.
 - (3) Threshold lighting should consist of:
 - (i) on a non-instrument or non-precision approach runway, at least six lights;
 - (ii) on a precision approach runway category I, at least the number of lights that would be required if the lights were uniformly spaced at intervals of 3 m between the rows of runway edge lights; and
 - (iii) on a precision approach runway category II or III, lights uniformly spaced between the rows of runway edge lights at intervals of not more than 3 m.
 - (4) The lights prescribed in (b)(3) (i) and (ii) above should be either:
 - (i) equally spaced between the rows of runway edge lights, or
 - (ii) symmetrically disposed about the runway centre line in two groups, with the lights uniformly spaced in each group and with a gap between the groups equal to the gauge of the touchdown zone marking or lighting, where such is provided, or otherwise not more than half the distance between the rows of runway edge lights.
- (c) Applicability of wing bar lights:
- (1) Wing bar lights should be provided on a precision approach runway when additional conspicuity is considered desirable.
 - (2) Wing bar lights should be provided on a non-instrument or non-precision approach runway where the threshold is displaced and runway threshold lights are required, but are not provided.
- (d) Location and positioning of wing bar lights: Wing bar lights should be symmetrically disposed about the runway centre line at the threshold in two groups, i.e. wing bars. Each wing bar should be formed by at least five lights extending at least 10 m outward from, and at right angles to, the line of the runway edge lights, with the innermost light of each wing bar in the line of the runway edge lights.
- (e) Characteristics of runway threshold and wing bar lights:
- (1) Runway threshold and wing bar lights should be fixed unidirectional lights showing green in the direction of approach to the runway. The intensity and beam spread of the lights should be adequate for the conditions of visibility and ambient light in which use of the runway is intended.
 - (2) Runway threshold lights on a precision approach runway should be in accordance with the specifications in CS ADR-DSN.U.940.

- (3) Threshold wing bar lights on a precision approach runway should be in accordance with the specifications in CS ADR-DSN.U.940.

CS ADR-DSN.M.685 Runway end lights

- (a) Applicability: Runway end lights should be provided for a runway equipped with runway edge lights.
- (b) Location and positioning:
 - (1) Runway end lights should be placed on a line at right angles to the runway axis as near to the end of the runway as possible and, in any case, not more than 3 m outside the end.
 - (2) Runway end lighting should consist of at least six lights. The lights should be either:
 - (i) equally spaced between the rows of runway edge lights; or
 - (ii) symmetrically disposed about the runway centre line in two groups with the lights uniformly spaced in each group and with a gap between the groups of not more than half the distance between the rows of runway edge lights.
 - (3) For a precision approach runway category III, the spacing between runway end lights, except between the two innermost lights if a gap is used, should not exceed 6 m.
- (c) Characteristics: Runway end lights should be fixed unidirectional lights showing red in the direction of the runway. The intensity and beam spread of the lights should be adequate for the conditions of visibility and ambient light in which use of the runway is intended.

Runway end lights on a precision approach runway should be in accordance with the chromaticity and characteristics specifications in CS ADR-DSN.U.930 and CS ADR-DSN.U.940.

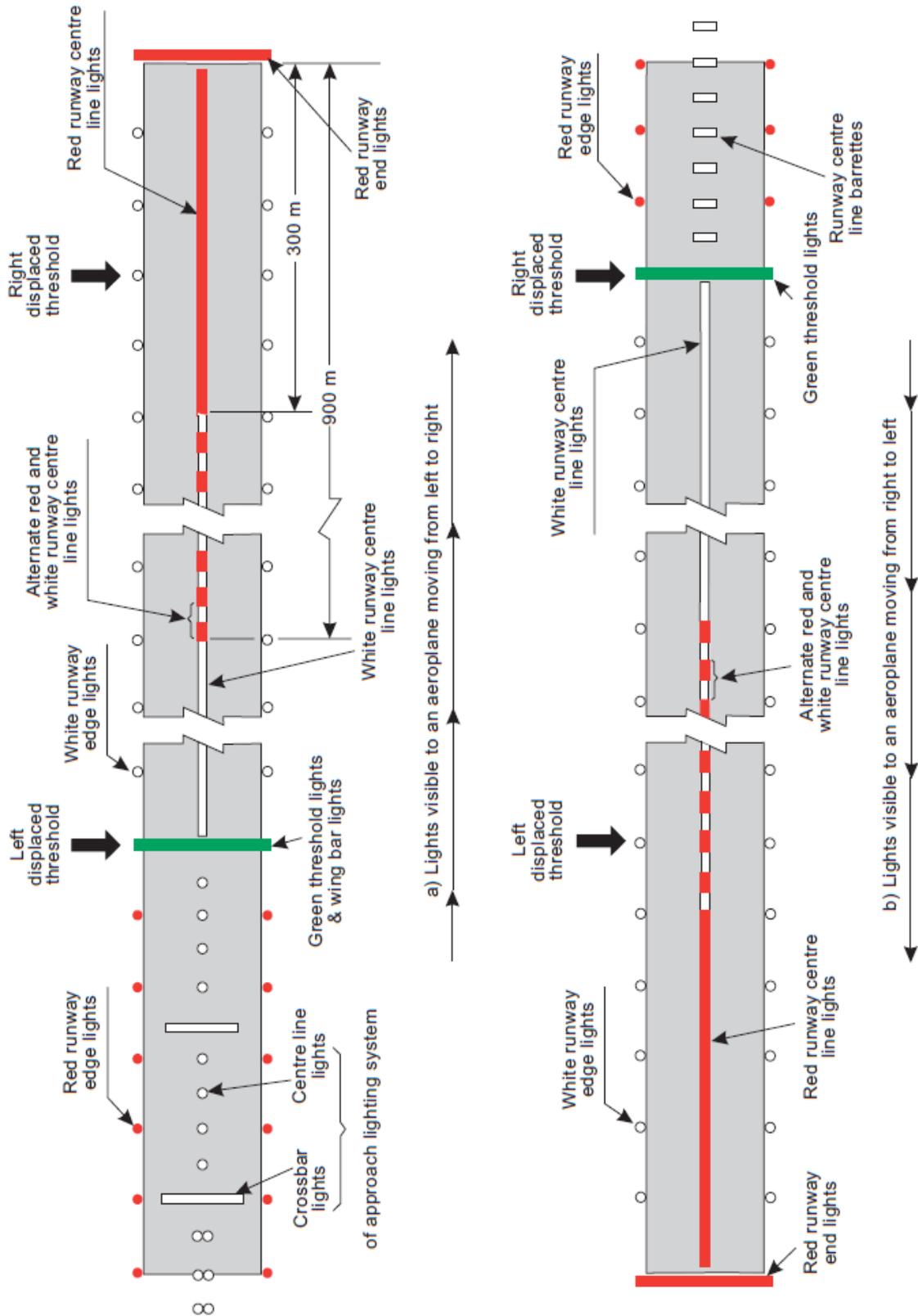
CONDITION	LIGHTS	RUNWAY TYPE			
		NON-INSTRUMENT AND NON-PRECISION APPROACH RUNWAYS	PRECISION APPROACH RUNWAYS CATEGORY I	PRECISION APPROACH RUNWAYS CATEGORY II	PRECISION APPROACH RUNWAYS CATEGORY III
THRESHOLD AT RUNWAY EXTREMITY	RUNWAY THRESHOLD AND RUNWAY END LIGHTS	<p>M.680(b)(1), (b)(3)(i), (b)(4); M.685(b)(1), (b)(2)</p>	<p>M.680(b)(1), (b)(3)(ii), (b)(4), (d); M.685(b)(1), (b)(2)</p>	<p>M.680(b)(1), (b)(3)(iii), (d); M.685(b)(1), (b)(2)</p>	<p>M.680(b)(1), (b)(3)(iii), (d); M.685(b)(1), (b)(2)</p>
THRESHOLD DISPLACED FROM RUNWAY EXTREMITY	RUNWAY THRESHOLD LIGHTS	<p>M.680(b)(2), (b)(3)(i), (b)(4); M.680(d)</p>	<p>M.680(b)(2), (b)(3)(ii), (b)(4), (d)</p>	<p>M.680(b)(2), (b)(3)(iii), (d)</p>	<p>M.680(b)(2), (b)(3)(iii), (d)</p>
	RUNWAY END LIGHTS		<p>M.685(b)(1), (b)(2)</p>		<p>M.685(b)(1), (b)(2)</p>

LEGEND

- UNIDIRECTIONAL LIGHT
- BIDIRECTIONAL LIGHT
- CONDITIONAL RECOMMENDATION

Note.— The minimum number of lights are shown for a runway 45 m wide with runway edge lights installed at the edge.

Figure M-7. Arrangement of runway threshold and runway end lights



Example shows lighting on a runway having displaced thresholds at each end and a precision approach category I lighting system serving the left displaced threshold

Figure M-8. Example of approach and runway lighting for runway with displaced thresholds

CS ADR-DSN.M.690 Runway centre line lights

- (a) The safety objective of runway centre line lights is to facilitate safe take-off and landing in reduced visibility conditions.
- (b) Applicability:
 - (1) Runway centre line lights should be provided on a precision approach runway category II or III.
 - (2) Runway centre line lights should be provided on a runway intended to be used for take-off with an operating minimum below an RVR of the order of 400 m.
- (c) Location: Runway centre line lights should be located along the centre line of the runway, except that the lights may be uniformly offset to the same side of the runway centre line by not more than 60 cm where it is not practicable to locate them along the centre line. The lights should be located from the threshold to the end at longitudinal spacing of approximately 15 m. Where the serviceability level of the runway centre line lights specified as maintenance objectives in CS ADR.DSN.S.895 can be demonstrated, and the runway is intended for use in runway visual range conditions of 350 m or greater, the longitudinal spacing may be approximately 30 m.
- (d) Characteristics:
 - (1) Runway centre line lights should be fixed lights showing variable white from the threshold to the point 900 m from the runway end; alternate red and variable white from 900 m to 300 m from the runway end; and red from 300 m to the runway end, except that for runways less than 1 800 m in length, the alternate red and variable white lights should extend from the midpoint of the runway usable for landing to 300 m from the runway end.
 - (2) Runway centre line lights should be in accordance with the specifications in CS ADR-DSN.U.930 and CS ADR-DSN.U.940.
- (e) Centre line guidance for take-off from the beginning of a runway to a displaced threshold should be provided by:
 - (1) an approach lighting system if its characteristics and intensity settings afford the guidance required during take-off, and it does not dazzle the pilot of an aircraft taking off; or
 - (2) runway centre line lights; or
 - (3) barrettes of at least 3 m length, and spaced at uniform intervals of 30 m, as shown in Figure M-8, designed so that their photometric characteristics and intensity setting afford the guidance required during take-off without dazzling the pilot of an aircraft taking off.

Where necessary, provision should be made to extinguish those centre line lights specified in Books 1 & 2 or reset the intensity of the approach lighting system or barrettes when the runway is being used for landing. In no case should only the single source runway centre line lights show from the beginning of the runway to a displaced threshold when the runway is being used for landing.

CS ADR-DSN.M.695 Runway touchdown zone lights

- (a) Applicability: Touchdown zone lights should be provided in the touchdown zone of a precision approach runway category II or III.
- (b) Location and positioning:

CS ADR DSN — BOOK 1

CHAPTER M — VISUAL AIDS FOR NAVIGATION (LIGHTS)

- (1) Touchdown zone lights should extend from the threshold for a longitudinal distance of 900 m, except that, on runways less than 1 800 m in length, the system should be shortened so that it does not extend beyond the midpoint of the runway.
 - (2) The pattern should be formed by pairs of barrettes symmetrically located about the runway centre line. The lateral spacing between the innermost lights of a pair of barrettes should be equal to the lateral spacing selected for the touchdown zone marking. The longitudinal spacing between pairs of barrettes should be either 30 m or 60 m.
- (c) Characteristics:
- (1) A barrette should be composed of at least three lights with spacing between the lights of not more than 1.5 m.
 - (2) A barrette should be not less than 3 m or more than 4.5 m in length.
 - (3) Touchdown zone lights should be fixed unidirectional lights showing variable white.
 - (4) Touchdown zone lights should be in accordance with the chromaticity and characteristics specifications in CS ADR-DSN.U.930 and CS ADR-DSN.U.940.

CS ADR-DSN.M.700 Rapid exit taxiway indicator lights

- (a) The safety objective of a rapid exit taxiway indicator lights, in conjunction with a rapid exit taxiway, is to provide pilots with distance-to-go information to the nearest rapid exit taxiway of the runway in reduced visibility conditions, and enable pilots to apply braking action for safe roll-out and runway exit speeds.
- (b) Applicability:
- (1) Rapid exit taxiway indicator lights should be provided on a runway intended for use in runway visual range conditions less than a value of 350 m where the traffic density is heavy.
 - (2) Rapid exit taxiway indicator lights should not be displayed in the event of any lamp failure or other failure that prevents the display of the light pattern depicted in Figure M-9. in full.
- (c) Location:
- (1) A set of rapid exit taxiway indicator lights should be located on the runway on the same side of the runway centre line as the associated rapid exit taxiway, in the configuration shown in Figure M-9. In each set, the lights should be located 2 m apart and the light nearest to the runway centre line should be displaced 2 m from the runway centre line.
 - (2) Where more than one rapid exit taxiway exists on a runway, the set of rapid exit taxiway indicator lights for each exit should not overlap when displayed.
- (d) Characteristics:
- Rapid exit taxiway indicator lights should be fixed unidirectional yellow lights, aligned so as to be visible to the pilot of a landing aeroplane in the direction of approach to the runway.

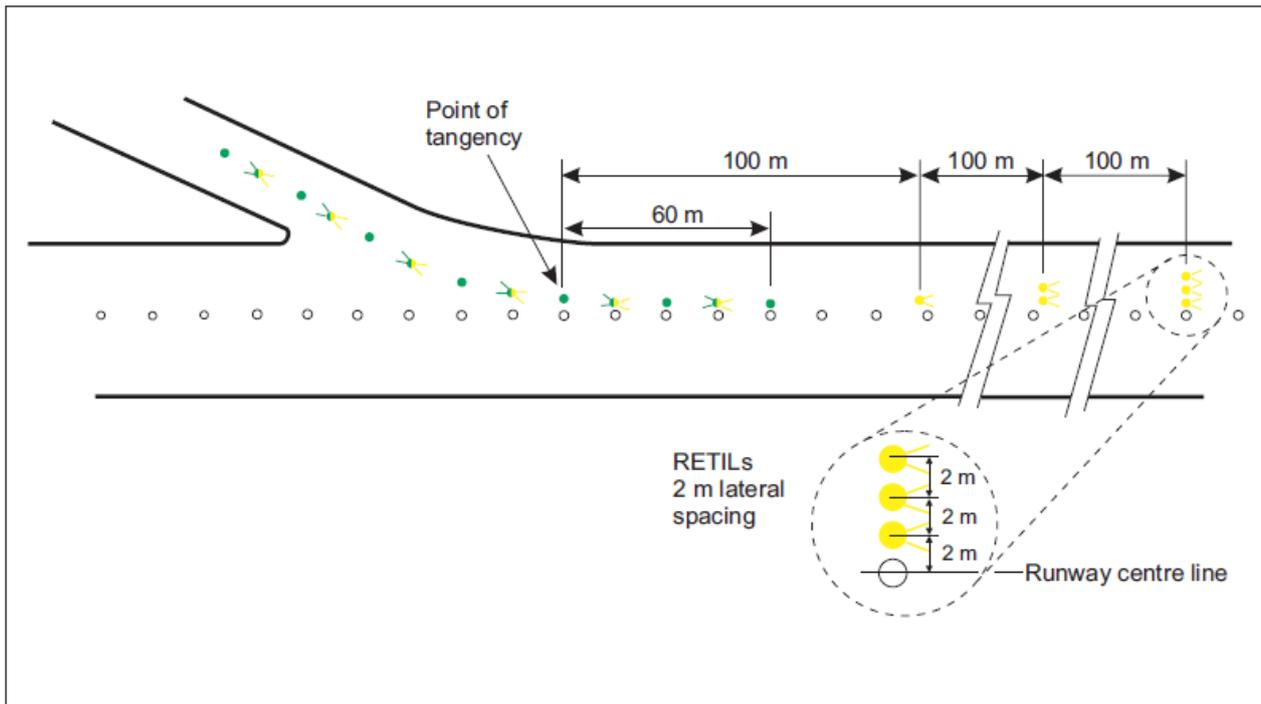


Figure M-9. Rapid exit taxiway indicator lights (RETILs)

- (1) Rapid exit taxiway indicator lights should be in accordance with the specifications in Chapter U, as appropriate.
- (2) Rapid exit taxiway indicator lights should be supplied with power on a separate circuit to other runway lighting so that they may be used when other lighting is switched off.

CS ADR-DSN.M.705 Stopway lights

- (a) Applicability and purpose: Stopway lights should be provided for a stopway intended for use at night.
- (b) Location: Stopway lights should be placed along the full length of the stopway and should be in two parallel rows that are equidistant from the centre line and coincident with the rows of the runway edge lights. Stopway lights should also be provided across the end of a stopway on a line at right angles to the stopway axis as near to the end of the stopway as possible and, in any case, not more than 3 m outside the end.
- (c) Characteristics:
 - (1) Stopway lights should be fixed unidirectional lights showing red in the direction of the runway.
 - (2) Stopway lights should be in accordance with the specifications of CS ADR-DSN.U.940.

CS ADR-DSN.M.710 Taxiway centre line lights

- (a) The safety objective of taxiway centre line lights is to provide guidance for the safe taxi of aircraft on a taxiway in reduced visibility conditions and at night
- (b) Applicability:
- (1) Taxiway centre line lights should be provided on an exit taxiway, taxiway, de-icing/anti-icing facility, and apron intended for use in runway visual range conditions less than a value of 350 m in such a manner as to provide continuous guidance between the runway centre line and aircraft stands, except that these lights need not be provided where the traffic density is light and taxiway edge lights, and centre line marking provide adequate guidance.
 - (2) Taxiway centre line lights should be provided on a taxiway intended for use at night in runway visual range conditions of 350 m or greater, and particularly on complex taxiway intersections and exit taxiways, except that these lights need not be provided where the traffic density is light and taxiway edge lights, and centre line marking provide adequate guidance.
 - (3) Taxiway centre line lights should be provided on an exit taxiway, taxiway, de-icing/anti-icing facility, and apron in all visibility conditions where specified as components of an advanced surface movement guidance and control system in such a manner as to provide continuous guidance between the runway centre line and aircraft stands.
 - (4) Taxiway centre line lights should be provided on a runway forming part of a standard taxi-route and intended for taxiing in runway visual range conditions less than a value of 350 m, except that these lights need not be provided where the traffic density is light and taxiway edge lights, and centre line marking provide adequate guidance.
 - (5) Taxiway centre line lights should be provided in all visibility conditions on a runway forming part of a standard taxi-route where specified as components of an advanced surface movement guidance and control system.
 - (6) Where a runway forming part of a standard taxi route is provided with runway lighting and taxiway lighting, the lighting systems should be interlocked to preclude the possibility of simultaneous operation of both forms of lighting.
- (c) Characteristics:
- (1) Taxiway centre line lights on a taxiway other than an exit taxiway and on a runway forming part of a standard taxi-route should be fixed lights showing green with beam dimensions such that the light is visible only from aeroplanes on, or in the vicinity of the taxiway.
 - (2) Taxiway centre line lights on an exit taxiway should be fixed lights. Alternate taxiway centre line lights should show green and yellow from their beginning near the runway centre line to the perimeter of the ILS/MLS critical/sensitive area, or the lower edge of the inner transitional surface, whichever is farthest from the runway; and thereafter all lights should show green (Figure M-11. Taxiway lighting). The light nearest to the perimeter should always show yellow.

Where aircraft follow the same centre line in both directions, the centre line lights should show green to aircraft approaching the runway.
 - (3) Taxiway centre line lights should be in accordance with the specifications of CS ADR-DSN.U.905, Figure U-16, U-17, or U-18, for taxiways intended for use in

runway visual range conditions of less than a value of 350 m; Figure U-19 or U-20, for other taxiways.

- (4) Where higher intensities are required, from an operational point of view, taxiway centre line lights on rapid exit taxiways intended for use in runway visual range conditions less than a value of 350 m should be in accordance with the specifications of CS ADR-DSN.U.940, Figure U-16. The number of levels of brilliancy settings for these lights should be the same as that for the runway centre line lights.
 - (5) Where taxiway centre line lights are specified as components of an advanced surface movement guidance and control system and where, from an operational point of view, higher intensities are required to maintain ground movements at a certain speed in very low visibilities or in bright daytime conditions, taxiway centre line lights should be in accordance with the specifications of CS ADR-DSN.U.940, Figure U-21, U-22, or U-23.
 - (6) High intensity centre line lights should only be used in case of an absolute necessity and following a specific study.
- (d) Location and positioning:
- (1) Taxiway centre line lights should normally be located on the taxiway centre line marking, except that they may be offset by not more than 30 cm where it is not practicable to locate them on the marking (see Figure M-10).
 - (2) Taxiway centre line lights on taxiways, runways, rapid exit taxiways or on other exit taxiways should be positioned in accordance with CS ADR-DSN.M.715.

CS ADR-DSN.M.715 Taxiway centre line lights on taxiways, runways, rapid exit taxiways, or on other exit taxiways

- (a) The safety objective of taxiway centre line lights is to provide guidance for the safe taxi of aircraft on a taxiway de-icing/anti-icing facility, and apron in reduced visibility conditions and at night
- (b) Taxiway centre line lights on taxiways:
 - (1) Taxiway centre line lights on a straight section of a taxiway should be spaced at longitudinal intervals of not more than 30 m, except that:
 - (i) intervals less than 30 m should be provided on short straight sections; and
 - (ii) on a taxiway intended for use in RVR conditions of less than a value of 350 m, the longitudinal spacing should not exceed 15 m.
 - (2) Taxiway centre line lights on a taxiway curve should continue from the straight portion of the taxiway at a constant distance from the outside edge of the taxiway curve. The lights should be spaced at intervals such that a clear indication of the curve is provided.
 - (3) On a taxiway intended for use in RVR conditions of less than a value of 350 m, the lights on a curve should not exceed spacing of 15 m, and on a curve of less than 400 m radius the lights should be spaced at intervals of not greater than 7.5 m. This spacing should extend for 60 m before and after the curve.
- (c) Taxiway centre line lights on rapid exit taxiways:
 - (1) Taxiway centre line lights on a rapid exit taxiway should commence at a point at least 60 m before the beginning of the taxiway centre line curve, and continue

beyond the end of the curve to a point on the centre line of the taxiway where an aeroplane can be expected to reach normal taxiing speed, as shown in Figure M-9. The lights on that portion parallel to the runway centre line should always be at least 60 cm from any row of runway centre line lights, as shown in Figure M-10.

- (2) The lights should be spaced at longitudinal intervals of not more than 15 m. Where runway centre line lights are not provided, a greater interval not exceeding 30 m may be used.
- (d) Taxiway centre line lights on other exit taxiways:
- (1) Taxiway centre line lights on exit taxiways other than rapid exit taxiways should commence at the point where the taxiway centre line marking begins to curve from the runway centre line, and follow the curved taxiway centre line marking at least to the point where the marking leaves the runway. The first light should be at least 60 cm from any row of runway centre line lights, as shown in Figure M-10, Arrangement of runway threshold and runway end lights.
 - (2) The lights should be spaced at longitudinal intervals of not more than 7.5 m.
- (e) Taxiway centre line lights on runways: Taxiway centre line lights on a runway forming part of a standard taxi-route, and intended for taxiing in runway visual range conditions less than a value of 350 m should be spaced at longitudinal intervals not exceeding 15 m.

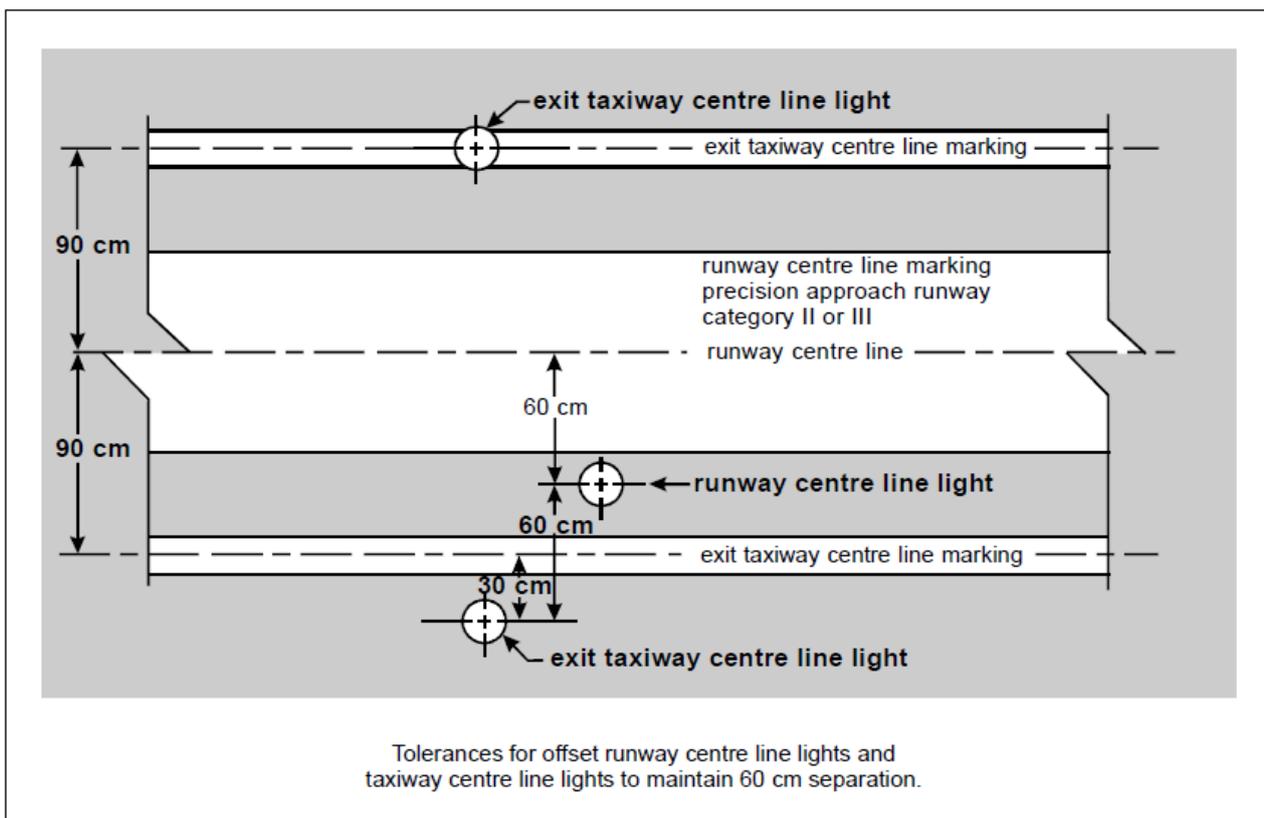


Figure M-10. Offset runway and taxiway centre line lights

- (f) Positioning of taxiway centre line lights on taxiway:

CS ADR DSN — BOOK 1

CHAPTER M — VISUAL AIDS FOR NAVIGATION (LIGHTS)

- (i) The spacing on a particular section of taxiway centre line lighting (straight or curved section) should be such that a clear indication of the taxiway centre line is provided, particularly on a curved section.
- (ii) Where a taxiway is only intended for use in RVR conditions of 350 m or greater, the spacing of taxiway centre line lights on curves should not exceed the table below:

Curve radius	Light spacing
up to 400 m	7.5 m
401 m to 899 m	15 m
900 m or greater	30 m

- (g) Taxiway centre line lights on straight sections of taxiways: Larger intervals not exceeding 60 m may be used where, because of the prevailing meteorological conditions, adequate guidance is provided by such spacing.

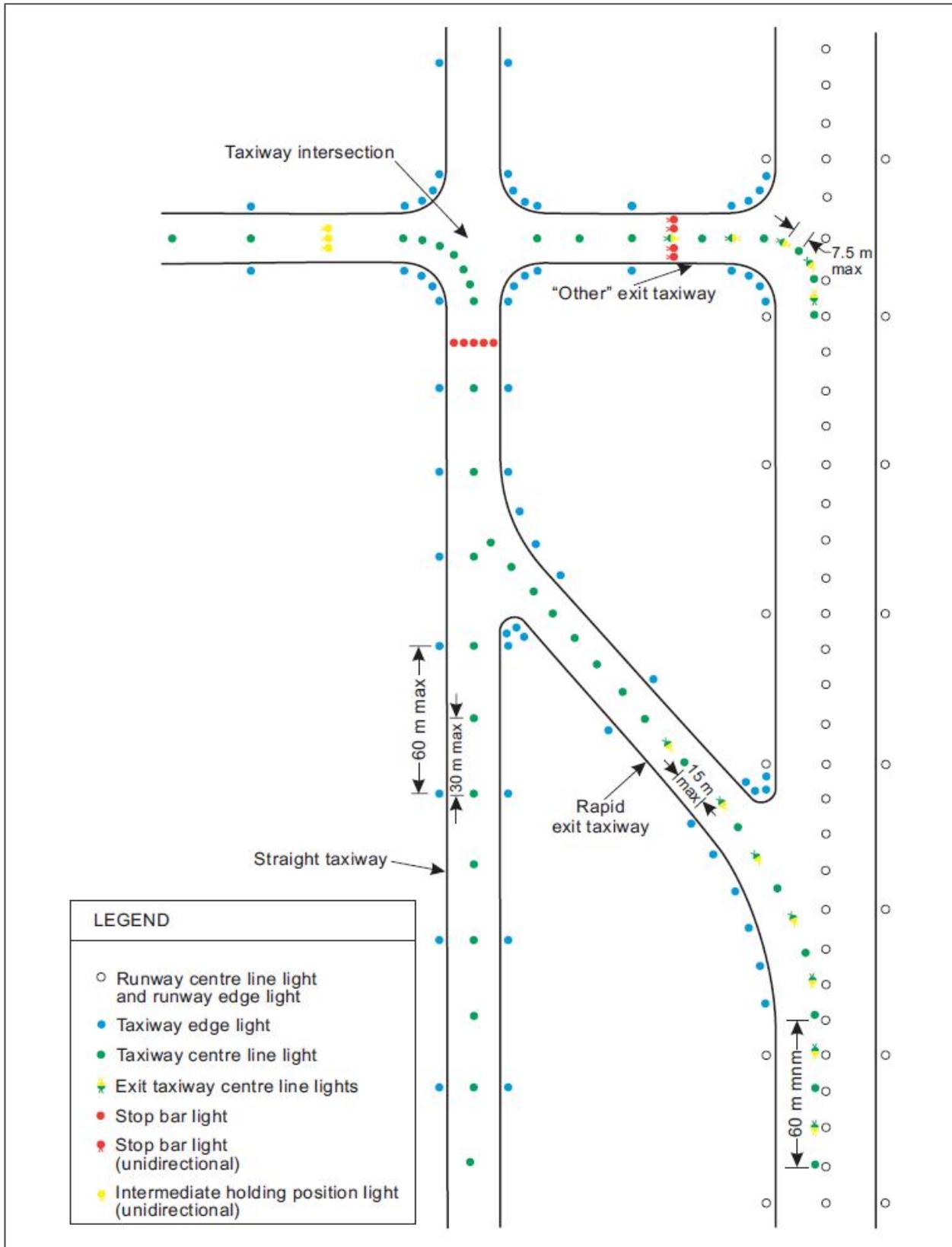


Figure M-11. Taxiway lighting

CS ADR-DSN.M.720 Taxiway edge lights

(a) Applicability:

- (1) Taxiway edge lights should be provided at the edges of a runway turn pad, holding bay, de-icing/anti-icing facility, apron, etc. intended for use at night, and on a taxiway not provided with taxiway centre line lights and intended for use at night, except that taxiway edge lights need not be provided where, considering the nature of the operations, adequate guidance can be achieved by surface illumination or other means.
- (2) Taxiway edge lights should be provided on a runway forming part of a standard taxi-route and intended for taxiing at night where the runway is not provided with taxiway centre line lights.
- (3) Where a runway forming part of a standard taxi route is provided with runway lighting and taxiway lighting, the lighting systems should be interlocked to preclude the possibility of simultaneous operation of both forms of lighting.

(b) Location and positioning:

- (1) Taxiway edge lights on a straight section of a taxiway and on a runway forming part of a standard taxi-route should be spaced at uniform longitudinal intervals of not more than 60 m. The lights on a curve should be spaced at intervals less than 60 m so that a clear indication of the curve is provided.
- (2) Taxiway edge lights on a holding bay, de-icing/anti-icing facility, apron, etc. should be spaced at uniform longitudinal intervals of not more than 60 m.
- (3) Taxiway edge lights on a runway turn pad should be spaced at uniform longitudinal intervals of not more than 30 m.
- (4) The lights should be located as near as practicable to the edges of the taxiway, runway turn pad, holding bay, de-icing/anti-icing facility, apron or runway, etc., or outside the edges at a distance of not more than 3 m.

(c) Characteristics:

- (1) Taxiway edge lights should be fixed lights showing blue.
- (2) The lights should show up to at least 75° above the horizontal and at all angles in azimuth necessary to provide guidance to a pilot taxiing in either direction. At an intersection, exit, or curve the lights should be shielded as far as practicable so that they cannot be seen in angles of azimuth in which they may be confused with other lights.
- (3) The intensity of taxiway edge lights should be at least 2 cd from 0° to 6° vertical, and 0.2 cd at any vertical angles between 6° and 75°.

CS ADR-DSN.M.725 Runway turn pad lights

- (a) The safety objective of runway turn pad lights is to provide guidance on a runway turn pad intended for use in reduced visibility conditions and at night to enable an aeroplane to complete a safe 180-degree turn, and align with the runway centre line.

(b) Applicability:

- (1) Runway turn pad lights should be provided for continuous guidance on a runway turn pad intended for use in runway visual range conditions less than a value of 350 m to enable an aeroplane to complete a 180-degree turn, and align with the runway centre line.

- (2) Runway turn pad lights should be provided on a runway turn pad intended for use at night.
- (c) Location:
 - (1) Runway turn pad lights should normally be located on the runway turn pad marking, except that they should be offset by not more than 30 cm where it is not practicable to locate them on the marking.
 - (2) Runway turn pad lights on a straight section of the runway turn pad marking should be spaced at longitudinal intervals of not more than 15 m.
 - (3) Runway turn pad lights on a curved section of the runway turn pad marking should not exceed a spacing of 7.5 m.
- (d) Characteristics:
 - (1) Runway turn pad lights should be unidirectional fixed lights showing green with beam dimensions such that the light is visible only from aeroplanes on or approaching the runway turn pad.
 - (2) Runway turn pad lights should be in accordance with the specifications of CS ADR-DSN.U.940, Figure U-17 and Figure U-18.

CS ADR-DSN.M.730 Stop bar lights

- (a) Applicability:
 - (1) A stop bar should be provided at every runway-holding position serving a runway when it is intended that the runway should be used in runway visual range conditions less than a value of 550 m, except where:
 - (i) appropriate aids and procedures are available to assist in preventing inadvertent incursions of aircraft and vehicles onto the runway; or
 - (ii) operational procedures exist to limit, in runway visual range conditions less than a value of 550 m, the number of:
 - (A) aircraft on the manoeuvring area to one at a time; and
 - (B) vehicles on the manoeuvring area to the essential minimum.
 - (2) A stop bar should be provided at an intermediate holding position when it is desired to supplement markings with lights, and to provide traffic control by visual means.
 - (3) Where the normal stop bar lights might be obscured from a pilot's view, for example, by snow or rain, or where a pilot may be required to stop the aircraft in a position so close to the lights that they are blocked from view by the structure of the aircraft, then a pair of elevated lights should be added to each end of the stop bar.
- (b) Location: Stop bars should be located across the taxiway at the point where it is desired that traffic stop. Where the additional lights specified in Books 1 & 2 are provided, these lights should be located not less than 3 m from the taxiway edge.
- (c) Characteristics:
 - (1) Stop bars should consist of lights spaced at intervals of 3 m across the taxiway, showing red in the intended direction(s) of approach to the intersection or runway-holding position.

CS ADR DSN — BOOK 1

CHAPTER M — VISUAL AIDS FOR NAVIGATION (LIGHTS)

- (2) Stop bars installed at a runway-holding position should be unidirectional, and should show red in the direction of approach to the runway.
- (3) Where the additional lights specified in (a)(3) above are provided, these lights should have the same characteristics as the lights in the stop bar but should be visible to approaching aircraft up to the stop bar position.
- (4) Selectively switchable stop bars should be installed in conjunction with at least three taxiway centre line lights (extending for a distance of at least 90 m from the stop bar) in the direction that it is intended for an aircraft to proceed from the stop bar.
- (5) The intensity in red light and beam spreads of stop bar lights should be in accordance with the specifications in CS ADR-DSN.U.940, Figures U-16 to U-20.
- (6) Where stop bars are specified as components of an advanced surface movement guidance and control system, and where, from an operational point of view, higher intensities are required to maintain ground movements at a certain speed in very low visibilities or in bright daytime conditions, the intensity in red light and beam spreads of stop bar lights should be in accordance with the specifications in CS ADR-DSN.U.940, Figure U-21, U-22 or U-23.
- (7) High-intensity stop bars should only be used in case of an absolute necessity and following a specific study.
- (8) Where a wide beam fixture is required, the intensity in red light and beam spreads of stop bar lights should be in accordance with the specifications in CS ADR-DSN.U.940, Figure U-21 or U-23.
- (9) The lighting circuit should be designed so that:
 - (i) stop bars located across entrance taxiways are selectively switchable;
 - (ii) stop bars located across taxiways intended to be used only as exit taxiways are switchable selectively or in groups;
 - (iii) when a stop bar is illuminated, any taxiway centre line lights installed beyond the stop bar should be extinguished for a distance of at least 90 m; and
 - (iv) stop bars should be interlocked with the taxiway centre line lights so that when the centre line lights beyond the stop bar are illuminated, the stop bar is extinguished and vice versa.

CS ADR-DSN.M.735 Intermediate holding position lights

- (a) Applicability:
 - (1) Except where a stop bar has been installed, intermediate holding position lights should be provided at an intermediate holding position intended for use in runway visual range conditions less than a value of 350 m.
 - (2) Intermediate holding position lights should be provided at an intermediate holding position where there is no need for stop-and-go signals as provided by a stop bar.
- (b) Location: Intermediate holding position lights should be located along the intermediate holding position marking at a distance of 0.3 m prior to the marking.
- (c) Characteristics: Intermediate holding position lights should consist of three fixed unidirectional lights showing yellow in the direction of approach to the intermediate holding position with a light distribution similar to taxiway centre line lights if provided.

The lights should be disposed symmetrically about and at right angle to the taxiway centre line, with individual lights spaced 1.5 m apart.

CS ADR-DSN.M.740 De-icing/anti-icing facility exit lights

- (a) **Applicability:** The purpose of the de-icing/anti-icing facility exit lights is to indicate the exit boundary of a remote de-icing/anti-icing facility adjoining a taxiway.
- (b) **Location:** Where provided, de-icing/anti-icing facility exit lights should be located 0.3 m inward of the intermediate holding position marking displayed at the exit boundary of a remote de-icing/ anti-icing facility.
- (c) **Characteristics:** Where provided, de-icing/anti-icing facility exit lights should consist of in-pavement fixed unidirectional lights spaced at intervals of 6 m showing yellow in the direction of the approach to the exit boundary with a light distribution similar to taxiway centre line lights (see Figure G-1).

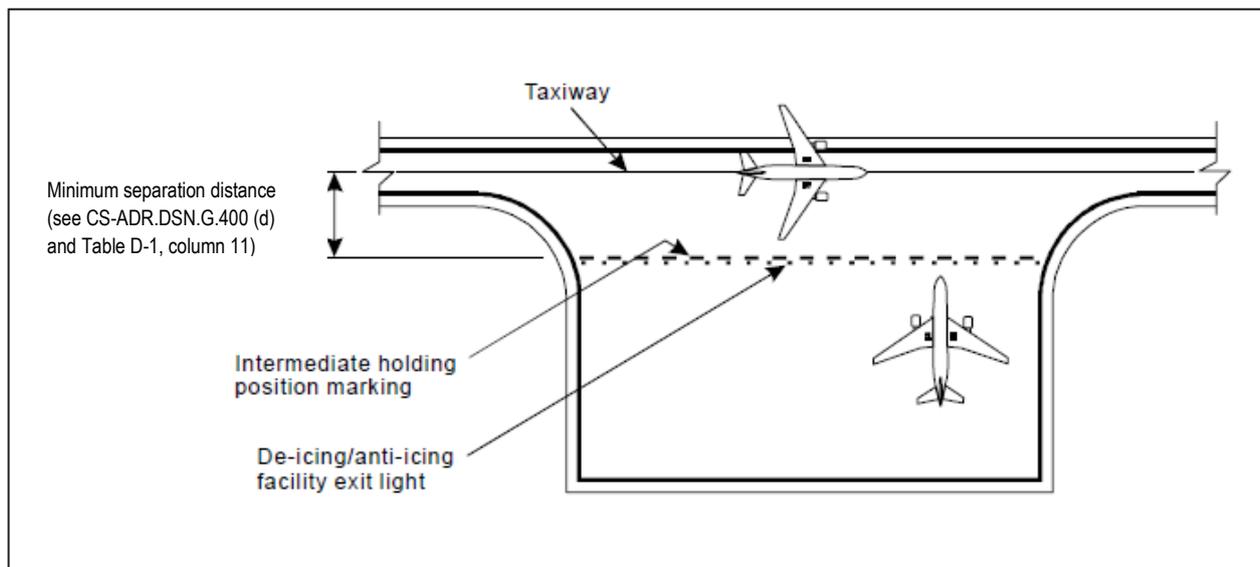


Figure M-12. Example of remote de-icing/anti-icing facility

CS ADR-DSN.M.745 Runway guard lights

- (a) The purpose is to warn pilots and drivers of vehicles when they are operating on taxiways, that they are about to enter an active runway. There are two standard configurations of runway guard lights as illustrated in Figure M-13.
- (b) **Applicability:**
 - (1) Runway guard lights, Configuration A, should be provided at each taxiway/runway intersection associated with a runway intended for use in:
 - (i) runway visual range conditions less than a value of 550 m regardless of whether or not a stop bar is installed; and
 - (ii) runway visual range conditions of values between 550 m and 1 200 m where the traffic density is heavy.

CS ADR DSN — BOOK 1

CHAPTER M — VISUAL AIDS FOR NAVIGATION (LIGHTS)

- (2) Runway guard lights, Configuration A, Configuration B, or both, should be provided at each taxiway/runway intersection where enhanced conspicuity of the taxiway/runway intersection is needed, such as on a wide-throat taxiway, except that Configuration B should not be collocated with a stop bar.
- (c) Location:
- (1) Runway guard lights, Configuration A should be located at each side of the taxiway and at the same distance as the runway-holding position marking.
 - (2) Runway guard lights, Configuration B, should be located across the taxiway and at the same distance as the runway-holding position marking.
- (d) Characteristics:
- (1) Runway guard lights, Configuration A, should consist of two pairs of yellow lights.
 - (2) Runway guard lights, Configuration B, should consist of yellow lights spaced at intervals of 3 m across the taxiway.
 - (3) The light beam should be unidirectional and aligned so as to be visible to the pilot of an aeroplane taxiing to the holding position.
 - (4) The intensity in yellow light and beam spreads of lights of Configuration A should be in accordance with the specifications in CS ADR-DSN.U.940, Figure U-27.
 - (5) Where runway guard lights are intended for use during the day, the intensity in yellow light and beam spreads of lights of Configuration A should be in accordance with the specifications in CS ADR-DSN.U.940, Figure U-28.
 - (6) Where runway guard lights are specified as components of an advanced surface movement guidance and control system where higher light intensities are required, the intensity in yellow light and beam spreads of lights of Configuration A should be in accordance with the specifications in CS ADR-DSN.U.940, Figure U-28.
 - (7) The intensity in yellow light and beam spreads of lights of Configuration B should be in accordance with the specifications in CS ADR-DSN.U.940, Figure U-28.
 - (8) Where runway guard lights are intended for use during the day, the intensity in yellow light and beam spreads of lights of Configuration B should be in accordance with the specifications in CS ADR-DSN.U.940, Figure U-24.
 - (9) Where runway guard lights are specified as components of an advanced surface movement guidance and control system where higher light intensities are required, the intensity in yellow light and beam spreads of lights of Configuration B should be in accordance with the specifications in CS ADR-DSN.U.940, Figure U-24.
 - (10) The lights in each unit of Configuration A should be illuminated alternately.
 - (11) For Configuration B, adjacent lights should be alternately illuminated and alternative lights should be illuminated in unison.
 - (12) The lights should be illuminated between 30 and 60 cycles per minute and the light suppression and illumination periods should be equal and opposite in each light.

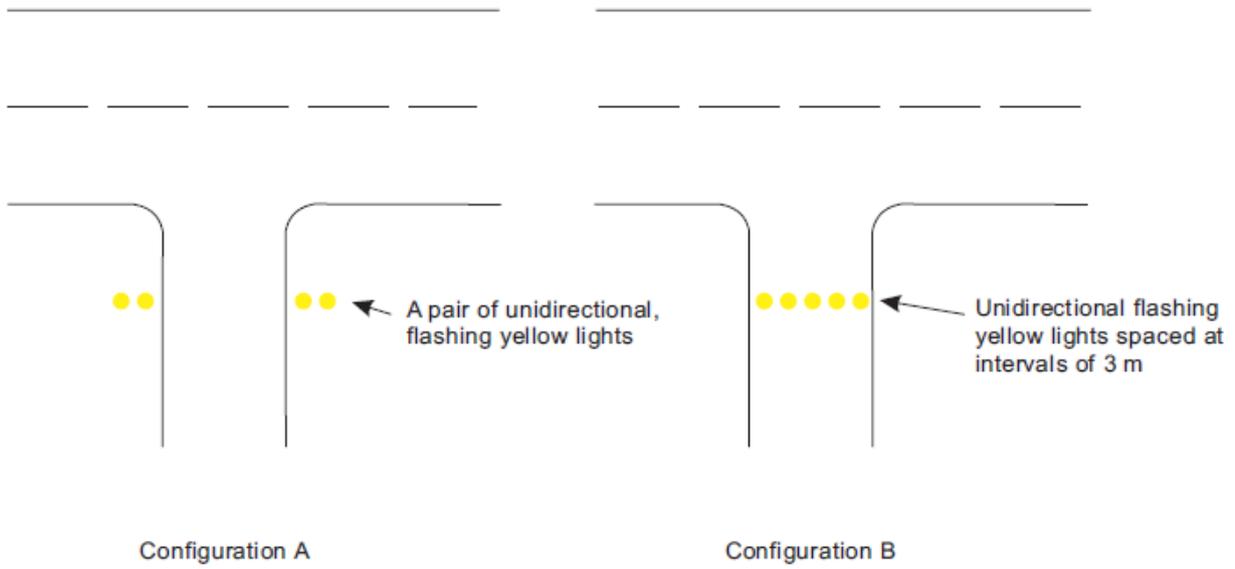


Figure M-13. Runway guard lights

SECTION 4 — APRON LIGHTING**CS ADR-DSN.M.750 Apron floodlighting**

- (a) The safety objective of apron floodlighting is to facilitate safe operations on an apron, on a de-icing/anti-icing facility, and on a designated isolated aircraft parking position intended to be used at night, and in reduced visibility.
- (b) Applicability: Apron floodlighting should be provided on an apron, on a de-icing/anti-icing facility, and on a designated isolated aircraft parking position intended to be used at night.
- (c) Location: Apron floodlights should be located so as to provide adequate illumination on all apron service areas, with a minimum of glare to pilots of aircraft in flight and on the ground, aerodrome and apron controllers, and personnel on the apron. The arrangement and aiming of floodlights should be such that an aircraft stand receives light from two or more directions to minimise shadows.
- (d) Characteristics:
 - (1) The spectral distribution of apron floodlights should be such that the colours used for aircraft marking connected with routine servicing, and for surface and obstacle marking, can be correctly identified.
 - (2) The average illuminance should be at least the following:
 - (i) Aircraft stand:
 - (A) horizontal illuminance — 20 lux with a uniformity ratio (average to minimum) of not more than 4 to 1; and
 - (B) vertical illuminance — 20 lux at a height of 2 m above the apron in relevant directions.
 - (ii) Other apron areas: horizontal illuminance — 50 % of the average illuminance on the aircraft stands with a uniformity ratio (average to minimum) of not more than 4 to 1.

CS ADR-DSN.M.755 Visual docking guidance system

- (a) Applicability: A visual docking guidance system should be provided when it is intended to indicate, by a visual aid, the precise positioning of an aircraft on an aircraft stand and other alternative means, such as marshallers are not practicable.
- (b) Characteristics:
 - (1) The system should provide both azimuth and stopping guidance.
 - (2) The azimuth guidance unit and the stopping position indicator should be adequate for use in all weather, visibility, background lighting, and pavement conditions for which the system is intended both by day and night but should not dazzle the pilot.
 - (3) The azimuth guidance unit and the stopping position indicator should be of a design such that:
 - (i) a clear indication of malfunction of either or both is available to the pilot; and
 - (ii) they can be turned off.

CS ADR DSN — BOOK 1

CHAPTER M — VISUAL AIDS FOR NAVIGATION (LIGHTS)

- (4) The accuracy of the system should be adequate for the type of loading bridge and fixed aircraft servicing installations with which it is to be used.
 - (5) The system should be usable by all types of aircraft for which the aircraft stand is intended, preferably without selective operation.
 - (6) If selective operation is required to prepare the system for use by a particular type of aircraft, then the system should provide an identification of the selected aircraft type to both the pilot and the system operator as a means of ensuring that the system has been set properly.
- (c) Location:
- (1) The azimuth guidance unit and the stopping position indicator should be located in such a way that there is continuity of guidance between the aircraft stand markings, the aircraft stand manoeuvring guidance lights if present, and the visual docking guidance system.
 - (2) The azimuth guidance unit should be located on or close to the extension of the stand centre line ahead of the aircraft so that its signals are visible from the cockpit of an aircraft throughout the docking manoeuvre, and aligned for use at least by the pilot occupying the left seat, although it is preferable for it to be aligned for use by the pilots occupying both the left and right seats.
 - (3) The azimuth guidance unit and the stopping position indicator should be positioned as prescribed below.
 - (i) The azimuth guidance unit should provide unambiguous left/right guidance which enables the pilot to acquire and maintain the lead-in line without over-controlling.
 - (ii) When azimuth guidance is indicated by colour change, green should be used to identify the centre line and red for deviations from the centre line.
 - (iii) The stopping position indicator should be located in conjunction with, or sufficiently close to, the azimuth guidance unit so that a pilot can observe both the azimuth and stop signals without turning the head.
 - (iv) The stopping position indicator should be usable at least by the pilot occupying the left seat, although it is preferable for it to be usable by the pilots occupying both the left and right seats.
 - (v) The stopping position information provided by the indicator for a particular aircraft type should account for the anticipated range of variations in pilot eye height and/or viewing angle.
 - (vi) The stopping position indicator should show the stopping position for the aircraft for which guidance is being provided and should provide closing rate information to enable the pilot to gradually decelerate the aircraft to a full stop at the intended stopping position.
 - (vii) The stopping position indicator should provide closing rate information over a distance of at least 10 m.
 - (viii) When stopping guidance is indicated by colour change, green should be used to show that the aircraft can proceed and red to show that the stop point has been reached, except that for a short distance prior to the stop point a third colour may be used to warn that the stopping point is close.

CS ADR-DSN.M.760 Advanced visual docking guidance system

(a) Application:

- (1) Advanced visual docking guidance systems should include those systems that, in addition to basic and passive azimuth, and stop position information, provide pilots with active (usually sensor-based) guidance information, such as aircraft type indication, distance-to-go information, and closing speed.
- (2) Advanced visual docking guidance systems should provide docking guidance information in three stages: the acquisition of the aircraft by the system, the azimuth alignment of the aircraft, and the stopping position information.
- (3) Advanced visual docking guidance system should be provided where it is operationally desirable, to confirm the correct aircraft type for which guidance is being provided, and/or to indicate the stand centre line in use, where more than one is provided for.
- (4) The Advanced visual docking guidance system should be suitable for use by all types of aircraft for which the aircraft stand is intended.
- (5) The Advanced visual docking guidance system should only be used in conditions in which its operational performance is specified.
- (6) The use of the Advanced visual docking guidance systems in conditions such as weather, visibility, and background lighting both by day and night would need to be specified.
- (7) Care is required in both the design and on-site installation of the system to ensure that glare, reflection of sunlight, or other light in the vicinity, does not degrade the clarity and conspicuity of the visual cues provided by the system.
- (8) The docking guidance information provided by an advanced visual docking guidance system should not conflict with that provided by a conventional visual docking guidance system on an aircraft stand if both types are provided, and are in operational use. A method of indicating that the system is not in operational use or unserviceable should be provided.
- (1) Location: The Advanced visual docking guidance system should be located such that unobstructed and unambiguous guidance is provided to the person responsible for, and persons assisting, the docking of the aircraft throughout the docking manoeuvre.

(b) Characteristics:

- (1) The Advanced visual docking guidance system should provide, at minimum, the following guidance information at the appropriate stage of the docking manoeuvre:
 - (i) an emergency stop indication;
 - (ii) the aircraft type and model for which the guidance is provided;
 - (iii) an indication of the lateral displacement of the aircraft relative to the stand centre line;
 - (iv) the direction of azimuth correction needed to correct a displacement from the stand centre line;
 - (v) an indication of the distance to the stop position;
 - (vi) an indication when the aircraft has reached the correct stopping position; and
 - (vii) a warning indication if the aircraft goes beyond the appropriate stop position.

CS ADR DSN – BOOK 1

CHAPTER M – VISUAL AIDS FOR NAVIGATION (LIGHTS)

- (2) The Advanced visual docking guidance system should be capable of providing docking guidance information for all aircraft taxi speeds encountered during the docking manoeuvre.
- (3) The time taken from the determination of the lateral displacement to its display should not result in a deviation of the aircraft when operated in normal conditions, from the stand centre line greater than 1 m.
- (4) The information on displacement of the aircraft relative to the stand centre line and distance to the stopping position, when displayed, should be provided with the accuracy specified in Table M-3. Symbols and graphics used to depict guidance information should be intuitively representative of the type of information provided.
- (i) The use of colour needs to be appropriate and should follow signal convention, i.e. red, yellow and green mean hazard, caution and normal/correct conditions respectively. The effects of colour contrasts also need to be considered.
 - (ii) Information on the lateral displacement of the aircraft relative to the stand centre line should be provided at least 25 m prior to the stop position.
 - (iii) The indication of the distance of the aircraft from the stop position may be colour-coded and presented at a rate and distance proportional to the actual closure rate, and distance of the aircraft approaching the stop point.
 - (iv) Continuous closure distance and closure rate should be provided from at least 15 m prior to the stop position.
 - (v) Where provided, closure distance displayed in numerals should be provided in metre integers to the stop position and displayed to 1 decimal place at least 3 m prior to the stop position.
 - (vi) Throughout the docking manoeuvre, an appropriate means should be provided on the Advanced visual docking guidance system to indicate the need to bring the aircraft to an immediate halt. In such an event which includes a failure of the system, no other information should be displayed.
 - (vii) Provision to initiate an immediate halt to the docking procedure should be made available to personnel responsible for the operational safety of the stand.
 - (viii) The word 'STOP' in red characters should be displayed when an immediate cessation of the docking manoeuvre is required.

Guidance information	Maximum deviation at stop position (stop area)	Maximum deviation at 9 m from stop position	Maximum deviation at 15 m from stop position	Maximum deviation at 25 m from stop position
Azimuth	±250 mm	±340 mm	±400 mm	±50 mm
Distance	±500 mm	±1 000 mm	±1 300 mm	Not specified

Table M-3. A-VDGS recommended displacement accuracy

CS ADR-DSN.M.765 Aircraft stand manoeuvring guidance lights

- (a) Applicability: Aircraft stand manoeuvring guidance lights should be provided to facilitate the positioning of an aircraft on an aircraft stand on a paved apron, or on a de-icing/anti-icing facility intended for use in poor visibility conditions unless adequate guidance is provided by other means.
- (b) Location: Aircraft stand manoeuvring guidance lights should be collocated with the aircraft stand markings.
- (c) Characteristics:
- (1) Aircraft stand manoeuvring guidance lights, other than those indicating a stop position, should be fixed yellow lights, visible throughout the segments within which they are intended to provide guidance.
 - (2) The lights used to delineate lead-in, turning, and lead-out lines should be spaced at intervals of not more than 7.5 m on curves and 15 m on straight sections.
 - (3) The lights indicating a stop position should be fixed, unidirectional lights showing red.
 - (4) The intensity of the lights should be adequate for the condition of visibility and ambient light in which the use of the aircraft stand is intended.
 - (5) The lighting circuit should be designed so that the lights may be switched on to indicate that an aircraft stand is to be used, and switched off to indicate that it is not to be used.

CS ADR-DSN.M.770 Road-holding position light

- (a) Applicability: A road-holding position light should be provided at each road-holding position serving a runway when it is intended that the runway should be used in runway visual range conditions less than a value of 550 m.
- (b) Location: A road-holding position light should be located adjacent to the holding position marking 1.5 m (± 0.5 m) from one edge of the road, i.e. left or right as appropriate to the local road traffic regulations.
- (c) Characteristics:
- (1) The road-holding position light should comprise:
 - (i) a controllable red (stop)/green (go) traffic light; or
 - (ii) a flashing-red light
 - (2) Provisions for control of the lights should be installed in the positions for the air traffic services.
 - (3) The road-holding position light beam should be unidirectional and aligned so as to be visible to the driver of a vehicle approaching the holding position.
 - (4) The intensity of the light beam should be adequate for the conditions of visibility and ambient light in which the use of the holding position is intended but should not dazzle the driver.
 - (5) The flash frequency of the flashing red light should be between 30 and 60 flashes per minute.

CHAPTER N – VISUAL AIDS FOR NAVIGATION (SIGNS)**CS ADR-DSN.N.775 General**

- (a) Signs should be either fixed message signs or variable message signs.
- (b) Application:
 - (1) Signs should be provided to convey a mandatory instruction, information on a specific location, or destination on a movement area or to provide other information.
 - (2) A variable message sign should be provided where:
 - (i) the instruction or information displayed on the sign is relevant only during a certain period of time; and/or
 - (ii) there is a need for variable predetermined information to be displayed.
- (c) Characteristics:
 - (1) Signs should be frangible. Those located near a runway or taxiway should be sufficiently low to preserve clearance for propellers and the engine pods of jet aircraft. The installed height of the sign should not exceed the dimension shown in the appropriate column of Table N-1.
 - (2) Signs should be rectangular, as shown in Figures N-4 and N-6 with the longer side horizontal.
 - (3) The only signs on the movement area utilising red should be mandatory instruction signs.
 - (4) The inscriptions on a sign should be in accordance with the provisions of Figures N-2A to N-2H and N-3.
 - (5) Signs should be illuminated when intended for use:
 - (i) in runway visual range conditions less than a value of 800 m; or
 - (ii) at night in association with instrument runways; or
 - (iii) at night in association with non-instrument runways where the code number is 3 or 4.
 - (6) Signs should be retroreflective and/or illuminated when intended for use at night in association with non-instrument runways where the code number is 1 or 2.
 - (7) Where variable pre-determined information is required, a variable sign should be provided.
 - (i) A variable message sign should show a blank face when not in use.
 - (ii) In case of failure, a variable message sign should not provide information that could lead to unsafe action from a pilot or a vehicle driver.
 - (iii) The time interval to change from one message to another on a variable message sign should be as short as practicable and should not exceed 5 seconds.

Sign height (mm)				Perpendicular distance from defined taxiway pavement edge to near side of sign	Perpendicular distance from defined runway pavement edge to near side of sign
Code number	Legend	Face (min)	Installed (max)		
1 or 2	200	400	700	5-11 m	3-10 m
1 or 2	300	600	900	5-11 m	3-10 m
3 or 4	300	600	900	11-21 m	8-15 m
3 or 4	400	800	1 100	11-21 m	8-15 m

Table N-1. Location distances for taxiing guidance signs including runway exit signs

(8) Inscription heights should conform to the Table N-2.

Runway code number	Minimum character height		
	Mandatory instruction sign	Information sign	
		Runway exit and runway vacated signs	Other signs
1 or 2	300 mm	300 mm	200 mm
3 or 4	400 mm	400 mm	300 mm

Table N-2. Minimum character height

(9) Where a taxiway location sign is installed in conjunction with a runway designation sign (see CS ADR-DSN.N.785(b)(9)), the character size should be that specified for mandatory instruction signs.

(i) Arrow dimensions should be as follows:

Legend height	Stroke
200 mm	32 mm
300 mm	48 mm
400 mm	64 mm

CS ADR DSN – BOOK 1

CHAPTER N – VISUAL AIDS FOR NAVIGATION (SIGNS)

- (ii) Stroke width for single letter should be as follows:

Legend height	Stroke
200 mm	32 mm
300 mm	48 mm
400 mm	64 mm

- (10) Sign luminance should be as follows:

- (i) Where operations are conducted in runway visual range conditions less than a value of 800 m, average sign luminance should be at least:

Red	30 cd/m ²
Yellow	150 cd/m ²
White	300 cd/m ²

- (ii) Where operations are conducted in accordance with CS ADR-DSN.N.775(c)(5)(ii) and (c)(6), average sign luminance should be at least:

Red	10 cd/m ²
Yellow	50 cd/m ²
White	100 cd/m ²

- (iii) In runway visual range conditions less than a value of 400 m, there should be some degradation in the performance of signs.

- (11) The luminance ratio between red and white elements of a mandatory sign should be between 1:5 and 1:10.

- (12) The average luminance of the sign is calculated by establishing grid points as shown in Figure N-1, and using the luminance values measured at all grid points located within the rectangle representing the sign.

- (13) The average value is the arithmetic average of the luminance values measured at all considered grid points. Guidance on measuring the average luminance of a sign is contained in the ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids.

- (14) The ratio between luminance values of adjacent grid points should not exceed 1.5:1. For areas on the sign face where the grid spacing is 7.5 cm, the ratio between luminance values of adjacent grid points should not exceed 1.25:1. The ratio between the maximum and minimum luminance value over the whole sign face should not exceed 5:1.

- (15) The forms of characters, i.e. letters, numbers, arrows, and symbols should conform to those shown in Figures N-2A to N-2H. The width of characters and the space between individual characters should be determined as indicated in Table N-3.

- (16) The face height of signs should be as follows:

Legend height	Face height (min)
200 mm	400 mm

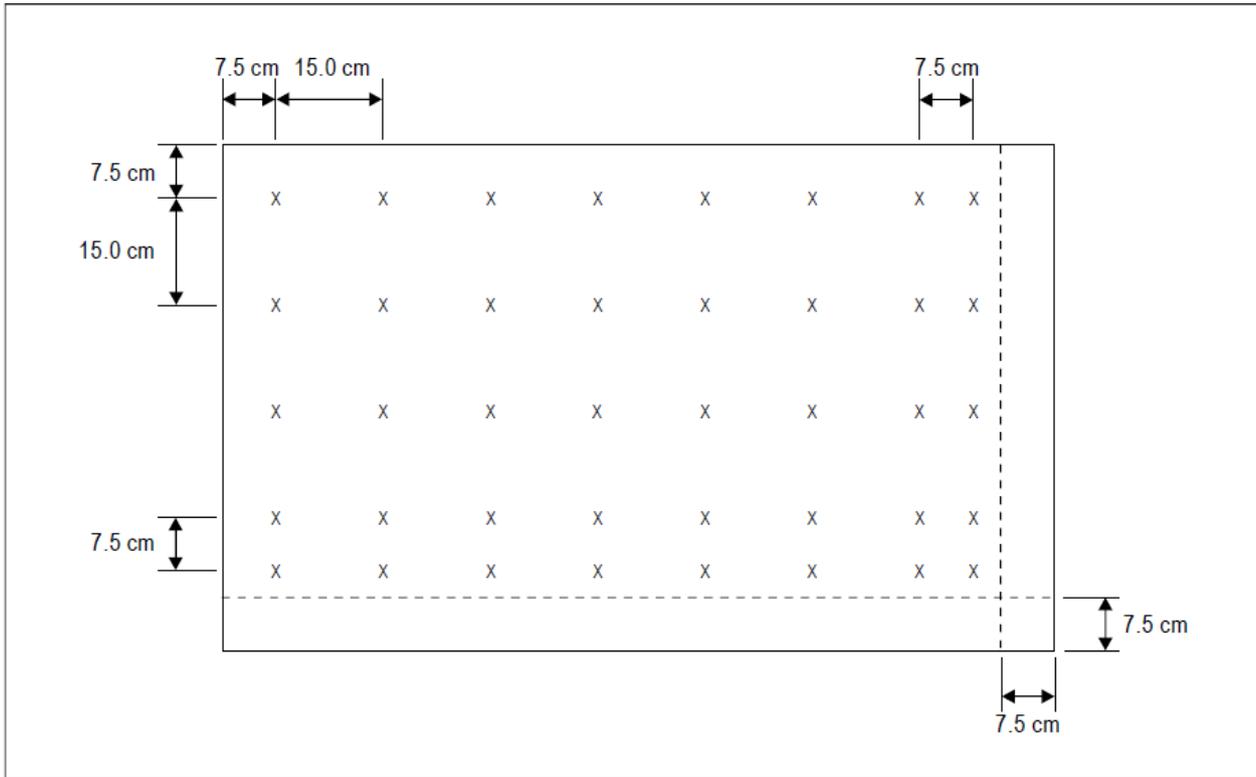
CS ADR DSN – BOOK 1

CHAPTER N – VISUAL AIDS FOR NAVIGATION (SIGNS)

300 mm	600 mm
400 mm	800 mm

- (17) The face width of signs should be determined using Figure N-3 except that, where a mandatory instruction sign is provided on one side of a taxiway only, the face width should not be less than:
- (i) 1.94 m where the code number is 3 or 4; and
 - (ii) 1.46 m where the code number is 1 or 2.
- (18) Borders:
- (i) The black vertical delineator between adjacent direction signs should have a width of approximately 0.7 of the stroke width.
 - (ii) The yellow border on a stand-alone location sign should be approximately 0.5 stroke width.
- (19) The colours of signs should be in accordance with the appropriate specifications in CHAPTER U – Colours for aeronautical ground lights, markings, signs and panels.
- a. Where operations are conducted in runway visual range conditions less than a value of 800 m, average sign luminance should be at least:
- | | |
|--------|-----------------------|
| Red | 30 cd/m ² |
| Yellow | 150 cd/m ² |
| White | 300 cd/m ² |
- b. Signs should be retroreflective and/or illuminated when intended for use at night in association with non-instrument runways where the code number is 1 or 2.
- c. Where operations are conducted at night in association with instrument runways ((5)(ii) above), or at night in association with non-instrument runways where the code number is 1 or 2 ((7) above), average sign luminance should be at least:
- | | |
|--------|-----------------------|
| Red | 10 cd/m ² |
| Yellow | 50 cd/m ² |
| White | 100 cd/m ² |
- (10) If instruction or information during a certain period of time, and/or there is a need to display variable pre-determined information, a variable information sign should be provided.
- (i) A variable message sign should show a blank face when not in use.
 - (ii) In case of failure, a variable message sign should not provide information that could lead to unsafe action from a pilot or a vehicle driver.
 - (iii) The time interval to change from one message to another on a variable message sign should be as short as practicable and should not exceed 5seconds.

If the runway threshold is displaced from the extremity of the runway, a sign showing the designation of the runway may be provided for aeroplanes taking off.



Note 1.— The average luminance of a sign is calculated by establishing grid points on a sign face showing typical inscriptions and a background of the appropriate colour (red for mandatory instruction signs and yellow for direction and destination signs) as follows:

- Starting at the top left corner of the sign face, establish a reference grid point at 7.5 cm from the left edge and the top of the sign face.
- Create a grid of 15 cm spacing horizontally and vertically from the reference grid point. Grid points within 7.5 cm of the edge of the sign face should be excluded.
- Where the last point in a row/column of grid points is located between 22.5 cm and 15 cm from the edge of the sign face (but not inclusive), an additional point should be added 7.5 cm from this point.
- Where a grid point falls on the boundary of a character and the background, the grid point should be slightly shifted to be completely outside the character.

Note 2.— Additional grid points may be required to ensure that each character includes at least five evenly spaced grid points.

Note 3.— Where one unit includes two types of signs, a separate grid should be established for each type.

Figure N-1. Grid points for calculating average luminance of a sign

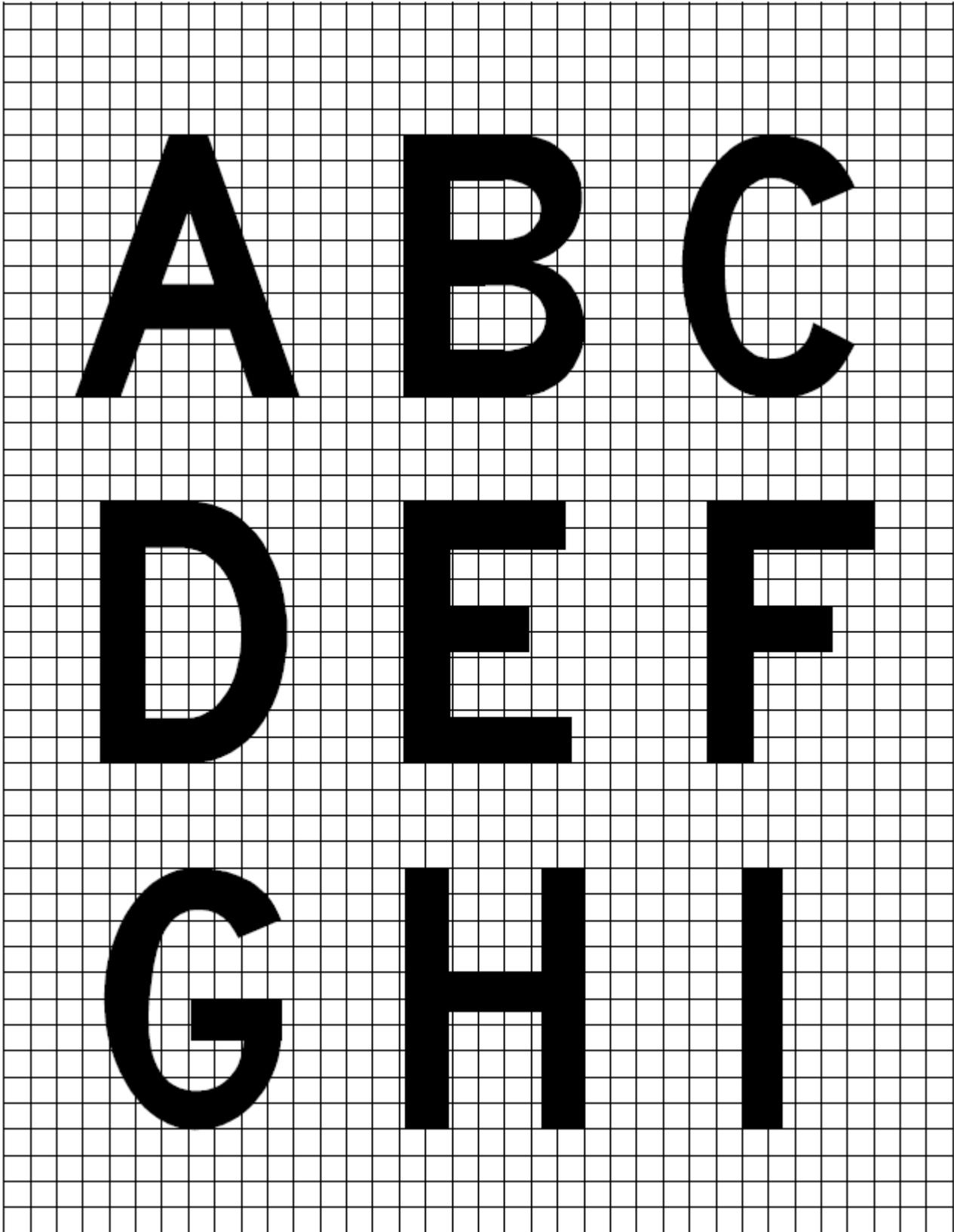


Figure N-2A. Forms of characters for signs

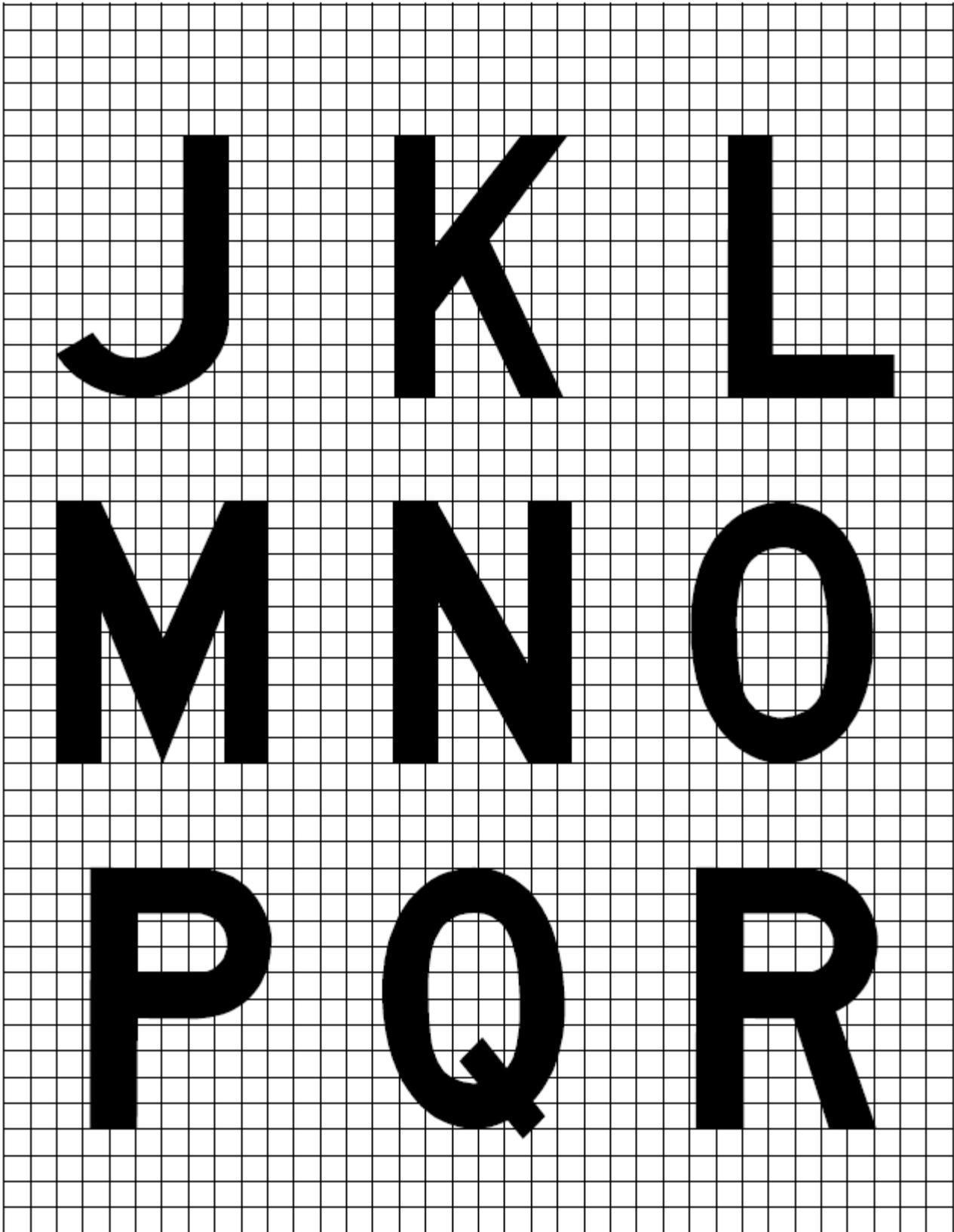


Figure N-2B. Forms of characters for signs

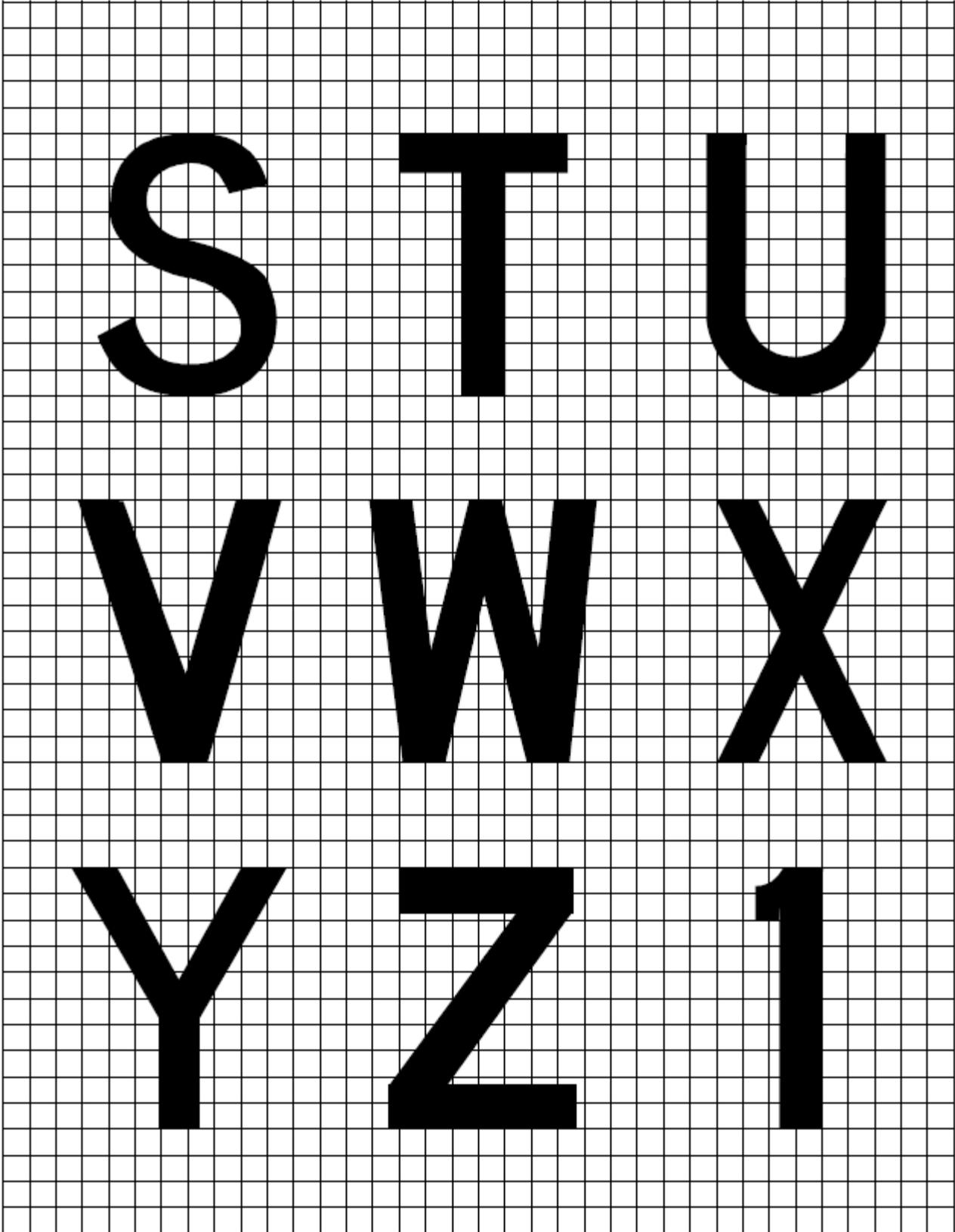


Figure N-2C. Forms of characters for signs

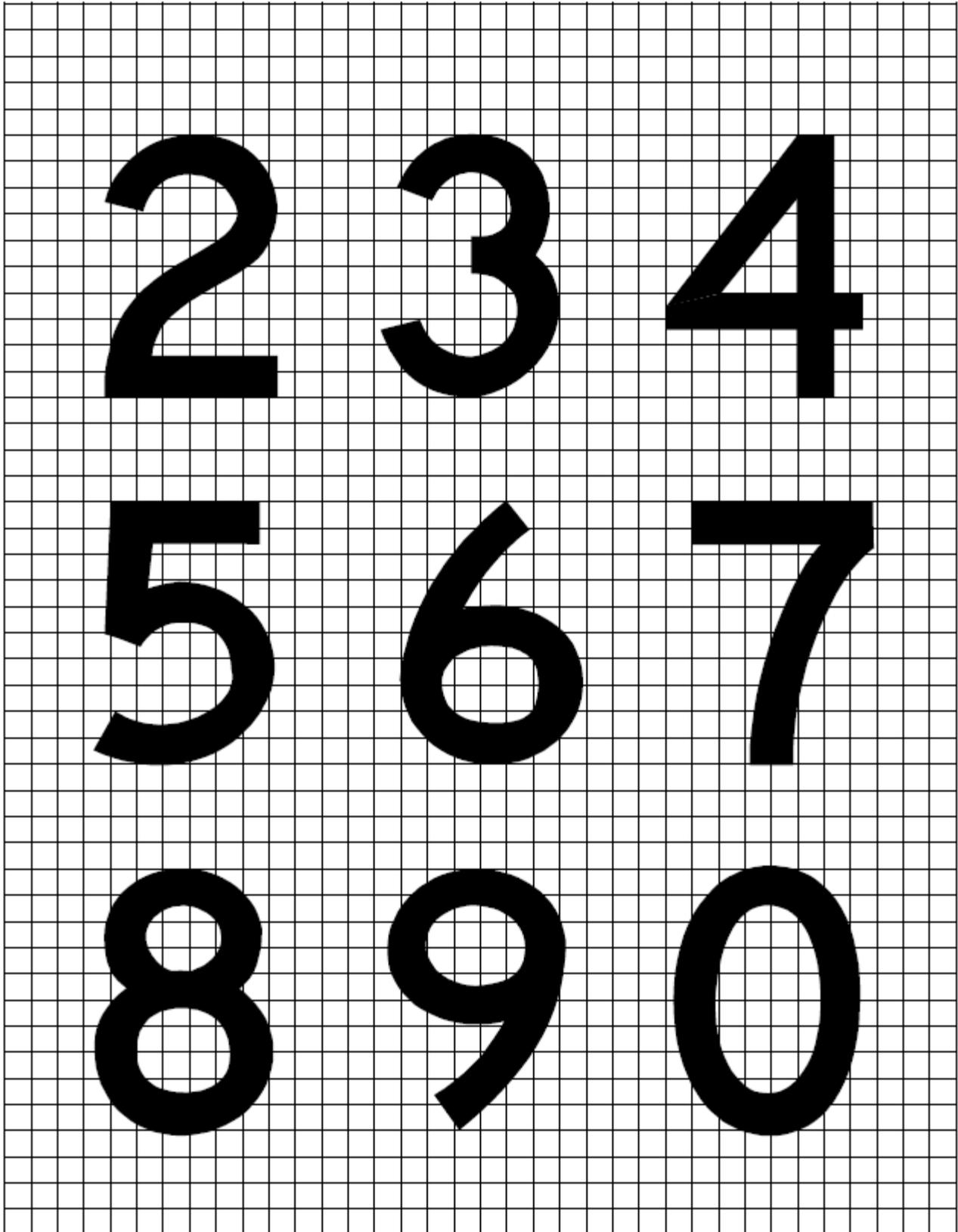


Figure N-2D. Forms of characters for signs

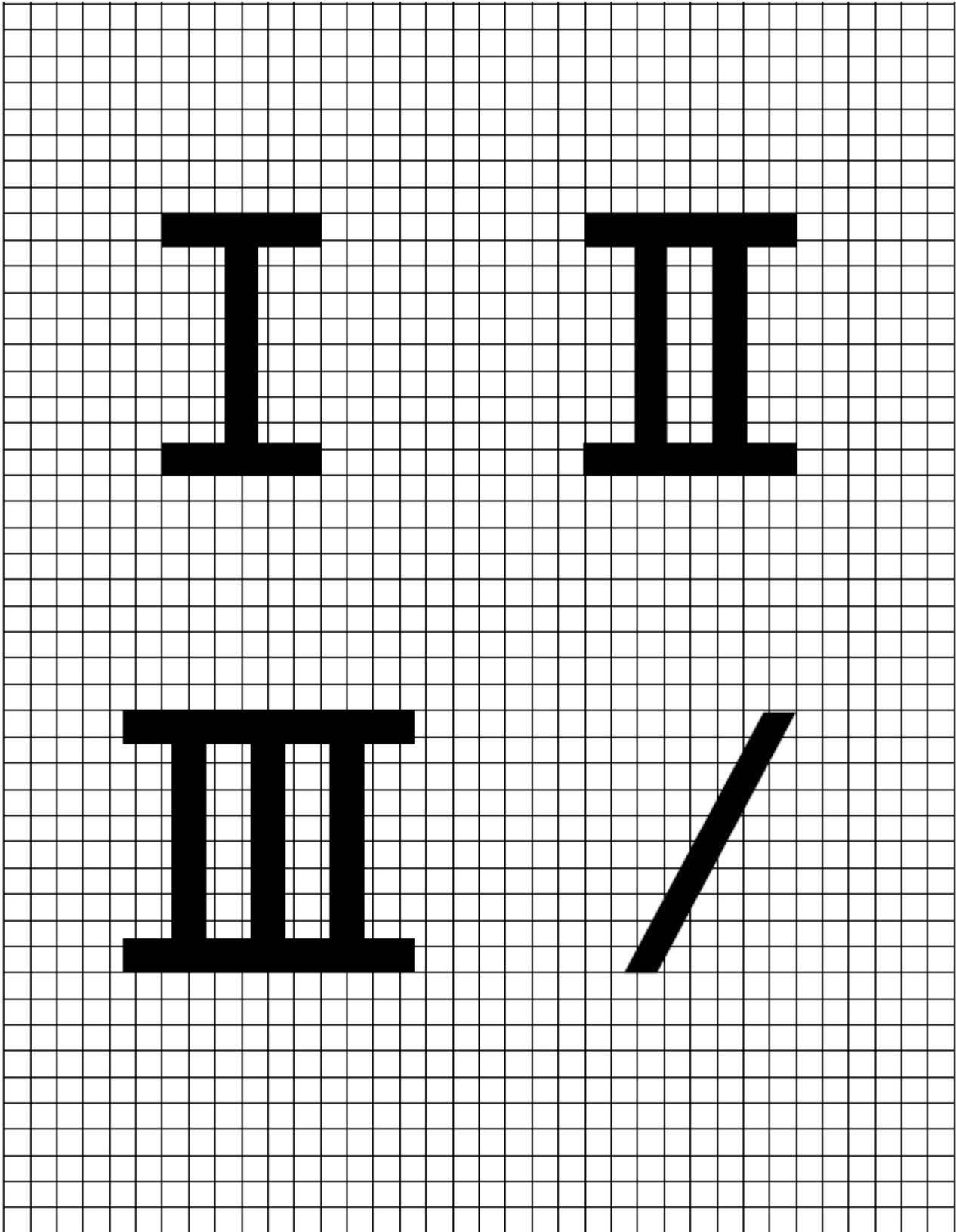


Figure N-2E. Forms of characters for signs

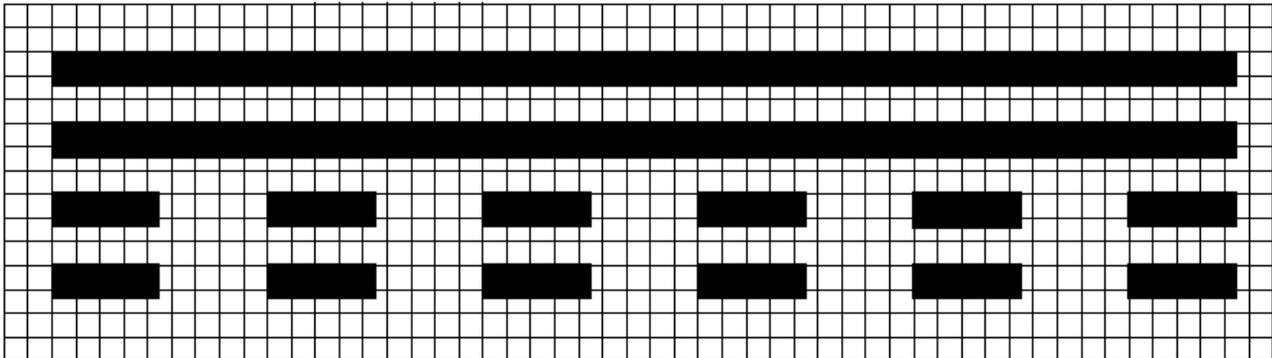


Figure N-2F. Runway vacated sign

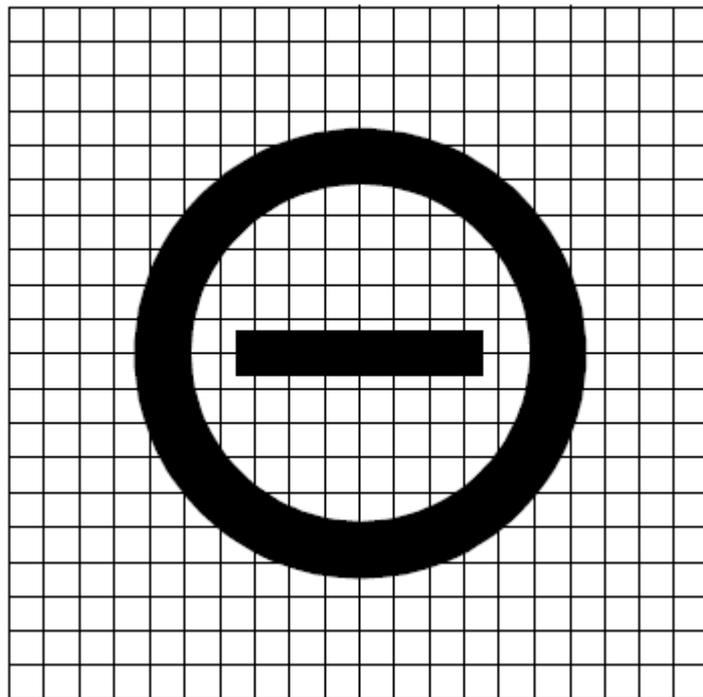
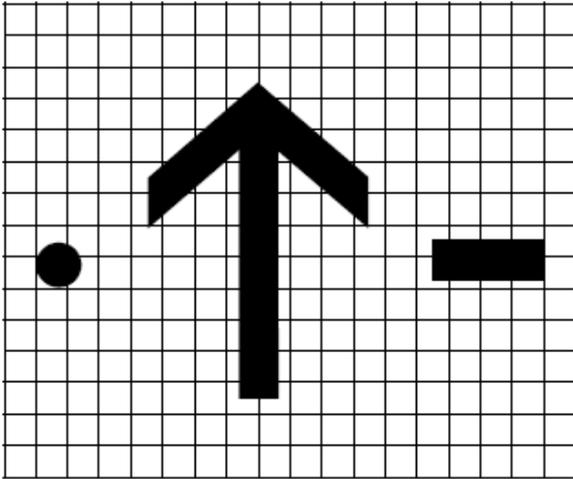


Figure N-2G. No entry sign



Note 1. — The arrow stroke width, diameter of the dot, and both width and length of the dash should be proportioned to the character stroke widths.

Note 2. — The dimensions of the arrow should remain constant for a particular sign size, regardless of orientation.

Figure N-2H. Forms of characters for signs

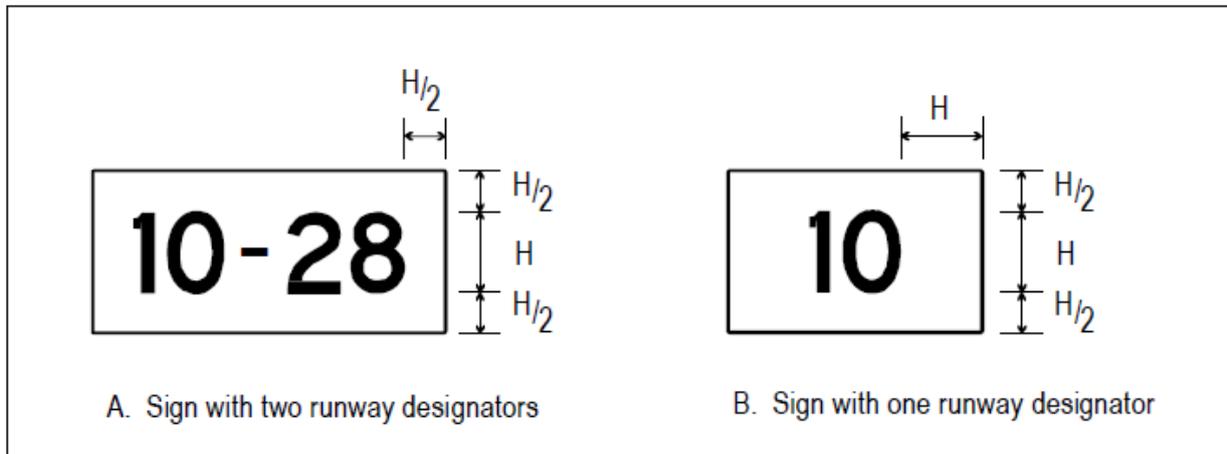


Figure N-3. Sign dimensions

CS ADR DSN – BOOK 1

CHAPTER N – VISUAL AIDS FOR NAVIGATION (SIGNS)

a) Letter to letter code number			
Preceding Letter	Following Letter		
	B, D, E, F, H, I, K, L, M, N, P, R, U	C, G, O, Q, S, X, Z	A, J, T, V, W, Y
	Code number		
A	2	2	4
B	1	2	2
C	2	2	3
D	1	2	2
E	2	2	3
F	2	2	3
G	1	2	2
H	1	1	2
I	1	1	2
J	1	1	2
K	2	2	3
L	2	2	4
M	1	1	2
N	1	1	2
O	1	2	2
P	1	2	2
Q	1	2	2
R	1	2	2
S	1	2	2
T	2	2	4
U	1	1	2
V	2	2	4
W	2	2	4
X	2	2	3
Y	2	2	4
Z	2	2	3

b) Numeral to numeral code number			
Preceding Numeral	Following number		
	1, 5	2, 3, 6, 8, 9, 0	4, 7
	Code number		
1	1	1	2
2	1	2	2
3	1	2	2
4	2	2	4
5	1	2	2
6	1	2	2
7	2	2	4
8	1	2	2
9	1	2	2
0	1	2	2

c) Space between characters			
Code No.	Letter height (mm)		
	200	300	400
	Space (mm)		
1	48	71	96
2	38	57	76
3	25	38	50
4	13	19	26

d) Width of letter			
Letter	Letter height (mm)		
	200	300	400
	Width (mm)		
A	170	255	340
B	137	205	274
C	137	205	274
D	137	205	274
E	124	186	248
F	124	186	248
G	137	205	274
H	137	205	274
I	32	48	64
J	127	190	254
K	140	210	280
L	124	186	248
M	157	236	314
N	137	205	274
O	143	214	286
P	137	205	274
Q	143	214	286
R	137	205	274
S	137	205	274
T	124	186	248
U	137	205	274
V	152	229	304
W	178	267	356
X	137	205	274
Y	171	257	342
Z	137	205	274

e) Width of numeral			
Numeral	Numeral height (mm)		
	200	300	400
	Width (mm)		
1	50	74	98
2	137	205	274
3	137	205	274
4	149	224	298
5	137	205	274
6	137	205	274
7	137	205	274
8	137	205	274
9	137	205	274
0	143	214	286

INSTRUCTIONS

- To determine the proper SPACE between letters or numerals, obtain the code number from table a) or b) and enter table c) for that code number to the desired letter or numeral height.
- The space between words or groups of characters forming an abbreviation or symbol should be equal to 0.5 to 0.75 of the height of the characters used except that where an arrow is located with a single character such as 'A →', the space may be reduced to not less than one quarter of the height of the character in order to provide a good visual balance.
- Where the numeral follows a letter or vice versa use Code 1.
- Where a hyphen, dot, or diagonal stroke follows a character or vice versa use Code 1.

Table N-3. Letter and numeral width and space between letters or numerals

CS ADR-DSN.N.780 Mandatory instruction signs

(a) Application:

- (1) A mandatory instruction sign should be provided to identify a location beyond which an aircraft taxiing or vehicle should not proceed unless authorised by the aerodrome control tower.
- (2) Mandatory instruction signs should include runway designation signs, category I, II, or III holding position signs, runway-holding position signs, road-holding position signs, and NO ENTRY signs.
- (3) A pattern 'A' runway-holding position marking should be supplemented at a taxiway/runway intersection or a runway/runway intersection with a runway designation sign.
- (4) A pattern 'B' runway-holding position marking should be supplemented with a category I, II, or III holding position sign.
- (5) A pattern 'A' runway-holding position marking at a runway-holding position should be supplemented with a runway-holding position sign.
- (6) A runway designation sign at a taxiway/runway intersection should be supplemented with a location sign in the outboard (farthest from the taxiway) position as appropriate.
- (7) A road holding position sign should be provided at all road entrances to a runway and may also be provided at road entrances to taxiways.
- (8) A NO ENTRY sign should be provided when entry into an area is prohibited.

(b) Location:

- (1) A runway designation sign at a taxiway/runway intersection or a runway/runway intersection should be located on each side of the runway-holding position marking facing the direction of approach to the runway.
- (2) A category I, II, or III holding position sign should be located on each side of the runway-holding position marking facing the direction of the approach to the critical area.
- (3) A NO ENTRY sign should be located at the beginning of the area to which entrance is prohibited on each side of the taxiway as viewed by the pilot.
- (4) A runway-holding position sign should be located on each side of the runway-holding position facing the approach to the obstacle limitation surface or ILS/MLS critical/sensitive area as appropriate.

(c) Characteristics:

- (1) A mandatory instruction sign should consist of an inscription in white on a red background. Where, owing to environmental or other factors, the conspicuity of the inscription on a mandatory instruction sign needs to be enhanced, the outside edge of the white inscription should be supplemented by a black outline measuring 10 mm in width for runway code numbers 1 and 2, and 20 mm in width for runway code numbers 3 and 4.
- (2) The inscription on a runway designation sign should consist of the runway designations of the intersecting runway properly oriented with respect to the viewing position of the sign, except that a runway designation sign installed in the

vicinity of a runway extremity may show the runway designation of the concerned runway extremity only.

- (3) The inscription on a category I, II, III, or joint II/III holding position sign should consist of the runway designator followed by CAT I, CAT II, CAT III, or CAT II/III as appropriate.
 - (4) The inscription on a NO ENTRY sign should be in accordance with Figure N-4.
 - (5) The inscription on a runway-holding position sign at a runway-holding position should consist of the taxiway designation and a number.
- (d) Where appropriate, the following inscriptions/symbol should be used:

Inscription/Symbol	Use
Runway designation of runway extremity	To indicate a runway holding position at a runway extremity
or	
Runway designation of both extremities of a runway	To indicate a runway holding position located at other taxiway/runway intersections or runway/runway intersections
25 CAT I (Example)	To indicate a category I runway-holding position at the threshold of runway 25
25 CAT II (Example)	To indicate a category II runway-holding position at the threshold of runway 25
25 CAT III (Example)	To indicate a category III runway-holding position at the threshold of runway 25
25 CAT II/III (Example)	To indicate a joint category II/III runway holding position at the threshold of runway 25
NO ENTRY symbol	To indicate that entry to an area is prohibited
B2 (Example)	To indicate a runway holding position established in accordance with the requirements for physical characteristics

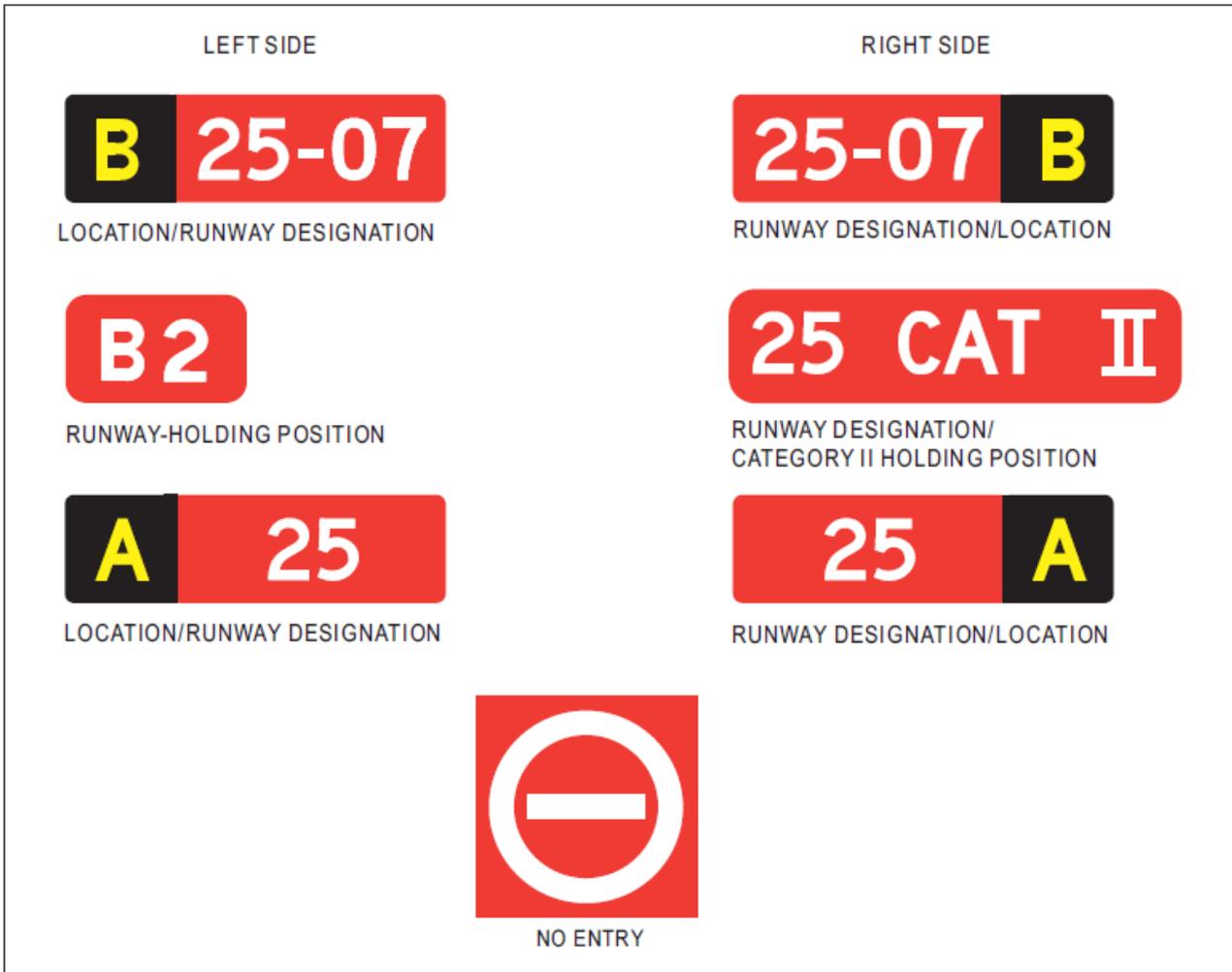
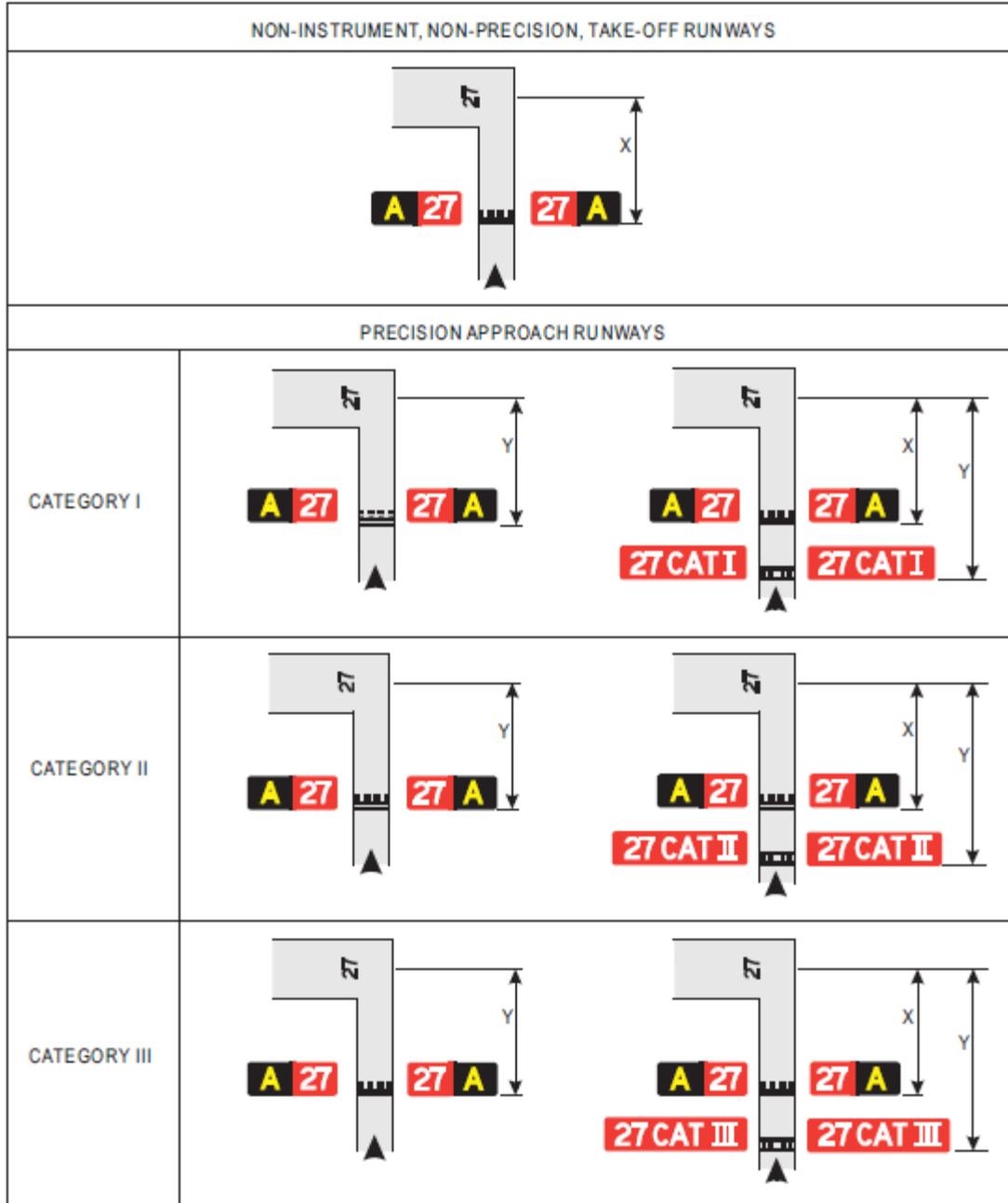


Figure N-4. Mandatory instruction signs



Note. – Distance X is established in accordance with Table D-2. Distance Y is established at the edge of ILS/MLS critical/sensitive area

Figure N-5. Positions of signs at taxiway/runway intersections

CS ADR-DSN.N.785 Information signs

(a) Application:

- (1) An information sign should be provided where there is an operational need to identify by a sign, a specific location, or routing (direction or destination) information.
- (2) Information signs should include: direction signs, location signs, destination signs, runway exit signs, runway vacated signs, and intersection take-off signs.
- (3) A runway exit sign should be provided where there is an operational need to identify a runway exit.
- (4) A runway vacated sign should be provided where the exit taxiway is not provided with taxiway centre line lights and there is a need to indicate to a pilot leaving a runway the perimeter of the ILS/MLS critical/sensitive area, or the lower edge of the inner transitional surface whichever is farther from the runway centre line.
- (5) An intersection take-off sign should be provided when there is an operational need to indicate the remaining take-off run available (TORA) for an intersection take-off.
- (6) Where necessary, a destination sign should be provided to indicate the direction to a specific destination on the aerodrome, such as cargo area, general aviation, etc.
- (7) A combined location and direction sign should be provided when it is intended to indicate routing information prior to a taxiway intersection.
- (8) A direction sign should be provided when there is an operational need to identify the designation and direction of taxiways at an intersection.
- (9) A location sign should be provided at an intermediate holding position.
- (10) A location sign should be provided in conjunction with a runway designation sign except at a runway/runway intersection.
- (11) A location sign should be provided in conjunction with a direction sign, except that it may be omitted where an aeronautical study indicates that it is not needed.
- (12) Where necessary, a location sign should be provided to identify taxiways exiting an apron or taxiways beyond an intersection.
- (13) Where a taxiway ends at an intersection such as a 'T' and it is necessary to identify this, a barricade, direction sign, and/or other appropriate visual aid should be used.

(b) Location:

- (1) Except as specified in (3), information signs should wherever practicable, be located on the left-hand side of the taxiway in accordance with Table N-1.
- (2) At a taxiway intersection, information signs should be located prior to the intersection and in line with the taxiway intersection marking. Where there is no taxiway intersection marking, the signs should be installed at least 60 m from the centre line of the intersecting taxiway where the code number is 3 or 4, and at least 40 m where the code number is 1 or 2.
- (3) A runway exit sign should be located on the same side of the runway as the exit is located (i.e. left or right), and positioned in accordance with Table N-1.
- (4) A runway exit sign should be located prior to the runway exit point in line with a position at least 60 m prior to the point of tangency where the code number is 3 or 4, and at least 30 m where the code number is 1 or 2.

CS ADR DSN — BOOK 1

CHAPTER N — VISUAL AIDS FOR NAVIGATION (SIGNS)

- (5) A runway vacated sign should be located at least on one side of the taxiway. The distance between the sign and the centre line of a runway should be not less than the greater of the following:
 - (i) the distance between the centre line of the runway and the perimeter of the ILS/MLS critical/sensitive area; or
 - (ii) the distance between the centre line of the runway and the lower edge of the inner transitional surface.
 - (6) Where provided in conjunction with a runway vacated sign, the taxiway location sign should be positioned outboard of the runway vacated sign.
 - (7) An intersection take-off sign should be located at the left-hand side of the entry taxiway. The distance between the sign and the centre line of the runway should be not less than 60 m where the code number is 3 or 4 and not less than 45 m where the code number is 1 or 2.
 - (8) A taxiway location sign installed in conjunction with a runway designation sign should be positioned outboard of the runway designation sign.
 - (9) A destination sign should not normally be collocated with a location or direction sign.
 - (10) An information sign other than a location sign should not be collocated with a mandatory instruction sign.
- (c) Characteristics:
- (1) An information sign other than a location sign should consist of an inscription in black on a yellow background.
 - (2) A location sign should consist of an inscription in yellow on a black background and where it is a stand-alone sign, should have a yellow border.
 - (3) The inscription on a runway exit sign should consist of the designator of the exit taxiway and an arrow indicating the direction to follow.
 - (4) The inscription on a runway vacated sign should depict the pattern A runway-holding position marking as shown in Figure N-6.
 - (5) The inscription on an intersection take-off sign should consist of a numerical message indicating the remaining take-off run available in metres, plus an arrow, appropriately located and oriented, indicating the direction of the take-off as shown in Figure N-6.
 - (6) The inscription on a destination sign should comprise an alpha, alphanumerical or numerical message identifying the destination, plus an arrow indicating the direction to proceed as shown in Figure N-6.
 - (7) The inscription on a direction sign should comprise an alpha or alphanumerical message identifying the taxiway(s), plus an arrow or arrows appropriately oriented as shown in Figure N-6.
 - (8) The inscription on a location sign should comprise the designation of the location taxiway, runway, or other pavement the aircraft is on or is entering, and should not contain arrows.
 - (9) Where it is necessary to identify each of a series of intermediate holding positions on the same taxiway, the location sign should consist of the taxiway designation and a progressive number.
 - (10) Where a location sign and direction signs are used in combination:

- (i) all direction signs related to left turns should be placed on the left side of the location sign and all direction signs related to right turns should be placed on the right side of the location sign, except that where the junction consists of one intersecting taxiway, the location sign may alternatively be placed on the left hand side;
 - (ii) the direction signs should be placed such that the direction of the arrows departs increasingly from the vertical with increasing deviation of the corresponding taxiway;
 - (iii) an appropriate direction sign should be placed next to the location sign where the direction of the location taxiway changes significantly beyond the intersection; and
 - (iv) adjacent direction signs should be delineated by a vertical black line as shown in Figure N-6.
- (11) A taxiway should be identified by a designator comprising a letter, letters, or a combination of a letter or letters followed by a number.
- (12) When designating taxiways, the use of the letters I, O, or X, and the use of words such as 'inner' and 'outer' should be avoided wherever possible, to avoid confusion with the numerals 1, 0, and closed marking.
- (13) The use of numbers alone on the manoeuvring area should be reserved for the designation of runways, or to indicate the location of aircraft stands.

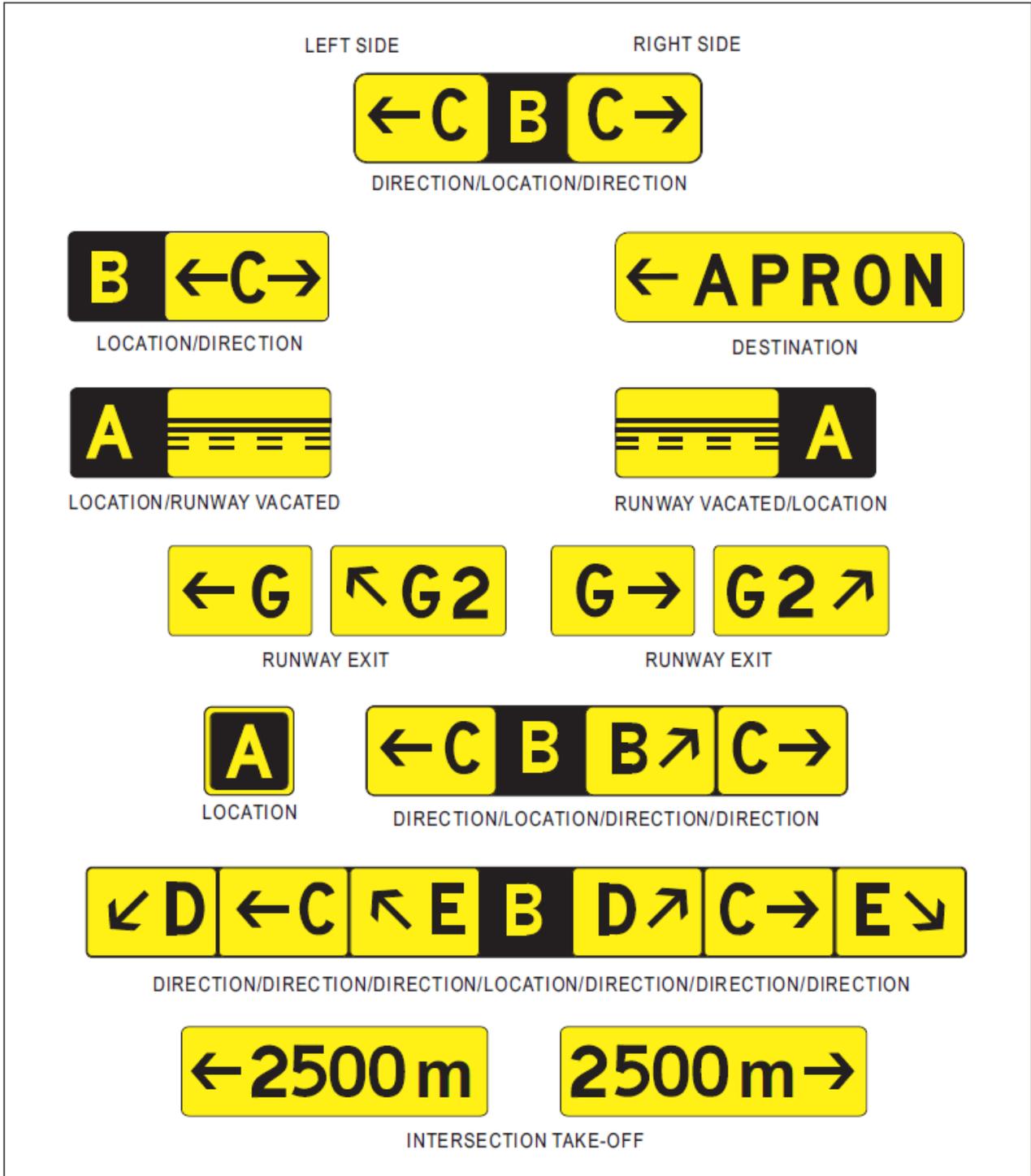


Figure N-6. Information signs

CS ADR-DSN.N.790 VOR aerodrome checkpoint sign

When a VOR aerodrome check-point is established, it should be indicated by a VOR aerodrome check-point marking and sign.

- (a) Location: A VOR aerodrome check-point sign should be located as near as possible to the check-point and so that the inscriptions are visible from the cockpit of an aircraft properly positioned on the VOR aerodrome check-point marking.
- (b) Characteristics:
 - (1) A VOR aerodrome check-point sign should consist of an inscription in black on a yellow background.
 - (2) The inscriptions on a VOR check-point sign should be in accordance with one of the alternatives shown in Figure N-7 in which:

VOR	is an abbreviation identifying this as a VOR check-point;
116.3	is an example of the radio frequency of the VOR concerned;
147°	is an example of the VOR bearing, to the nearest degree, which should be indicated at the VOR check-point; and
4.3 NM	is an example of the distance in nautical miles to a DME collocated with the VOR concerned.

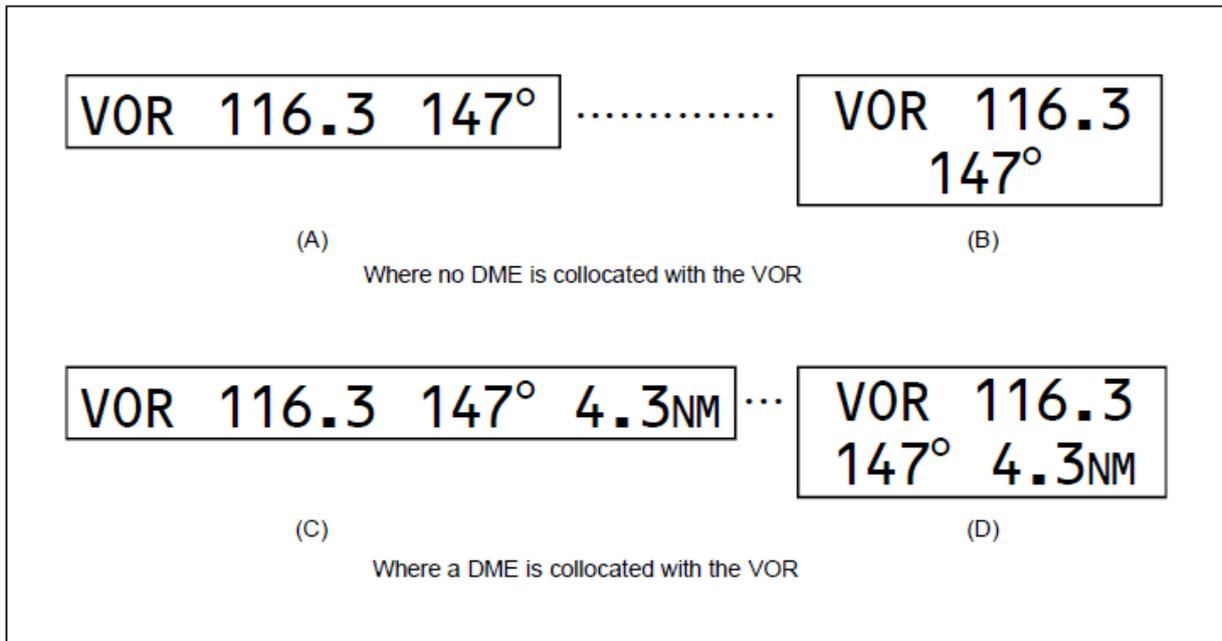


Figure N-7. VOR aerodrome check-point sign

CS ADR-DSN.N.795 Aircraft stand identification signs

- (a) Application: An aircraft stand identification marking should be supplemented with an aircraft stand identification sign where feasible.
- (b) Location: An aircraft stand identification sign should be located so as to be clearly visible from the cockpit of an aircraft prior to entering the aircraft stand.
- (c) Characteristics: An aircraft stand identification sign should consist of an inscription in black on a yellow background.

CS ADR-DSN.N.800 Road-holding position sign

- a) Application: A road-holding position sign should be provided at all road entrances to a runway.
- b) Location: The road-holding position sign should be located 1.5 m from one edge of the road (left or right as appropriate to the local road traffic regulations) at the holding position.
- c) Where a road intersects a taxiway, a suitable sign may be located adjacent to the roadway/taxiway intersection marking 1.5 m from one edge of the road, i.e. left or right as appropriate to the local road traffic regulations.
- d) Characteristics:
 - (1) A road-holding position sign at an intersection of a road with a runway should consist of an inscription in white on a red background.
 - (2) The inscription on a road-holding position sign should be in the national language, be in conformity with the local road traffic regulations, and include the following:
 - (i) a requirement to stop; and
 - (ii) where appropriate:
 - (A) a requirement to obtain ATC clearance; and
 - (B) location designator.
 - (3) A road-holding position sign intended for night use should be retroreflective or illuminated.
 - (4) A road-holding position sign at the intersection of a road with a taxiway should be in accordance with the local road traffic regulations for a yield right of way sign or a stop sign.

CHAPTER P — VISUAL AIDS FOR NAVIGATION (MARKERS)**CS ADR-DSN.P.805 General**

Markers should be frangible. Those located near a runway or taxiway should be sufficiently low to preserve clearance for propellers, and for the engine pods of jet aircraft.

CS ADR-DSN.P.810 Unpaved runway edge markers

- (a) Applicability: Markers should be provided when the extent of an unpaved runway is not clearly indicated by the appearance of its surface compared with that of the surrounding ground.
- (b) Characteristics:
 - (1) Where runway lights are provided, the markers should be incorporated in the light fixtures. Where there are no lights, markers of flat rectangular or conical shape should be placed so as to delimit the runway clearly.
 - (2) The flat rectangular markers should have a minimum size of 1 m by 3 m, and should be placed with their long dimension parallel to the runway centre line. The conical markers should have a height not exceeding 0.50 m.

CS ADR-DSN.P.815 Stopway edge markers

- (iii) Applicability: Stopway edge markers should be provided when the extent of a stopway is not clearly indicated by its appearance compared with that of the surrounding ground.
- (iv) Characteristics: The stopway edge markers should be sufficiently different from any runway edge markers used to ensure that the two types of markers cannot be confused.

CS ADR-DSN.P.820 Edge markers for snow-covered runways

- (a) Applicability: Edge markers for snow-covered runways should be used to indicate the usable limits of a snow-covered runway when the limits are not otherwise indicated.
- (b) Location: Edge markers for snow-covered runways should be placed along the sides of the runway at intervals of not more than 100 m, and should be located symmetrically about the runway centre line at such a distance from the centre line that there is adequate clearance for wing tips and powerplants. Sufficient markers should be placed across the threshold and end of the runway.

CS ADR-DSN.P.825 Taxiway edge markers

- (a) Applicability: Taxiway edge markers should be provided on a taxiway where taxiway centre line or edge lights or taxiway centre line markers are not provided.
- (b) Location: Taxiway edge markers should be installed at least at the same locations as would the taxiway edge lights, had they been used.
- (c) Characteristics:
 - (1) A taxiway edge marker should be retroreflective blue.
 - (2) The marked surface as viewed by the pilot should be a rectangle and should have a minimum viewing area of 150 cm².

- (3) Taxiway edge markers should be frangible. Their height should be sufficiently low to preserve clearance for propellers and for the engine pods of jet aircraft.

CS ADR-DSN.P.830 Taxiway centre line markers

- (a) Applicability:
 - (1) Taxiway centre line markers should be provided on a taxiway where taxiway centre line or edge lights or taxiway edge markers are not provided.
 - (2) Taxiway centre line markers should be provided on a taxiway where taxiway centre line lights are not provided if there is a need to improve the guidance provided by the taxiway centre line marking.
- (b) Location
 - (1) Taxiway centre line markers should be installed at least at the same location as would taxiway centre line lights had they been used.
 - (2) Taxiway centre line markers should be located on the taxiway centre line marking except that they may be offset by not more than 0.3 m.
- (c) Characteristics:
 - (1) A taxiway centre line marker should be retroreflective green.
 - (2) The marked surface as viewed by the pilot should be a rectangle, and should have a minimum viewing area of 20 cm².
 - (3) Taxiway centre line markers should be so designed and fitted as to withstand being run over by the wheels of an aircraft without damage either to the aircraft or to the markers themselves.

CS ADR-DSN.P.835 Unpaved taxiway edge markers

- (a) Applicability: Where the extent of an unpaved taxiway is not clearly indicated by its appearance compared with that of the surrounding ground, markers should be provided.
- (b) Characteristics:
 - (1) Where taxiway lights are provided, the markers should be incorporated in the light fixtures.
 - (2) Where there are no lights, suitable markers should be placed so as to clearly delineate the taxiway.

CHAPTER Q – VISUAL AIDS FOR DENOTING OBSTACLES**CS ADR-DSN.Q.840 Objects to be marked and/or lighted**

- (b) A fixed obstacle that extends above a take-off climb, approach or transitional surface within 3 000 m of the inner edge of the take-off climb or approach surface should be marked and if the runway is used at night, lighted, except that:
- (1) such marking and lighting may be omitted when the obstacle is shielded by another fixed obstacle;
 - (2) the marking may be omitted when the obstacle is lighted by medium-intensity obstacle lights, Type A, by day, and its height above the level of the surrounding ground does not exceed 150 m;
 - (3) the marking may be omitted when the obstacle is lighted by high-intensity obstacle lights by day if medium intensity lights are deemed insufficient; and
 - (4) the lighting may be omitted where the obstacle is a lighthouse and an aeronautical study indicates the lighthouse light to be sufficient.
- (c) A fixed object, other than an obstacle, adjacent to a take-off climb, approach or transitional surface should be marked and if the runway is used at night, lighted, if such marking and lighting is considered necessary to ensure its avoidance, except that the marking may be omitted when:
- (1) the object is lighted by medium-intensity obstacle lights, Type A, by day, and its height above the level of the surrounding ground does not exceed 150 m; or
 - (2) the object is lighted by high-intensity obstacle lights by day if medium intensity lights are deemed insufficient.
- (d) A fixed obstacle above a horizontal surface should be marked and if the aerodrome is used at night, lighted, except that:
- (1) such marking and lighting may be omitted when:
 - (i) the obstacle is shielded by another fixed obstacle; or
 - (ii) for a circuit extensively obstructed by immovable objects or terrain, procedures have been established to ensure safe vertical clearance below prescribed flight paths; or
 - (iii) an aeronautical study shows the obstacle not to be of operational significance.
 - (2) the marking may be omitted when the obstacle is lighted by medium-intensity obstacle lights, Type A, by day, and its height above the level of the surrounding ground does not exceed 150 m;
 - (3) the marking may be omitted when the obstacle is lighted by high-intensity obstacle lights by day if medium intensity lights are deemed insufficient.
- (e) A fixed object that extends above an obstacle protection surface should be marked and, if the runway is used at night, lighted.
- (f) Elevated aeronautical ground lights within the movement area should be marked so as to be conspicuous by day. Obstacle lights should not be installed on elevated ground lights or signs in the movement area.

- (g) All obstacles within the distance specified in Table D-1, from the centre line of a taxiway, an apron taxiway, or aircraft stand taxilane should be marked and if the taxiway, apron taxiway or aircraft stand taxilane is used at night, lighted.

CS ADR-DSN.Q.845 Marking of objects

- (a) All fixed objects to be marked should whenever practicable, be coloured but if this is not practicable, markers or flags should be displayed on or above them, except that objects that are sufficiently conspicuous by their shape, size, or colour need not be otherwise marked.
- (b) Use of colours
- (1) An object should be coloured to show a chequered pattern if it has essentially unbroken surfaces, and its projection on any vertical plane equals or exceeds 4.5 m in both dimensions. The pattern should consist of rectangles of not less than 1.5 m and not more than 3 m on a side, the corners being of the darker colour. The colours of the pattern should contrast with each other and with the background against which they should be seen.
 - (2) An object should be coloured to show alternating contrasting bands if:
 - (iv) it has essentially unbroken surfaces, and has one dimension, horizontal or vertical, greater than 1.5 m, and the other dimension, horizontal or vertical, less than 4.5 m; or
 - (v) it is of skeletal type with either a vertical or a horizontal dimension greater than 1.5 m.
 - (3) The bands should be perpendicular to the longest dimension and have a width approximately 1/7 of the longest dimension or 30 m, whichever is less. The colours of the bands should contrast with the background against which they should be seen. Orange and white should be used, except where such colours are not conspicuous when viewed against the background. The bands on the extremities of the object should be of the darker colour (see Figures Q-1 and Q-2). The dimensions of the marking band widths are shown in Table Q-3.
 - (4) An object should be coloured in a single conspicuous colour if its projection on any vertical plane has both dimensions less than 1.5 m. Orange or red should be used, except where such colours merge with the background.
- (c) Use of markers:
- (1) Markers displayed on or adjacent to objects should be located in conspicuous positions so as to retain the general definition of the object and should be recognisable in clear weather from a distance of at least 1 000 m for an object to be viewed from the air and 300 m for an object to be viewed from the ground in all directions in which an aircraft is likely to approach the object. The shape of markers should be distinctive to the extent necessary to ensure that they are not mistaken for markers employed to convey other information, and they should be such that the hazard presented by the object they mark is not increased.
 - (2) Marker displayed on an overhead wire, cable, etc., should be spherical and have a diameter of not less than 60 cm.
 - (3) The spacing between two consecutive markers, or between a marker and a supporting tower should be appropriate to the diameter of the marker. The spacing should normally not exceed:

CHAPTER Q – VISUAL AIDS FOR DENOTING OBSTACLES

- (i) 30 m where the marker diameter is 60 cm, increasing progressively with increase of the marker diameter to:
- (A) 35 m where the marker diameter is 80 cm; and
- (B) further progressive increases to a maximum of 40 m where the marker diameter is of at least 130 cm.

Where multiple wires, cables, etc., are involved, a marker should be located not lower than the level of the highest wire at the point marked.

- (4) A marker should be of one colour. When installed, white and red, or white and orange markers should be displayed alternately. The colour selected should contrast with the background against which it should be seen.

(d) Use of flags

- (1) Flags used to mark objects should be displayed around, on top of, or around the highest edge of, the object. When flags are used to mark extensive objects or groups of closely spaced objects, they should be displayed at least every 15 m. Flags should not increase the hazard presented by the object they mark.
- (2) Flags used to mark fixed objects should not be less than 0.6 m square.
- (3) Flags used to mark fixed objects should be orange in colour or a combination of two triangular sections, one orange and the other white, or one red and the other white, except that where such colours merge with the background, other conspicuous colours should be used.

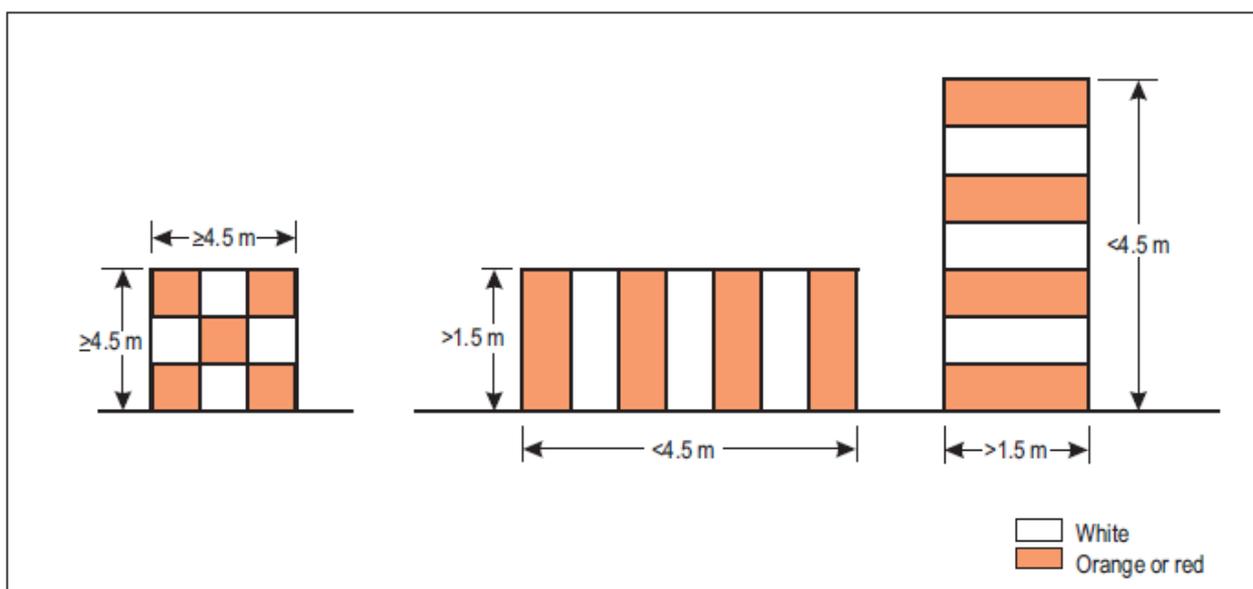


Figure Q-1. Basic marking patterns

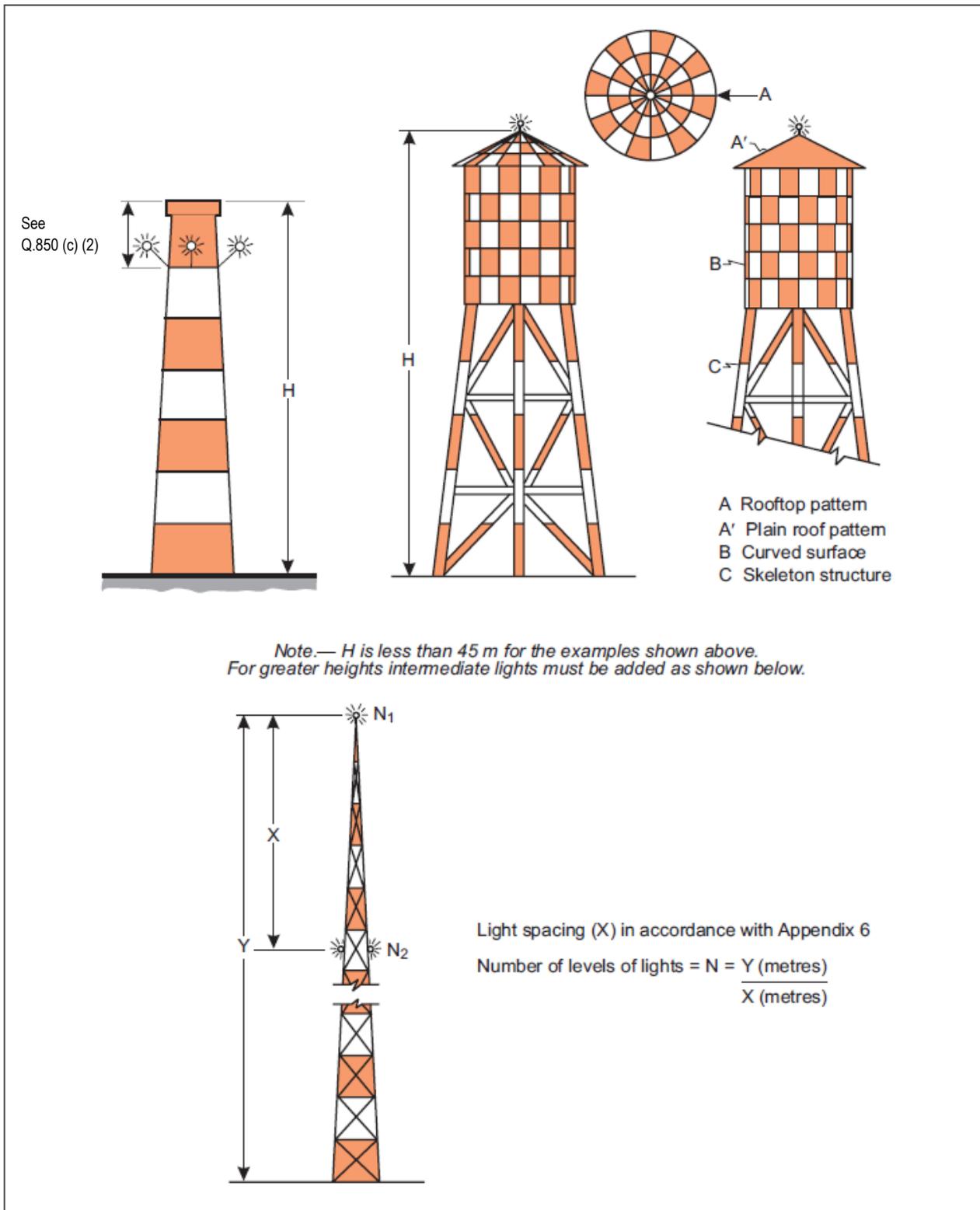


Figure Q-2. Examples of lighting and marking of tall structures

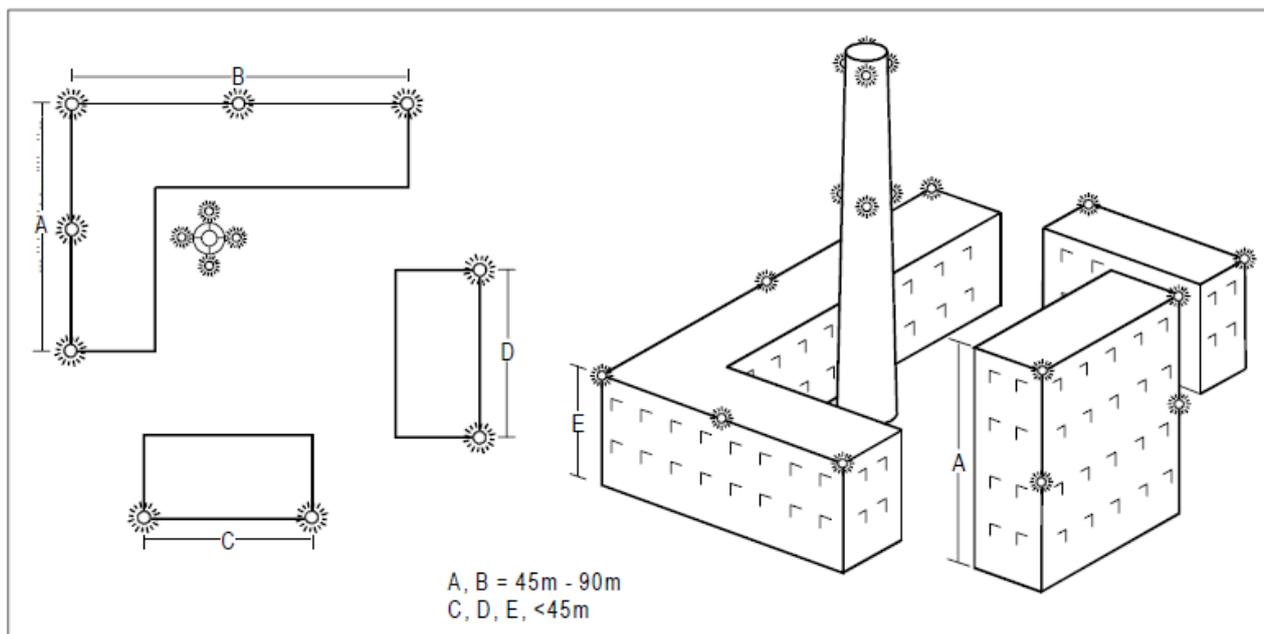


Figure Q-3. Lighting of buildings

CS ADR-DSN.Q.850 Lighting of objects

- (a) The specifications below apply only to the area under control of the aerodrome operator.
- (b) Use of obstacle lights:
 - (1) The presence of objects which should be lighted, should be indicated by low-, medium- or high-intensity obstacle lights, or a combination of such lights.
 - (2) Low-intensity obstacle lights, Type A or B, should be used where the object is a less extensive one and its height above the surrounding ground is less than 45 m.
 - (3) Where the use of low-intensity obstacle lights, Type A or B would be inadequate, or an early special warning is required, then medium- or high-intensity obstacle lights should be used.
 - (4) Low-intensity obstacle lights, Type B, should be used either alone or in combination with medium-intensity obstacle lights, Type B, in accordance with subparagraph (7) below.
 - (5) Medium-intensity obstacle lights, Type A, B, or C, should be used where the object is an extensive one or its height above the level of the surrounding ground is greater than 45 m. Medium-intensity obstacle lights, Types A and C, should be used alone, whereas medium-intensity obstacle lights, Type B, should be used either alone or in combination with low-intensity obstacle lights, Type B.
 - (6) High-intensity obstacle lights, Type A, should be used to indicate the presence of an object if its height above the level of the surrounding ground exceeds 150 m and an aeronautical study indicates such lights to be essential for the recognition of the object by day.
 - (7) When a dual obstacle lighting system is provided, the system should be composed of high-intensity obstacle lights, Type A, or B, or medium-intensity obstacle lights,

Type A, as appropriate, for daytime and twilight use and medium-intensity obstacle lights, Type B or C, for night-time use.

(c) Location of obstacle lights:

- (1) One or more low-, medium- or high-intensity obstacle lights should be located as close as practicable to the top of the object. The top lights should be so arranged as to at least indicate the points or edges of the object highest in relation to the obstacle limitation surface.
- (2) In the case of chimney or other structure of like function, the top lights should be placed sufficiently below the top so as to minimise contamination by smoke, etc. (see Figures Q-2 and Q-3).
- (3) In the case of a tower or antenna structure indicated by high-intensity obstacle lights by day with an appurtenance, such as a rod or an antenna, greater than 12 m where it is not practicable to locate a high-intensity obstacle light on the top of the appurtenance, such a light should be located at the highest practicable point, and if practicable, a medium-intensity obstacle light, Type A, mounted on the top.
- (4) In the case of an extensive object or of a group of closely spaced objects, top lights should be displayed at least on the points or edges of the objects highest in relation to the obstacle limitation surface so as to indicate the general definition and the extent of the objects. If two or more edges are of the same height, the edge nearest the landing area should be marked. Where low-intensity lights are used, they should be spaced at longitudinal intervals not exceeding 45 m. Where medium-intensity lights are used, they should be spaced at longitudinal intervals not exceeding 900 m.
- (5) When the obstacle limitation surface concerned is sloping and the highest point above the obstacle limitation surface is not the highest point of the object, additional obstacle lights should be placed on the highest point of the object.
- (6) Where an object is indicated by medium-intensity obstacle lights, Type A, and the top of the object is more than 105 m above the level of the surrounding ground, or the elevation of tops of nearby buildings (when the object to be marked is surrounded by buildings), additional lights should be provided at intermediate levels. These additional intermediate lights should be spaced as equally as practicable, between the top lights and ground level or the level of tops of nearby buildings as appropriate, with the spacing not exceeding 105 m (see subparagraph (b)(5) above).
- (7) Where an object is indicated by medium-intensity obstacle lights, Type B, and the top of the object is more than 45 m above the level of the surrounding ground or the elevation of tops of nearby buildings (when the object to be marked is surrounded by buildings), additional lights should be provided at intermediate levels. These additional intermediate lights should be alternately low-intensity obstacle lights, Type B, and medium-intensity obstacle lights, Type B, and should be spaced as equally as practicable, between the top lights and ground level or the level of tops of nearby buildings as appropriate, with the spacing not exceeding 52 m.
- (8) Where an object is indicated by medium-intensity obstacle lights, Type C, and the top of the object is more than 45 m above the level of the surrounding ground or the elevation of tops of nearby buildings (when the object to be marked is surrounded by buildings), additional lights should be provided at intermediate levels. These additional intermediate lights should be spaced as equally as

CHAPTER Q — VISUAL AIDS FOR DENOTING OBSTACLES

practicable, between the top lights and ground level or the level of tops of nearby buildings as appropriate, with the spacing not exceeding 52 m.

- (9) Where high-intensity obstacle lights, Type A, are used, they should be spaced at uniform intervals not exceeding 105 m between the ground level and the top light(s) specified in paragraph (c)(1) above, except that where an object to be marked is surrounded by buildings, the elevation of the tops of the buildings may be used as the equivalent of the ground level when determining the number of light levels.
 - (10) Where high-intensity obstacle lights, Type B, are used, they should be located at three levels:
 - (i) at the top of the tower;
 - (ii) at the lowest level of the catenary of the wires or cables; and
 - (iii) at approximately midway between these two levels.
 - (11) The installation setting angles for high-intensity obstacle lights, Types A and B, should be in accordance with Table Q-1.
 - (12) The number and arrangement of low-, medium- or high-intensity obstacle lights at each level to be marked should be such that the object is indicated from every angle in azimuth. Where a light is shielded in any direction by another part of the object, or by an adjacent object, additional lights should be provided on that object in such a way as to retain the general definition of the object to be lighted. If the shielded light does not contribute to the definition of the object to be lighted, it may be omitted.
- (d) Low-intensity obstacle lights — Characteristics:
- (1) Low-intensity obstacle lights on fixed objects, Types A and B, should be fixed-red lights.
 - (2) Low-intensity obstacle lights, Types A and B, should be in accordance with the specifications in Table Q-2.
 - (3) Low-intensity obstacle lights, Type C, displayed on vehicles associated with emergency or security should be flashing-blue and those displayed on other vehicles should be flashing-yellow.
 - (4) Low-intensity obstacle lights, Type D, displayed on follow-me vehicles should be flashing-yellow.
 - (5) Low-intensity obstacle lights, Types C and D, should be in accordance with the specifications in Table Q-2.
 - (6) Low-intensity obstacle lights on objects with limited mobility such as aerobridges, should be fixed-red. The intensity of the lights should be sufficient to ensure conspicuity considering the intensity of the adjacent lights and the general levels of illumination against which they would normally be viewed.
 - (7) Low-intensity obstacle lights on objects with limited mobility should as a minimum be in accordance with the specifications for low-intensity obstacle lights, Type A, in Table Q-2.
- (e) Medium-intensity obstacle lights — Characteristics:
- (1) Medium-intensity obstacle lights, Type A, should be flashing-white lights, Type B should be flashing-red lights, and Type C should be fixed-red lights.

CHAPTER Q – VISUAL AIDS FOR DENOTING OBSTACLES

- (2) Medium-intensity obstacle lights, Types A, B and C, should be in accordance with the specifications in Table Q-2.
- (3) Medium-intensity obstacle lights, Types A and B, located on an object should flash simultaneously.
- (a) High-intensity obstacle lights – Characteristics:
- (1) High-intensity obstacle lights, Types A and B, should be flashing-white lights.
- (2) High-intensity obstacle lights, Types A and B, should be in accordance with the specifications in Table Q-2.
- (3) High-intensity obstacle lights, Type A, located on an object should flash simultaneously.
- (4) High-intensity obstacle lights, Type B, indicating the presence of a tower supporting overhead wires, cables, etc., should flash sequentially; first the middle light, second the top light, and last the bottom light. The intervals between flashes of the lights should approximate the following ratios:

Flash interval between	Ratio of cycle time
Middle and top light	1:13
Top and bottom light	2:13
Bottom and middle light	10:13

Height of light unit above terrain	Angle of the peak of the beam above the horizontal
Greater than 151 m AGL	0°
122 m to 151 m AGL	1°
92 m to 122 m AGL	2°
Less than 92 m AGL	3°

Table Q-1. Installation setting angles for high-intensity obstacle lights

1	2	3	4	5	6	7	8	9	10	11	12
Light type	Colour	Signal type/flash rate	Peak intensity (cd) at given background luminance			Vertical beam spread ^a	Intensity (cd) at given elevation angles when the light unit is levelled ^d				
			Above 500 cd/m ²	50-500 cd/m ²	Below 50 cd/m ²		-10° ^e	-1° ^f	±0° ^f	+6°	+10°
Low-intensity Type A (fixed obstacle)	Red	Fixed	N/A	10 mnm	10 mnm	10°	–	–	–	10 mnm ^g	10 mnm ^g
Low-intensity Type B (fixed obstacle)	Red	Fixed	N/A	32 mnm	32 mnm	10°	–	–	–	32 mnm ^g	32 mnm ^g
Low-intensity Type C (mobile obstacle)	Yellow/blue _a	Flashing (60-90 fpm)	N/A	40 mnm ^b 400 max	40 mnm ^b 400 max	12° ^h	–	–	–	–	–
Low-intensity Type D (follow-me vehicle)	Yellow	Flashing (60-90 fpm)	N/A	200 mnm ^b 400 max	200 mnm ^b 400 max	12° ⁱ	–	–	–	–	–
Medium-intensity Type A	White	Flashing (20-60 fpm)	20 000 ^b ±25 %	20 000 ^b ±25 %	2 000 ^b ±25 %	3° mnm	3° max	50 % mnm 75 % max	100 % mnm	–	–
Medium-intensity Type B	Red	Flashing (20-60 fpm)	N/A	N/A	2 000 ^b ±25%	3° mnm	–	50 % mnm 75 % max	100 % mnm	–	–

Medium-intensity Type C	Red	Fixed	N/A	N/A	2 000 ^b ±25%	3° mnm	—	50 % mnm 75 % max	100 % mnm	—	—
High-intensity Type A	White	Flashing (40-60 fpm)	200 000 ^b ±25%	20 000 ^b ±25%	2 000 ^b ±25%	3°-7°	3° max	50 % mnm 75 % max	100 % mnm	—	—
High-intensity Type B	White	Flashing (40-60 fpm)	100 000 ^b ±25%	20 000 ^b ±25%	2 000 ^b ±25%	3°-7°	3° max	50 % mnm 75 % max	100 % mnm	—	—
<p>^a CS ADR.DSN.Q.850, (d) (3)</p> <p>^b Effective intensity as determined in accordance with the ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids.</p> <p>^c Beam spread is defined as the angle between two directions in a plane for which the intensity is equal to 50 % of the lower tolerance value of the intensity shown in columns 4, 5, and 6. The beam pattern is not necessarily symmetrical about the elevation angle at which the peak intensity occurs.</p> <p>^d Elevation (vertical) angles are referenced to the horizontal.</p> <p>^e Intensity at any specified horizontal radial as a percentage of the actual peak intensity at the same radial when operated at each of the intensities shown columns 4, 5, and 6.</p> <p>^f Intensity at any specified horizontal radial as a percentage of the lower tolerance value of the intensity shown in columns 4, 5, and 6.</p> <p>^g In addition to specified values, lights should have sufficient intensity to ensure conspicuity at elevation angles between ±0° and 50°.</p> <p>^h Peak intensity should be located at approximately 2.5° vertical.</p> <p>ⁱ Peak intensity should be located at approximately 17° vertical.</p> <p>fpm = flashes per minute; N/A = not applicable</p>											

Table Q-2. Characteristics of obstacle lights

Longest dimension		Band width
Greater than	Not exceeding	
1.5 m	210 m	1/7 of longest dimension
210 m	270 m	1/9 " " "
270 m	330 m	1/11 " " "
330 m	390 m	1/13 " " "
390 m	450 m	1/15 " " "
450 m	510 m	1/17 " " "
510 m	570 m	1/19 " " "
570 m	630 m	1/21 " " "

Table Q-3. Obstacle marking band widths

CHAPTER R – VISUAL AIDS FOR DENOTING RESTRICTED USE AREAS**CS ADR-DSN.R.855 Closed runways and taxiways, or parts thereof**

- (a) Applicability of closed marking:
- (1) A closed marking should be displayed on a runway, or taxiway, or portion thereof which is permanently closed to the use of all aircraft.
 - (2) A closed marking should be displayed on a temporarily closed runway, or taxiway, or portion thereof, except that such marking may be omitted when the closing is of short duration, and adequate warning by air traffic services is provided.
- (b) Location of closed markings: On a runway, a closed marking should be placed at each end of the runway, or portion thereof, declared closed, and additional markings should be so placed that the maximum interval between markings does not exceed 300 m. On a taxiway a closed marking should be placed at least at each end of the taxiway or portion thereof closed.
- (c) Characteristics of closed markings:
- (1) The closed marking should be of the form and proportions as detailed in Figure R-1, Illustration (a), when displayed on a runway, and should be of the form and proportions as detailed in Figure R-1, Illustration (b), when displayed on a taxiway. The marking should be white when displayed on a runway and should be yellow when displayed on a taxiway.
 - (2) When a runway, or taxiway, or portion thereof is permanently closed, all normal runway and taxiway markings should be obliterated.
- (d) Lighting on a closed runway, or taxiway, or portion thereof should not be operated, except as required for maintenance purposes.
- (e) In addition to closed markings, when the runway, or taxiway, or portion thereof closed is intercepted by a usable runway or taxiway which is used at night, unserviceability lights should be placed across the entrance to the closed area at intervals not exceeding 3 m (see CS ADR-DSN.R.870 (c) (2)).

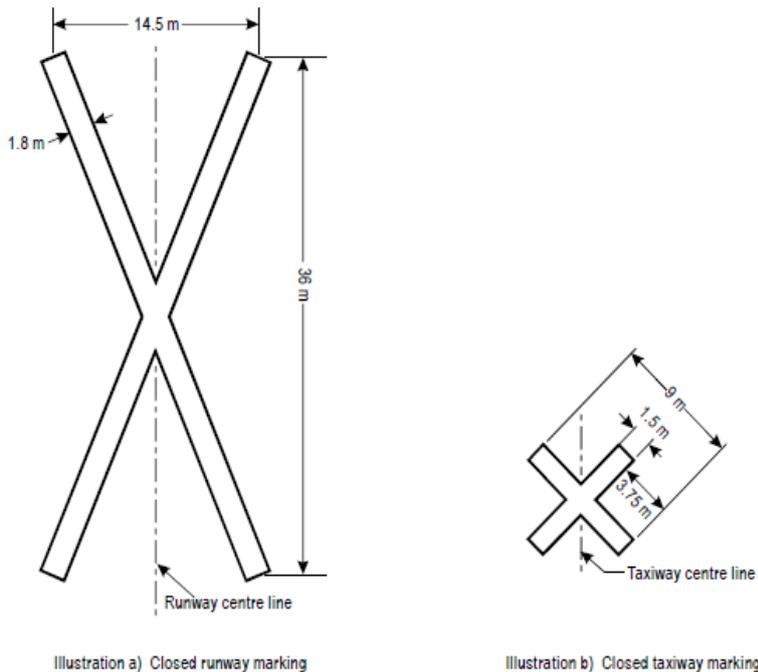


Figure R-1. Runway and taxiway closed markings

CS ADR-DSN.R.860 Non-load-bearing surfaces

- (a) Shoulders for taxiways, runway turn pads, holding bays and aprons, and other non-load-bearing surfaces which cannot readily be distinguished from load-bearing surfaces and which, if used by aircraft, might result in damage to the aircraft, should have the boundary between such areas and the load-bearing surface marked by a taxi side stripe marking (specifications for markings are in CS ADR-DSN.L.550).
- (b) A taxi side stripe marking should consist of a pair of solid lines, each 15 cm wide and spaced 15 cm apart, and the same colour as the taxiway centre line marking.

CS ADR-DSN.R.865 Pre-threshold area

- (a) Applicability of Pre-threshold area: When the surface before a threshold is paved and exceeds 60 m in length, and is not suitable for normal use by aircraft, the entire length before the threshold should be marked with a chevron marking.
- (b) Location: A chevron marking should point in the direction of the runway and be placed as shown in Figure R-2.
- (c) Characteristics:
 - (1) A chevron marking should be of conspicuous colour and contrast with the colour used for the runway markings; it should preferably be yellow and should have an overall width of at least 0.9 m.
 - (2) For pre-threshold areas shorter than 60 m, markings may be modified or reduced in size so as to present the correct picture to aircrew.

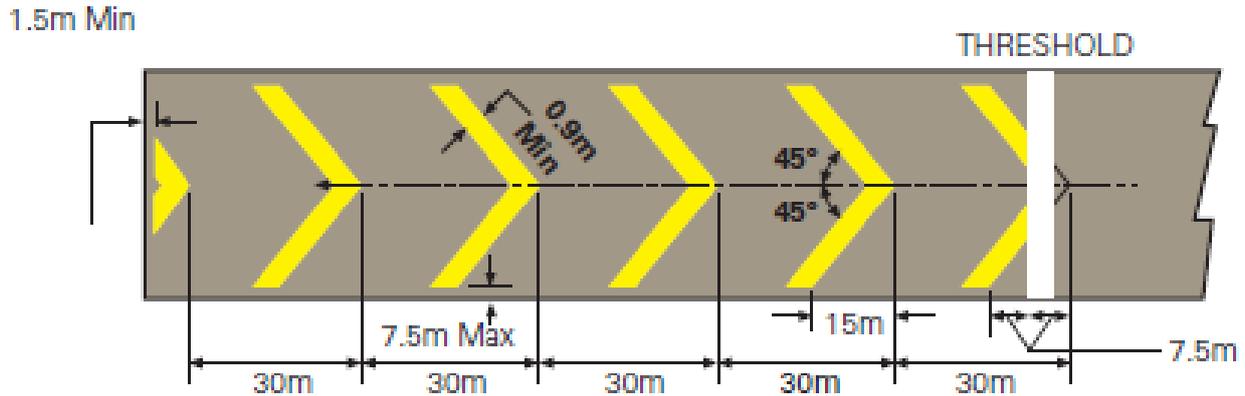


Figure R-2. Pre-threshold area marking

CS ADR-DSN.R.870 Unserviceable areas

(a) Applicability of unserviceability markers and lights:

Unserviceability markers should be displayed wherever any portion of a taxiway, apron, or holding bay is declared unfit for the movement of aircraft but it is still possible for aircraft to bypass the area safely. On a movement area used at night, unserviceability lights should be used.

(b) Location: Unserviceability markers and lights should be placed at intervals sufficiently close so as to delineate the unserviceable area.

(c) Characteristics

- (1) Unserviceability markers should consist of conspicuous upstanding devices such as flags, cones, or marker boards.
- (2) An unserviceability light should consist of a red fixed light. The light should have intensity sufficient to ensure conspicuity considering the intensity of the adjacent lights and the general level of illumination against which it would normally be viewed. In no case should the intensity be less than 10 cd of red light.
- (3) An unserviceability cone should be at least 0.5 m in height and red, orange, or yellow, or any one of these colours in combination with white.
- (4) An unserviceability flag should be at least 0.5 m square and red, orange, or yellow, or any one of these colours in combination with white.
- (5) An unserviceability marker board should be at least 0.5 m in height and 0.9 m in length, with alternate red and white, or orange and white vertical stripes.

CHAPTER 5 – ELECTRICAL SYSTEMS**CS ADR-DSN.S.875 Electrical power supply systems for air navigation facilities**

- (a) Adequate primary power supply should be available at aerodromes for the safe functioning of air navigation facilities.
- (b) The design and provision of electrical power systems for aerodrome visual and radio navigation aids should be such that an equipment failure should not leave the pilot with inadequate visual and non-visual guidance, or misleading information.
- (c) Electric power supply connections to those facilities for which secondary power is required should be so arranged that the facilities are automatically connected to the secondary power supply on failure of the primary source of power.
- (d) The time interval between failure of the primary source of power and the complete restoration of the services required by CS ADR-DSN.S.880(e) should be as short as practicable, except that for visual aids associated with non-precision, precision approach, or take-off runways the requirements of Table S-1 for maximum switch-over times should apply.

CS ADR-DSN.S.880 Electrical power supply systems for visual aids

- (a) For a precision approach runway, a secondary power supply capable of meeting the requirements of Table S-1 for the appropriate category of precision approach runway should be provided. Electric power supply connections to those facilities for which secondary power is required should be so arranged that the facilities are automatically connected to the secondary power supply on failure of the primary source of power.
- (b) For a runway meant for take-off in runway visual range conditions less than a value of 800 m, a secondary power supply capable of meeting the relevant requirements of Table S-1 should be provided.
- (c) At an aerodrome where the primary runway is a non-precision approach runway, a secondary power supply capable of meeting the requirements of Table 1 should be provided except that a secondary power supply for visual aids need not be provided for more than one non-precision approach runway.
- (d) The following aerodrome facilities should be provided with a secondary power supply capable of supplying power when there is a failure of the primary power supply:
 - (1) the signalling lamp and the minimum lighting necessary to enable air traffic services personnel to carry out their duties;
 - (2) obstacle lights which are essential to ensure the safe operation of aircraft;
 - (3) approach, runway and taxiway lighting as specified in CS ADR-DSN.M.625 to CS ADR-DSN.M.745;
 - (4) meteorological equipment;
 - (5) essential equipment and facilities for the parking position if provided, in accordance with CS ADR-DSN.M.755(a); and
 - (6) illumination of apron areas over which passengers may walk.

CS ADR-DSN.S.885 System design

- (a) For a runway meant for use in runway visual range conditions less than a value of 550 m, the electrical systems for the power supply, lighting, and control of the lighting systems included in Table S-1 should be so designed that an equipment failure should not leave the pilot with inadequate visual guidance or misleading information.
- (b) Where the secondary power supply of an aerodrome is provided by the use of duplicate feeders, such supplies should be physically and electrically separate so as to ensure the required level of availability and independence.
- (c) Where a runway forming part of a standard taxi-route is provided with runway lighting and taxiway lighting, the lighting systems should be interlocked to preclude the possibility of simultaneous operation of both forms of lighting.

CS ADR-DSN.S.890 Monitoring

- (a) A system of monitoring should be employed to indicate the operational status of the lighting systems.
- (b) Where lighting systems are used for aircraft control purposes, such systems should be monitored automatically so as to provide an indication of any fault which may affect the control functions. This information should be automatically relayed to the air traffic service unit.
- (c) Where a change in the operational status of lights has occurred, an indication should be provided within two seconds for a stop bar at a runway-holding position and within five seconds for all other types of visual aids.
- (d) For a runway meant for use in runway visual range conditions less than a value of 550 m, the lighting systems detailed in Table S-1 should be monitored automatically so as to provide an indication when the serviceability level of any element falls below a minimum serviceability level specified in CS ADR-DSN.S.895. This information should be automatically relayed to the maintenance crew.
- (e) For a runway meant for use in runway visual range conditions less than a value of 550 m, the lighting systems detailed in Table S-1 should be monitored automatically to provide an indication when the serviceability level of any element falls below a minimum level specified in CS ADR-DSN.S.895, below which operations should not continue. This information should be automatically relayed to the air traffic services unit and displayed in a prominent position.

CS ADR-DSN.S.895 Serviceability levels

- (a) A light should be deemed to be unserviceable when the main beam average intensity is less than 50 % of the value specified in the appropriate Figure in CS ADR-DSN.U.940. For light units where the designed main beam average intensity is above the value shown in CS ADR-DSN.U.940, the 50 % value should be related to that design value.
- (b) A system of preventive maintenance of visual aids should be employed to ensure lighting and marking system reliability.
- (c) The system of preventive maintenance employed for a precision approach runway category II or III should have as its objective that, during any period of category II or III operations, all approach and runway lights are serviceable and that, in any event, at least:

- (1) 95 % of the lights are serviceable in each of the following particular significant elements:
 - (i) precision approach category II and III lighting system, the inner 450 m;
 - (ii) runway centre line lights;
 - (iii) runway threshold lights; and
 - (iv) runway edge lights.
 - (2) 90 % of the lights are serviceable in the touchdown zone lights;
 - (3) 85 % of the lights are serviceable in the approach lighting system beyond 450 m; and
 - (4) 75 % of the lights are serviceable in the runway end lights.
 - (5) In order to provide continuity of guidance, the allowable percentage of unserviceable lights should not be permitted in such a way as to alter the basic pattern of the lighting system.
 - (6) Additionally, an unserviceable light should not be permitted adjacent to another unserviceable light, except in a barrette or a crossbar where two adjacent unserviceable lights may be permitted.
- (d) The system of preventive maintenance employed for a stop bar provided at a runway-holding position used in conjunction with a runway intended for operations in runway visual range conditions less than a value of 350 m should have the following objectives:
- (1) no more than two lights should remain unserviceable; and
 - (2) two adjacent lights should not remain unserviceable unless the light spacing is significantly less than that specified.
- (e) The system of preventive maintenance employed for a taxiway intended for use in runway visual range conditions less than a value of 350 m should have as its objective that no two adjacent taxiway centre line lights be unserviceable.
- (f) The system of preventive maintenance employed for a precision approach runway category I should have as its objective that, during any period of category I operations, all approach and runway lights are serviceable and that, in any event, at least 85 % of the lights are serviceable in each of the following:
- (1) precision approach category I lighting system;
 - (2) runway threshold lights;
 - (3) runway edge lights; and
 - (4) runway end lights.
- In order to provide continuity of guidance an unserviceable light should not be permitted adjacent to another unserviceable light unless the light spacing is significantly less than that specified.
- (g) The system of preventive maintenance employed for a runway meant for take-off in runway visual range conditions less than a value of 550 m should have as its objective that, during any period of operations, all runway lights are serviceable, and that in any event:
- (1) at least 95 % of the lights are serviceable in the runway centre line lights (where provided) and in the runway edge lights; and;

(2) at least 75 % of the lights are serviceable in the runway end lights.

In order to provide continuity of guidance, an unserviceable light should not be permitted adjacent to another unserviceable light.

- (h) The system of preventive maintenance employed for a runway meant for take-off in runway visual range conditions of a value of 550 m or greater should have as its objective that, during any period of operations, all runway lights are serviceable, and that, in any event, at least 85 % of the lights are serviceable in the runway edge lights and runway end lights. In order to provide continuity of guidance, an unserviceable light should not be permitted adjacent to another unserviceable light.

Runway	Lighting aids requiring power	Maximum switch-over time
Non-instrument	Visual approach slope indicators ^a Runway edge ^b Runway threshold ^b Runway end ^b Obstacle ^a	See CS ADR-DSN.M.850(d) and CS ADR-DSN.M.855(d)
Non-precision approach	Approach lighting system Visual approach slope indicators ^{a, d} Runway edge ^d Runway threshold ^d Runway end ^d Obstacle ^a	15 seconds 15 seconds 15 seconds 15 seconds 15 seconds 15 seconds
Precision approach category I	Approach lighting system Runway edge ^d Visual approach slope indicators ^{a, d} Runway threshold ^d Runway end Essential taxiway ^a Obstacle ^a	15 seconds 15 seconds 15 seconds 15 seconds 15 seconds 15 seconds
Precision approach category II/III	Inner 300 m of the approach lighting system Other parts of the approach lighting system Obstacle ^a Runway edge Runway threshold Runway end Runway centre line Runway touchdown zone	1 second 15 seconds 15 seconds 15 seconds 1 second 1 second 1 second 1 second 1 second 15 seconds

	All stop bars Essential taxiway	
Runway meant for take-off in runway visual range conditions less than a value of 800 m	Runway edge Runway end Runway centre line All stop bars Essential taxiway ^a Obstacle ^a	15 seconds 1 second 1 second 1 second 15 seconds 15 seconds
<p>a. Supplied with secondary power when their operation is essential to the safety of flight operation.</p> <p>b. The use of emergency lighting should be in accordance with any procedures established.</p> <p>c. One second where no runway centre line lights are provided.</p> <p>d. One second where approaches are over hazardous or precipitous terrain.</p>		
Table S-1. Secondary power supply requirements		

Light type	CAT II/III Approach	CAT I Approach	RVR<550m take-off	RVR>550m take-off
Approach inner 450 m	95 %	85 %	-	-
Approach outer 450 m	85 %	85 %	-	-
Runway threshold	95 %	85 %	-	-
Runway centre line	95 %	85 %	95 %	85 %
Runway edge	95 %	85 %	95 %	85 %
Runway end	75 %	85 %	75 %	85 %
Touchdown zone	90 %	(85 %) ^a	-	-
<i>Note (a): If touchdown zone lights are available.</i>				
Table S-2. Allowable percentages of serviceable lights				

CHAPTER T — AERODROME OPERATIONAL SERVICES, EQUIPMENT AND INSTALLATION**CS ADR-DSN.T.900 Emergency access and service roads**

Emergency access roads should be equipped with a road holding position at all intersections with runway and taxiways.

CS ADR-DSN.T.905 Fire stations

- (a) All rescue and firefighting vehicles should normally be housed in a fire station. Satellite fire stations should be provided whenever the response time cannot be achieved from a single fire station.
- (b) The fire station should be located so that the access for rescue and firefighting vehicles into the runway area is direct and clear, requiring a minimum number of turns.
- (c) The fire station, and any satellite fire stations, should be located outside taxiway and runway strips, and not infringe obstacle limitation surfaces.

CS ADR-DSN.T.910 Equipment frangibility requirements

Frangible structures should be designed to withstand the static and operational wind or jet blast loads with a suitable factor of safety but should break, distort, or yield readily when subjected to the sudden collision forces of a 3 000 kg aircraft airborne and travelling at 140 km/h (75 kt), or moving on the ground at 50 km/h (27 kt).

CS ADR-DSN.T.915 Siting of equipment and installations on operational areas

- (a) Equipment and installations should be sited as far away from the runway and taxiway centre lines as practicable.
- (b) Unless its function requires it to be there for air navigation or for aeroplane safety purposes, no equipment or installation endangering an aircraft should be located:
 - (1) on a runway strip, a runway end safety area, a taxiway strip, or within the following distances:

Code Letter	Distance to — Taxiway, other than aircraft stand taxilane centre line to object (metres)
A	16.25
B	21.5
C	26
D	40.5
E	47.5

CS ADR DSN — BOOK 1

CHAPTER T — AERODROME OPERATIONAL SERVICES, EQUIPMENT AND INSTALLATION

F	57.5
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if it would endanger an aircraft, or

- (2) on a clearway if it would endanger an aircraft in the air.
- (c) Any equipment or installation required for air navigation purposes which should be located:
- (1) on that portion of a runway strip within:
- (i) 75 m of the runway centre line where the code number is 3 or 4; or
 - (ii) 45 m of the runway centre line where the code number is 1 or 2;
- (2) on a runway end safety area, a taxiway strip, or within the distances specified in Table D-1; or
- (3) on a clearway and which would endanger an aircraft in the air;
- should be frangible and mounted as low as possible.
- (d) Unless its function requires it to be there for air navigation purposes, no equipment or installation should be located within 240 m from the end of the strip and within:
- (1) 60 m of the extended centre line where the code number is 3 or 4; or
 - (2) 45 m of the extended centre line where the code number is 1 or 2;
- of a precision approach runway category I, II or III.
- (e) Any equipment or installation required for air navigation purposes which should be located on or near a strip of a precision approach runway category I, II, or III and which:
- (1) is situated on that portion of the strip within 77.5 m of the runway centre line where the code number is 4 and the code letter is F; or
 - (2) is situated within 240 m from the end of the strip and within:
 - (i) 60 m of the extended runway centre line where the code number is 3 or 4; or
 - (ii) 45 m of the extended runway centre line where the code number is 1 or 2; or
 - (3) penetrates the inner approach surface, the inner transitional surface, or the balked landing surface;
- should be frangible and mounted as low as possible.
- (f) Any equipment or installation required for air navigation or for aeroplane safety purposes that is an obstacle of operational significance in accordance with CS ADR-DSN.J.470 (d), CS ADR-DSN.J.475 (e), CS ADR-DSN.J.480 (g), or CS ADR-DSN.J.485 (e) should be frangible and mounted as low as possible.

CS ADR DSN — BOOK 1

CHAPTER T — AERODROME OPERATIONAL SERVICES, EQUIPMENT AND INSTALLATION

- (g) Any equipment or installation required for air navigation purposes which should be located on the non-graded portion of a runway strip should be regarded as an obstacle and should be frangible and mounted as low as possible.

CS ADR-DSN.T.920 Fencing

- (a) The safety objective of fencing is to prevent animals or unauthorised persons that could be a safety risk to aircraft operations, to enter the aerodrome.
- (b) Fencing should be sited as far away from the runway and taxiway centre lines as practicable.
- (c) Suitable means of protection such as fence or other suitable barrier should be provided on an aerodrome to prevent the entrance to the aerodrome:
- (1) by non-flying animals large enough to be a hazard to aircraft; and/or
 - (2) by an unauthorised person.

This includes the barring of sewers, ducts, tunnels, etc. where necessary to prevent access.

- (d) Suitable means of protection should be provided to deter the inadvertent or premeditated access of unauthorised persons into ground installations and facilities essential for the safety of civil aviation located off the aerodrome.

**CHAPTER U — COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS
AND PANELS****CS ADR-DSN.U.925 General**

- (a) The specifications in this Chapter define the chromaticity limits of colours to be used for aeronautical ground lights, markings, signs, and panels. The specifications are in accord with the specifications of the International Commission on Illumination (CIE).
- (b) The chromaticities are expressed in terms of the standard observer and coordinate system adopted by the International Commission on Illumination (CIE).

CS ADR-DSN.U.930 Colours for aeronautical ground lights

- (a) The chromaticities of aeronautical ground lights should be within the following boundaries:
- (2) CIE Equations (see Figure U-1):
- (3) Red
- | | |
|-----------------|-----------------|
| Purple boundary | $y = 0.980 - x$ |
| Yellow boundary | $y = 0.335$ |
- (4) Yellow
- | | |
|----------------|----------------------|
| Red boundary | $y = 0.382$ |
| White boundary | $y = 0.790 - 0.667x$ |
| Green boundary | $y = x - 0.120$ |
- (5) Green
- | | |
|-----------------|----------------------|
| Yellow boundary | $x = 0.360 - 0.080y$ |
| White boundary | $x = 0.650y$ |
| Blue boundary | $y = 0.390 - 0.171x$ |
- (6) Blue
- | | |
|-----------------|----------------------|
| Green boundary | $y = 0.805x + 0.065$ |
| White boundary | $y = 0.400 - x$ |
| Purple boundary | $x = 0.600y + 0.133$ |
- (7) White
- | | |
|-----------------|----------------------|
| Yellow boundary | $x = 0.500$ |
| Blue boundary | $x = 0.285$ |
| Green boundary | $y = 0.440$ |
| and | $y = 0.150 + 0.640x$ |
| Purple boundary | $y = 0.050 + 0.750x$ |

CS ADR DSN — BOOK 1

CHAPTER U — COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS
AND PANELS

and $y = 0.382$

(8) Variable white

Yellow boundary $x = 0.255 + 0.750y$

and $x = 1.185 - 1.500 y$

Blue boundary $x = 0.285$

Green boundary $y = 0.440$

and $y = 0.150 + 0.640x$

Purple boundary $y = 0.050 + 0.750x$

and $y = 0.382$

(b) Where increased certainty of recognition is more important than maximum visual range, green signals should be within the following boundaries:

(1) Yellow boundary $y = 0.726 - 0.726x$

(2) White boundary $x = 0.625y - 0.041$

(3) Blue boundary $y = 0.390 - 0.171x$

(c) Discrimination between lights

(1) If there is a requirement to discriminate yellow and white from each other, they should be displayed in close proximity of time or space as, for example, by being flashed successively from the same beacon.

(2) If there is a requirement to discriminate yellow from green and/or white, as for example on exit taxiway centre line lights, the y coordinates of the yellow light should not exceed a value of 0.40. The limits of white have been based on the assumption that they should be used in situations in which the characteristics (colour temperature) of the light source should be substantially constant.

(3) The colour variable white is intended to be used only for lights that are to be varied in intensity, e.g. to avoid dazzling. If this colour is to be discriminated from yellow, the lights should be so designed and operated that:

(i) the x coordinate of the yellow is at least 0.050 greater than the x coordinate of the white; and

(ii) the disposition of the lights should be such that the yellow lights are displayed simultaneously and in close proximity to the white lights.

(4) The colour of aeronautical ground lights should be verified as being within the boundaries specified in Figure U-1 by measurement at five points within the area limited by the innermost isocandela curve in the isocandela diagrams in CS ADR-DSN.U.940, with operation at rated current or voltage. In the case of elliptical or circular isocandela curves, the colour measurements should be taken at the centre and at the horizontal and vertical limits. In the case of rectangular isocandela curves, the colour measurements should be taken at the centre and the limits of the diagonals (corners). In addition, the colour of the light should be checked at the outermost isocandela curve to ensure that there is no colour shift that might cause signal confusion to the pilot.

(5) For the outermost isocandela curve, a measurement of colour coordinates should be made and recorded for review and judgement of acceptability.

CS ADR DSN — BOOK 1

CHAPTER U — COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS
AND PANELS

- (6) If certain light units have application so that they may be viewed and used by pilots from directions beyond that of the outermost isocandela curve (e.g. stop bar lights at significantly wide runway-holding positions), then an assessment of the actual application should be conducted, and if necessary, a check of colour shift at angular ranges beyond the outermost curve carried out.
- (7) In the case of visual approach slope indicators and other light units having a colour transition sector, the colour should be measured at points in accordance with paragraph (4) above, except that the colour areas should be treated separately and no point should be within 0.5 degrees of the transition sector.

CS ADR-DSN.U.935 Colours for markings, signs and panels

- (a) The specifications of surface colours given below apply only to freshly coloured surfaces. Colours used for markings, signs, and panels usually change with time and, therefore, require renewal.
- (b) The specifications in paragraph (f) below for internally illuminated panels are interim in nature and are based on the CIE specifications for internally illuminated signs. It is intended that these specifications should be reviewed and updated as and when CIE develops specifications for internally illuminated panels.
- (c) The chromaticities and luminance factors of ordinary colours, colours of retroreflective materials, and colours of internally illuminated (internally illuminated) signs and panels should be determined under the following standard conditions:
- (1) angle of illumination: 45°;
 - (2) direction of view: perpendicular to surface; and
 - (3) illuminant: CIE standard illuminant D65.
- (d) The chromaticity and luminance factors of ordinary colours for markings and externally illuminated signs and panels should be within the following boundaries when determined under standard conditions.
- (1) CIE Equations (see Figure U-2):
 - (2) Red

Purple boundary	$y = 0.345 - 0.051x$
White boundary	$y = 0.910 - x$
Orange boundary	$y = 0.314 + 0.047x$
Luminance factor	$\beta = 0.07$ (minimum)
 - (3) Orange

Red boundary	$y = 0.285 + 0.100x$
White boundary	$y = 0.940 - x$
Yellow boundary	$y = 0.250 + 0.220x$
Luminance factor	$\beta = 0.20$ (minimum)
 - (4) Yellow

Orange boundary	$y = 0.108 + 0.707x$
-----------------	----------------------

CS ADR DSN — BOOK 1

CHAPTER U — COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS
AND PANELS

- | | |
|------------------|--------------------------|
| White boundary | $y = 0.910 - x$ |
| Green boundary | $y = 1.35x - 0.093$ |
| Luminance factor | $\beta = 0.45$ (minimum) |
- (5) White
- | | |
|------------------|--------------------------|
| Purple boundary | $y = 0.010 + x$ |
| Blue boundary | $y = 0.610 - x$ |
| Green boundary | $y = 0.030 + x$ |
| Yellow boundary | $y = 0.710 - x$ |
| Luminance factor | $\beta = 0.75$ (minimum) |
- (6) Black
- | | |
|------------------|--------------------------|
| Purple boundary | $y = x - 0.030$ |
| Blue boundary | $y = 0.570 - x$ |
| Green boundary | $y = 0.050 + x$ |
| Yellow boundary | $y = 0.740 - x$ |
| Luminance factor | $\beta = 0.03$ (maximum) |
- (7) Yellowish green
- | | |
|-----------------|--------------------|
| Green boundary | $y = 1.317x + 0.4$ |
| White boundary | $y = 0.910 - x$ |
| Yellow boundary | $y = 0.867x + 0.4$ |
- (8) Green
- | | |
|------------------|--------------------------|
| Yellow boundary | $x = 0.313$ |
| White boundary | $y = 0.243 + 0.670x$ |
| Blue boundary | $y = 0.493 - 0.524x$ |
| Luminance factor | $\beta = 0.10$ (minimum) |

The small separation between surface red and surface orange is not sufficient to ensure the distinction of these colours when seen separately.

- (e) The chromaticity and luminance factors of colours of retroreflective materials for markings, signs, and panels should be within the following boundaries when determined under standard conditions.

(1) CIE Equations (see Figure U-3):

(2) Red

- | | |
|-----------------|----------------------|
| Purple boundary | $y = 0.345 - 0.051x$ |
| White boundary | $y = 0.910 - x$ |
| Orange boundary | $y = 0.314 + 0.047x$ |

CS ADR DSN — BOOK 1

CHAPTER U — COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS
AND PANELS

- | | | |
|-----|------------------|--------------------------|
| | Luminance factor | $\beta = 0.03$ (minimum) |
| (3) | Orange | |
| | Red boundary | $y = 0.265 + 0.205x$ |
| | White boundary | $y = 0.910 - x$ |
| | Yellow boundary | $y = 0.207 + 0.390x$ |
| | Luminance factor | $\beta = 0.14$ (minimum) |
| (4) | Yellow | |
| | Orange boundary | $y = 0.160 + 0.540x$ |
| | White boundary | $y = 0.910 - x$ |
| | Green boundary | $y = 1.35x - 0.093$ |
| | Luminance factor | $\beta = 0.16$ (minimum) |
| (5) | White | |
| | Purple boundary | $y = x$ |
| | Blue boundary | $y = 0.610 - x$ |
| | Green boundary | $y = 0.040 + x$ |
| | Yellow boundary | $y = 0.710 - x$ |
| | Luminance factor | $\beta = 0.27$ (minimum) |
| (6) | Blue | |
| | Green boundary | $y = 0.118 + 0.675x$ |
| | White boundary | $y = 0.370 - x$ |
| | Purple boundary | $y = 1.65x - 0.187$ |
| | Luminance factor | $\beta = 0.01$ (minimum) |
| (7) | Green | |
| | Yellow boundary | $y = 0.711 - 1.22x$ |
| | White boundary | $y = 0.243 + 0.670x$ |
| | Blue boundary | $y = 0.405 - 0.243x$ |
| | Luminance factor | $\beta = 0.03$ (minimum) |
- (f) The chromaticity and luminance factors of colours for luminescent or internally illuminated signs and panels should be within the following boundaries when determined under standard conditions.
- | | | |
|-----|---------------------------------|----------------------|
| (2) | CIE Equations (see Figure U-4): | |
| (3) | Red | |
| | Purple boundary | $y = 0.345 - 0.051x$ |
| | White boundary | $y = 0.910 - x$ |

CS ADR DSN — BOOK 1

CHAPTER U — COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS
AND PANELS

- | | |
|--------------------|--------------------------|
| Orange boundary | $y = 0.314 + 0.047x$ |
| Luminance factor | |
| (day condition) | $\beta = 0.07$ (minimum) |
| Relative luminance | 5 % (minimum) |
| to white (night | |
| condition) | 20 % (max) |
| (4) Yellow | |
| Orange boundary | $y = 0.108 + 0.707x$ |
| White boundary | $y = 0.910 - x$ |
| Green boundary | $y = 1.35x - 0.093$ |
| Luminance factor | |
| (day condition) | $\beta = 0.45$ (minimum) |
| Relative luminance | 30 % (minimum) |
| to white (night | |
| condition) | 80 % (max) |
| (5) White | |
| Purple boundary | $y = 0.010 + x$ |
| Blue boundary | $y = 0.610 - x$ |
| Green boundary | $y = 0.030 + x$ |
| Yellow boundary | $y = 0.710 - x$ |
| Luminance factor | |
| (day condition) | $\beta = 0.75$ (minimum) |
| Relative luminance | |
| to white (night | |
| conditions) | 100 % |
| (6) Black | |
| Purple boundary | $y = x - 0.030$ |
| Blue boundary | $y = 0.570 - x$ |
| Green boundary | $y = 0.050 + x$ |
| Yellow boundary | $y = 0.740 - x$ |
| Luminance factor | |
| (day condition) | $\beta = 0.03$ (max) |

CS ADR DSN — BOOK 1

CHAPTER U — COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS
AND PANELS

Relative luminance	
to white (night	0 % (minimum)
condition)	2 % (maximum)
(7) Green	
Yellow boundary	$x = 0.313$
White boundary	$y = 0.243 + 0.670x$
Blue boundary	$y = 0.493 - 0.524x$
Luminance factor	
(day conditions)	$\beta = 0.10$ minimum
Relative luminance	5 % (minimum)
to white (night	
conditions)	30 % (maximum)

CS ADR DSN — BOOK 1

CHAPTER U — COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS AND PANELS

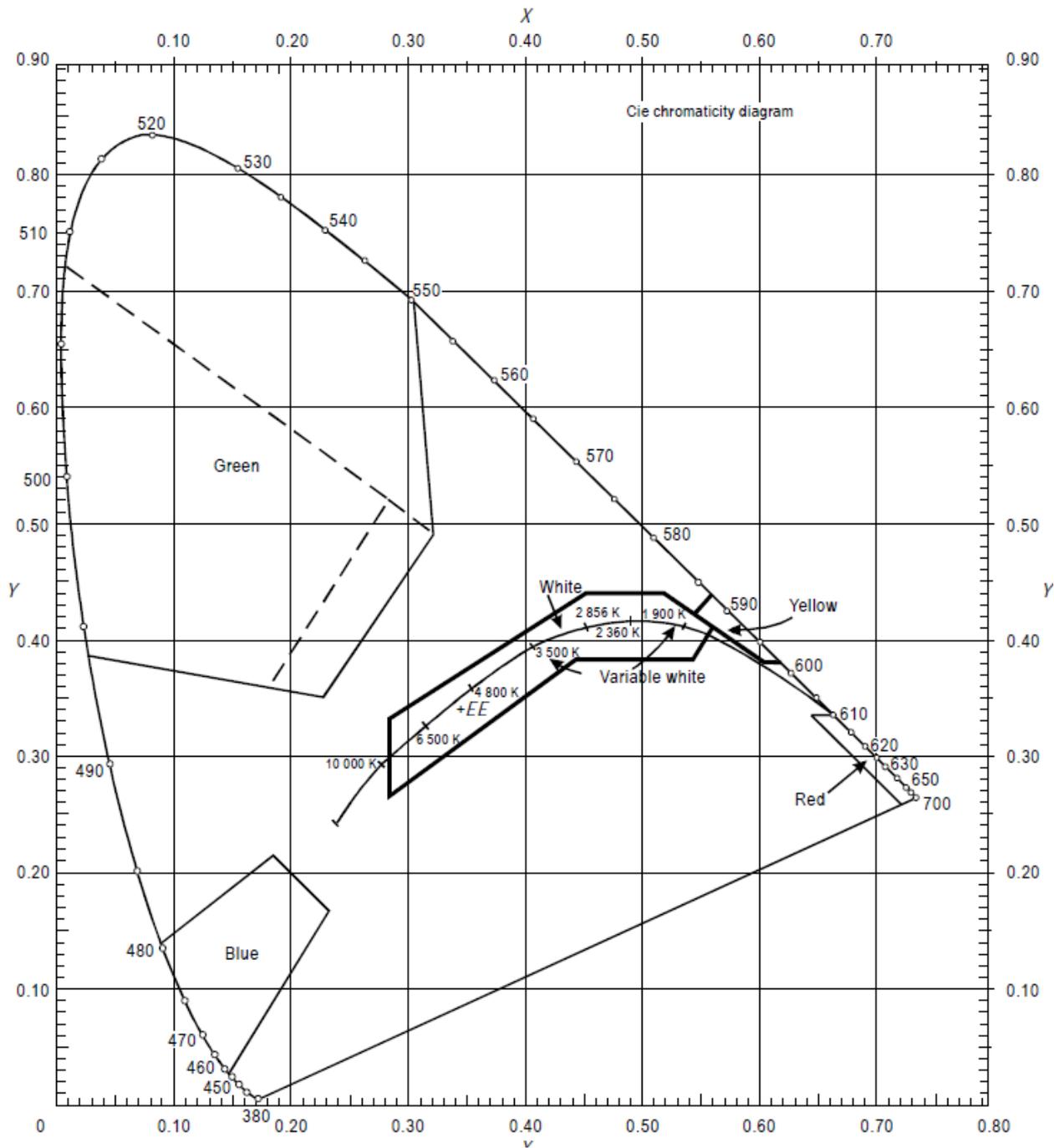


Figure U-1. Colours for aeronautical ground lights

CS ADR DSN — BOOK 1

CHAPTER U — COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS AND PANELS

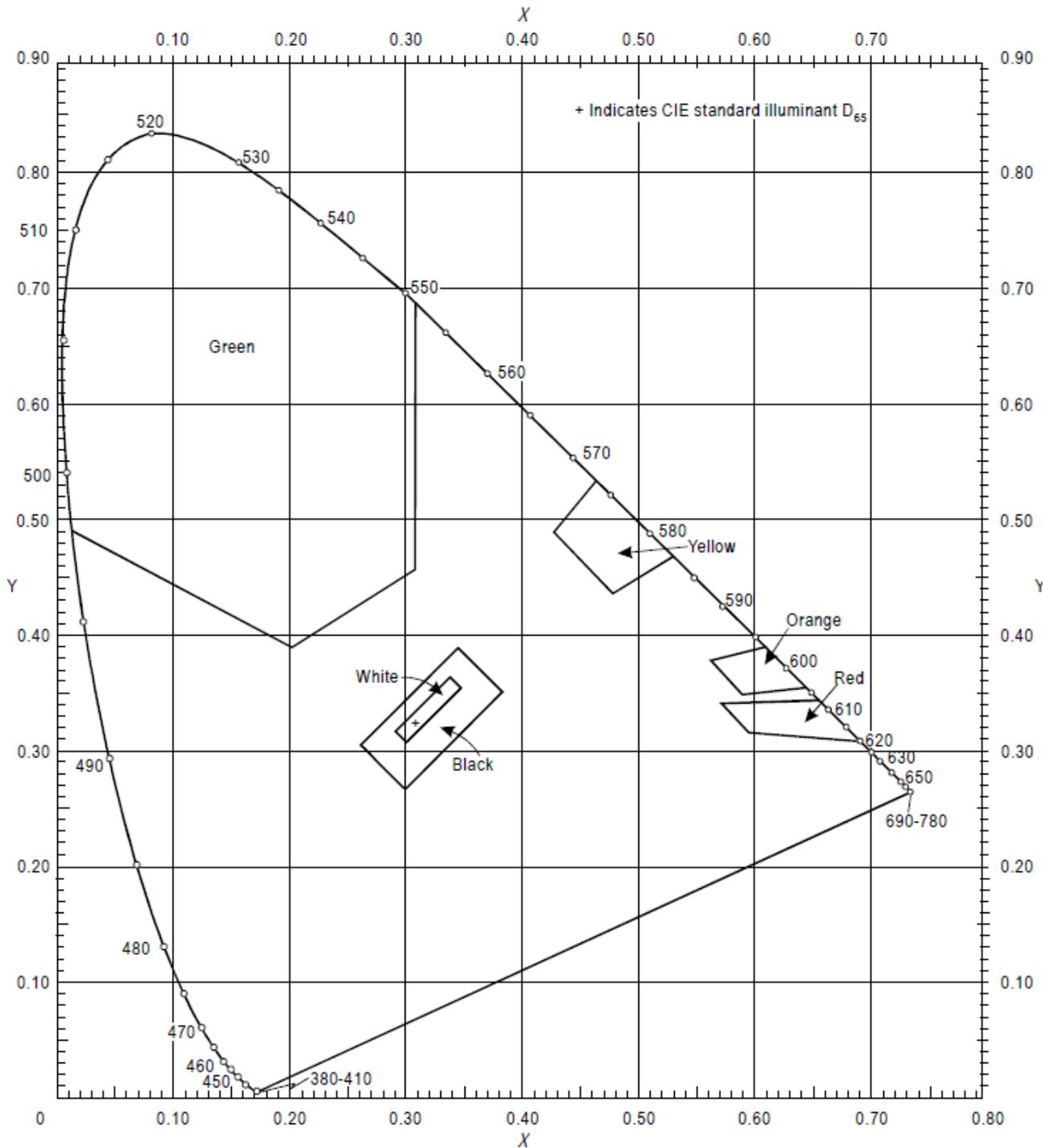


Figure U-2. Ordinary colours for markings and externally illuminated signs and panels

CS ADR DSN — BOOK 1

CHAPTER U — COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS AND PANELS

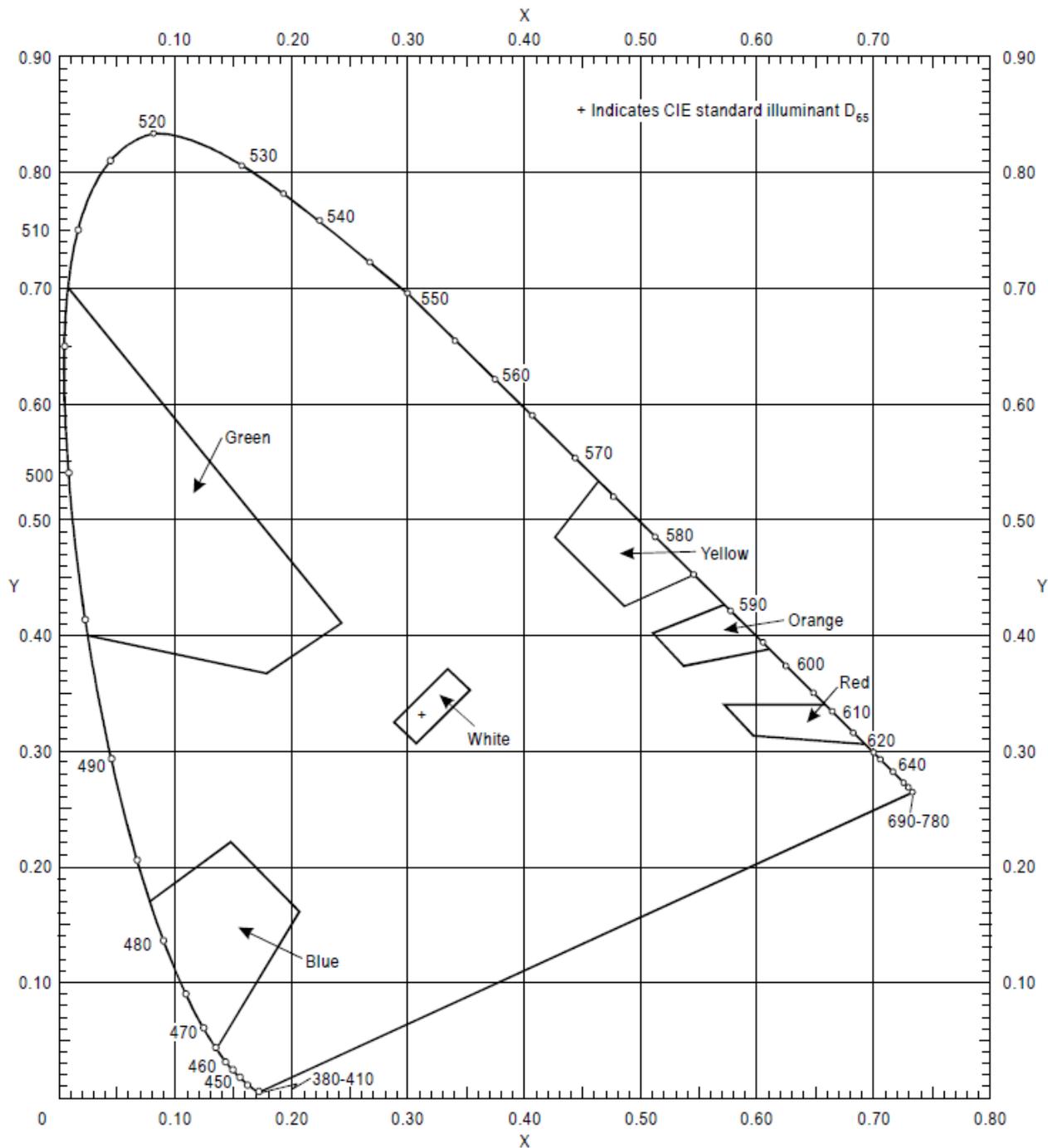


Figure U-3. Colours of retroreflective materials for markings, signs and panels

CS ADR DSN — BOOK 1

CHAPTER U — COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS AND PANELS

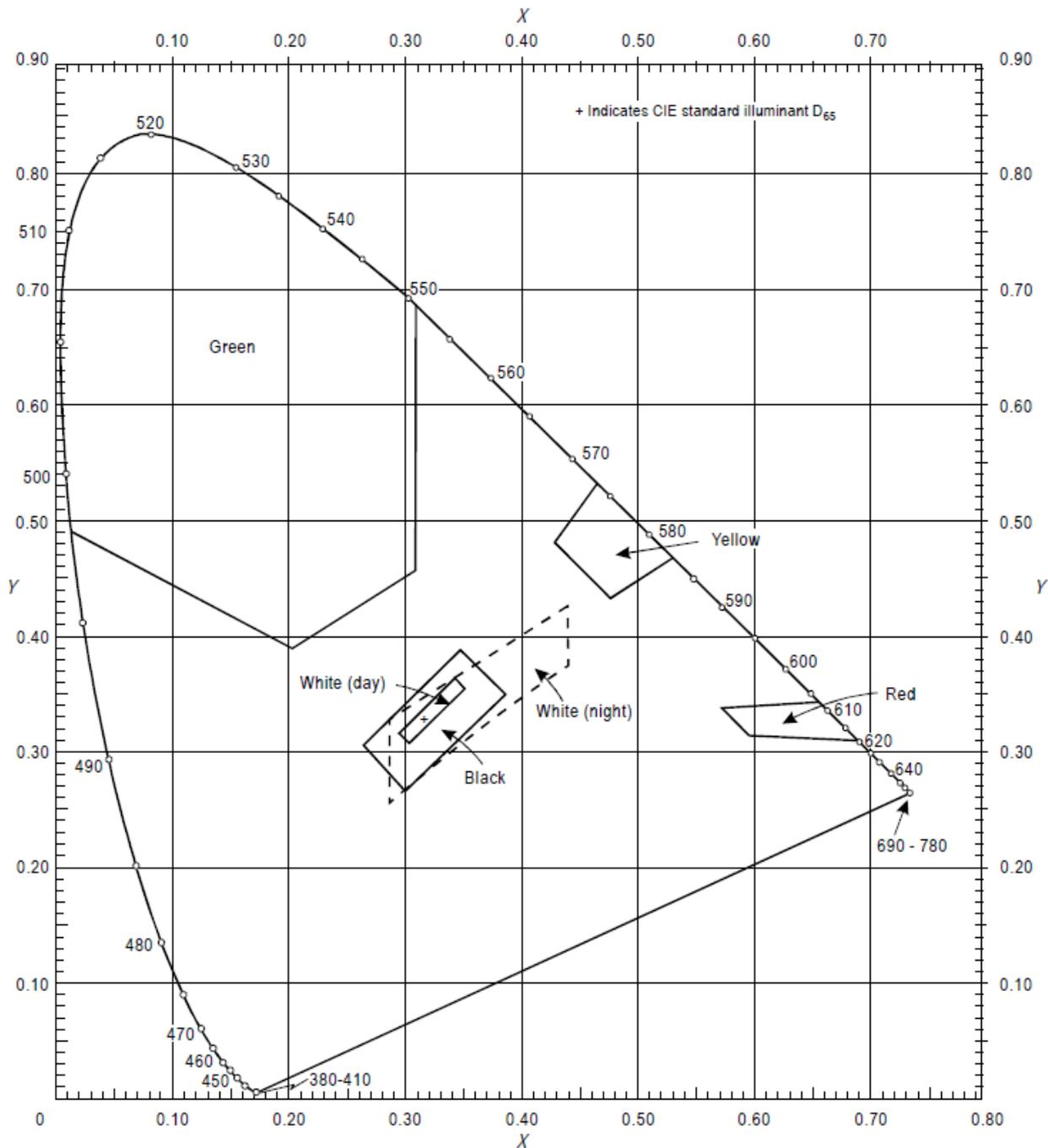


Figure U-4. Colours of luminescent or internally illuminated signs and panels

CS ADR-DSN.U.940 Aeronautical ground light characteristics

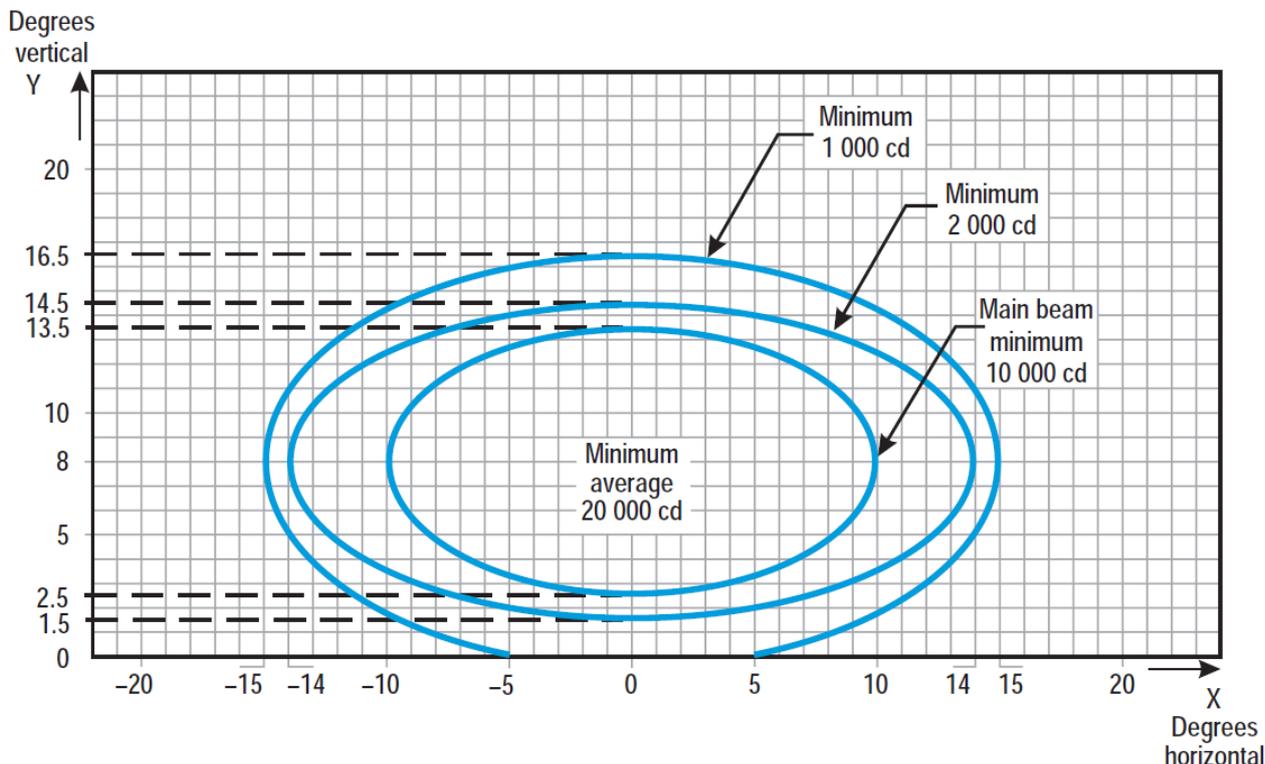


Figure U-5. Isocandela diagram for approach centre line light and crossbars (white light)

Notes:

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

a	10	14	15
b	5.5	6.5	8.5

- (a) Curves calculated on formula
- (b) Vertical setting angles of the lights should be such that the following vertical coverage of the main beam should be met:

distance from threshold	vertical main beam coverage
threshold to 315 m	0° - 11°
316 m to 475 m	0.5° - 11.5°
476 m to 640 m	1.5° - 12.5°
641 m and beyond	2.5° -13.5° (as illustrated above)
- (c) Lights in crossbars beyond 22.5 m from the centre line should be toed-in 2 degrees. All other lights should be aligned parallel to the centre line of the runway.
- (d) See collective notes for Figures U-5 to U-15.

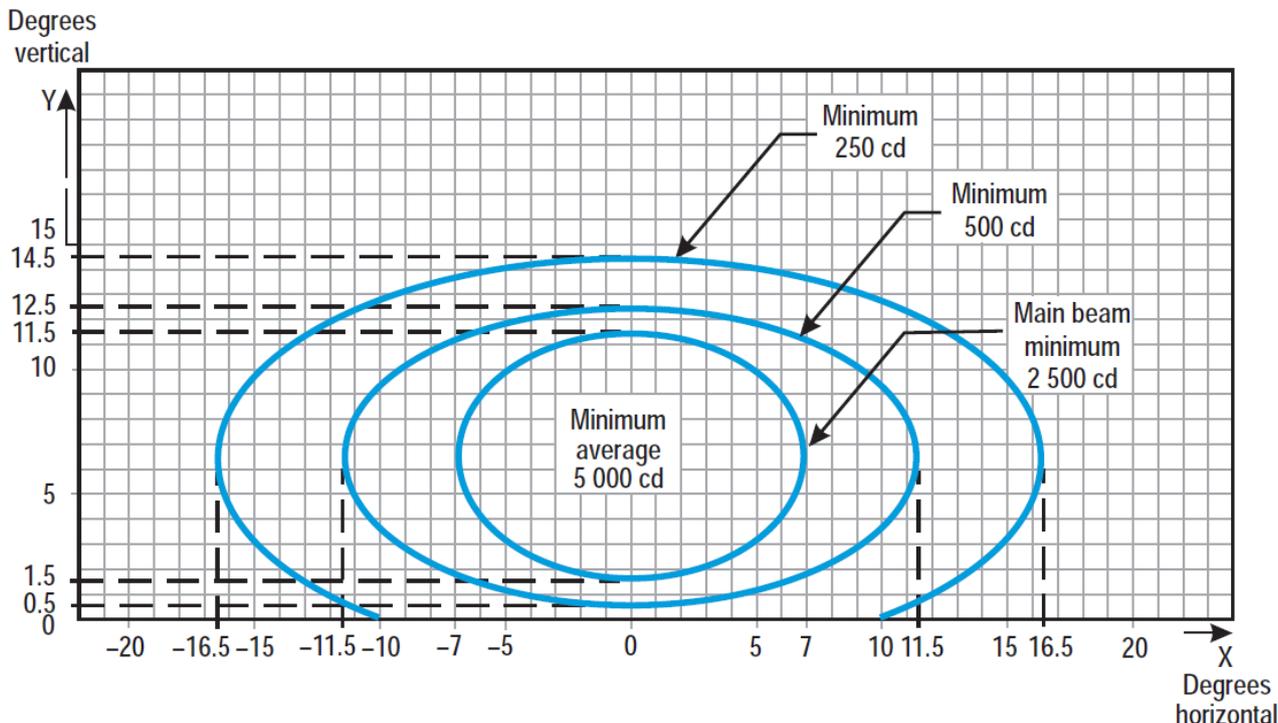


Figure U-6. Isocandela diagram for approach side row light (red light)

Notes:

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

a	7.0	11.5	16.5
b	5.0	6.0	8.0

- (a) Curves calculated on formula
- (b) Toe-in 2 degrees
- (c) Vertical setting angles of the lights should be such that the following vertical coverage of the main beam should be met:

distance from threshold	vertical main beam coverage
threshold to 115 m	0.5° - 10.5°
116 m to 215 m	1° - 11°
216 m and beyond	1.5° - 11.5° (as illustrated above)
- (d) See collective notes for Figures U-5 to U-15.

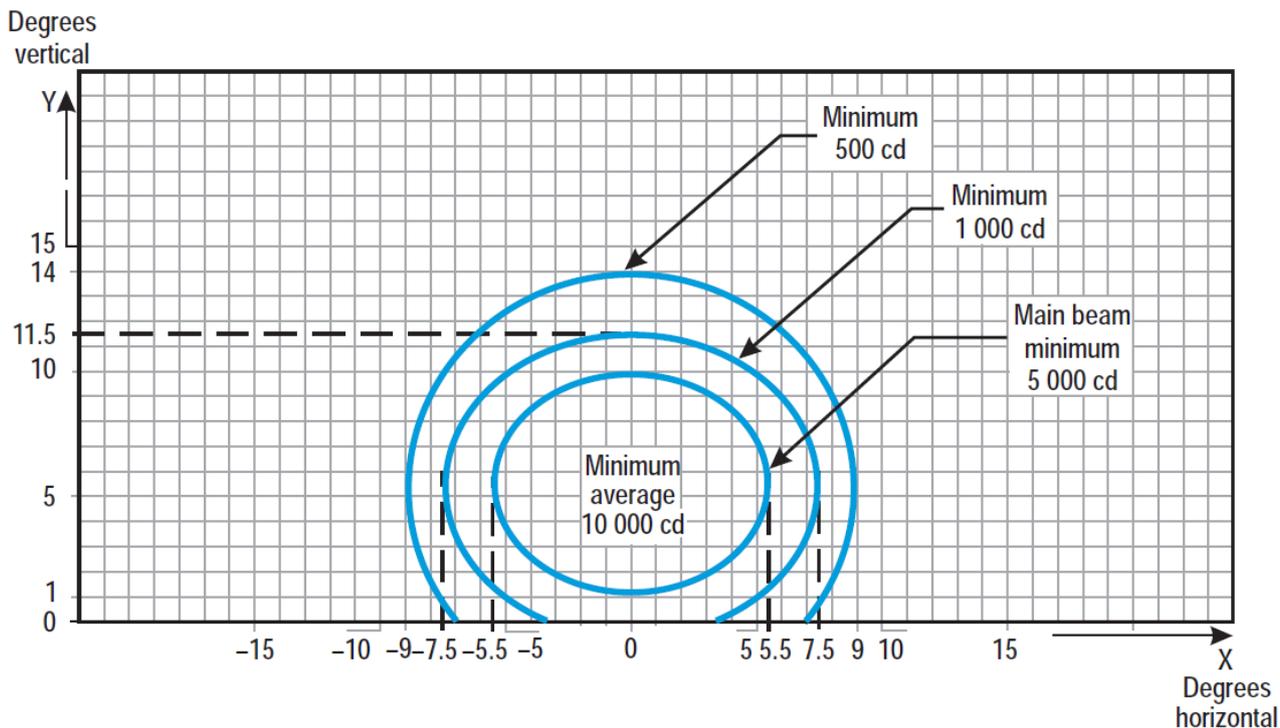


Figure U-7. Isocandela diagram for threshold light (green light)

Notes:

(a) Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

a	5.5	7.5	9.0
b	4.5	6.0	8.5

(b) Toe-in 3.5 degrees

(c) See collective notes for Figures U-5 to U-15.

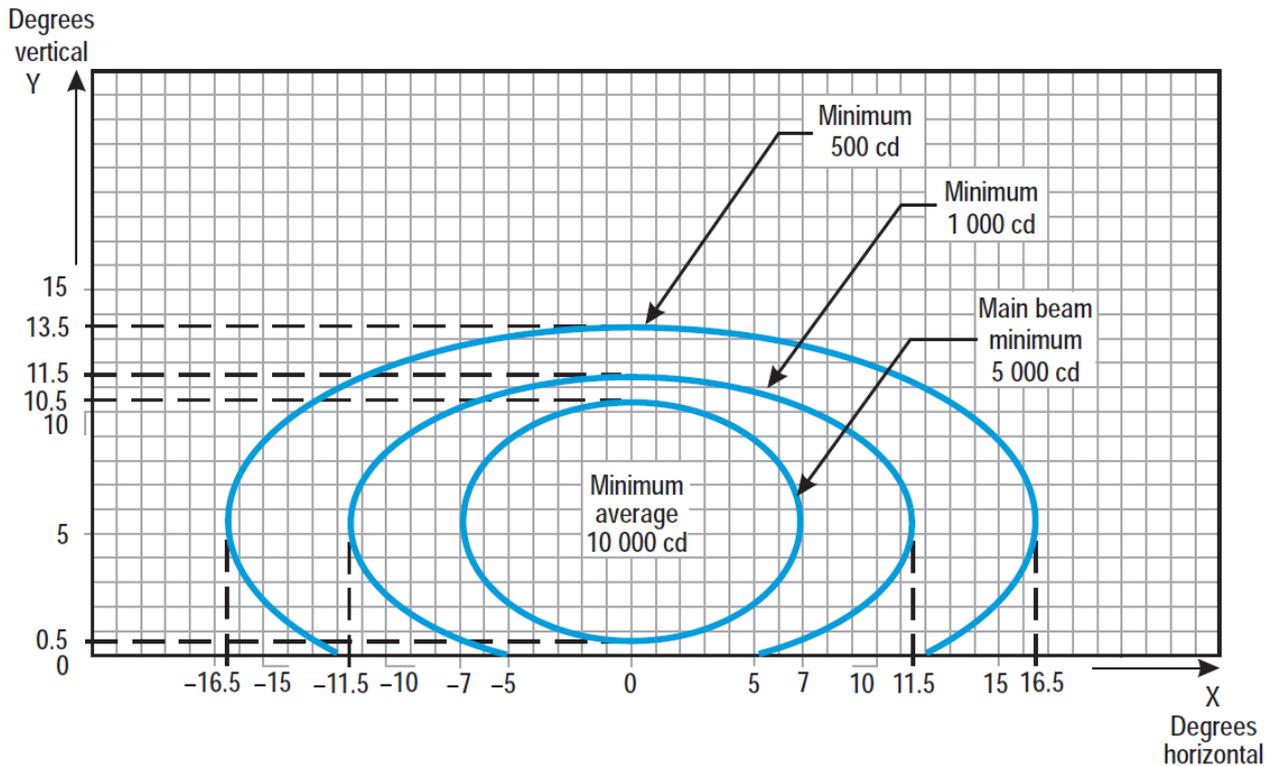


Figure U-8. Isocandela diagram for threshold wing bar light (green light)

Notes:

(a) Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

(b) Toe-in 2 degrees

(c) See collective notes for Figures U-5 to U-15.

a	7.0	11.5	16.5
b	5.0	6.0	8.0

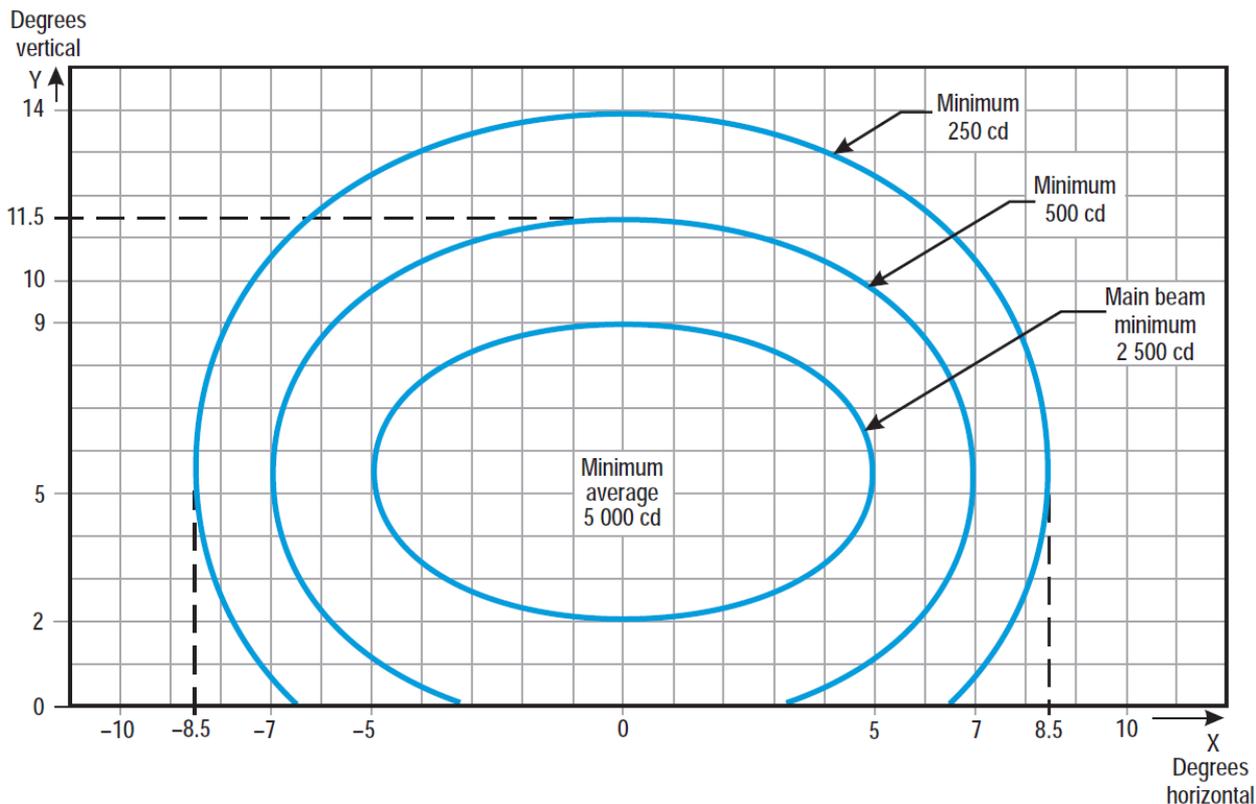


Figure U-9. Isocandela diagram for touchdown zone light (white light)

Notes:

(a) Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

a	5.0	7.0	8.5
b	3.5	6.0	8.5

(b) Toe-in 4 degrees

(c) See collective notes for Figures U-5 to U-15.

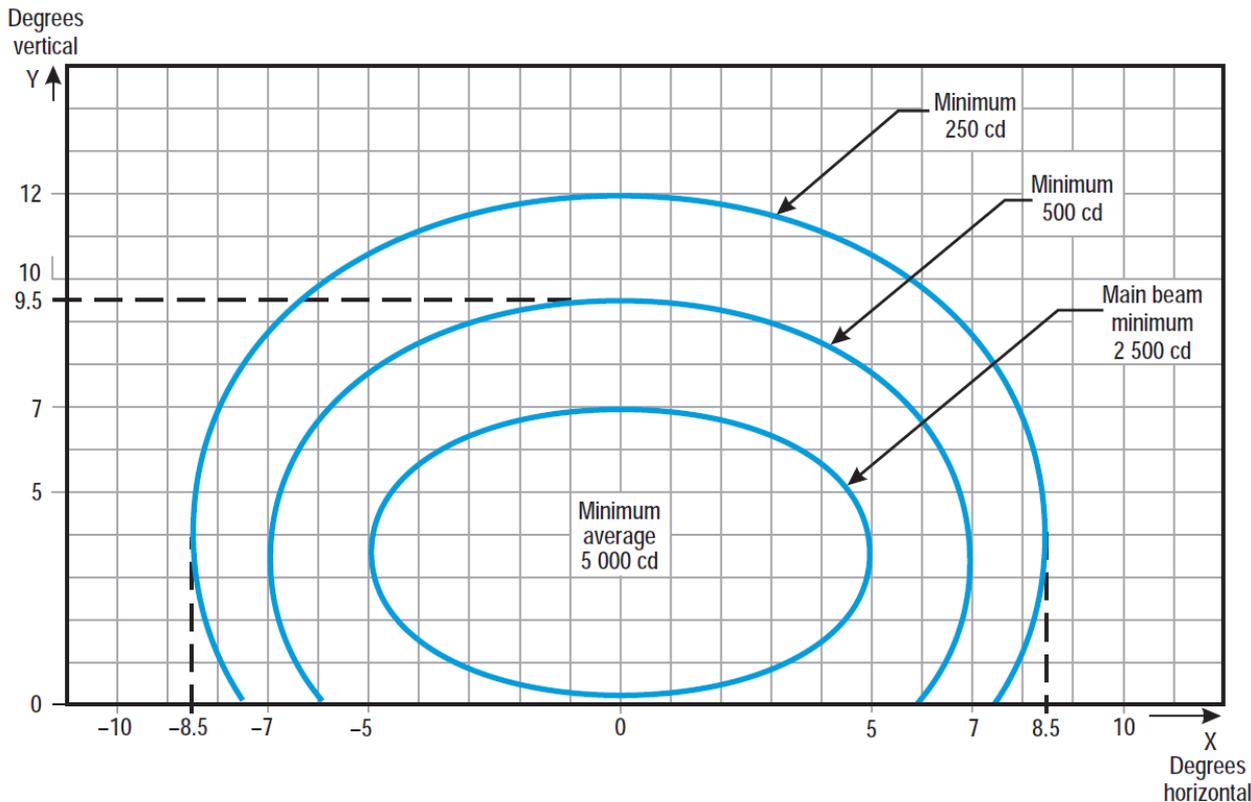


Figure U-10. Isocandela diagram for runway centre line light with 30 m longitudinal spacing (white light) and rapid exit taxiway indicator light (yellow light)

Notes:

(a) Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

a	5.0	7.0	8.5
b	3.5	6.0	8.5

- (b) For red light, multiply values by 0.15.
- (c) For yellow light, multiply values by 0.40.
- (d) See collective notes for Figures U-5 to U-15.

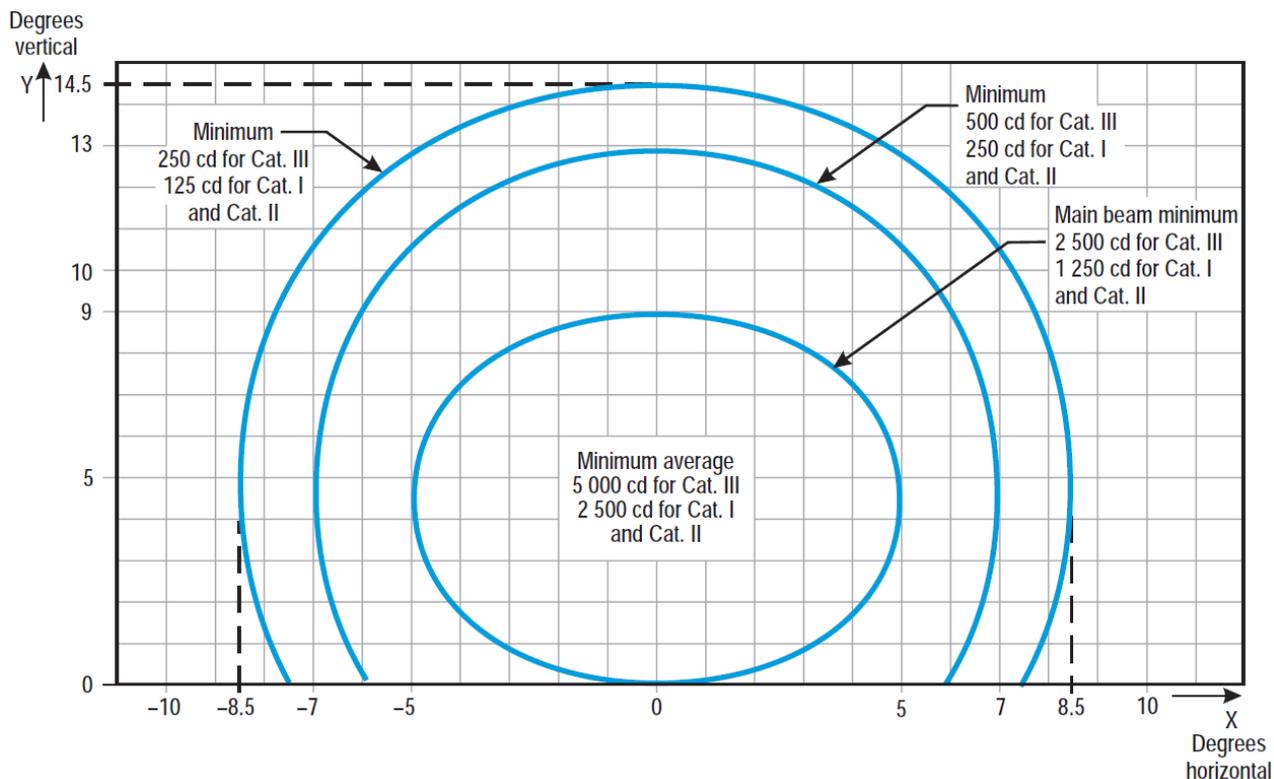


Figure U-11. Isocandela diagram for runway centre line light with 15 m longitudinal spacing (white light) and rapid exit taxiway indicator light (yellow light)

Notes:

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

- (a) Curves calculated on formula
- (b) For red light, multiply values by 0.15.
- (c) For yellow light, multiply values by 0.40.
- (d) See collective notes for Figures U-5 to U-15.

a	5.0	7.0	8.5
b	4.5	8.5	10

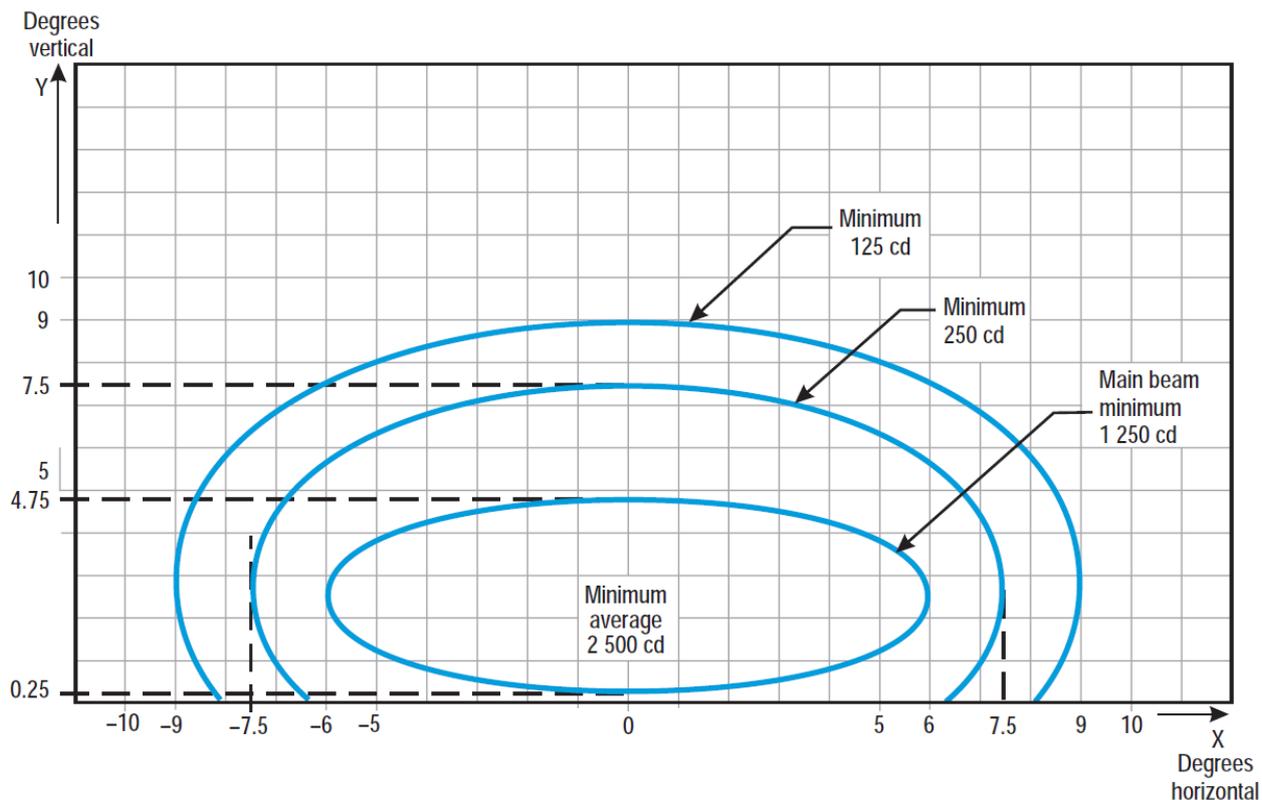


Figure U-12. Isocandela diagram for runway end light (red light)

Notes:

(a) Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

a	6.0	7.5	9.0
b	2.25	5.0	6.5

(b) See collective notes for Figures U-5 to U-15.

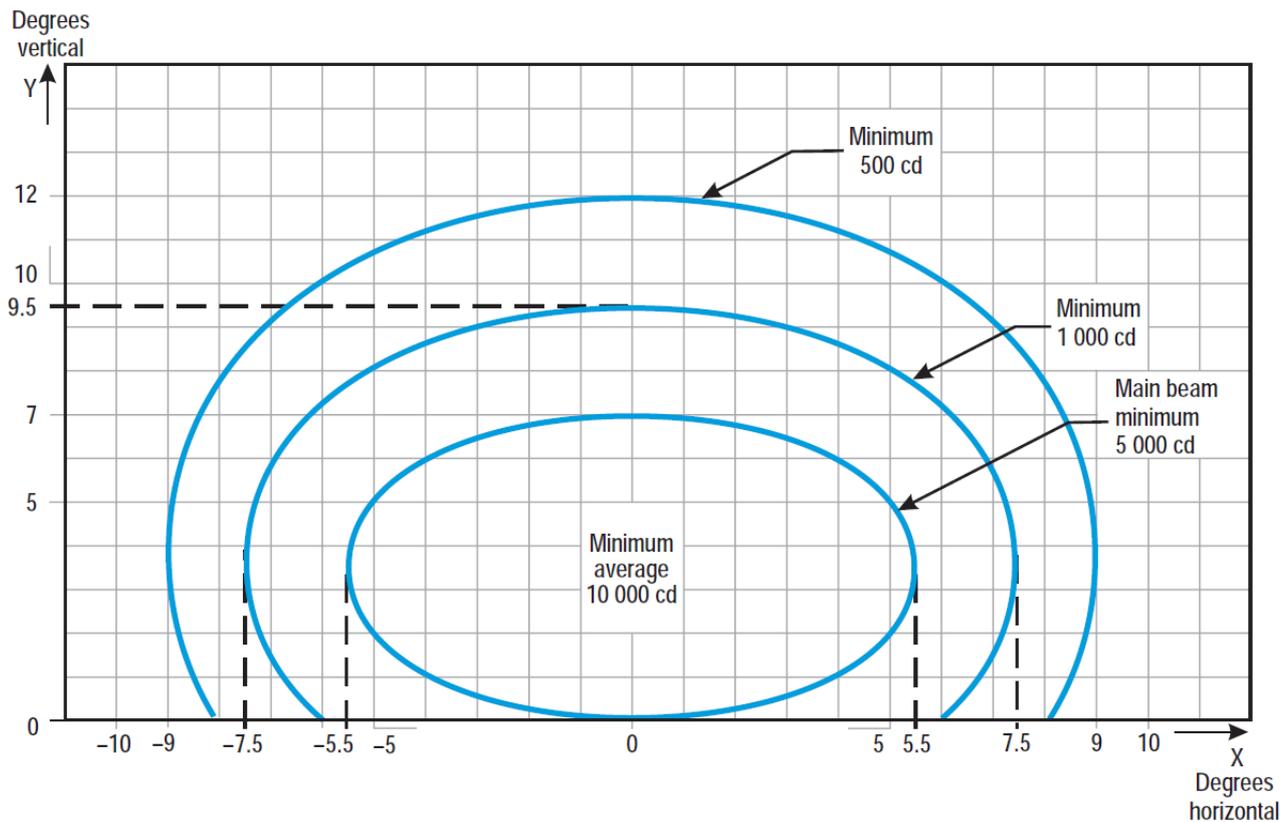


Figure U-13. Isocandela diagram for runway edge light where width of runway is 45 m (white light)

Notes:

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

a	5.5	7.5	9.0
b	3.5	6.0	8.5

- (a) Curves calculated on formula
- (b) Toe-in 3.5 degrees
- (c) For red light, multiply values by 0.15.
- (d) For yellow light, multiply values by 0.40.
- (e) See collective notes for Figures U-5 to U-15.

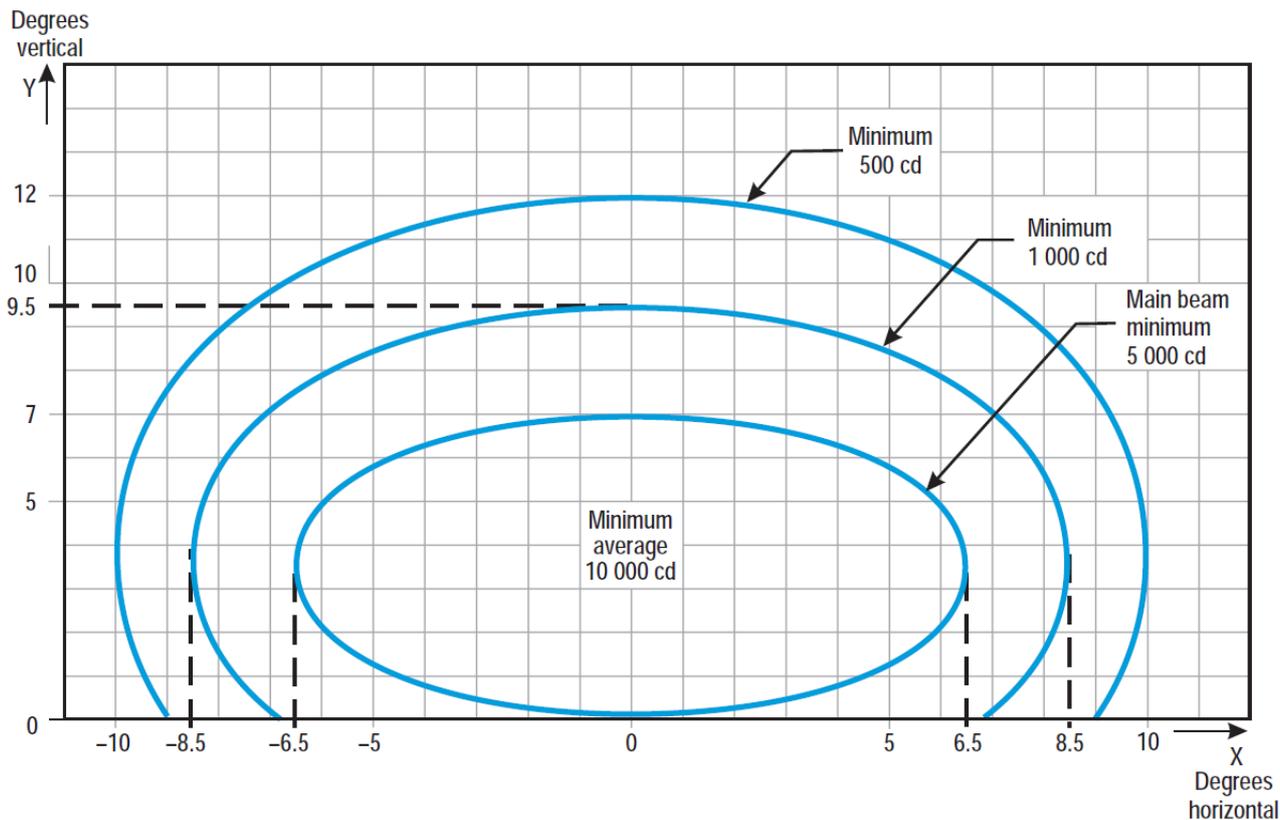


Figure U-14. Isocandela diagram for runway edge light where width of runway is 60 m (white light)

Notes:

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

- (a) Curves calculated on formula
- (b) Toe-in 4.5 degrees
- (c) For red light, multiply values by 0.15.
- (d) For yellow light, multiply values by 0.40.
- (e) See collective notes for Figures U-5 to U-15.

a	6.5	8.5	10.0
b	3.5	6.0	8.5

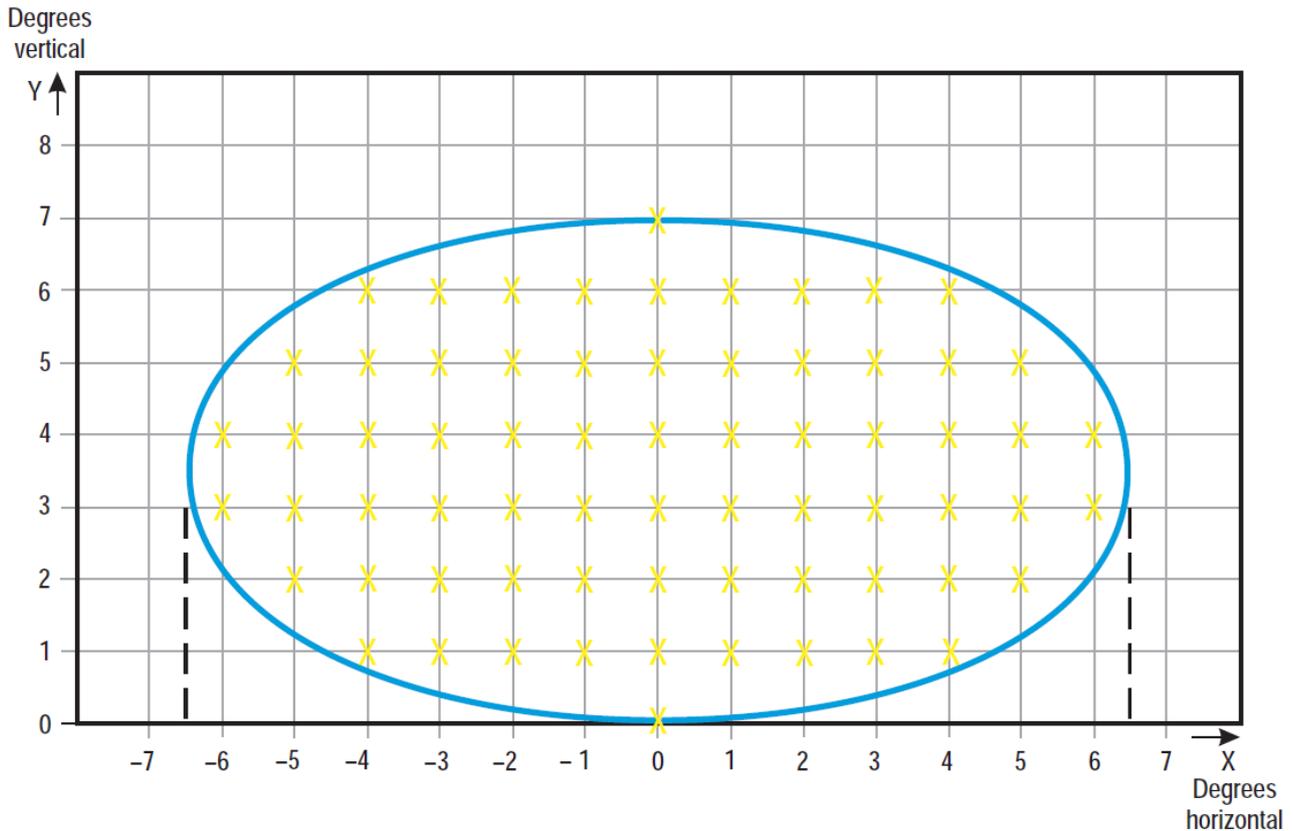


Figure U-15. Grid points to be used for the calculation of average intensity of approach and runway lights

Collective notes to Figures U-5 to U-15

- The ellipses in each Figure are symmetrical about the common vertical and horizontal axes.
- Figures U-5 to U-14 show the minimum allowable light intensities. The average intensity of the main beam is calculated by establishing grid points as shown in Figure U-15 and using the intensity value measures at all grid points located within and on the perimeter of the ellipse representing the main beam. The average value is the arithmetic average of light intensities measured at all considered grid points.
- No deviations are acceptable in the main beam pattern when the lighting fixture is properly aimed.
- Average intensity ratio. The ratio between the average intensity within the ellipse defining the main beam of a typical new light and the average light intensity of the main beam of a new runway edge light should be as follows:

CS ADR DSN — BOOK 1

CHAPTER U — COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS
AND PANELS

Figure U-5	Approach centre line and crossbars	1.5 to 2.0	(white light)
Figure U-6	Approach side row	0.5 to 1.0	(red light)
Figure U-7	Threshold	1.0 to 1.5	(green light)
Figure U-8	Threshold wing bar	1.0 to 1.5	(green light)
Figure U-9	Touchdown zone	0.5 to 1.0	(white light)
Figure U-10	Runway centre line (longitudinal spacing 30 m)	0.5 to 1.0	(white light)
Figure U-11	Runway centre line (longitudinal spacing 15 m)	0.5 to 1.0 for CAT III 0.25 to 0.5 for CAT I, II	(white light) (white light)
Figure U-12	Runway end	0.25 to 0.5	(red light)
Figure U-13	Runway edge (45 m runway width)	1.0	(white light)
Figure U-14	Runway edge (60 m runway width)	1.0	(white light)

- (e) The beam coverages in the Figures provide the necessary guidance for approaches down to an RVR of the order of 150 m and take-offs down to an RVR of the order of 100 m.
- (f) Horizontal angles are measured with respect to the vertical plane through the runway centre line. For lights other than centre line lights, the direction towards the runway centre line is considered positive. Vertical angles are measured with respect to the horizontal plane.
- (g) Where, for approach centre line lights and crossbars and for approach side row lights, inset lights are used in lieu of elevated lights, e.g. on a runway with a displaced threshold, the intensity requirements can be met by installing two or three fittings (lower intensity) at each position.
- (h) The importance of adequate maintenance cannot be overemphasised. The average intensity should never fall to a value less than 50 % of the value shown in the Figures, and it should be the aim of aerodrome operator to maintain a level of light output close to the specified minimum average intensity.
- (i) The light unit should be installed so that the main beam is aligned within one-half degree of the specified.

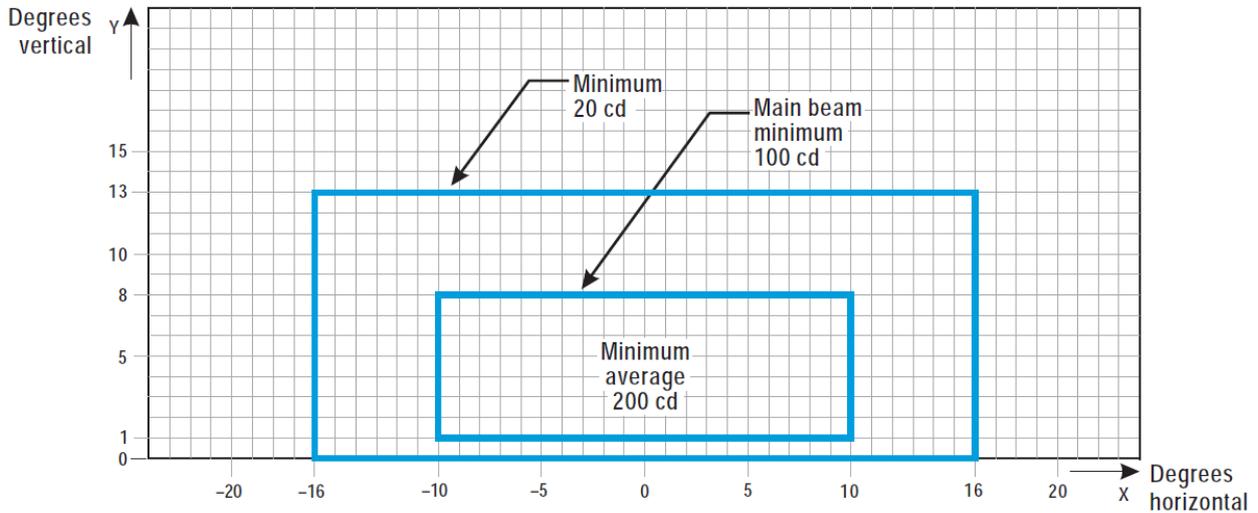


Figure U-16. Isocandela diagram for taxiway centre line (15 m spacing) and stop bar lights in straight sections intended for use in runway visual range conditions of less than a value of 350 m where large offsets can occur and for low-intensity runway guard lights, Configuration B

Notes:

- (a) These beam coverages allow for displacement of the cockpit from the centre line up to distances of the order of 12 m and are intended for use before and after curves.
- (b) See collective notes for Figures U-16 to U-25.
- (c) Increased intensities for enhanced rapid exit taxiway centre line lights are four times the respective intensities in the figure (i.e. 800 cd for minimum average main beam).

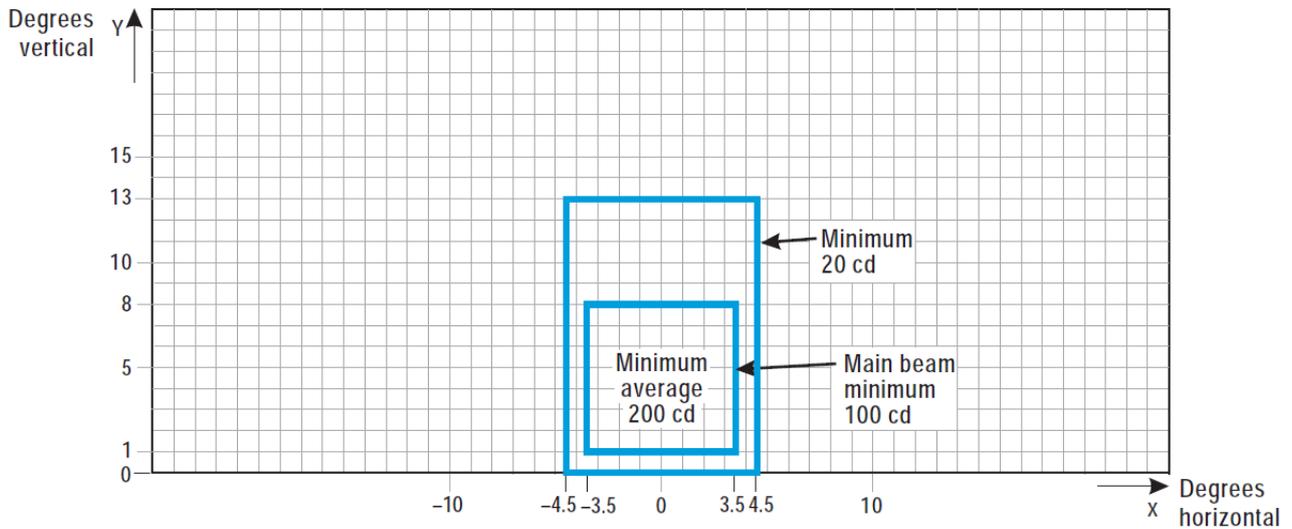


Figure U-17. Isocandela diagram for taxiway centre line (15 m spacing) and stop bar lights in straight sections intended for use in runway visual range conditions of less than a value of 350 m

Notes:

- (a) These beam coverages are generally satisfactory and cater for a normal displacement of the cockpit from the centre line of approximately 3 m.
- (b) See collective notes for Figures U-16 to U-25.

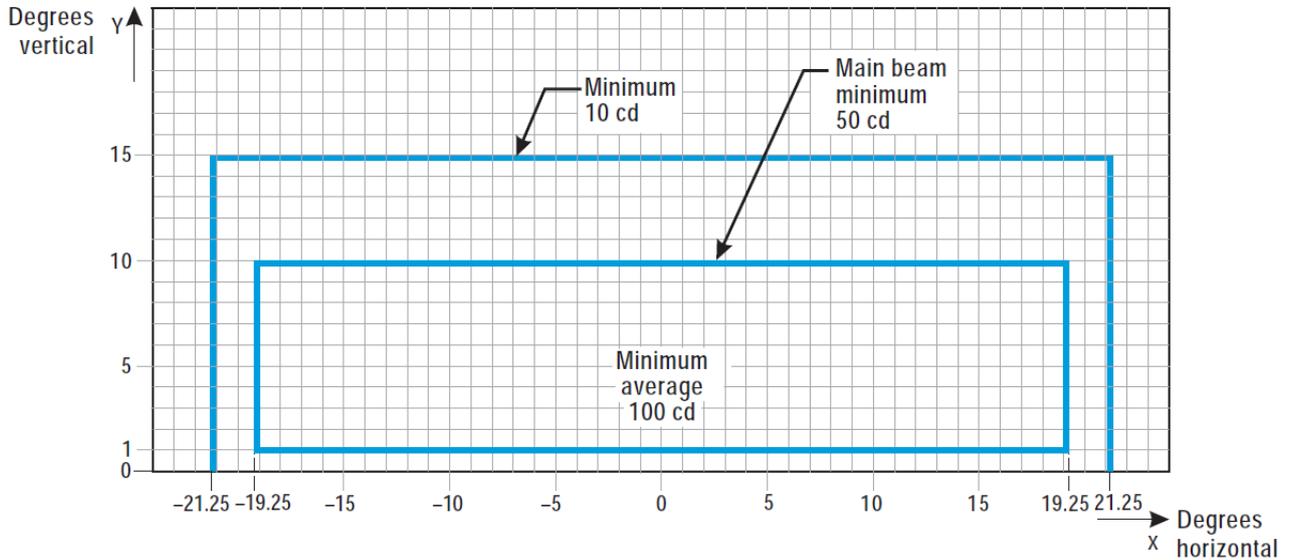


Figure U-18. Isocandela diagram for taxiway centre line (7.5 m spacing) and stop bar lights in curved sections intended for use in runway visual range conditions of less than a value of 350 m

Notes:

- (a) Lights on curves to be toed-in 15.75 degrees with respect to the tangent of the curve.
- (b) See collective notes for Figures U-16 to U-25.

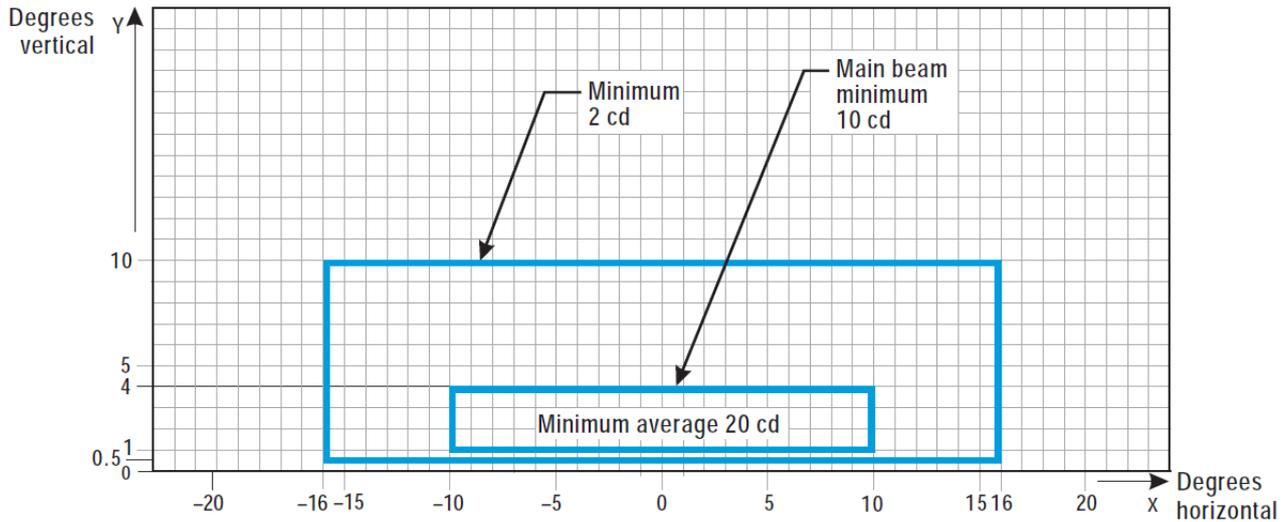


Figure U-19. Isocandela diagram for taxiway centre line (30 m, 60 m spacing) and stop bar lights in straight sections intended for use in runway visual range conditions of 350 m or greater

Notes:

- (a) At locations where high background luminance is usual, and where deterioration of light output resulting from dust, snow, and local contamination is a significant factor, the cd-values should be multiplied by 2.5.
- (b) Where omnidirectional lights are used they should comply with the vertical beam requirements in this Figure.
- (c) See collective notes for Figures U-16 to U-25.

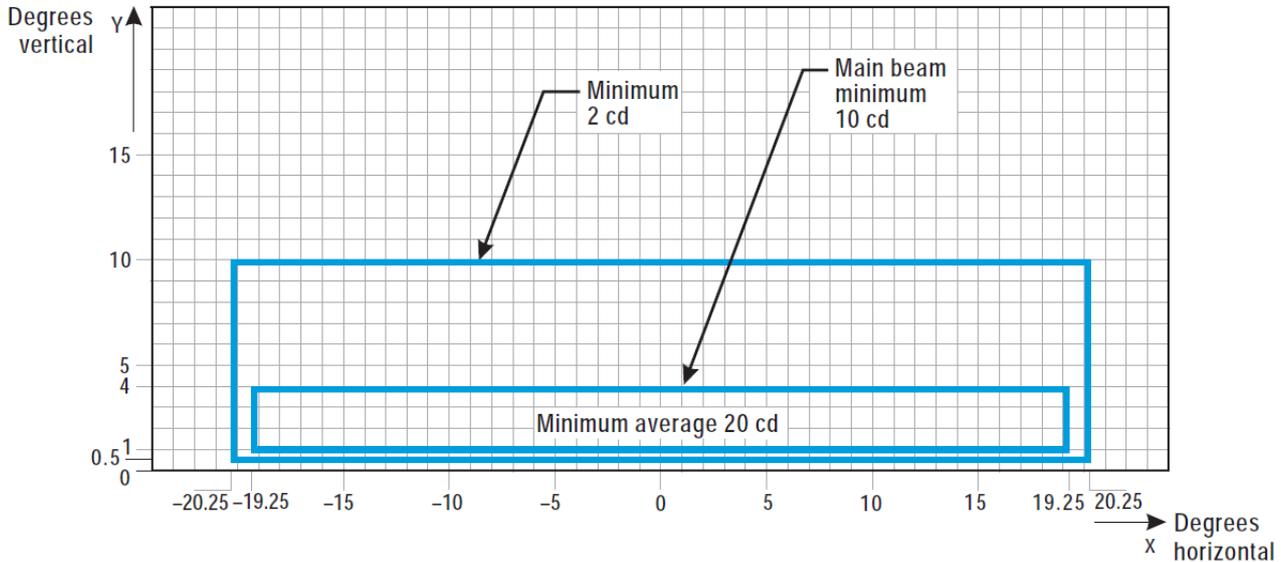
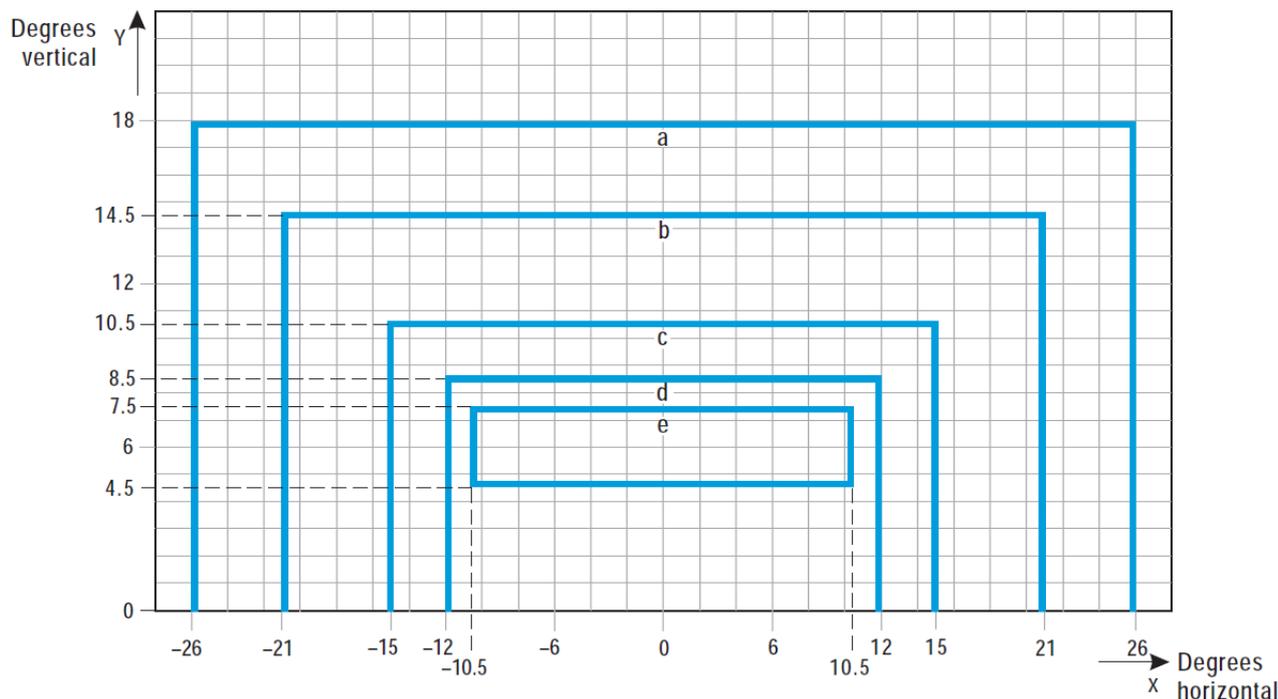


Figure U-20. Isocandela diagram for taxiway centre line (7.5 m, 15 m, 30 m spacing) and stop bar lights in curved sections intended for use in runway visual range conditions of 350 m or greater

Notes:

- Lights on curves to be toed-in 15.75 degrees with respect to the tangent of the curve.
- At locations where high background luminance is usual and where deterioration of light output resulting from dust, snow and, local contamination is a significant factor, the cd-values should be multiplied by 2.5.
- These beam coverages allow for displacement of the cockpit from the centre line up to distances of the order of 12 m as could occur at the end of curves.
- See collective notes for Figures U-16 to U-25.

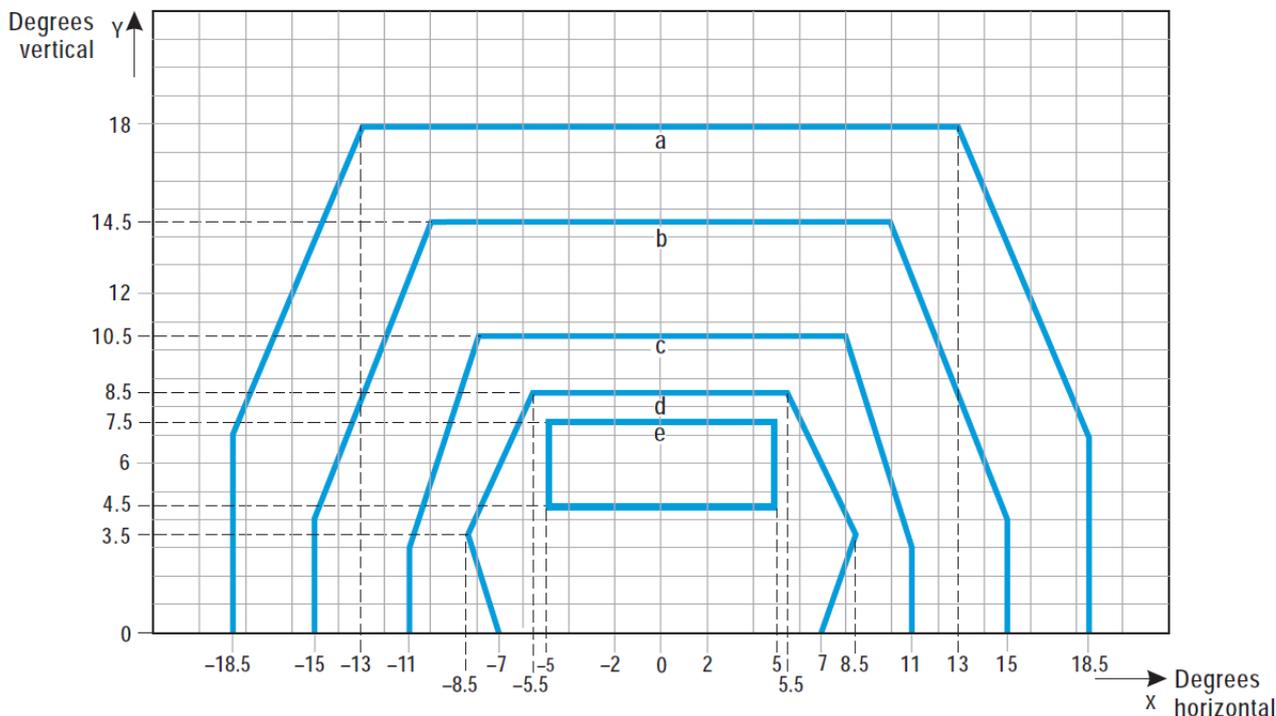


Curve	a	b	c	d	e
Intensity (cd)	8	20	100	450	1800

Figure U-21. Isocandela diagram for high-intensity taxiway centre line (15 m spacing) and stop bar lights in straight sections intended for use in an advanced surface movement guidance, and control system where higher light intensities are required and where large offsets can occur.

Notes:

- (a) These beam coverages are generally satisfactory and cater for a normal displacement of the cockpit corresponding to the outer main gear wheel on the taxiway edge.
- (b) See collective notes for Figures U-16 to U-25.

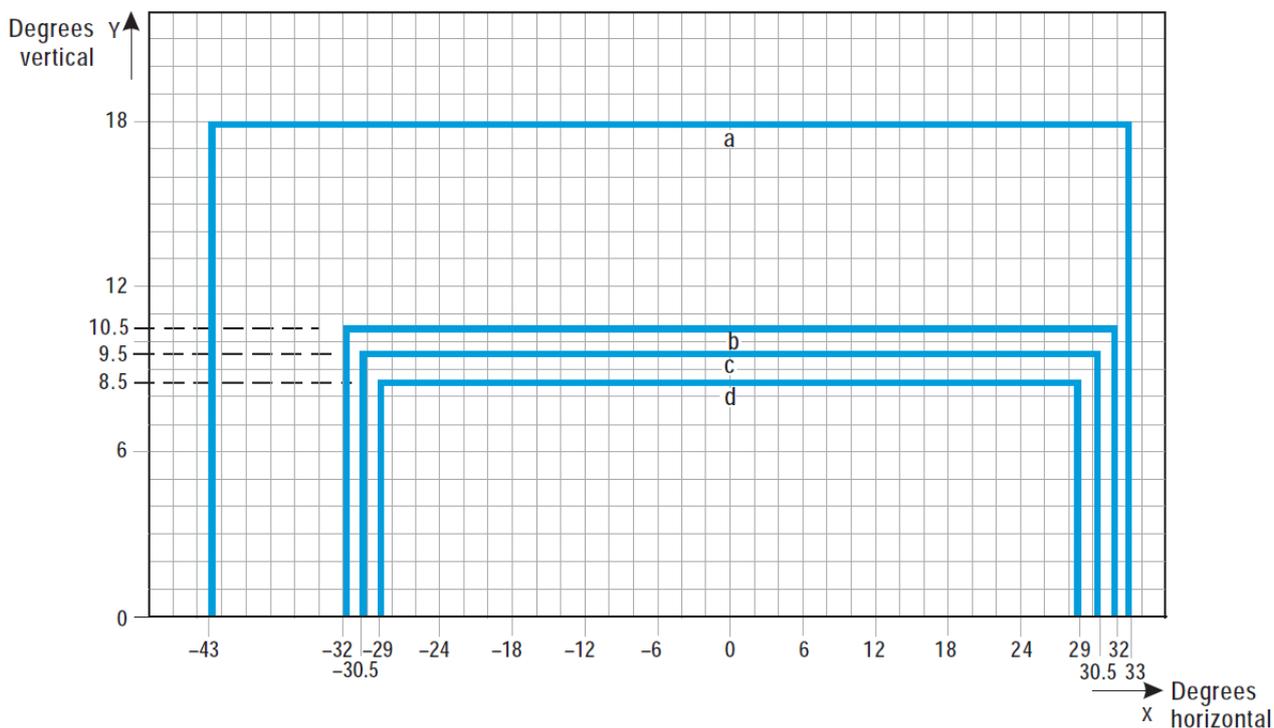


Curve	a	b	c	d	e
Intensity (cd)	8	20	100	450	1800

Figure U-22. Isocandela diagram for high-intensity taxiway centre line (15 m spacing) and stop bar lights in straight sections intended for use in an advanced surface movement guidance, and control system where higher light intensities are required

Notes:

- (a) These beam coverages are generally satisfactory and cater for a normal displacement of the cockpit corresponding to the outer main gear wheel on the taxiway edge.
- (b) See collective notes for Figures U-16 to U-25.



Curve	a	b	c	d
Intensity (cd)	8	100	200	400

Figure U-23. Isocandela diagram for high-intensity taxiway centre line (7.5 m spacing) and stop bar lights in curved sections intended for use in an advanced surface movement guidance, and control system where higher light intensities are required

Notes:

- (a) Lights on curves to be toed-in 17 degrees with respect to the tangent of the curve.
- (b) See collective notes for Figures U-16 to U-25.

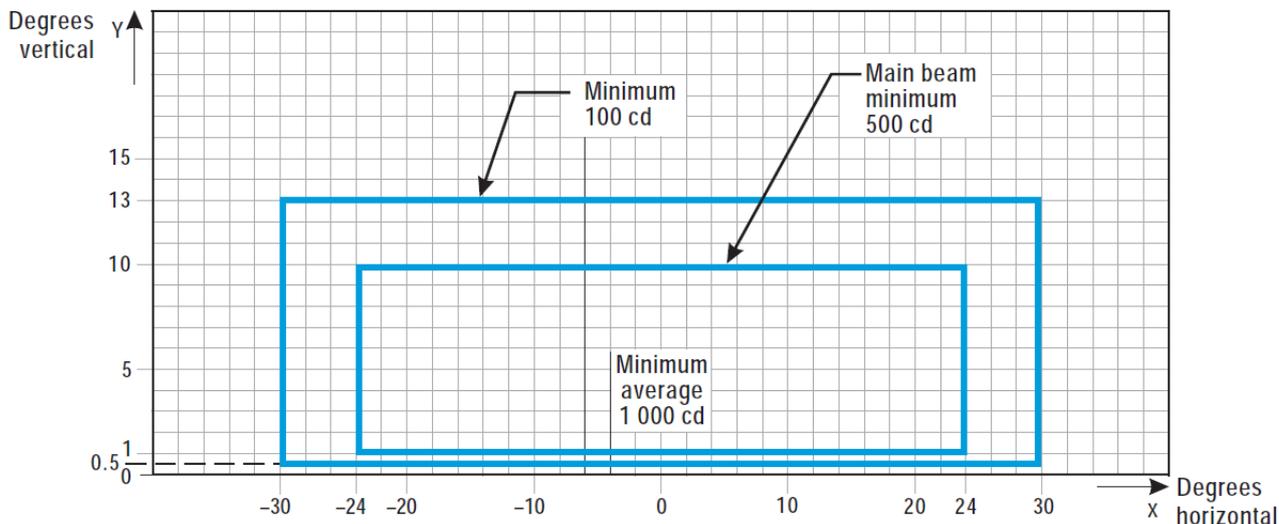


Figure U-24. Isocandela diagram for high-intensity runway guard lights, Configuration B

Notes:

- (a) Although the lights flash in normal operation, the light intensity is specified as if the lights were fixed for incandescent lamps.
- (b) See collective notes for Figures U-16 to U-25.

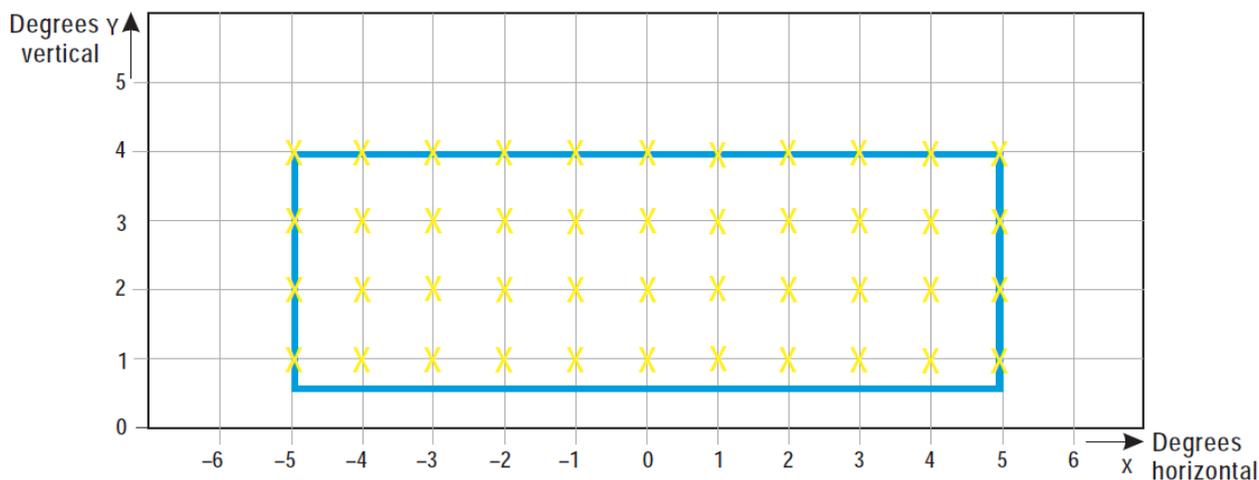


Figure U-25. Grid points to be used for calculation of average intensity of taxiway centre line and stop bar lights

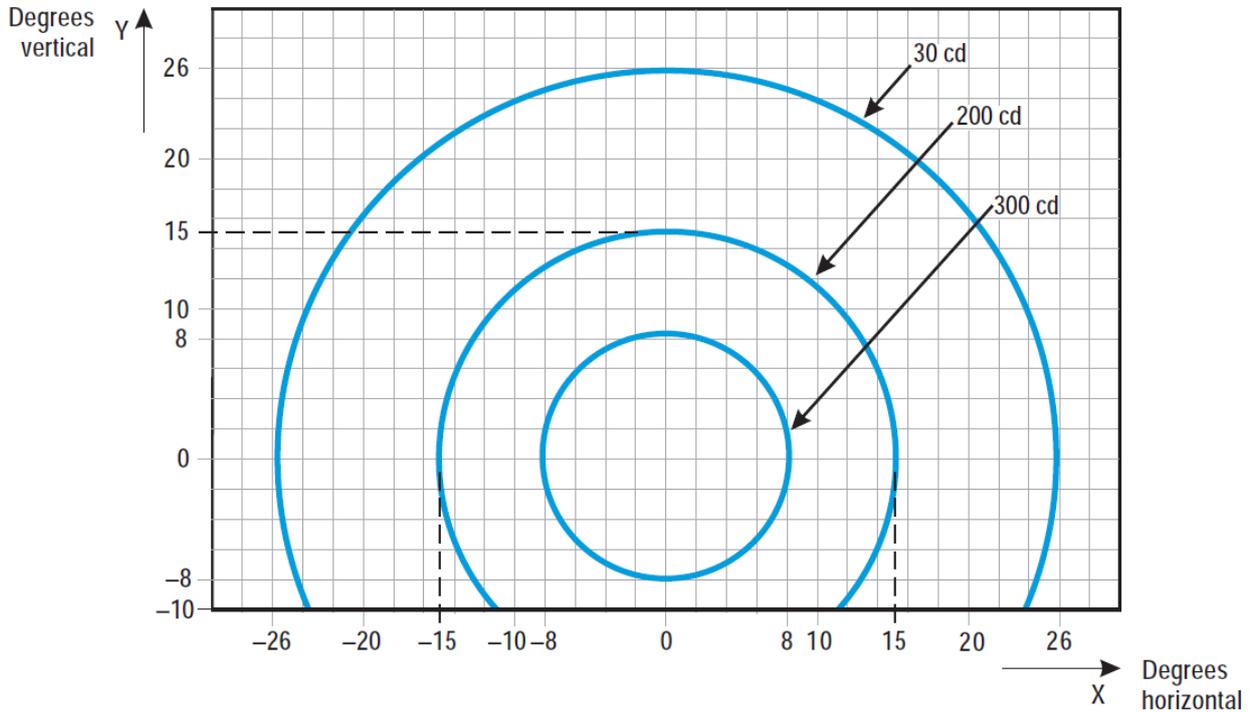


Figure U-27. Isocandela diagram for each light in low-intensity runway guard lights, Configuration A

Notes:

- (a) Although the lights flash in normal operation, the light intensity is specified as if the lights were fixed for incandescent lamps.
- (b) The intensities specified are in yellow light.

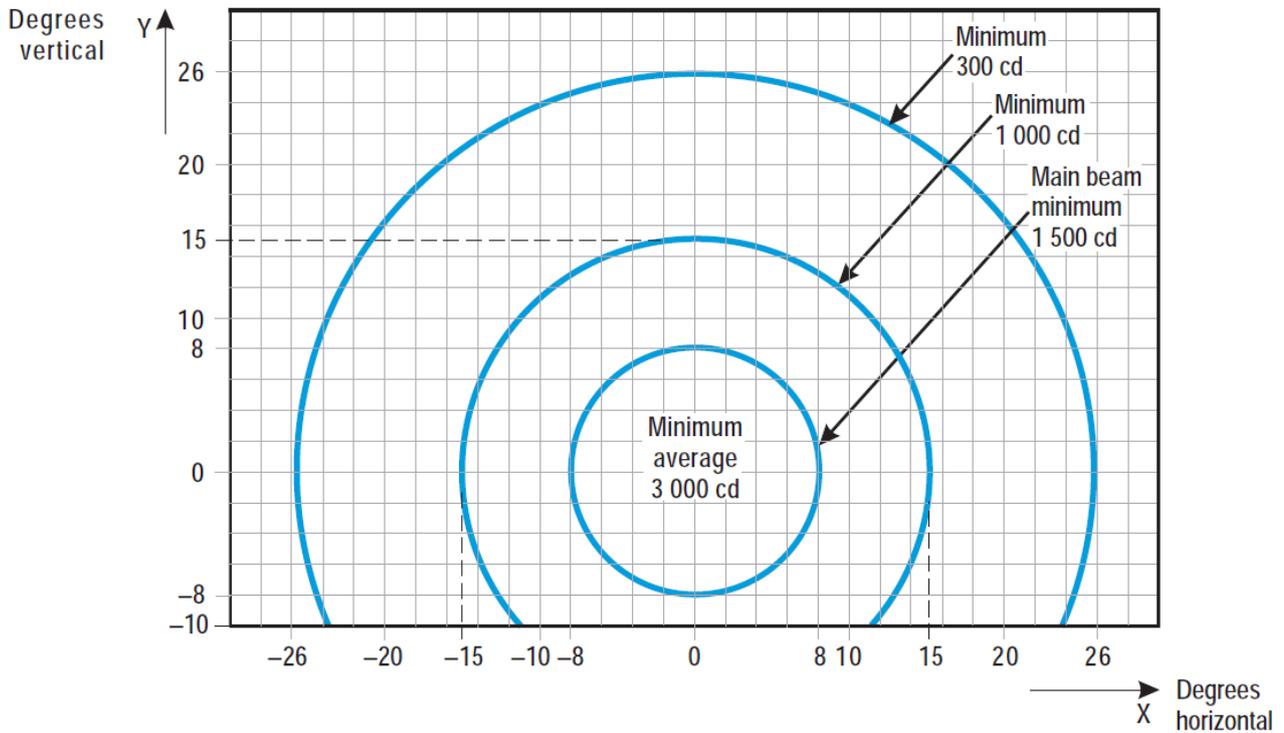


Figure U-28. Isocandela diagram for each light in high-intensity runway guard lights, Configuration A

Notes:

- (a) Although the lights flash in normal operation, the light intensity is specified as if the lights were fixed for incandescent lamps.
- (b) The intensities specified are in yellow light.

BOOK 2**EASA GUIDANCE MATERIAL FOR AERODROME DESIGN****CHAPTER A — GENERAL****GM1 ADR-DSN.A.001 Applicability**

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GM1 ADR-DSN.A.002 Definitions

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GM1 ADR-DSN.A.005 Aerodrome Reference Code

- (a) The intent of the reference code is to provide a simple method for interrelating the numerous specifications concerning the characteristics of aerodromes so as to provide a series of aerodrome facilities that are suitable for the aeroplanes that are intended to operate at the aerodrome. The code is not intended to be used for determining runway length or pavement strength requirements. The code is composed of two elements which are related to the aeroplane performance characteristics and dimensions.
- (b) Element 1 is a number based on the aeroplane reference field length, and element 2 is a letter based on the aeroplane wingspan and outer main gear wheel span. A particular specification is related to the more appropriate of the two elements of the code, or to an appropriate combination of the two code elements. The code letter or number within an element selected for design purposes is related to the critical aeroplane characteristics for which the facility is provided. When applying NPA text, the aeroplanes which the aerodrome is intended to serve, are first identified and then the two elements of the code.
- (c) The determination of the aeroplane reference field length is solely for the selection of a code number, and is not intended to influence the actual runway length provided.
- (d) In addition to the reference code, other aircraft characteristics, such as aircraft length and tail height, may also have an impact on the design of an aerodrome. Additionally, some characteristics of a piece of infrastructure are directly related to one element of the code (wingspan or wheel span) but are not impacted by other. The art of the aerodrome designer should be to consider all the relationships between aircraft characteristics and aerodromes and piece of infrastructures characteristics.
- (e) It is not intended that the specifications deriving from the aerodrome reference code limit or regulate the operation of an aircraft.
- (f) It is recognised that not all areas of the aerodrome should need to correspond to the critical aircraft that determines the Aerodrome Reference Code. Elements of the aerodrome infrastructure that do not meet the requirements of the Aerodrome Reference Code for the design aircraft should be designated with an appropriate code letter for its dimensions. Limitations should be identified to a/c size permitted or operating limitations.

ICAO, Annex 14 does not provide sufficient flexibility for infrastructure intended for different sizes of aircraft. It addresses only the 'design aircraft'. This enables all areas of the aerodrome to reflect the aerodrome reference code.

GM1 ADR-DSN.A.010

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CHAPTER B — RUNWAYS**GM1 ADR-DSN.B.015 Number, siting, and orientation of runways**

- (a) In practice the number and orientation of runways at an aerodrome should normally be such that the usability factor of the aerodrome would normally be not less than 95 % for the aeroplanes that the aerodrome is intended to serve.
- (b) Many factors affect the determination of the orientation, siting, and number of runways:
- (1) The wind distribution (to minimise crosswinds liable to affect runways);
 - (i) Wind statistics used for the calculation of the usability factor are normally available in ranges of speed and direction, and the accuracy of the results obtained depends, to a large extent, on the assumed distribution of observations within these ranges. In the absence of any sure information as to the true distribution, it is usual to assume a uniform distribution since, in relation to the most favorable runway orientations, this generally results in a slightly conservative usability factor.
 - (ii) The maximum mean crosswind components given in GM1 ADR-DSN.B.020, refer to normal circumstances. There are some factors which may require that a reduction of those maximum values be taken into account at a particular aerodrome. These include:
 - A. the wide variations which may exist, in handling characteristics and maximum permissible crosswind components, among diverse types of aeroplanes (including future types) within each of the three groups given in GM1 ADR-DSN.B.020;
 - B. prevalence and nature of gusts;
 - C. prevalence and nature of turbulence;
 - D. the availability of a secondary runway;
 - E. the width of runways;
 - F. the runway surface conditions — water, snow, and ice on the runway materially reduce the allowable crosswind component; and
 - G. the strength of the wind associated with the limiting crosswind component.
 - (2) The need to facilitate the provision of approaches conforming to the approach surface specifications, ensuring that obstacles in these areas or other factors should not restrict the operation of the aeroplanes for which the runway is intended. This may relate to individual obstacles or local geography (e.g. high ground).
 - (3) The need to minimise interference with areas approved for residential use and other noise-sensitive areas close to the aerodrome.
 - (4) The need to avoid the turbulence impacts of buildings on or close to the aerodrome.
 - (5) Type of operation. Attention should be paid in particular to whether the aerodrome is to be used in all meteorological conditions or only in visual meteorological conditions, and whether it is intended for use by day and night, or only by day.
 - (6) Topography of the aerodrome site, its approaches, and surroundings, particularly:

- (i) compliance with the obstacle limitation surfaces;
 - (ii) current and future land use. The orientation and layout should be selected so as to protect as far as possible, the particularly sensitive areas, such as residential, school and hospital zones, from the discomfort caused by aircraft noise. Detailed information on this topic is provided in the ICAO Doc 9184, Airport Planning Manual, Part 2, Land Use and Environmental Control and in ICAO Doc 9829, Guidance on the Balanced Approach to Aircraft Noise Management;
 - (iii) current and future runway lengths to be provided;
 - (iv) construction costs; and
 - (v) possibility of installing suitable non-visual and visual aids for approach-to-land.
- (7) Air traffic in the vicinity of the aerodrome, particularly:
- (i) proximity of other aerodromes or ATS routes;
 - (ii) traffic density; and
 - (iii) air traffic control and missed approach procedures.
- (c) The number of runways to be provided in each direction depends on the number of aircraft movements to be catered for.
- (d) Whatever the factors that determine the runway orientation, the siting, and orientation of runways at an aerodrome should where possible, be such that safety is optimised.
- (e) One important factor is the usability factor, as determined by the wind distribution which is specified hereunder. Another important factor is the alignment of the runway to facilitate the provision of approaches conforming to the approach surface specifications of CS1 ADR-DSN.H.425. In ICAO Annex 14, Attachment A, Section 1, information is given concerning these and other factors. When a new instrument runway is being located, particular attention needs to be given to areas over which aeroplanes should be required to fly when following instrument approach and missed approach procedures so as to ensure that obstacles in these areas or other factors should not restrict the operation of the aeroplanes for which the runway is intended.

GM1 ADR-DSN.B.020 Choice of maximum permissible crosswind components

- (a) Choice of maximum permissible crosswind components.
- (1) In the application of (1)(i) it should be assumed that landing or take-off of aeroplanes is, in normal circumstances, precluded when the crosswind component exceeds:
- (i) 37 km/h (20 kt) in the case of aeroplanes whose reference field length is 1 500 m or over, except that when poor runway braking action owing to an insufficient longitudinal coefficient of friction is experienced with some frequency, a crosswind component not exceeding 24 km/h (13 kt) should be assumed;
 - (ii) 24 km/h (13 kt) in the case of aeroplanes whose reference field length is 1 200 m or up to but not including 1 500 m; and
 - (iii) 19 km/h (10 kt) in the case of aeroplanes whose reference field length is less than 1 200 m.

GM1 ADR-DSN.B.025 Data to be used

The selection of data to be used for the calculation of the usability factor should be based on reliable wind distribution statistics that extend over as long a period as possible, preferably of not less than five years. The observations used should be made at least eight times daily and spaced at equal intervals of time.

GM1 ADR-DSN.B.030 Runway threshold

- (a) Additional distance should be provided to meet the requirements of the runway end safety area as appropriate (this is to be added to the RESA related provisions).
- (b) Where this displacement is due to an unserviceable runway condition, a cleared and graded area of at least 60 m in length should be available between the unserviceable area and the displaced threshold.
- (c) Guidance Material on the survey requirements for aerodromes is provided in the ICAO World Geodetic system – 1984 (WGS-84) Manual, notably in Section 5.3. However, this guidance does not accurately define the survey locations for the runway edge or the runway threshold because, in both cases, the measurement point is not the centre of the relevant paint marking.
- (d) Location of threshold:
 - (1) The threshold is normally located at the extremity of a runway if there are no obstacles penetrating above the approach surface. In some cases, however, due to local conditions it may be desirable to displace the threshold permanently (see below). When studying the location of a threshold, consideration should also be given to the height of the ILS reference datum, and/or MLS approach reference datum, and the determination of the obstacle clearance limits. (Specifications concerning the height of the ILS reference datum and MLS approach reference datum are given in ICAO Annex 10, Volume I.)
 - (2) In determining that no obstacles penetrate above the approach surface, account should be taken of mobile objects (vehicles on roads, trains, etc.) at least within that portion of the approach area within 1 200 m longitudinally from the threshold and of an overall width of not less than 150 m.
- (e) Displaced threshold:
 - (1) If an object extends above the approach surface and the object cannot be removed, consideration should be given to displacing the threshold permanently.
 - (2) To meet the obstacle limitation objectives of Book 1, Chapter H, the threshold should ideally be displaced down the runway for the distance necessary to provide that the approach surface is cleared of obstacles.
 - (3) However, displacement of the threshold from the runway extremity should inevitably cause reduction of the landing distance available, and this may be of greater operational significance than penetration of the approach surface by marked and lighted obstacles. A decision to displace the threshold, and the extent of such displacement, should, therefore, have regard to an optimum balance between the considerations of clear approach surfaces and adequate landing distance. In deciding this question, account should need to be taken of the types of aeroplanes which the runway is intended to serve, the limiting visibility and cloud base conditions under which the runway should be used, the position of the

obstacles in relation to the threshold and extended centre line, and, in the case of a precision approach runway, the significance of the obstacles to the determination of the obstacle clearance limit.

- (4) Notwithstanding the consideration of landing distance available, the selected position for the threshold should not be such that the obstacle-free surface to the threshold is steeper than 3.3 % where the code number is 4 or steeper than 5 % where the code number is 3.
- (5) In the event of a threshold being located according to the criteria for obstacle-free surfaces in the preceding paragraph, the obstacle marking requirements of Chapter 6 should continue to be met in relation to the displaced threshold.
- (6) Depending on the length of the displacement, the RVR at the threshold could differ from that at the beginning of the runway for take-offs. The use of red runway edge lights with photometric intensities lower than the nominal value of 10 000 cd for white lights increases that phenomenon.

GM1 ADR-DSN.B.035 Actual length of the runway and declared distances

- (a) Length of the runway:
 - (1) This specification does not necessarily mean providing for operations by the critical aeroplane at its maximum mass.
 - (2) Both take-off and landing requirements need to be considered when determining the length of runway to be provided and the need for operations to be conducted in both directions of the runway.
 - (3) Local conditions that may need to be considered include elevation, temperature, runway slope, humidity, and the runway surface characteristics.
 - (4) When performance data on aeroplanes for which the runway is intended, are not known, guidance on the determination of the actual length of a primary runway by application of general correction factors is given in the ICAO Doc 9157, Aerodrome Design Manual, Part 1, Runways.
 - (5) Except as provided in GM1 ADR-DSN.B.040, the actual runway length to be provided for a runway should be adequate to meet the operational requirements of the aeroplanes for which the runway is intended, and should be not less than the longest length determined by applying the corrections for local conditions to the operations and performance characteristics of the relevant aeroplanes.

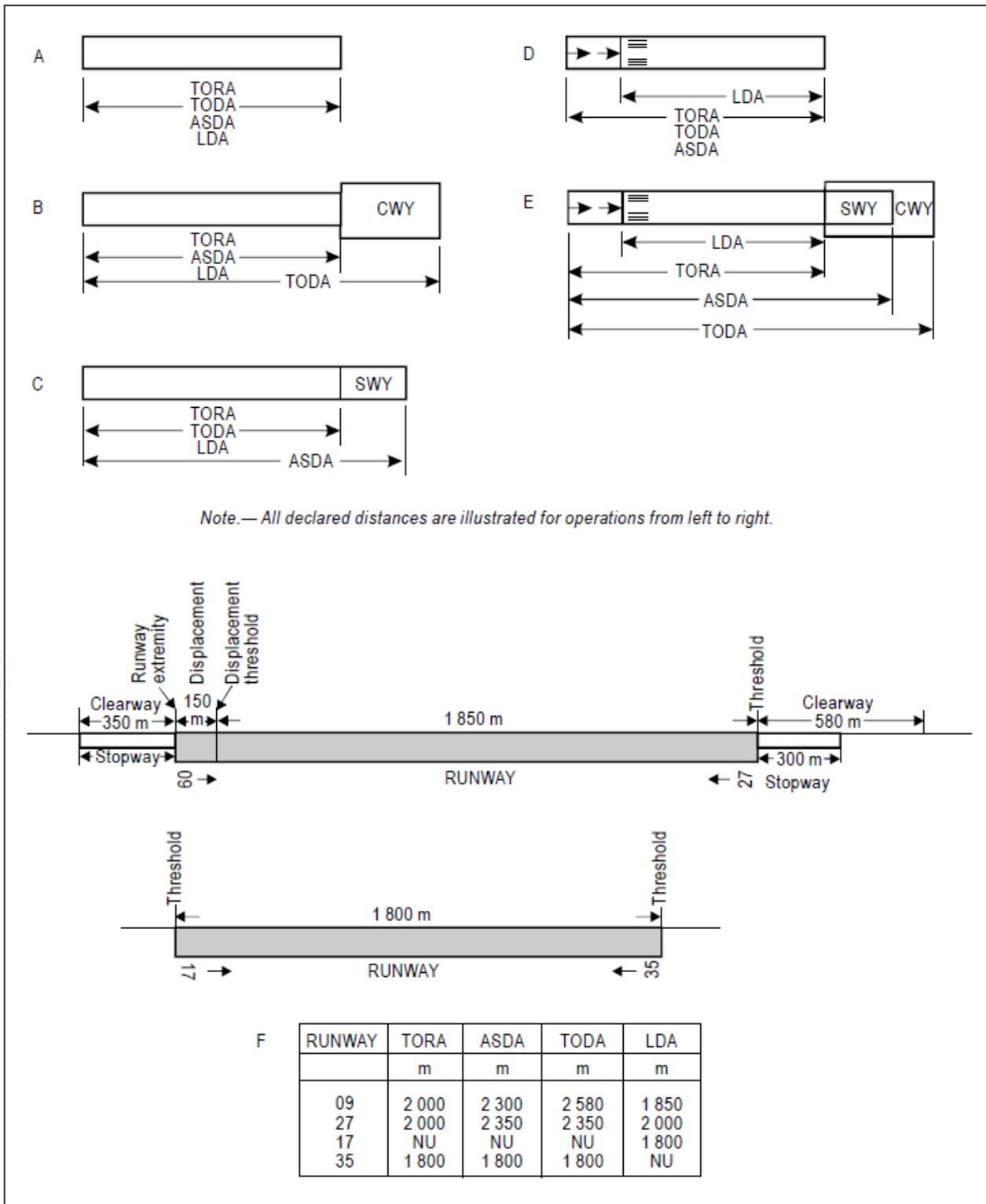


Figure GM-B-1. Illustration of declared distances

GM1 ADR-DSN.B.040 Runways with stopways, or clearways

Where a runway is associated with a stopway or clearway, an actual runway length less than that resulting from application of GM1 ADR-DSN.B.035 as appropriate, may be considered satisfactory but, in such a case, any combination of runway, stopway, and clearway provided should permit compliance with the operational requirements for take-off and landing of the aeroplanes the runway is intended to serve.

GM1 ADR-DSN.B.045 Width of runways

- (a) The combinations of code numbers and letters for which widths are specified have been developed for typical aeroplane characteristics.
- (b) Factors affecting runway width are given in the ICAO Doc 9157, Aerodrome Design Manual, Part 1, Runways.

GM1 ADR-DSN.B.050 Minimum distance between parallel non-instrument runways

- (a) Except that for independent parallel approaches, combinations of minimum distances and associated conditions other than those specified in the PANS-ATM (Doc 4444) may be applied when it is determined that such combinations would not adversely affect the safety of aircraft operations.
- (b) Procedures for wake turbulence categorisation of aircraft and wake turbulence separation minima are contained in the Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM), Doc 4444, Chapter 4, 4.9 and Chapter 5, 5.8, respectively.

GM1 ADR-DSN.B.055 Minimum distance between parallel instrument runways

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GM1 ADR-DSN.B.060 Longitudinal slopes on runways

The slopes on a runway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). The water (or possible fluid contaminant) evacuation is facilitated by an adequate combination between longitudinal and transverse slopes, and may also be assisted by grooving the runway surface. Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft. For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, should be designed so that they should correspond to the characteristics needed for such type of approach.

GM1 ADR-DSN.B.065 Longitudinal slopes changes on runways

- (a) Slope changes are so designed as to reduce dynamic loads on the undercarriage system of the aeroplane. Minimising slope changes is especially important on runways where aircraft move at high speeds.

- (b) For precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, are so designed that they should correspond to the characteristics needed for such type of approach.

GM1 ADR-DSN.B.070 Sight distance

Runway longitudinal slopes and slopes changes are so designed that the pilot in the aircraft has an unobstructed line of sight over all or as much of the runway as possible, thereby enabling him to see aircraft or vehicles on the runway, and to be able to manoeuvre and take avoiding action.

GM1 ADR-DSN.B.075 Distance between slope changes on runways

The following example illustrates how the distance between slope changes is to be determined (see Figure GM-B-2):

D for a runway where the code number is 3 should be at least:

$$15\ 000 (|x - y| + |y - z|) \text{ m}$$

$|x - y|$ being the absolute numerical value of $x - y$

$|y - z|$ being the absolute numerical value of $y - z$

Assuming $x = +0.01$

$$y = -0.005$$

$$z = +0.005$$

then $|x - y| = 0.015$

$$|y - z| = 0.01$$

To comply with the specifications, D should be not less than:

$$15\ 000 (0.015 + 0.01) \text{ m,}$$

that is, $15\ 000 \times 0.025 = 375 \text{ m}$

When a runway is planned that should combine the extreme values for the slopes and changes in slope permitted under Book 1, CS ADR-DSN.B.060 to CS ADR-DSN.B.080, a study should be made to ensure that the resulting surface profile should not hamper the operation of aeroplanes.

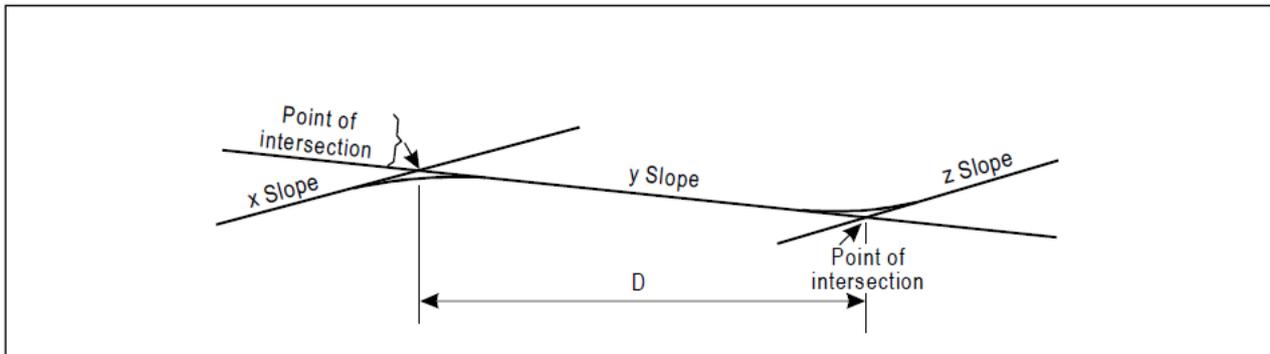


Figure GM-B-2. Profile on centre line of runway

GM1 ADR-DSN.B.080 Transverse slopes on runways

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GM1 ADR-DSN.B.085 Runway strength

- (a) Pavement forming part of the movement area needs to be of sufficient strength to allow aircraft to operate without risk of damage either to the pavement or to the aircraft. Pavements subject to overload conditions should deteriorate at an increasing rate depending upon the degree of overload. To control this, it is necessary to classify both pavement and aircraft under a system whereby the load-bearing capacity of the pavement and the loads imposed by the aircraft can be compared. The method used is the Aircraft Classification Number - Pavement Classification Number (ACN/PCN) method. The ACN/PCN method has been developed by ICAO as an international method of reporting the bearing strength of pavements.
- (b) All pavements forming part of the movement area should be of adequate bearing strength for the types of aircraft expected to use the aerodrome. All pavements should be regularly examined by a suitably qualified person. Any pavements which have been subjected to overload conditions should be closely monitored by suitably qualified staff for a period of several weeks or until it is clear that no rapid deterioration of the pavement has been triggered.
- (c) Reporting pavement bearing strength:
 - (1) The ACN/PCN method of classifying the bearing strength of pavements considers the load imposed on the pavement by the aircraft. In this respect, the load rating of the aircraft is most significantly affected by the subgrade support strength of the pavement. ACNs are, therefore, numbers giving a relative load rating of the aircraft on pavements for certain specified subgrade strengths. ACN values for most aeroplanes have been calculated by ICAO and are published in Aeronautical Information Publications. The PCN is also a number which represents the load-bearing strength of the pavement in terms of the highest ACN which can be accepted on the pavement for unrestricted use.
 - (2) A PCN can also be identified and reported without a technical evaluation of the pavement by means of an assessment of the results of aircraft using the pavement. Providing the type and subgrade support strength of the pavement are

known, the ACN of the most critical aircraft successfully using the pavement can be reported as the PCN.

- (3) A PCN is reported in a five-part format. Apart from the numerical value, notification is also required of the pavement type (rigid or flexible) and the subgrade support category. Additionally, provision is made for the aerodrome operator to limit the maximum allowable tire pressure. A final indication is whether the assessment has been made by a technical evaluation or from past experience of aircraft using the pavement.
- (d) Overload operations
- (1) Overloading of pavements can result either from loads too large, or from a substantially increased application rate, or both. Loads larger than the defined (design or evaluation) load shorten the design life, whilst smaller loads extend it. With the exception of massive overloading, pavements in their structural behaviour are not subject to a particular limiting load above which they suddenly or catastrophically fail. Behaviour is such that a pavement can sustain a definable load for an expected number of repetitions during its design life. As a result, occasional minor overloading is acceptable, when expedient, with only limited loss in pavement life expectancy and relatively small acceleration of pavement deterioration. For those operations in which magnitude of overload and/or the frequency of use do not justify a detailed analysis, the following criteria are suggested:
 - (i) for flexible pavements, occasional movements by aircraft with ACN not exceeding 10 % above the reported PCN should not adversely affect the pavement;
 - (ii) for rigid or composite pavements in which a rigid pavement layer provides a primary element of the structure, occasional movements by aircraft with ACN not exceeding 5 % above the reported PCN should not adversely affect the pavement, and
 - (iii) if the pavement structure is unknown, the 5 % limitation should apply; and
 - (iv) the annual number of overload movements should not exceed approximately 5 % of the total annual aircraft movements.
- (e) Such overload movements should not normally be permitted on pavements exhibiting signs of distress or failure. Furthermore, overloading should be avoided during any periods of thaw following frost penetration, or when the strength of the pavement or its subgrade could be weakened by water. Where overload operations are conducted, the relevant pavement condition should be reviewed regularly. Also the criteria for overload operations should be reviewed periodically since excessive repetition of overloads can cause severe shortening of pavement life or require major rehabilitation of pavement. Further information is contained in the ICAO Doc 9157, Aerodrome Design Manual, Part 3, Pavements.

GM1 ADR-DSN.B.090 Surface of runways

- (a) In adopting tolerances for runway surface irregularities, a good engineering practice is that: except across the crown of a camber or across drainage channels, the finished surface of the wearing course is to be of such regularity that when tested with a 3 m straight-edge placed anywhere in any direction on the surface, there is no deviation greater than 3 mm between the bottom of the straight-edge and the surface of the pavement anywhere along the straight-edge.

- (b) Caution should also be exercised when inserting runway lights or drainage grilles in runway surfaces to ensure that adequate smoothness of the surface is maintained.

SECTION 1 – RUNWAY TURN PADS

GM1 ADR-DSN.B.095 Runway turn pads

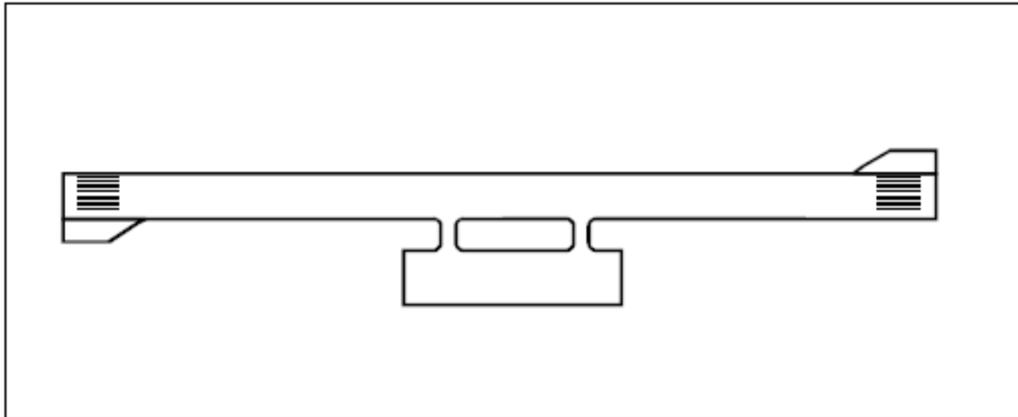


Figure GM B-3. Typical turn pad layout

GM1 ADR-DSN.B.100 Slopes on runway turn pads

Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft.

GM1 ADR-DSN.B.105 Strength of runway turn pads

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GM1 ADR-DSN.B.110 Surface of runway turn pads

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GM1 ADR-DSN.B.115 Width of shoulders for runway turn pads

As a minimum, the width of the shoulders would need to cover the outer engine of the most demanding aeroplane and thus may be wider than the associated runway shoulders.

GM1 ADR-DSN.B.120 Strength of shoulders for runway turn pads

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SECTION 2 — RUNWAY SHOULDERS**GM1 ADR-DSN.B.125 Runway shoulders**

- (a) Runway shoulders should be so prepared as to be capable of supporting the aeroplanes using the runway without causing structural damage to those aeroplanes. They should also be capable of supporting vehicles such as firefighting appliances. In some cases, whilst the bearing strength of the natural ground may be sufficient, special preparation may be necessary to avoid erosion and the possible ingestion of debris by engines.
- (b) Runway shoulders are required because strong crosswinds may result in significant deviation from the runway centre line. As a result, with some large aircraft the wing-mounted engines may overhang the runway edge and there is then a risk of jet blast eroding the surface adjacent to the runway. This can cause dust and the possible ingestion of debris by the engines.
- (c) However, for runways where the code letter is D, there may be circumstances where the shoulder need not be paved. Where the runway is not used by 4-engined aircraft, it may be possible to contain the risk from erosion or the ingestion of debris in the absence of paved shoulders. In such cases:
 - (1) The ground should be prepared so that there is full grass coverage with no loose gravel or other material. This may include additional materials if the bearing strength and surface of the ground are not sufficient.
 - (2) A programme of inspections of the shoulders and runway may be implemented to confirm its continuing serviceability, and ensure that there is no deterioration that could create a risk of FOD, or otherwise hazard aircraft operations.
 - (3) A programme of sweeping may be required before and after movements, should debris be drawn onto the runway surface.
 - (4) If movements of 4-engined aircraft with a code letter D or larger take place, the need for full paved width shoulders should be assessed by local hazard analysis.

There may be circumstances where reduced shoulder widths may be possible if the width of the runway and the configuration of the aircraft so permit, subject to local safety assessment. Further guidance is given in ICAO Doc 9157, Aerodrome Design Manual, Part 1, Runways).

- (d) Guidance on characteristics and treatment of runway shoulders:
 - (1) The shoulder of a runway or stopway should be prepared or constructed so as to minimise any hazard to an aeroplane running off the runway or stopway. Some guidance is given in the following paragraphs on certain special problems which may arise, and on the further question of measures to avoid the ingestion of loose stones or other objects by turbine engines.
 - (2) In some cases, the bearing strength of the natural ground in the strip may be sufficient, without special preparation, to meet the requirements for shoulders. Where special preparation is necessary, the method used should depend on local soil conditions and the mass of the aeroplanes the runway is intended to serve. Soil tests should help in determining the best method of improvement (e.g. drainage, stabilisation, surfacing and light paving).
- (e) Attention should also be paid when designing shoulders to prevent the ingestion of stones or other objects by turbine engines. Similar considerations apply here to those which are discussed for the margins of taxiways in the ICAO Doc 9157, Aerodrome

Design Manual, Part 2, Taxiways, Aprons and Holding Bays), both as to the special measures which may be necessary and as to the distance over which such special measures if required, should be taken.

- (f) Where shoulders have been treated specially, either to provide the required bearing strength or to prevent the presence of stones or debris, difficulties may arise because of a lack of visual contrast between the runway surface and that of the adjacent strip. This difficulty can be overcome either by providing a good visual contrast in the surfacing of the runway or strip, or by providing a runway side stripe marking.
- (g) Possible additional mitigation measures could be to provide the runway with inset runway edge lights (in lieu of elevated lights, to protect aeroplane from ingestion) and additional runway centre line guidance.

GM1 ADR-DSN.B.130 Slopes on runway shoulders

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GM1 ADR-DSN.B.135 Width of runway shoulders

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GM1 ADR-DSN.B.140 Strength of runway shoulders

Guidance on strength of runway shoulders is given in the ICAO, Doc 9157, Aerodrome Design Manual Part 1, Runways).

GM1 ADR-DSN.B.145 Surface of runway shoulders

Where a runway shoulder is not paved, additional surface treatment or inspections may be necessary, especially for runways that accept operations by 4-engined aircraft with a code letter D or larger.

SECTION 3 – RUNWAY STRIP**GM1 ADR-DSN.B.150 Runway strip to be provided**

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GM1 ADR-DSN.B.155 Length of runway strip

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GM1 ADR-DSN.B.160 Width of runway strip

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GM1 ADR-DSN.B.185 Transverse slopes on runway strips

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GM1 ADR-DSN.B.190 Strength of runway strips

Since the graded portion of a strip is provided to minimise the hazard to an aircraft running off the runway, it should be graded in such a manner as to prevent the collapse of the nose landing gear of the aircraft. The surface should be prepared in such a manner as to provide drag to an aircraft and below the surface, it should have sufficient bearing strength to avoid damage to the aircraft. To meet these divergent needs, the following guidelines are provided for preparing the strip. Aircraft manufacturers consider that a depth of 15 cm is the maximum depth to which the nose gear may sink without collapsing. Therefore, it is recommended that the soil at a depth of 15 cm below the finished strip surface be prepared to have a bearing strength of California Bearing Ratio (CBR) value of 15 to 20. The intention of this underlying prepared surface is to prevent the nose gear from sinking more than 15 cm. The top 15 cm may be of lesser strength which would facilitate deceleration of aircraft.

SECTION 4 — CLEARWAYS, STOPWAYS AND RADIO ALTIMETER OPERATING AREA**GM1 ADR-DSN.B.195 Clearways**

- (a) Because of transverse or longitudinal slopes on a runway, shoulder, or strip, in certain cases, the lower limit of the clearway plane specified above may be below the corresponding elevation of the runway, shoulder, or strip. It is not intended that these surfaces be graded to conform with the lower limit of the clearway plane, nor is it intended that terrain or objects which are above the clearway plane beyond the end of the strip but below the level of the strip be removed unless it is considered that they may endanger aeroplanes.
- (b) Abrupt upward changes in slope should be avoided when the slope on the ground in a clearway is relatively small or when the mean slope is upward. In such situations, in that portion of the clearway within a distance of 22.5 m or half the runway width whichever is greater, on each side of the extended centre line, the slopes, slope changes, and the transition from runway to clearway should generally conform with those of the runway with which the clearway is associated.
- (c) The decision to provide a stopway and/or a clearway as an alternative to an increased length of runway should depend on the physical characteristics of the area beyond the runway end, and on the operating performance requirements of the prospective aeroplanes. The runway, stopway, and clearway lengths to be provided are determined by the aeroplane take-off performance but a check should also be made of the landing distance required by the aeroplanes using the runway to ensure that adequate runway length is provided for landing. The length of a clearway, however, cannot exceed half the length of take-off run available.
- (d) The aeroplane performance operating limitations require a length which is enough to ensure that the aeroplane can, after starting a take-off, either be brought safely to a stop or complete the take-off safely. For the purpose of discussion, it is supposed that the runway, stopway and clearway lengths provided at the aerodrome are only just adequate for the aeroplane requiring the longest take-off and accelerate-stop distances, taking into account its take-off mass, runway characteristics, and ambient atmospheric conditions. Under these circumstances there is, for each take-off, a speed, called the decision speed;

below this speed, the take-off should be abandoned if an engine fails while above it the take-off should be completed. A very long take-off run and take-off distance would be required to complete a take-off when an engine fails before the decision speed is reached because of the insufficient speed and the reduced power available. There would be no difficulty in stopping in the remaining accelerate-stop distance available provided action is taken immediately. In these circumstances the correct course of action would be to abandon the take-off.

- (e) On the other hand if an engine fails after the decision speed is reached, the aeroplane should have sufficient speed and power available to complete the take-off safely in the remaining take-off distance available. However, because of the high speed, there would be difficulty in stopping the aeroplane in the remaining accelerate-stop distance available.
- (f) The decision speed is not a fixed speed for any aeroplane but can be selected by the pilot within limits to suit the accelerate-stop and take-off distance available, aeroplane take-off mass, runway characteristics, and ambient atmospheric conditions at the aerodrome. Normally, a higher decision speed is selected as the accelerate-stop distance available increases.
- (g) A variety of combinations of accelerate-stop distances required and take-off distances required can be obtained to accommodate a particular aeroplane, taking into account the aeroplane take-off mass, runway characteristics, and ambient atmospheric conditions. Each combination requires its particular length of take-off run.
- (h) The most familiar case is where the decision speed is such that the take-off distance required is equal to the accelerate-stop distance required; this value is known as the balanced field length. Where stopway and clearway are not provided, these distances are both equal to the runway length. However, if landing distance is for the moment ignored, runway is not essential for the whole of the balanced field length, as the take-off run required is, of course, less than the balanced field length. The balanced field length can, therefore, be provided by a runway supplemented by an equal length of clearway and stopway, instead of wholly as a runway. If the runway is used for take-off in both directions, an equal length of clearway and stopway has to be provided at each runway end. The saving in runway length is, therefore, bought at the cost of a greater overall length.
- (i) In case economic considerations preclude the provision of stopway and, as a result, only runway and clearway are to be provided, the runway length (neglecting landing requirements) should be equal to the accelerate-stop distance required or the take-off run required whichever is greater. The take-off distance available should be the length of the runway plus the length of clearway.
- (j) The minimum runway length and the maximum stopway or clearway length to be provided may be determined as follows, from the data in the aeroplane flight manual for the aeroplane considered to be critical from the viewpoint of runway length requirements:
 - (1) If a stopway is economically possible, the lengths to be provided are those for the balanced field length. The runway length is the take-off run required or the landing distance required whichever is greater. If the accelerate-stop distance required is greater than the runway length so determined, the excess may be provided as stopway, usually at each end of the runway. In addition, a clearway of the same length as the stopway should also be provided;
 - (2) If a stopway is not to be provided, the runway length is the landing distance required, or if it is greater, the accelerate-stop distance required, which

corresponds to the lowest practical value of the decision speed. The excess of the take-off distance required over the runway length may be provided as clearway, usually at each end of the runway.

- (k) In addition to the above consideration, the concept of clearways in certain circumstances can be applied to a situation where the take-off distance required for all engines operating exceeds that required for the engine failure case.

GM1 ADR-DSN.B.200 Stopways

- (a) The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding:
- (1) 0.3 % per 30 m (minimum radius of curvature of 10 000 m) where the code number is 3 or 4; and
 - (2) 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.
- (b) The friction characteristics of an unpaved stopway should not be substantially less than that of the runway with which the stopway is associated.
- (c) The economy of a stopway can be entirely lost if, after each usage, it should be regraded and compacted. Therefore, it should be designed to withstand at least a certain number of loadings of the aeroplane which the stopway is intended to serve without inducing structural damage to the aeroplane. Notwithstanding that a stopway may have a paved surface, it is not intended that PCN Figures need to be developed for a stopway. Further guidance may be found in ICAO Doc 4444, PANS-OPS.

GM1 ADR-DSN.B.205 Radio altimeter operating area

- (a) In order to accommodate aeroplanes making auto-coupled approaches and automatic landings (irrespective of weather conditions), it is desirable that slope changes be avoided or kept to a minimum, on a rectangular area at least 300 m long before the threshold of a precision approach runway. The area should be symmetrical about the extended centre line, 120 m wide. When special circumstances so warrant, the width may be reduced to no less than 60 m if an aeronautical study indicates that such reduction would not affect the safety of operations of aircraft. This is desirable because these aeroplanes are equipped with a radio altimeter for final height and flare guidance, and when the aeroplane is above the terrain immediately prior to the threshold, the radio altimeter should begin to provide information to the automatic pilot for auto-flare. Where slope changes cannot be avoided, the rate of change between two consecutive slopes should not exceed 2 % per 30 m.
- (b) The inclusion of detailed specifications for radio altimeter operating area in this GM is not intended to imply that a radio altimeter operating area has to be provided.
- (c) With a radio altimeter operating area in the pre-threshold area of a precision approach runway the margin to calculate the decision altitude should be smaller and the usability of the adjacent runway may be enhanced.
- (d) Further guidance on radio altimeter operating area is given in Manual of All-Weather Operations, (ICAO, Doc 9365, Section 5.2). Guidance on the use of radio altimeter is given in the ICAO, PANS-OPS, Volume II, Part II, Section 1.

CHAPTER C – RUNWAY END SAFETY AREA**GM1 ADR-DSN.C.210 Runway end safety areas**

(a) General

- (1) A runway end safety area should provide an area long and wide enough, and suitable to contain overruns and undershoots resulting from a reasonably probable combination of adverse operational factors. On a precision approach runway, the ILS localiser is normally the first upstanding obstacle, and the runway end safety area should extend up to this facility. In other circumstances and on a non-precision approach runway, the first upstanding obstacle may be a road, a railroad, or other constructed or natural feature. In such circumstances, the runway end safety area should extend as far as the obstacle.
- (2) Whatever length of RESA is provided, it is important to ensure that likelihood of, and potential impacts arising from an overrun are minimised as far as reasonably practicable.
- (3) It is recognised that achieving the recommended distance could present challenges. Therefore, the aim of this guidance is to identify the types of aerodrome activities that can be undertaken to reduce the likelihood and consequences of an overrun occurring, and to decide on appropriate actions.
- (4) The overrun is a complex risk to assess because there are a number of variables, such as prevailing weather, type of aeroplane, the landing aids available, runway characteristics and available distances, the surrounding environment, and human factors. Each of these can have a significant contribution to the overall hazard; furthermore, the nature of the hazard and level of risk should be different for each aerodrome and even for each runway direction at any one aerodrome. The aerodrome may address some, and these are included below. Additionally, aircraft operating procedures may impact but the aerodrome may have little ability to influence these. This should not prevent aerodromes from working with aircraft operators so that the operations are conducted so as to minimise the likelihood of an overrun occurring.
- (5) Noting the requirement for a runway end safety area (RESA) consideration should be given to providing an area long enough to contain overruns and undershoots resulting from a reasonably probable combination of adverse operational factors. Therefore, aerodromes should try to maximise the length of RESA available on all applicable runways. When considering the RESA distance required for individual circumstances, aerodromes operators should take into account factors, such as:
 - (i) the runway length and slope, in particular the general operating lengths required for take-off and landing versus the runway distances available, including the excess of available length over that required;
 - (ii) current RESA provision (length & width – how much the RESA complies with the recommended distance) and options to increase or improve this;
 - (iii) the nature and location of any hazard beyond the runway end, including the topography and obstruction environment in and beyond the RESA and outside the runway strip;

- (iv) the type of aeroplane and level of traffic at the aerodrome, and actual or proposed changes to either;
 - (v) aircraft performance limitations arising from runway and RESA length – high performance aircraft, operating at high loads and speeds have greater length requirements than smaller, low-performance aircraft, the relationship between required balanced field length and available distances;
 - (vi) navigation aids available (PBN, instrument or visual - if an ILS is only available on one runway direction, a downwind approach and landing may be necessary in poor weather) and the availability of vertical guidance ;
 - (vii) friction and drainage characteristics of the runway, which impact on runway susceptibility to surface contamination and aeroplane braking action;
 - (viii) traffic density, which may lead to increased pressure to vacate so increased speed;
 - (ix) aerodrome weather patterns, including wind shear;
 - (x) aerodrome overrun history; and
 - (xi) overrun/undershoot causal factors.
- (b) Assessment of runway end safety areas
- (1) The RESA assessment should help the aerodrome operator identify the hazards and appropriate actions to reduce the risk. A range of measures may be available, singly or in combination, to reduce the risks of an overrun occurring or becoming an accident. Measures aimed at reducing the likelihood of an overrun/undershoot include:
 - (i) improving runway surfaces and friction measurement, particularly when the runway is contaminated — know your runways and their condition and characteristics in precipitation;
 - (ii) ensuring that accurate and up-to-date information on weather, the runway state and characteristics, is notified and passed to flight crews in a timely way, particularly when flight crews need to make operational adjustments;
 - (iii) improving an aerodrome management’s knowledge, recording, prediction and dissemination of wind data, including wind shear, and any other relevant weather information, particularly when it is a significant feature of an aerodrome’s weather pattern;
 - (iv) upgrading visual and instrument landing aids to improve the accuracy of aeroplane delivery at the correct landing position on runways (including the provision of Instrument Landing PBN approach systems, location of aiming point and harmonisation with PAPIs);
 - (v) formulating, in consultation with aeroplane operators, adverse weather and any other relevant aerodrome operating procedures or restrictions, and promulgating such information appropriately; and
 - (vi) working with aircraft operators to optimise the operation.
 - (2) Combined with this, measures may be considered that would reduce the severity of the consequences should an event occur. Wherever practicable, aerodrome operators should seek to optimise the RESA. This may be achieved through a combination of:
 - (i) relocation, shifting or realignment of the runway — it may be possible to

construct additional pavement at the start of take-off end to make more pavement available to retain the declared distances. The start and end of declared distances can be moved towards the downwind (start of take-off) end, thereby retaining the declared distance and creating space for a longer RESA, as shown in GM1 ADR-DSN.B.035;

- (ii) in the case where undershoot RESA is limited and the runway has a displaced landing threshold, examine whether the threshold can be moved (downwind) to increase the RESA and/or runway length;
 - (iii) reducing declared runway distances in order to provide the necessary RESA. Reducing declared distances may be a viable option where the existing runway length exceeds that which is required for the existing or projected design aircraft — if the take-off distance required for the critical aircraft operating at the aerodrome is less than the take-off distance available, there may be opportunity to reduce the TODR;
 - (iv) increasing the length of a RESA, and/or minimising the obstruction environment in the area beyond the RESA. Means to increase the RESA provision include land acquisition, improvements to the grading, realigning fences or roads to provide additional area;
 - (v) installing suitably positioned and designed arresting systems, to supplement or as an alternative to a RESA where an equivalent level of safety is demonstrated;
 - (vi) improving the slopes in the RESA to minimise or remove downward slopes; and
 - (vii) providing paved RESA with known friction characteristics.
- (3) A runway meant for take-off and landing in both directions should have 2 RESAs extending for the required distance beyond the end of the strip extending from the runway end. Depending of the position of the threshold on a runway, the RESA related to the reverse runway should protect aircraft undershooting the threshold. Assessments of overruns and undershoots have shown that the likelihood of an undershoot is approximately four times less than for an overrun. Additionally, the undershoot rate shows that the likelihood of an event is further reduced by the availability of precision approach aids, especially those with vertical guidance. Therefore, on a precision approach runway consideration may include whether to reduce the minimum length of RESA towards the length of the runway strip before the runway.
- (4) It is recognised that improving RESAs is often difficult. However, it is important to note that incremental gains should be obtained wherever possible, as any gain is valuable. Therefore, whenever a runway project involves construction, consideration should also be given to improving the RESA.
- (5) The above lists are not in any particular order, are not exhaustive, and should complement action by aeroplane operators, designers and aviation regulators.
- (6) RESA provision should be considered by the Local Runway Safety Team.
- (c) Arresting systems on runway end safety areas
- (1) In recent years, recognising the difficulties associated with achieving a standard runway end safety area (RESA) at all aerodromes, research programmes have been undertaken on the use of various materials for arresting systems. Furthermore, research programmes have been undertaken to evaluate and develop arrestor

systems using engineered materials (EMAS). This research was driven by the recognition that many runways where natural obstacles, local development, and/or environmental constraints inhibit the provision of RESA (as required by changes to ICAO SARPS in 1999) lead to limited dimension RESAs. Additionally, there had been accidents at some aerodromes where the ability to stop an overrunning aeroplane within the RESA would have prevented major damage to aeroplane and/or injuries to passengers.

- (2) The research programmes, as well as evaluation of actual aeroplane overruns into an EMAS installation, have demonstrated that EMAS systems are effective in arresting aeroplane overruns.
- (3) EMAS or other arresting system designs should be supported by a validated design method that can predict the performance of the system. The design method should be derived from field or laboratory tests. Testing may be based either on passage of an actual aircraft or an equivalent single wheel load through a test bed. The design should consider multiple aircraft parameters, including but not limited to allowable aircraft gear loads, gear configuration, tire contact pressure, aircraft centre of gravity, and aircraft speed. The model should calculate imposed aircraft gear loads, g-forces on aircraft occupants, deceleration rates, and stopping distances within the arresting system. Any rebound of the crushed material that may lessen its effectiveness, should also be considered.
- (4) Demonstrated performance of an arresting system can be achieved by a validated design method which can predict the performance of the system. The design and performance should be based on the type of aircraft anticipated to use the associated runway that imposes the greatest demand upon the arresting system. The system design should be based on a critical (or design) aircraft which is defined as aircraft using the associated runway that imposes the greatest demand upon the arresting system. This is usually but not always, the heaviest/largest aircraft that regularly uses the runway. Arresting system performance is dependent not only on aircraft weight but landing gear configuration and tire pressure. All configurations should be considered in optimising the arresting system design. The aerodrome operator and arresting system manufacturer should consult regarding the selection of the design aircraft that should optimise the arresting system for a particular aerodrome.
- (5) EASA considers that the FAA performance specifications and requirements which have been accepted by the ICAO Aerodromes Panel, provide suitable information for aerodromes considering the installation of EMAS. Therefore, attention is drawn to the documents listed below which give guidance on the requirements and evaluation process used by the FAA:
 - (i) FAA Advisory Circular 150/5300-13 — 'Airport Design';
 - (ii) FAA Advisory Circular 150/5220-22A — 'Engineered Materials Arresting Systems (EMAS) for Aeroplane Overruns';
 - (iii) FAA Order 5200.8 — 'Runway Safety Area Program';
 - (iv) FAA Order 5200.9 — 'EMAS Financial Feasibility and Equivalency'.
- (6) The presence of an arresting system should be published in the AIP entry and information/instructions promulgated to local runway safety teams and others to promote awareness in the pilot community.
- (7) Additional information is given in the ICAO Doc 9157, Aerodrome Design Manual, Part 1, Runways.

GM1 ADR-DSN.C.215 Dimensions of runway end safety areas

It is accepted that many aerodromes were constructed before requirements for RESAs were introduced. Where the CS cannot be achieved, the aerodrome should undertake a safety assessment to confirm that an acceptable level of safety is achieved.

GM1 ADR-DSN.C.220 Objects on runway end safety areas

Information regarding siting of equipment and installations on operational areas, including RESA, is detailed in CS ADR-DSN.T.915.

GM1 ADR-DSN.C.225 Clearing and grading of runway end safety areas

- (a) The surface of the runway end safety area should be prepared but does not need to be prepared to the same quality as the runway strip.
- (b) Guidance on Clearing and grading of runway end safety areas is given in the ICAO Doc 9157, Aerodrome Design Manual, Part 1, Runways).

GM1 ADR-DSN.C.230 Slopes on runway end safety areas

Where clearway is provided, the slope on the RESA should be amended accordingly.

GM1 ADR-DSN.C.235 Strength of runway end safety areas

- (a) A runway end safety area should be so prepared or constructed as to reduce the risk of damage to an aeroplane undershooting or overrunning the runway, enhance aeroplane deceleration, and facilitate the movement of rescue and firefighting vehicles.
- (b) Guidance on the strength of a runway end safety area is given in the ICAO Doc 9157, Aerodrome Design Manual, Part 1, Runways).

CHAPTER D — TAXIWAYS

GM1 ADR-DSN.D.240 Taxiways general

- (a) Taxiways should be provided to permit the safe and expeditious surface movement of aircraft. Sufficient entrance and exit taxiways for a runway should be provided to expedite the movement of aeroplanes to and from the runway and provision of rapid exit taxiways considered when traffic volumes are high.
- (b) Guidance on layout of taxiways is given in the ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays).

GM1 ADR-DSN.D.245 Width of taxiways

The width of the taxiway should be measured at the edge of the paved surface, or where the taxiway edge is marked, at the outside edge of the taxiway edge marking.

GM1 ADR-DSN.D.250 Taxiways curves

- (a) The location of taxiway centre line markings and lights is specified in CS ADR-DSN.L.555 and CS ADR-DSN.M.710.
- (b) Compound curves may reduce or eliminate the need for extra taxiway width.
- (c) An example of widening taxiways to achieve the wheel clearance specified is illustrated in Figure GM-D-1. Guidance on the values of suitable dimensions is given in the ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays).

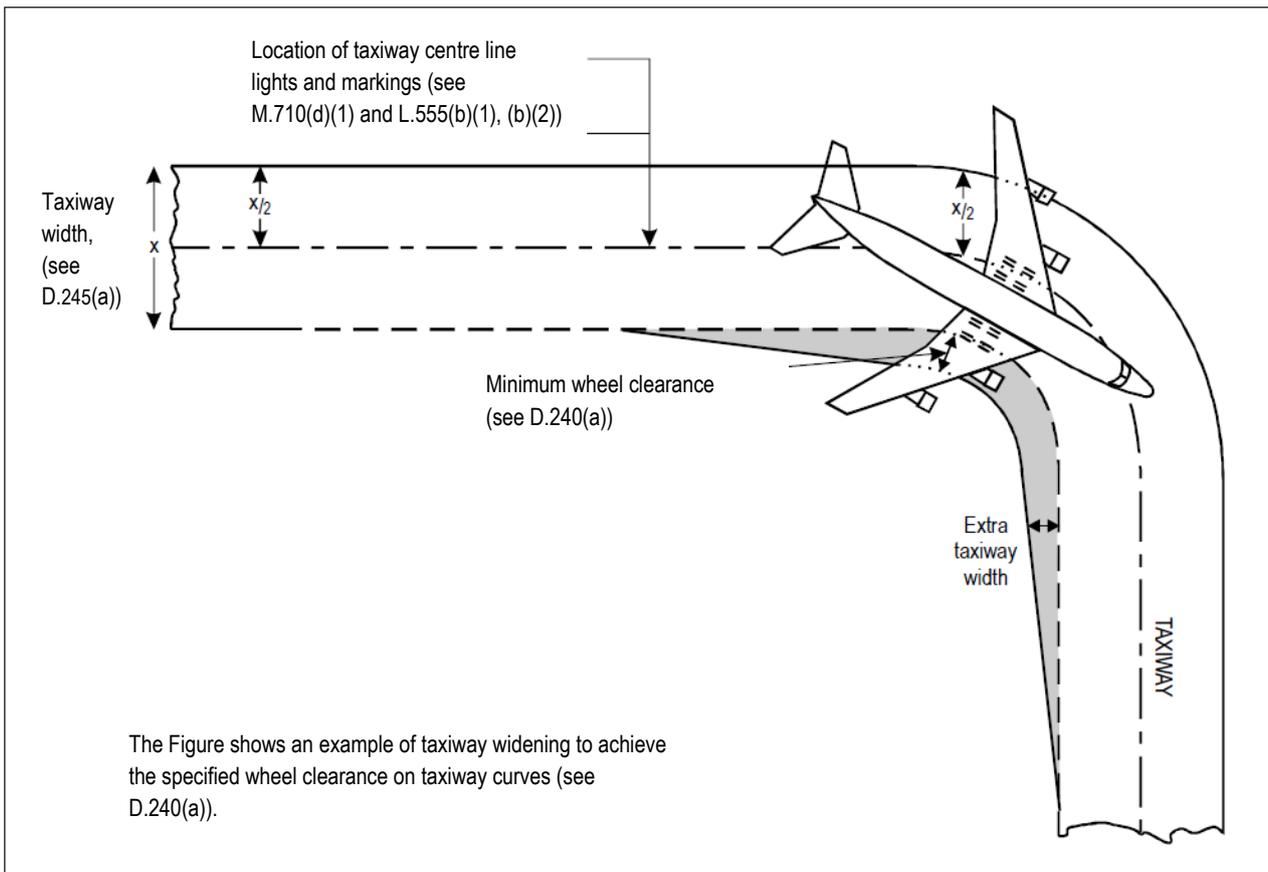


Figure GM-D-1 Taxiway curve

GM1 ADR-DSN.D.255 Junction and intersection of taxiways

Consideration should be given to the aeroplane datum length when designing fillets. Guidance on the design of fillets and the definition of the term aeroplane datum length are given in the ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays).

GM1 ADR-DSN.D.260 Taxiway minimum separation distance

- Guidance on factors which may be considered in the aeronautical study, is given in the ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays).
- ILS and MLS installations may also influence the location of taxiways due to interferences to ILS and MLS signals by a taxiing or stopped aircraft. Information on critical and sensitive areas surrounding ILS and MLS installations is contained in ICAO, Annex 10, Volume I, Attachments C and G (respectively).
- The separation distances of Book 1, Table D-1, column 10, do not necessarily provide the capability of making a normal turn from one taxiway to another parallel taxiway. Guidance for this condition is given in the ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays).
- The separation distance between the centre line of an aircraft stand taxilane and an object shown in Book 1, Table D-1, column 12, may need to be increased when jet exhaust wake velocity may cause hazardous conditions for ground servicing.

- (e) It may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

GM1 ADR-DSN.D.265 Longitudinal slopes on taxiways

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GM1 ADR-DSN.D.270 Longitudinal slope changes on taxiways

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GM1 ADR-DSN.D.275 Sight distance of taxiways

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GM1 ADR-DSN.D.280 Transverse slopes on taxiways

The slopes on a taxiway are intended to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Slopes should be so designed as to minimise impact on aircraft and so not to hamper the operation of aircraft.

GM1 ADR-DSN.D.285 Strength of taxiways

Information regarding pavement bearing strength, including the ACN/PCN classification system may be found in GM-ADR-DSN.B.085.

Due consideration being given to the fact that a taxiway should be subjected to a greater density of traffic and as a result of slow moving and stationary aeroplanes, to higher stresses than the runway it serves.

GM1 ADR-DSN.D.290 Surface of taxiways

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GM1 ADR-DSN.D.295 Rapid exit taxiways

- (a) The following guidance applies particularly to rapid exit taxiways. See Book 1, Figure D-1. The general requirements for taxiways in Book 1 are also applicable to rapid exit taxiways. Guidance on the provision, location and design of rapid exit taxiways is included in the ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays).
- (b) The locations of rapid exit taxiways along a runway are based on several criteria described in the ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays), in addition to different speed criteria.

GM1 ADR-DSN.D.300 Taxiways on bridges

If aeroplane engines overhang the bridge structure, protection of adjacent areas below the bridge from engine blast may be required.

GM1 ADR-DSN.D.305 Taxiway shoulders

Guidance on characteristics of taxiway shoulders and on shoulder treatment is given in the ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays).

GM1 ADR-DSN.D.310 Taxiway Strip

A taxiway strip should be so prepared or constructed as to minimise hazards arising from differences in load bearing capacity to aeroplanes which the taxiway is intended to serve in the event of an aeroplane accidentally running off the taxiway.

Guidance on characteristics of taxiway strips is given in the ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays).

GM1 ADR-DSN.D.315 Width of taxiway strips

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GM1 ADR-DSN.D.320 Objects on taxiway strips

Consideration should be given to the location and design of drains on a taxiway strip to prevent damage to an aeroplane accidentally running off a taxiway. Suitably designed drain covers may be required.

GM1 ADR-DSN.D.325 Grading of taxiway strips

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GM1 ADR-DSN.D.330 Slopes on taxiway strips

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GM1 ADR-DSN.D.335 Holding bays, runway-holding positions, intermediate holding positions, and road-holding positions

- (a) At low levels of aerodrome activity (less than approximately 50 000 annual operations), there is normally little need to make deviations in the departure sequence. However, for higher activity levels, aerodromes with single taxiways and no holding bays or other bypasses provide aerodrome control units with no opportunity to change the sequence of departures once the aircraft have left the apron. In particular, at aerodromes with large apron areas, it is often difficult to arrange for aircraft to leave the apron in such a way that they should arrive at the end of the runway in the sequence required by air traffic services units.
- (b) The provision of an adequate number of holding bay spaces or other bypasses, based upon an analysis of the current and near-term hourly aircraft departure demand, should allow a large degree of flexibility in generating the departure sequence.

- (c) The space required for a holding bay depends on the number of aircraft positions to be provided, the size of the aircraft to be accommodated, and the frequency of their utilisation. The dimensions should allow for sufficient space between aircraft to enable them to manoeuvre independently.
- (d) Emergency access roads are not intended for use for the functions of aerodrome service roads. Therefore, it is possible to provide different access control which should be clearly visible for all service ground traffic. Road holding position markings, lights, or runway guard lights are not necessary if the access to an emergency access road is ensured for RFF only.
- (e) Further guidance is given in ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays) and Procedures for Air Navigation Services — Air Traffic Management (ICAO, Doc 4444).

GM1 ADR-DSN.D.340 Location of holding bays, runway-holding positions, intermediate holding positions, and road-holding positions

- (a) Care should be taken so that propeller wash and jet blast from holding aircraft do not interfere with aircraft operations, cause damage to vehicles, or injure people.
- (b) Generally, when used to allow flexible departure sequencing, the most advantageous location for a holding bay is adjacent to the taxiway serving the runway end. Other locations along the taxiway are satisfactory for aircraft performing pre-flight checks or engine run-ups, or as a holding point for aircraft awaiting departure clearance.
- (c) An aircraft taxiing could endanger aircraft operations when the aircraft is too close to the runway during take-off and landings. It is so advised to check if the aircraft taking off or landing could be hindered. For this OLS and specially approach surfaces, take-off climb surfaces and OFZ are the first aspects to consider. An aircraft taxiing could also endanger aircraft operations when the aircraft location and orientation are so that the aircraft interfere with nav aids. It is specific to instrument runways and especially important for precision approach runways. The non-penetration of critical/sensitive areas is the first check.
- (d) For all runways, it should be verified that the distance between a holding bay, runway-holding position established at a taxiway/runway intersection or road-holding position and the centre line of a runway is so that a holding aircraft or vehicle should not infringe the approach surface and/or take-off climb surface.
- (e) If the affected runway is used under precision approach procedures, it should be also verified that the distance between a holding bay, runway-holding position established at a taxiway/runway intersection or road-holding position and the centre line of a runway is so that a holding aircraft or vehicle should not infringe the obstacle-free zone and the critical/sensitive areas of precision approach nav aids (e.g. ILS/MLS).
- (f) If a holding bay, runway-holding position or road-holding position for a precision approach runway code number 4 is at a greater elevation compared to the threshold, the distance of 90 m or 107.5 m, as appropriate, specified in Table D-2 could be further increased 5 m for every metre the bay or position is higher than the threshold.
- (g) An aircraft taxiing could also endanger aircraft operation when the aircraft is too close to other taxiing aircraft. For this, separation distances or margins between taxiing aircraft or taxiways should be considered.
- (h) Further guidance is given in ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays).

CHAPTER E — APRONS**GM1 ADR-DSN.E.345 General**

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GM1 ADR-DSN.E.350 Size of aprons

- (a) The total apron area should be adequate to permit safe and expeditious handling of aerodrome traffic at its maximum anticipated density.
- (b) The amount of area required for a particular apron layout depends upon the following factors:
 - (1) the size and manoeuvrability characteristics of the aircraft using the apron;
 - (2) the volume of traffic using the apron;
 - (3) clearance requirements;
 - (4) type of ingress and egress to the aircraft stand;
 - (5) basic terminal layout or other aerodrome use;
 - (6) aircraft ground activity requirements; and
 - (7) taxiways and service roads.
- (c) Passenger aircraft services that are carried out during the time the aircraft is parked in a stand position include: galley; toilet and potable water service; baggage handling; fuelling; provision of air conditioning, oxygen, electrical power supply and starting air; and aircraft towing. Most of these functions have a vehicle and/or equipment associated with them, or have some type of fixed installation established to conduct these services. (ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays, par. 3.4.6).
- (d) Consideration should be given to providing sufficient area on the starboard side of the aircraft to support the level of activity that take place in the turnaround operation (ICAO Doc 9157, Aerodrome Design Manual, Part 2, Taxiways, Aprons and Holding Bays, par. 3.4.6).

GM1 ADR-DSN.E.355 Strength of aprons

- (a) Apron pavement protection against fuel: On aircraft stands, pavement surface in bituminous concrete and joints between concrete slabs should be protected from fuel effects.
- (b) Fuel on bituminous concrete provokes a disintegration of the concrete which becomes a kind of dark powder. On aircraft stands, it is not rare to have fuel on the pavement surface, due to leakage from aircraft or refuelling devices or due to a wrong move during refuelling. Therefore, if the aircraft stand pavement is in bituminous concrete, a specific protection is considered. Such protection is:
 - (1) a surface protection consisting in an overlay with a material inert against fuel; or
 - (2) a product incorporated in the mass of the bituminous concrete during its fabrication, protecting aggregates and binder.

- (c) The first solution has the disadvantages to be fragile against stamping effects due to aircraft at the stand but is very useful for existing pavement protection.
- (d) Taking into account the stamping due to aircraft at stands and the weakness of bituminous concrete against fuel, the aircraft stand pavements are often in cement concrete, which offers a much better resistance to stamping and to fuel. Nevertheless, joints between cement concrete slabs could be also damaged by fuel. According to the location of such joints regarding aircraft location and refuelling devices location, it is preferable to manufacture such joints in a material resistant to the fuel.

GM1 ADR-DSN.E.360 Slopes on aprons

- (a) The design of slopes should direct spilled fuel away from building and apron service areas. Where such slopes are unavoidable, special measures should be taken to reduce the fire hazard resulting from fuel spillage.
- (b) Slopes on apron have the same purpose as other pavement slopes, meaning to prevent the accumulation of water (or possible fluid contaminant) on the surface and to facilitate rapid drainage of surface water (or possible fluid contaminant). Nevertheless, the design of the apron, especially for the parts containing airplane stands, should specifically take into account the impact of the slopes on the airplane during its braking at the stand and during its start for departure (with push-back or with its own engines). The aims are, on the one hand, to avoid that an airplane passes its stop point and goes on the service road or to the closest building and on the other hand, to save fuel and optimise the manoeuvrability of the airplane or of the push-back device.
- (c) Where the slope limitation of 1 % on the stands cannot be achieved, the slope should be kept as shallow as possible and should be such that the operation of the aircraft and vehicles is not compromised.

GM1 ADR-DSN.E.365 Clearance distances on aircraft stands

- (a) Reduced separation at the gate is possible where azimuth guidance by a visual docking guidance system is provided, in combination with additional mitigation measures, such as:
 - (1) good condition of marking and signage;
 - (2) maintenance of visual docking systems.
- (b) Reduced clearance distances on aircraft stands
 - (1) On aircraft stands where reduced clearance distances exist, guidance by visual docking guidance system should be provided.
 - (2) All objects for which reduced clearances apply should be properly marked or lighted (Chapter Q Visual Aids for Denoting Obstacles).
 - (3) Aircraft stands where reduced clearance distances apply should be identified and the information published in the AIP.
 - (4) An aircraft stand equipped with a visual docking guidance system should provide the minimum clearance of 4.5 metres between an aircraft using the stand and any adjacent building, aircraft on another stand or other objects.

CHAPTER F — ISOLATED AIRCRAFT PARKING POSITION

GM1 ADR-DSN.F.370 Isolated aircraft parking position

Care should be taken to ensure that the position is not located over underground utilities, such as gas and aviation fuel and, to the extent feasible, electrical or communication cables. The aerodrome control tower should be advised of an area or areas suitable for the parking of an aircraft.

CHAPTER G — DE-ICING/ANTI-ICING FACILITIES**GM1 ADR-DSN.G.375 General**

Combinations of ice, snow and/or standing water may, especially when rain, rain and snow, or snow is falling, produce substances with specific gravities in excess of 0.8. These substances, due to their high water/ice content, should have a transparent rather than a cloudy appearance and, at the higher specific gravities, should be readily distinguishable from slush.

GM1 ADR-DSN.G.380 Location

- (a) The de-icing/anti-icing facilities should be so located as to ensure that the holdover time of the anti-icing treatment is still in effect at the end of taxiing, and when take-off clearance of the treated aeroplane is given.
- (b) To further maximise departure flow rates for all aeroplanes, the location and size of de-icing/anti-icing facilities should be such that they allow for bypass taxiing during de-icing/anti-icing operations. (ICAO, Doc 9640: — Manual of aircraft ground de-icing/anti-icing operations, paragraph 8.5(e).)
- (c) Remote de-icing/anti-icing facilities located near departure runway ends or along taxiways are recommended when taxi times from terminals or off-terminal de-icing/anti-icing locations frequently exceed holdover times.
- (d) Remote facilities compensate for changing weather conditions when icing conditions or blowing snow are expected to occur along the taxi-route taken by the aeroplane to the runway meant for take-off.
- (e) The de-icing/anti-icing facilities should be so located as to provide for an expeditious traffic flow, perhaps with a bypass configuration, and not require unusual taxiing manoeuvre into and out of the pads.
- (f) The jet blast effects caused by a moving aeroplane on other aeroplanes receiving the anti-icing treatment or taxiing behind should have to be taken into account to prevent degradation of the treatment.

GM1 ADR-DSN.G.385 Size of de-icing/anti-icing pads

- (a) It is recommended that the aerodrome have facilities with a de-icing/anti-icing capability equivalent to the maximum peak hour departure rate that can be managed by the ATC units during de-icing/anti-icing operations. (Doc 9640: Manual of aircraft ground de-icing/anti-icing operations, paragraph 8.3.)
- (b) The number of de-icing/anti-icing pads required should be determined based on the meteorological conditions, the type of aeroplanes to be treated, the method of application of de-icing/anti-icing fluid, the type and capacity of the dispensing equipment used, and the volume of traffic and departure flow rates.
- (c) An aeroplane de-icing/anti-icing pad consists of:
 - (1) an inner area for parking of an aeroplane to be treated; and
 - (2) an outer area for movement of two or more mobile de-icing/anti-icing equipment.
- (d) Where more than one de-icing/anti-icing pad is provided, consideration should be given to providing de-icing/anti-icing vehicle movement areas of adjacent pads that do not

overlap but are exclusive for each pad. Consideration should also be given to bypassing of the area by other aeroplanes with the clearances specified in CS ADR-DSN.G.400.

GM1 -ADR-DSN.G.390 Slopes on de-icing/anti-icing pads

It is recommended that the drainage arrangements for the collection and safe disposal of excess de-icing/anti-icing fluids prevent ground water contamination.

GM1 ADR-DSN.G.395 Strength of de-icing/anti-icing pads

Consideration should be given to the fact that the de-icing/anti-icing pad (in common with an apron) should be subjected to a higher density of traffic and, as a result of slow-moving or stationary aircraft, to higher stresses than a runway.

GM1 ADR-DSN.G.400 Clearance distances on a de-icing/anti-icing pad

- (a) The separation criteria should take into account the need for individual de-icing/anti-icing pads to provide sufficient maneuvering area around the airplane to allow simultaneous treatment by two or more mobile de-icing/anti-icing vehicles and sufficient non-overlapping space for a vehicle safety zone between adjacent de-icing pads and for other de-icing/anti-icing pads.
- (b) The minimum clearance distance of 3.8 m is necessary for the movement of de-icing/anti-icing vehicles round the aircraft.
- (c) Where the de-icing/anti-icing facility is located in a non-movement area, the minimum clearance distance can be reduced.

CHAPTER H — OBSTACLE LIMITATION SURFACES**GM1 ADR-DSN.H.405 Applicability**

- (a) The obstacle limitation surfaces define the limits to which objects may project into the airspace. Each surface is related to one or more phases of a flight, and provides protection to aircraft during that phase.
- (b) The OLS also help to prevent the aerodromes from becoming unusable by the growth of obstacles around the aerodromes.
- (c) The effective utilisation of an aerodrome may be considerably influenced by natural features and man-made constructions outside its boundary. These may result in limitations on the distance available for take-off and landing and on the range of meteorological conditions in which take-off and landing can be undertaken. For these reasons, certain areas of the local airspace should be regarded as integral parts of the aerodrome environment.
- (d) Objects which penetrate the obstacle limitation surfaces may in certain circumstances cause an increase in the obstacle clearance altitude/height for an instrument approach procedure or any associated visual circling procedure or have other operational impact on flight procedure design. Criteria for flight procedure design are contained in the Procedures for Air Navigation Services — Aircraft Operations (ICAO, PANS-OPS, Doc 8168).
- (e) In ideal circumstances all the surfaces should be free from obstacles but when a surface is infringed, any safety measures required should have regard to:
 - (1) the nature of the obstacle and its location relative to the surface origin, to the extended centre line of the runway or normal approach and departure paths, and to existing obstructions;
 - (2) the amount by which the surface is infringed;
 - (3) the gradient presented by the obstacle to the surface origin;
 - (4) the type of air traffic at the aerodrome; and
 - (5) the instrument approach procedures published for the aerodrome.
- (f) Safety measures could be as follows:
 - (1) promulgation in the AIP of appropriate information;
 - (2) marking and/or lighting of the obstacle;
 - (3) variation of the runway distances declared as available;
 - (4) limitation of the use of the runway to visual approaches only;
 - (5) restrictions on the type of traffic.
- (g) In addition to the requirements described in Book 1, Chapter H (CS ADR-DSN.H.405 et al.), it may be necessary to call for other restrictions to development and construction on and in the vicinity of the aerodrome in order to protect the performance of visual and electronic aids to navigation and to ensure that such development does not adversely affect instrument approach procedures and the associated obstacle clearance limits.

GM1 ADR-DSN.H.410 Outer horizontal surface

- (a) The outer horizontal surface should extend from the periphery of the conical surface.
- (b) An outer horizontal surface is a specified portion of a horizontal plane around an aerodrome beyond the limits of the conical surface. It represents the level above which consideration needs to be given to the control of new obstacles in order to facilitate practicable and efficient instrument approach procedures, and together with the conical and inner horizontal surfaces to ensure safe visual manoeuvring in the vicinity of an aerodrome.
- (c) The outer horizontal surface is of particular importance for safe operations in areas of high ground or where there are concentrations of obstacles.

GM1 ADR-DSN.H.415 Conical surface

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GM1 ADR-DSN.H.420 Inner horizontal surface

- (a) The shape of the inner horizontal surface need not necessarily be circular. Guidance on determining the extent of the inner horizontal surface is contained in the ICAO Doc 9137, Airport Services Manual, Part 6, Control of Obstacles.
- (b) The limits of the inner horizontal surface for longer runways (1 800 m or more in length) are defined as circles of radius 4 000 m centred on the strip ends of the runway. These circles are joined by common tangents parallel to the runway centre line to form a racetrack pattern. The boundary of this pattern is the boundary of the inner horizontal surface.
- (c) For runways less than 1 800 m in length, the inner horizontal surface is defined as a circle centred on the midpoint of the runway.
- (d) To protect two or more runways, a more complex pattern could become necessary. In this situation, all the circles are joined tangentially by straight lines: illustrated at the Figure GM-H-1.
- (e) For more complex inner horizontal surfaces, with runways on different levels or runways where the thresholds differ more than 6 m, a common elevation is not essential but where surfaces overlap, the lower surface should be regarded as dominant.
- (f) Further guidance is contained in the ICAO Doc 9137, Airport Services Manual, Part 6, Control of Obstacles.

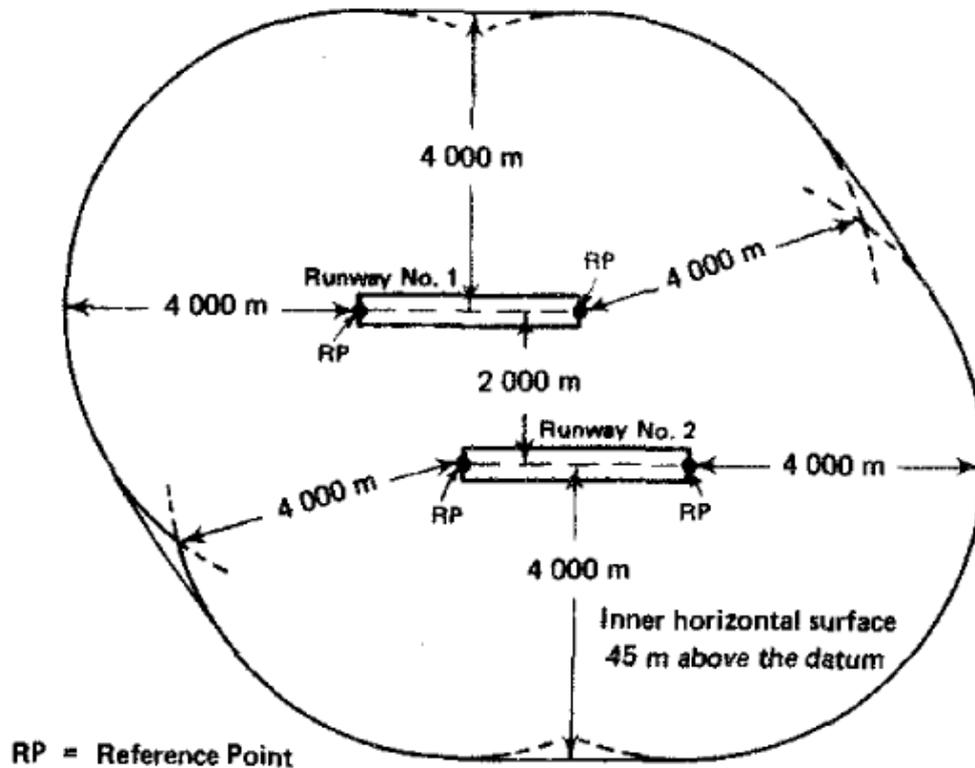


Figure GM-H-1. Composite inner horizontal surface for two parallel runways (where the runway code is 4)

GM1 ADR-DSN.H.425 Approach surface

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GM1 ADR-DSN.H.430 Transitional surface

When the elevation of a point on the lower edge is along the strip and equal to the elevation of the nearest point on the centre line of the runway or its extension as a result the transitional surface along the strip should be curved if the runway profile is curved, or a plane if the runway profile is a straight line. The intersection of the transitional surface with the inner horizontal surface should also be a curved or a straight line depending on the runway profile.

GM1 ADR-DSN.H.435 Take-off climb surface

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GM1 ADR-DSN.H.440 Slewed Take-off climb surface

The edge of a Take-off climb surface may be slewed in the direction of a turn away from the extended runway centre line up to a maximum of 15° splay. The portion of Take-off climb surface encompassing the new departure track should be the same shape and dimensions as the original Take-off climb surface measured relative to the new departure track. The opposite edge of the Take-off climb surface should remain unchanged unless there is another turning departure towards that side as well, in which case, the edge may be slewed in that direction too.

GM1 ADR-DSN.H.445 Obstacle-free zone

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GM1 ADR-DSN.H.450 Inner approach surface

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GM1 ADR-DSN.H.455 Inner transitional surface

- (a) It is intended that the inner transitional surface be the controlling obstacle limitation surface for navigation aids, aircraft, and other vehicles that should be near the runway, and which is not to be penetrated except for frangible objects. The transitional surface is intended to remain as the controlling obstacle limitation surface for buildings, etc.
- (b) The inner transitional surface along the strip should be curved if the runway profile is curved or a plane if the runway profile is a straight line. The intersection of the inner transitional surface with the inner horizontal surface should also be a curved or straight line depending on the runway profile.

GM1 ADR-DSN.H.460 Balked landing surface

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CHAPTER J — OBSTACLE LIMITATION REQUIREMENTS**GM1 ADR-DSN.J.465 General**

The requirements for obstacle limitation surfaces are specified on the basis of the intended use of a runway, i.e. take-off or landing, and type of approach, and are intended to be applied when such use of the runway is made. In cases where operations are conducted to or from both directions of a runway, the function of certain surfaces may be nullified because of more stringent requirements of another lower surface.

GM1 ADR-DSN.J.470 Non-instrument runways

- (a) Circumstances in which the shielding principle may reasonably be applied are described in the ICAO Doc 9137, Airport Services Manual, Part 6, Control of Obstacles.
- (b) Because of transverse or longitudinal slopes on a strip, in certain cases the inner edge or portions of the inner edge of the approach surface may be below the corresponding elevation of the strip. It is not intended that the strip be graded to conform with the inner edge of the approach surface, nor is it intended that terrain or objects which are above the approach surface beyond the end of the strip but below the level of the strip, be removed unless it is considered that they may endanger aeroplanes.

GM1 ADR-DSN.J.475 Non-precision approach runways

- (a) If it is of particular importance for safe operation on circuits, arrival routes towards the aerodrome or on departure or missed approach climb-paths, an outer horizontal surface for non-precision approach runways should be established.
- (b) Circumstances in which the shielding principle may reasonably be applied are described in the ICAO Doc 9137, Airport Services Manual, Part 6, Control of Obstacles.
- (c) Because of transverse or longitudinal slopes on a strip, in certain cases the inner edge or portions of the inner edge of the approach surface may be below the corresponding elevation of the strip. It is not intended that the strip be graded to conform with the inner edge of the approach surface, nor is it intended that terrain or objects which are above the approach surface beyond the end of the strip but below the level of the strip, be removed unless it is considered they may endanger aeroplanes.

GM1 ADR-DSN.J.480 Precision approach runways

- (a) The following obstacle limitation surfaces should be established for a precision approach runway category I:
 - (1) inner approach surface;
 - (2) inner transitional surfaces; and
 - (3) balked landing surface.
- (b) See CS ADR-DSN.T.915 for information regarding siting of equipment and installations on operational areas.
- (c) Guidance on obstacle limitation surfaces for precision approach runways is given in the ICAO Doc 9137, Airport Services Manual, Part 6, Control of Obstacles.

CS ADR DSN — BOOK 2

CHAPTER J — OBSTACLE LIMITATION REQUIREMENTS

- (d) Circumstances in which the shielding principle may reasonably be applied are described in the ICAO Doc 9137, Airport Services Manual, Part 6, Control of Obstacles.
- (e) Because of transverse or longitudinal slopes on a strip, in certain cases the inner edge or portions of the inner edge of the approach surface may be below the corresponding elevation of the strip. It is not intended that the strip be graded to conform with the inner edge of the approach surface, nor is it intended that terrain or objects which are above the approach surface beyond the end of the strip but below the level of the strip, be removed unless it is considered that they may endanger aeroplanes.

GM1 ADR-DSN.J.485 Runways meant for take-off

- (a) If no object reaches the 2 % (1:50) take-off climb surface, an obstacle-free surface of 1.6 % (1:62.5) should be established.
- (b) When local conditions differ widely from sea level standard atmospheric conditions, it may be advisable for the slope specified in Book 1, Table J-2 (repeated below as Table GM-J-1) to be reduced. The degree of this reduction depends on the divergence between local conditions and sea level standard atmospheric conditions, and on the performance characteristics and operational requirements of the aeroplanes for which the runway is intended.
- (c) Circumstances in which the shielding principle may reasonably be applied are described in the ICAO Doc 9137, Airport Services Manual, Part 6, Control of Obstacles.
- (d) Because of transverse slopes on a strip or clearway, in certain cases portions of the inner edge of the take-off climb surface may be below the corresponding elevation of the strip or clearway. It is not intended that the strip or clearway be graded to conform with the inner edge of the take-off climb surface, nor is it intended that terrain or objects which are above the take-off climb surface beyond the end of the strip or clearway but below the level of the strip or clearway, be removed unless it is considered that they may endanger aeroplanes. Similar considerations apply at the junction of a clearway and strip where differences in transverse slopes exist.
- (e) The operational characteristics of aeroplanes for which the runway is intended should be examined to see if it is desirable to reduce the slope specified in Table J-2 when critical operating conditions are to be catered to. If the specified slope is reduced, corresponding adjustment in the length of the take-off climb surface should be made so as to provide protection to a height of 300 m.

GM1 ADR-DSN.J.486 Other objects

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CHAPTER K — VISUAL AIDS FOR NAVIGATION (INDICATORS AND SIGNALLING DEVICES)**GM1 ADR-DSN.K.490 Wind direction indicator**

- (a) Wind direction indicators are important visual aids for all runway ends. Large wind direction indicators are particularly important at aerodromes where landing information is not available through radio communications. On the other hand, landing direction indicators are seldom used due to the necessity and, consequently, responsibility, of changing their direction as wind direction shifts. Visual ground signals for runway and taxiway serviceability are contained in Annex 2. See also ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids, Chapter 3).
- (b) A fabric wind cone is generally the type preferred by pilots because it provides a general indication of wind speed. Cones that extend fully at wind speeds of about 15 kt are most useful since this is the maximum crosswind landing component for small aircraft.
- (c) It may be possible to improve the perception by the pilot of the location of the wind direction indicator by several means notably by circular marking around this indicator. The location of at least one wind direction indicator should be marked by a circular band 15 m in diameter and 1.2 m wide. The band should be centred about the wind direction indicator support, and should be in a colour chosen to give adequate conspicuity, preferably white.
- (d) The usefulness of any visual aid is determined largely by its size, conspicuity, and location. Given conditions of good atmospheric visibility, the maximum distance at which the information available from an illuminated wind sleeve can be usefully interpreted is 1 km. Thus, in order that a pilot may make use of this information whilst on approach, the wind sleeve should be sited no farther from the runway threshold than 600 m. Obstacle criteria excluded, the ideal location is 300 m along the runway from the threshold and laterally displaced at 80 m from the runway centre line.
- (e) This means, in effect, that only those aerodromes where the thresholds are less than 1 200 m apart can meet the minimum requirement with a single unit. Most code 3 and 4 aerodromes should require two or more units suitably sited in order to provide the best possible coverage.
- (f) The final choice of unit numbers and location should depend on a number of factors which should vary from aerodrome to aerodrome. However, when deciding on the most appropriate location, account should be taken to ensure that the wind direction indicator is:
- (1) outside the Cleared and Graded Area of the runway and taxiway strips;
 - (2) clear of the OFZ and ILS critical/sensitive areas where appropriate;
 - (3) preferably not more than 200 m lateral displacement from the runway edge;
 - (4) preferably between 300 m and 600 m from the runway threshold measured along the runway;
 - (5) in an area with low background levels of illumination;
 - (6) visible from the approach and take-off positions of all runways; and
 - (7) free from the effects of air disturbance caused by nearby objects.

GM1 ADR-DSN.K.495 Landing direction indicator

The landing 'T' may be constructed of wood or other light material and its dimensions may correspond to those shown in Figure K-1. It may be painted white or orange. The landing 'T' should be mounted on a cement concrete pedestal adequately reinforced with steel bars to avoid cracks resulting from unequal settlement. The surface of the pedestal should be finished smooth with a steel trowel and coated with paint of appropriate colour. The colour of the pedestal should be chosen to contrast with the colour of the landing 'T'. Before fastening the landing 'T' base to the concrete pedestal, the mounting bolts should be checked for correct spacing. The landing 'T' should be assembled and mounted in accordance with the manufacturer's installation instructions. It should be free to move about a vertical axis so that it can be set in any direction. Where required for use at night, the landing 'T' should either be illuminated or outlined by white lights.

GM1 ADR-DSN.K.500 Signalling lamp

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GM1 ADR-DSN.K.505 Signal panels and signal area

- (a) A signal panels and signal area should be provided when visual ground signals are used to communicate with aircraft in flight.
- (b) A signal panel and signal area may be needed when the aerodrome does not have an aerodrome control tower or an aerodrome flight information service unit, or when the aerodrome is used by aeroplanes not equipped with radio. Visual ground signals may also be useful in the case of failure of two-way radio communication with aircraft. It should be recognised, however, that the type of information which may be conveyed by visual ground signals should normally be available in AIP or NOTAM. The potential need for visual ground signals should, therefore, be evaluated before deciding to provide a signal area.
- (c) ICAO Annex 2, Appendix 1, specifies the shape, colour and use of visual ground signals.

GM1 ADR-DSN.K.510 Location of signal panels and signal area

A signal area should be located so as to be visible for all angles of azimuth above an angle of 10° above the horizontal when viewed from a height of 300 m.

GM1 ADR-DSN.K.515 Characteristics of signal panels and signal area

- (a) The signal area should be an even horizontal surface at least 9 m square.
- (b) The signal area should be constructed of cement concrete reinforced with an adequate quantity of steel to avoid cracks resulting from unequal settlement. The top surface should be finished smooth with a steel trowel and coated with paint of appropriate colour. The colour of the signal area should be chosen to contrast with the colours of the signal panels to be displayed thereon. (More guidance could be find in ICAO Doc 9157, Aerodrome Design Manual Part 4, Visual Aids, Chapter 3).
- (c) The colour of the signal area should be chosen to contrast with the colours of the signal panels used, and it should be surrounded by a white border not less than 0.3 m wide.

CHAPTER L — VISUAL AIDS FOR NAVIGATION (MARKINGS)**GM1 ADR-DSN.L.520 General – Colour and conspicuity**

- (a) Where there is insufficient contrast between the marking and the pavement surface, the marking should include an appropriate border.
 - (1) This border should be white or black;
 - (2) It is preferable that the risk of uneven friction characteristics on markings be reduced in so far as practicable by the use of a suitable kind of paint; and
 - (3) Markings may consist of solid areas or a series of longitudinal stripes providing an effect figure equivalent to the solid areas.
- (b) At aerodromes where operations take place at night, pavement markings may be made with reflective materials designed to enhance the visibility of the markings.
- (c) Circumstances may occur when it is not practicable to install permanent markings, for example during runway resurfacing. So as to provide sufficient visual guidance to aircraft, the following markings should be considered:
 - (1) runway centre line – required for operations below PA Category I;
 - (2) taxiway centre line lead on/off;
 - (3) runway edge line;
 - (4) runway threshold; and
 - (5) touchdown zone and aiming point markings.
- (d) Centre line and edge lights widths can be replaced by reduced width temporary markings and can reduce from 0.9 m to 0.6 m if required.
- (e) Touchdown zone and aiming point markings need not be repainted during the same shift as the asphaltting but should be done as soon as practicable.
- (f) Threshold markings should be returned as soon as possible initially in temporary materials, then permanent materials.

GM1 ADR-DSN.L.525 Runway designation marking

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GM1 ADR-DSN.L.530 Runway centre line marking

For the centre line marking the 30 m length of and gap between stripes may be adjusted to take into consideration the runway thresholds locations.

GM1 ADR-DSN.L.535 Threshold marking

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GM1 ADR-DSN.L.540 Aiming point marking

When additional conspicuity of the aiming point is desirable, an aiming point marking should be provided at each approach end of:

- a) a non-instrument runway where the code number is 3 or 4,
- b) an instrument runway where the code number is 1.

GM1 ADR-DSN.L.545 Touchdown zone marking

- (a) In order to give information regarding the overall extension of a distance coding touchdown marking, as specified in Book 1 CS ADR-DSN.L.545, the last pair of markings after the threshold should consist of two single stripes, and the other pairs should correspond to the patterns shown in Book 1, Figure L-4.
- (b) Such sequential layout gives intuitive information about the extension of the touchdown zone and, as a consequence, of the LDA or of the distance between thresholds.

GM1 ADR-DSN.L.550 Runway side stripe marking

When turn pads are not available at the end of a runway for back-track manoeuvres and threshold is displaced, in order to better identify full-strength bearing surface, it may be useful to display specific dashed markings as showed by Figure GM-L-1 and with dimensions described in Table GM-L-1.

GM1 ADR-DSN.L.555 Taxiway centre line marking

The term 'continuous guidance' is not intended to require that taxiway centre line markings are provided onto aircraft stands. Instead, it is intended that the centre line marking be provided on taxiways leading to aircraft stands or other apron areas, from which visual cues or other means exist, such as lead-in arrows and stand number indicators, to enable aircrew to manoeuvre the aircraft onto a stand or other parking area.

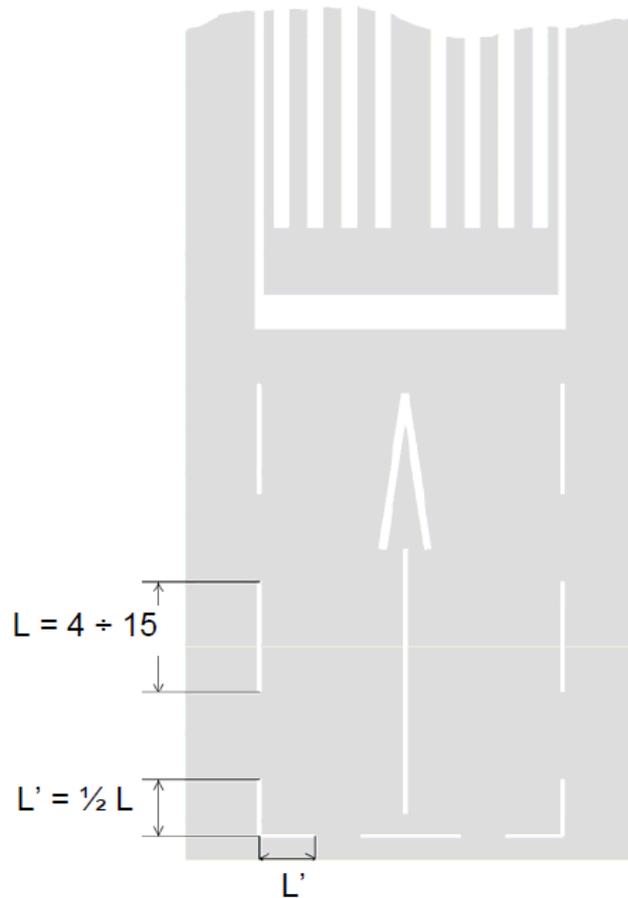


Figure GM-L-1. Dashed runway side stripe marking

Runway width (m)	Single dash dimensions	
	Length (minimum m)	Width (m)
60	15	0.45
45	15	0.45
30	10	0.45
23	6	0.25
18	4	0.25

Table GM-L-1. Runway dashed markings

GM1 ADR-DSN.L.560 Interruption of runway markings

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GM1 ADR-DSN.L.565 Runway turn pad marking

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GM1 ADR-DSN.L.570 Enhanced taxiway centre line marking

- (a) Enhanced taxiway centre line marking may be provided to denote the proximity of a runway-holding position. The provision of enhanced taxiway centre line marking may form part of runway incursion prevention measures.
- (b) Enhanced taxiway centre line marking may be installed at taxiway/runway intersections at that aerodrome as determined by the aerodrome operator/runway safety team as part of the aerodrome's runway incursion prevention programme.
- (c) Those locations where enhanced taxiway centre lines are installed, should be promulgated to AIS and included on the aerodrome chart if required.

GM1 ADR-DSN.L.575 Runway-holding position marking

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GM1 ADR-DSN.L.580 Intermediate holding position marking

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GM1 ADR-DSN.L.585 VOR aerodrome checkpoint marking

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GM1 ADR-DSN.L.590 Aircraft stand marking

- (a) The distances to be maintained between the stop line and the lead-in line may vary according to different aircraft types, taking into account the pilot's field of view.
- (b) Apron markings are installed to support the safe operation of aircraft on stands and apron areas. Markings may not be required where appropriate procedures are employed, giving flexibility of operations. Examples would include situations where aircraft marshallers are used or where aircraft are required to self-park on an open apron where different combinations of aircraft preclude dedicated markings. Specific markings/stands are normally more applicable for larger aircraft.

GM1 ADR-DSN.L.595 Apron safety lines

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GM1 ADR-DSN.L.600 Road-holding position marking

- (a) Where a road that accesses a runway is unpaved, it may not be possible to install markings. In such cases, a road-holding position signs and/or lights should be installed, combined with appropriate instructions on how the driver of a vehicle should proceed.

- (b) Where it is possible to install markings, they should conform to national regulations for traffic signs and markings.

GM1 ADR-DSN.L.605 Mandatory instruction marking

Except where operationally required, a mandatory instruction marking should not be located on a runway.

GM1 ADR-DSN.L.610 Information marking

- (a) Applicability: Where operationally required information sign should be supplemented by a marking on the pavement surface.
- (b) Location:
 - (1) An information (location/direction) marking should be displayed prior to and following complex taxiway intersections, and where operational experience has indicated the addition of a taxiway location marking could assist flight crew ground navigation, and on the pavement surface at regular intervals along taxiways of great length.
 - (2) The information marking should be displayed across the surface of the taxiway or apron where necessary, and positioned so as to be legible from the cockpit of an approaching aircraft.

CHAPTER M — VISUAL AIDS FOR NAVIGATION (LIGHTS)**GM1 ADR-DSN.M.615 General**

- (a) Aeronautical ground lights near navigable waters should be taken into consideration to ensure that the lights do not cause confusion to mariners.
- (b) In dusk or poor visibility conditions by day, lighting can be more effective than marking. For lights to be effective in such conditions or in poor visibility by night, they should be of adequate intensity. To obtain the required intensity, it should usually be necessary to make the light directional, in which case the arcs over which the light shows should be adequate and so orientated as to meet the operational requirements. The runway lighting system should be considered as a whole, to ensure that the relative light intensities are suitably matched to the same end.
- (c) While the lights of an approach lighting system may be of higher intensity than the runway lighting, it is good practice to avoid abrupt changes in intensity as these could give a pilot a false impression that the visibility is changing during approach.
- (d) The conspicuity of a light depends on the impression received of contrast between the light and its background. If a light is to be useful to a pilot by day when on approach, it should have an intensity of at least 2 000 or 3 000 cd, and in the case of approach lights an intensity of the order of 20 000 cd is desirable. In conditions of very bright daylight fog it may not be possible to provide lights of sufficient intensity to be effective.
- (e) On the other hand, in clear weather on a dark night, an intensity of the order of 100 cd for approach lights and 50 cd for the runway edge lights may be found suitable. Even then, owing to the closer range at which they are viewed, pilots have sometimes complained that the runway edge lights seemed unduly bright.
- (f) In fog the amount of light scattered is high. At night this scattered light increases the brightness of the fog over the approach area and runway to the extent that little increase in the visual range of the lights can be obtained by increasing their intensity beyond 2 000 or 3 000 cd. In an endeavour to increase the range at which lights would first be sighted at night, their intensity should not be raised to an extent that a pilot might find excessively dazzling at diminished range.
- (g) From the foregoing should be evident the importance of adjusting the intensity of the lights of an aerodrome lighting system according to the prevailing conditions, so as to obtain the best results without excessive dazzle that would disconcert the pilot. The appropriate intensity setting on any particular occasion should depend both on the conditions of background brightness and the visibility.
- (h) Assessment on dazzle in the aerodrome vicinity:
 - (1) Human vision is a complex mechanism using both eye and brain. Even though this mechanism is quite handled for eye, there is still a lack of knowledge on the interpretation of it by the brain. Thus, vision varies from one human being to another.
 - (2) The field of view is defined by the area perceived by eyes. The perception of details is based on the luminance ratio between elements of the scene, taking into account spatial distribution. Luminance and contrast are key elements of vision mechanism.
 - (3) Four sectors can be identified in the field of view (FOV):

- (i) sensation field, corresponding to the absolute boundaries of FOV; it opens up to approximately 90° on each side of the eye direction;
- (ii) visibility field, which is narrower and enables the perception of an object; it opens up to 60°;
- (iii) conspicuity field, which enables the recognition, it opens up to 30°;
- (iv) working conspicuity field, which is further tightly centred on the eye direction (1 to 2°); it enables the identification and is the working area of the vision.

It is reminded that the retina is composed in its centre by cone cells (that see colours and details) and at the periphery by rod cells (that perceive movements and change of state).

- (i) A safety assessment is conducted in order to identify situations where the risk of dazzling becomes unacceptable. Thus, it is noted that dazzle represents such a risk in the following situations:
 - (1) during approach, especially after the aircraft has descended below the decision height: the pilot should not lose any visual cue;
 - (2) at touchdown the pilot should not be surprised by a flash;
 - (3) during rolling (landing or take-off), the pilot should be able to perceive his environment and detect any deviation from the centre line: the pilot should not lose any visual cue.
 - (4) Thus:
 - (i) prejudicial dazzle due to veiling luminance should not occur during approach (slightly before the decision height) and rolling; and
 - (ii) surprise effect should not occur at touchdown.
- (j) Regarding air traffic controllers, it has been considered that dazzle induced by veiling effect should not reduce the visual perception of aircraft operations on, and close to the runway.
- (k) The elements here above can be applied to solar panels.
- (l) The following assumptions can be made:
 - (1) solar panels are inclined so as to efficiently capture the sunlight, conducting to a range of cross section surfaces;
 - (2) the maximum acceptable luminance value has been fixed to 20 000 cd/m²; and
 - (3) the surfaces varied from 100 m² to several hectares.
- (m) It is assumed that the aircraft maintains precisely its trajectory whereas in reality the approach is conducted into a conical envelop around the expected trajectory.

GM1 ADR-DSN.M.620 Aeronautical beacons

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SECTION 1 — APPROACH LIGHTING SYSTEMS**GM1 ADR-DSN.M.625 Approach lighting systems, general and applicability**

(a) Types and characteristics

- (1) The specifications in Books 1 & 2 provide for the basic characteristics for simple and precision approach lighting systems. For certain aspects of these systems, some latitude is permitted, for example, in the spacing between centre line lights and crossbars. The approach lighting patterns that have been generally adopted are shown in Figures M-1 and M-2. A diagram of the inner 300 m of the precision approach category II and III lighting system is shown in Figures M-5A and M-5B.
- (2) Examples of flight path envelopes used in designing the lighting are shown in Figure GM-M-2.

(b) Horizontal installation tolerances:

- (1) The dimensional tolerances are shown in Figure M-1 and M-2.
- (2) The centre line of an approach lighting system should be as coincident as possible with the extended centre line of the runway with a maximum tolerance of $\pm 15'$.
- (3) The longitudinal spacing of the centre line lights should be such that one light (or group of lights) is located in the centre of each crossbar, and the intervening centre line lights are spaced as evenly as practicable, between two crossbars or a crossbar and a threshold.
- (4) The crossbars and barrettes should be at right angles to the centre line of the approach lighting system with a tolerance of $\pm 30'$ if the pattern in Figure M-2(A) is adopted or $\pm 2^\circ$ if Figure M-2(B) is adopted.
- (5) When a crossbar has to be displaced from its standard position, any adjacent crossbar should where possible, be displaced by appropriate amounts in order to reduce the differences in the crossbar spacing.
- (6) When a crossbar in the system shown in Figure M-2(A) is displaced from its standard position, its overall length should be adjusted so that it remains one-twentieth of the actual distance of the crossbar from the point of origin. It is not necessary, however, to adjust the standard 2.7 m spacing between the crossbar lights but the crossbars should be kept symmetrical about the centre line of the approach lighting.

(c) Vertical installation tolerances:

- (1) The ideal arrangement is to mount all the approach lights in the horizontal plane passing through the threshold (see Figure GM-M-1), and this should be the general aim as far as local conditions permit. However, buildings, trees, etc. should not obscure the lights from the view of a pilot who is assumed to be 1° below the electronic glide path in the vicinity of the outer marker.
- (2) Within a stopway or clearway, and within 150 m of the end of a runway, the lights should be mounted as near to the ground as local conditions permit in order to minimise risk of damage to aeroplanes in the event of an overrun or undershoot. Beyond the stopway and clearway, it is not so necessary for the lights to be mounted close to the ground, and, therefore, undulations in the ground contours can be compensated for by mounting the lights on poles of appropriate height.

- (3) It is desirable that the lights be mounted so that as far as possible, no object within a distance of 60 m on each side of the centre line protrudes through the plane of the approach lighting system. Where a tall object exists within 60 m of the centre line and within 1 350 m from the threshold for a precision approach lighting system, or 900 m for a simple approach lighting system, it may be advisable to install the lights so that the plane of the outer half of the pattern clears the top of the object.
 - (4) In order to avoid giving a misleading impression of the plane of the ground, the lights should not be mounted below a gradient of 1 in 66 downwards from the threshold to a point 300 m out, and below a gradient of 1 in 40 beyond the 300 m point. For a precision approach category II and III lighting system, more stringent criteria may be necessary, e.g. negative slopes not permitted within 450 m of the threshold.
 - (i) Centre line. The gradients of the centre line in any section (including a stopway or clearway) should be as small as practicable, and the changes in gradients should be as few and small as can be arranged, and should not exceed 1 in 60. Experience has shown that as one proceeds outwards from the runway, rising gradients in any section of up to 1 in 66, and falling gradients of down to 1 in 40, are acceptable.
 - (ii) Crossbars. The crossbar lights should be so arranged as to lie on a straight line passing through the associated centre line lights, and wherever possible, this line should be horizontal. It is permissible, however, to mount the lights on a transverse gradient not more than 1 in 80 if this enables crossbar lights within a stopway or clearway to be mounted nearer to the ground on sites where there is a cross-fall.
 - (5) When the barrette is composed of lights approximating to point sources, a spacing of 1.5 m between adjacent lights in the barrette has been found satisfactory.
 - (6) At locations where identification of the simple approach lighting system is difficult at night due to surrounding lights, sequence flashing lights installed in the outer portion of the system may resolve this problem.
- (d) Clearance of obstacles:
- (1) An area, hereinafter referred to as the light plane, has been established for obstacle clearance purposes, and all lights of the system are in this plane. This plane is rectangular in shape and symmetrically located about the approach lighting system's centre line. It starts at the threshold and extends 60 m beyond the approach end of the system, and is 120 m wide.
 - (2) No objects are permitted to exist within the boundaries of the light plane which are higher than the light plane except as designated herein. All roads and highways are considered as obstacles extending 4.8 m above the crown of the road, except aerodrome service roads where all vehicular traffic is under control of the aerodrome operator and coordinated with the aerodrome air traffic control. Railroads, regardless of the amount of traffic, are considered as obstacles extending 5.4 m above the top of the rails.
 - (3) It is recognised that some components of electronic landing aids systems, such as reflectors, antennas, monitors, etc. should be installed above the light plane. Every effort should be made to relocate such components outside the boundaries of the light plane. In the case of reflectors and monitors, this can be done in many instances.

- (4) Where an ILS localiser is installed within the light plane boundaries, it is recognised that the localiser, or screen if used, should extend above the light plane. In such cases, the height of these structures should be held to a minimum and they should be located as far from the threshold as possible. In general, the rule regarding permissible heights is 15 cm for each 30 m the structure is located from the threshold. As an example, if the localiser is located 300 m from the threshold, the screen should be permitted to extend above the plane of the approach lighting system by $10 \times 15 = 150$ cm maximum but preferably should be kept as low as possible, consistent with proper operation of the ILS.
 - (5) In locating an MLS azimuth antenna the guidance contained in ICAO Annex 10, Volume I, Attachment G, should be followed. This material which also provides guidance on collocating an MLS azimuth antenna with an ILS localiser antenna, suggests that the MLS azimuth antenna may be sited within the light plane boundaries where it is not possible or practical to locate it beyond the outer end of the approach lighting for the opposite direction of approach. If the MLS azimuth antenna is located on the extended centre line of the runway, it should be as far as possible from the closest light position to the MLS azimuth antenna in the direction of the runway end. Furthermore, the MLS azimuth antenna phase centre should be at least 0.3 m above the light centre of the light position closest to the MLS azimuth antenna in the direction of the runway end. (This could be relaxed to 0.15 m if the site is otherwise free of significant multipath problems.)
 - (6) Compliance with this requirement which is intended to ensure that the MLS signal quality is not affected by the approach lighting system, could result in the partial obstruction of the lighting system by the MLS azimuth antenna. To ensure that the resulting obstruction does not degrade visual guidance beyond an acceptable level, the MLS azimuth antenna should not be located closer to the runway end than 300 m and the preferred location is 25 m beyond the 300 m crossbar (this would place the antenna 5 m behind the light position 330 m from the runway end). Where an MLS azimuth antenna is so located, a central part of the 300 m crossbar of the approach lighting system would alone be partially obstructed. Nevertheless, it is important to ensure that the unobstructed lights of the crossbar remain serviceable all the time.
 - (7) Objects existing within the boundaries of the light plane, requiring the light plane to be raised in order to meet the criteria contained herein, should be removed, lowered, or relocated where this can be accomplished more economically than raising the light plane.
 - (8) In some instances objects may exist which cannot be removed, lowered, or relocated economically. These objects may be located so close to the threshold that they cannot be cleared by the 2 % slope. Where such conditions exist and no alternative is possible, the 2 % slope may be exceeded or a 'stair step' resorted to in order to keep the approach lights above the objects. Such 'step' or increased gradients should be resorted to only when it is impracticable to follow standard slope criteria, and they should be held to the absolute minimum. Under this criterion no negative slope is permitted in the outermost portion of the system.
- (e) Consideration of the effects of reduced lengths:
- (1) The need for an adequate approach lighting system to support precision approaches where the pilot is required to acquire visual references prior to landing, cannot be stressed too strongly. The safety and regularity of such operations is dependent on this visual acquisition. The height above runway threshold at which the pilot decides there are sufficient visual cues to continue the precision approach and land, should

vary, depending on the type of approach being conducted and other factors such as meteorological conditions, ground and airborne equipment, etc. The required length of approach lighting system which should support all the variations of such approaches is 900 m, and this should always be provided whenever possible.

- (2) However, there are some runway locations where it is impossible to provide the 900 m length of approach lighting system to support precision approaches.
- (3) In such cases, every effort should be made to provide as much approach lighting system as possible. Restrictions on operations could be imposed on runways equipped with reduced lengths of approach lighting. There are many factors which determine at what height the pilot should have decided to continue the approach to land or execute a missed approach. It should be understood that the pilot does not make an instantaneous judgement upon reaching a specified height. The actual decision to continue the approach and landing sequence is an accumulative process which is only concluded at the specified height. Unless lights are available prior to reaching the decision point, the visual assessment process is impaired and the likelihood of missed approaches should increase substantially. There are many operational considerations which should be taken into account in deciding if any restrictions are necessary to any precision approach and these are detailed in ICAO Annex 6 – Operation of Aircrafts.
- (f) For Precision Runways it is advisable to give consideration to the installation of a precision approach category I lighting system or to the addition of a runway lead-in lighting system.

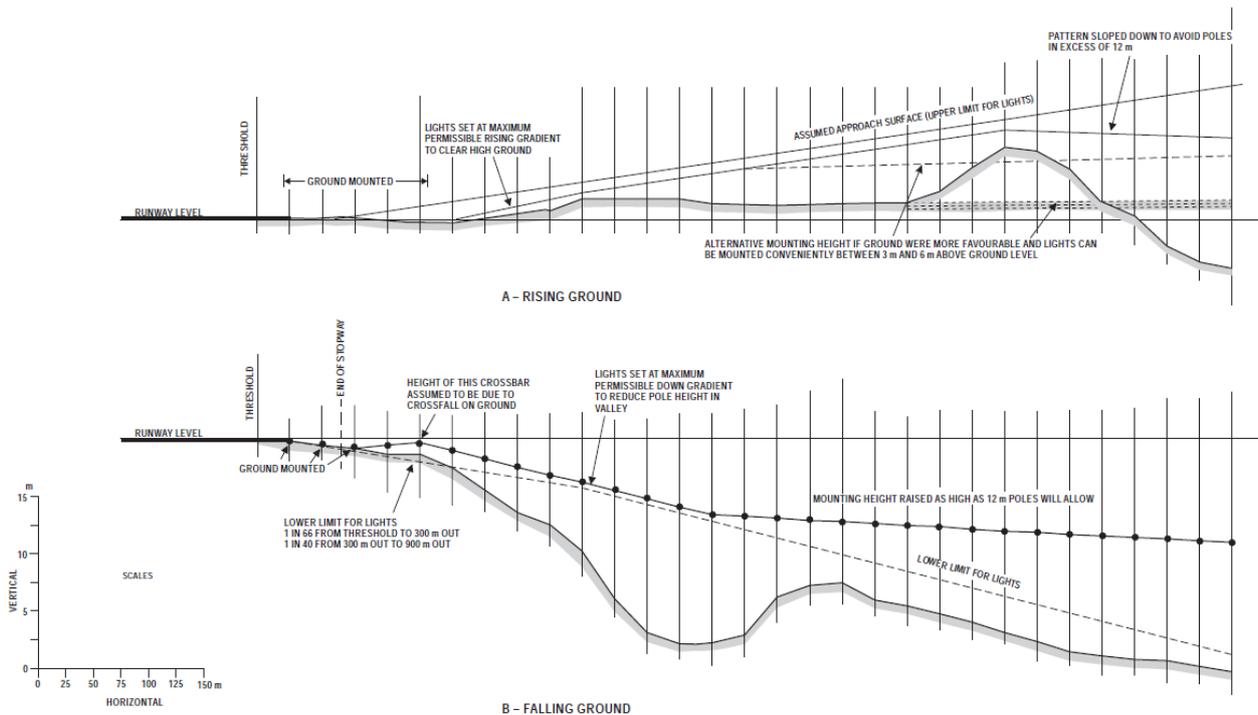


Figure GM-M-1. Vertical installation tolerances

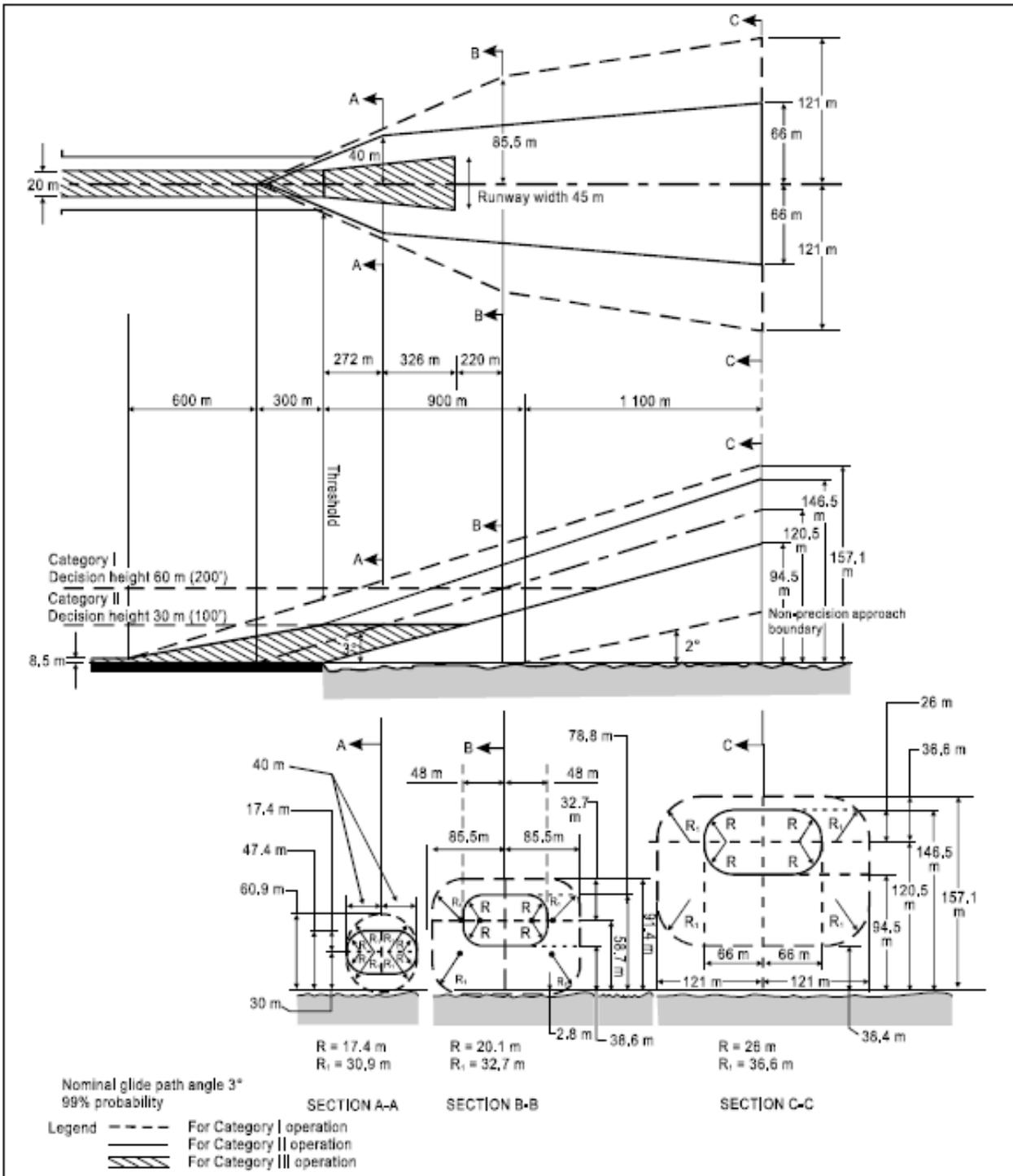


Figure GM-M-2. Flight path envelope examples for lighting design for category I, II and III operations - Centre line lights

GM1 ADR-DSN.M.626 Simple approach lighting systems

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GM1 ADR-DSN.M.630 Precision approach category I lighting system

- (a) The installation of an approach lighting system of less than 900 m in length may result in operational limitations on the use of the runway.
- (b) Spacings for the crossbar lights between 1 m and 4 m are in use. Gaps on each side of the centre line may improve directional guidance when approaches are made with a lateral error, and facilitate the movement of rescue and firefighting vehicles.

GM1 ADR-DSN.M.635 Precision approach category II and III lighting system

The length of 900 m is based on providing guidance for operations under category I, II and III conditions. Reduced lengths may support category II and III operations but may impose limitations on category I operations. See ICAO Annex 14, Attachment A, Section 11.

SECTION 2 – VISUAL APPROACH SLOPE INDICATOR SYSTEMS**GM1 ADR-DSN.M.640 Visual approach slope indicator systems**

- (a) Factors that should be considered when making a decision on which runway on an aerodrome should receive first priority for the installation of a visual approach slope indicator system are:
- (1) frequency of use;
 - (2) seriousness of the hazard;
 - (3) presence of other visual and non-visual aids;
 - (4) type of aeroplanes using the runway; and
 - (5) frequency and type of adverse weather conditions under which the runway should be used.
- (b) With respect to the seriousness of the hazard, the order given in the CS ADR-DSN.M.640 may be used as a general guide. These may be summarised as:
- (1) inadequate visual guidance because of:
 - (i) approaches over water or featureless terrain, or absence of sufficient extraneous light in the approach area by night;
 - (ii) deceptive surrounding terrain.
 - (2) serious hazard in approach;
 - (3) serious hazard if aeroplanes undershoot or overrun; and
 - (4) unusual turbulence.
- (c) The presence of other visual or non-visual aids is a very important factor. Runways equipped with ILS or MLS would generally receive the lowest priority for a visual approach slope indicator system installation. It should be remembered, though, that visual approach slope indicator systems are visual approach aids in their own right and can supplement electronic aids. When serious hazards exist and/or a substantial number of aeroplanes not equipped for ILS or MLS use a runway, priority might be given to installing a visual approach slope indicator on this runway.
- (d) Priority may be given to runways used by turbojet aeroplanes.
- (e) Where a runway threshold is temporarily displaced from the normal position and one or more of the conditions specified in paragraph (a) above exist, a PAPI should be provided except that where the code number is 1 or 2 either an APAPI may be provided.

GM1 ADR-DSN.M.645 PAPI and APAPI

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GM1 ADR-DSN.M.650 Approach slope and elevation setting of light units (for PAPI and APAPI)

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GM1 ADR-DSN.M.655 Obstacle protection surface for PAPI and APAPI

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GM1 ADR-DSN.M.660 Circling guidance lights

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SECTION 3 — RUNWAY & TAXIWAY LIGHTS

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GM1 ADR-DSN.M.665 Runway lead-in lighting systems

- (a) Applicability: A runway lead-in lighting system may be provided for purposes of noise abatement routing.
- (b) Characteristics: Where practicable, the flashing lights in each group should flash in sequence towards the runway.

GM1 ADR-DSN.M.670 Runway threshold identification lights

- (a) Applicability: Runway threshold identification lights should be installed:
 - (1) at the threshold of a non-precision approach runway when additional threshold conspicuity is necessary or where it is not practicable to provide other approach lighting aids; and
 - (2) where a runway threshold is permanently displaced from the runway extremity or temporarily displaced from the normal position and additional threshold conspicuity is necessary.
- (b) Characteristics: Runway threshold identification lights should be flashing white lights with a flash frequency between 60 and 120 per minute.

GM1 ADR-DSN.M.675 Runway edge lights

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GM1 ADR-DSN.M.680 Runway threshold and wing bar lights

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GM1 ADR-DSN.M.685 Runway end lights

When the threshold is at the runway extremity, fittings serving as threshold lights may be used as runway end lights.

GM1 ADR-DSN.M.690 Runway centre line lights

- (a) Runway centre line lights should be provided on a precision approach runway category I when the runway is used by aircraft with high landing speeds or where the width between the runway edge lights is greater than 50 m.
- (b) Runway centre line lights should be provided on a runway intended to be used for take-off with an operating minimum of an RVR of the order of 400 m or higher when used by aeroplanes with a very high take-off speed where the width between the runway edge lights is greater than 50 m.

GM1 ADR-DSN.M.695 Runway touchdown zone lights

To allow for operations at lower visibility minima, it may be advisable to use a 30 m longitudinal spacing between barrettes.

GM1 ADR-DSN.M.700 Rapid exit taxiway indicator lights

- (a) The purpose of rapid exit taxiway indicator lights (RETILs) is to provide pilots with distance-to-go information to the nearest rapid exit taxiway on the runway, to enhance situational awareness in low visibility conditions, and enable pilots to apply braking action for more efficient roll-out and runway exit speeds. It is essential that pilots operating at aerodromes with runway(s) displaying rapid exit taxiway indicator lights be familiar with the purpose of these lights.
- (b) Rapid exit taxiway indicator lights (RETILs) comprise a set of yellow unidirectional lights installed in the runway adjacent to the centre line. The lights are positioned in a 3-2-1 sequence at 100 m intervals prior to the point of tangency of the rapid exit taxiway centre line. They are intended to give an indication to pilots of the location of the next available rapid exit taxiway.
- (c) In low visibility conditions, RETILs provide useful situational awareness cues while allowing the pilot to concentrate on keeping the aircraft on the runway centre line.
- (d) Following a landing, runway occupancy time has a significant effect on achievable runway capacity. RETILs allow pilots to maintain a good roll-out speed until it is necessary to decelerate to an appropriate speed for the turn into a rapid exit turn-off. A roll-out speed of 60 kt until the first RETIL (three-light barrette) is reached is seen as the optimum.

GM1 ADR-DSN.M.705 Stopway lights

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GM1 ADR-DSN.M.710 Taxiway centre line lights

- (a) In the case where taxiway centre line lights are provided and where there may be a need to delineate the edges of a taxiway, e.g. on a rapid exit taxiway, narrow taxiway, or in

snow conditions, this may be done with taxiway edge lights or markers. Care is necessary to limit the light distribution of green lights on or near a runway so as to avoid possible confusion with threshold lights.

- (b) The term 'continuous guidance' is not intended to require that taxiway centre line lighting is provided onto aircraft stands. Instead, it is intended that centre line lighting be provided on taxiways leading to aircraft stands or other apron areas, from which visual cues or other means exist to enable aircrew to manoeuvre the aircraft onto a stand or other parking area.

GM1 ADR-DSN.M.715 Taxiway centre line lights on taxiways, runways, rapid exit taxiways, or on other exit taxiways

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GM1 ADR-DSN.M.720 Taxiway edge lights

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GM1 ADR-DSN.M.725 Runway turn pad lights

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GM1 ADR-DSN.M.730 Stop bar lights

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GM1 ADR-DSN.M.735 Intermediate holding position lights

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GM1 ADR-DSN.M.740 De-icing/anti-icing facility exit lights

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GM1 ADR-DSN.M.745 Runway guard lights

- (a) Some other device or design, e.g. specially designed optics, may be used in lieu of the visor.
- (b) Higher light intensities may be required to maintain ground movement at a certain speed in low visibilities
- (c) The optimum flash rate is dependent on the rise and fall times of the lamps used. Runway guard lights, Configuration A, installed on 6.6 ampere series circuits have been found to look best when operated at 45 to 50 flashes per minute per lamp. Runway guard lights, Configuration B, installed on 6.6 ampere series circuits have been found to look best when operated at 30 to 32 flashes per minute per lamp.

- (d) Where there is a need to enhance the contrast between the on- and off-state of runway guard lights, Configuration A, intended for use during the day, a visor of sufficient size to prevent sunlight from entering the lens without interfering with the function of the fixture should be located above each lamp.

SECTION 4 — APRON LIGHTING

GM1 ADR-DSN.M.750 Apron floodlighting

Where a de-icing/anti-icing facility is located in close proximity to the runway and permanent floodlighting could be confusing to pilots, other means of illumination of the facility may be required.

GM1 ADR-DSN.M.755 Visual docking guidance system

- (a) The factors to be considered in evaluating the need for a visual docking guidance system are in particular: the number and type(s) of aircraft using the aircraft stand, weather conditions, space available on the apron, and the precision required for manoeuvring into the parking position due to aircraft servicing installation, passenger loading bridges, etc.
- (b) Care is required in both the design and on-site installation of the system to ensure that reflection of sunlight, or other light in the vicinity, does not degrade the clarity and conspicuity of the visual cues provided by the system.

GM1 ADR-DSN.M.760 Advanced visual docking guidance system

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GM1 ADR-DSN.M.765 Aircraft stand manoeuvring guidance lights

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GM1 ADR-DSN.M.770 Road-holding position light

Where a road intersects a taxiway where operationally required, a suitable holding position light may be located adjacent to the roadway/taxiway intersection marking 1.5 m (± 0.5 m) from one edge of the road, i.e. left or right as appropriate to the local road traffic regulations.

CHAPTER N — VISUAL AIDS FOR NAVIGATION (SIGNS)

GM1 ADR-DSN.N.775 General

- (a) Guidance on signs is contained in the ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids, Chapter 11.
- (b) Guidance on frangibility is contained in the ICAO Doc 9157, Aerodrome Design Manual, Part 6, Frangibility.
- (c) Signs may need to be orientated to improve readability.
- (d) If the runway threshold is displaced from the extremity of the runway, a sign showing the designation of the runway may be provided for aeroplanes taking off.

GM1 ADR-DSN.N.780 Mandatory instruction signs

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GM1 ADR-DSN.N.785 Information signs

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GM1 ADR-DSN.N.790 VOR aerodrome checkpoint sign

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GM1 ADR-DSN.N.795 Aircraft stand identification signs

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GM1 ADR-DSN.N.800 Road-holding position sign

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CHAPTER P – VISUAL AIDS FOR NAVIGATION (MARKERS)**GM1 ADR-DSN.P.805 General**

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GM1 ADR-DSN.P.810 Unpaved runway edge markers

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GM1 ADR-DSN.P.815 Stopway edge markers

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GM1 ADR-DSN.P.820 Edge markers for snow-covered runways

- (a) Characteristics: Runway lights could be used to indicate the limits.
- (b) Edge markers for snow-covered runways should consist of conspicuous objects such as evergreen trees about 1.5 m high, or light-weight markers.

GM1 ADR-DSN.P.825 Taxiway edge markers

- (a) At small aerodromes, taxiway edge markers may be used, in lieu of taxiway edge lights, to delineate the edges of taxiways, particularly at night (ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids, Chapter 2, par. 2.4.1).
- (b) On a straight section of a taxiway, taxiway edge markers should be spaced at uniform longitudinal intervals of not more than 60 m. On a curve the markers should be spaced at intervals less than 60 m so that a clear indication of the curve is provided. The markers should be located as near as practicable to the edges of the taxiway, or outside the edges at a distance of not more than 3 m (ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids, Chapter 2, par. 2.4.2).
- (c) The markers commonly used are cylindrical in shape. Ideally, the design of the marker should be such that when installed properly, no portion should exceed 35 cm total height above the mounting surface. However, where significant snow heights are possible, markers exceeding 35 cm in height may be used but their total height should be sufficiently low to preserve clearance for propellers, and for the engine pods of jet aircraft (ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids, Chapter 2, par. 2.4.4).
- (d) A taxiway edge marker should be lightweight and frangible. One type of marker meeting these requirements is detailed in Figure 2-10. The post is made up of flexible PVC and its colour is blue. The sleeve which is retro-reflective, is also blue. Note that the area of the marked surface is 150 cm² (ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids, Chapter 2, par. 2.4.5).

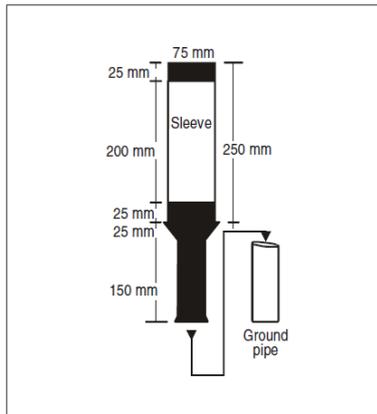


Figure GM-P-1. Taxiway edge marker

GM1 ADR-DSN.P.830 Taxiway centre line markers

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GM1 ADR-DSN.P.835 Unpaved taxiway edge markers

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CHAPTER Q – VISUAL AIDS FOR DENOTING OBSTACLES**GM1 ADR-DSN.Q.840 Objects to be marked and/or lighted**

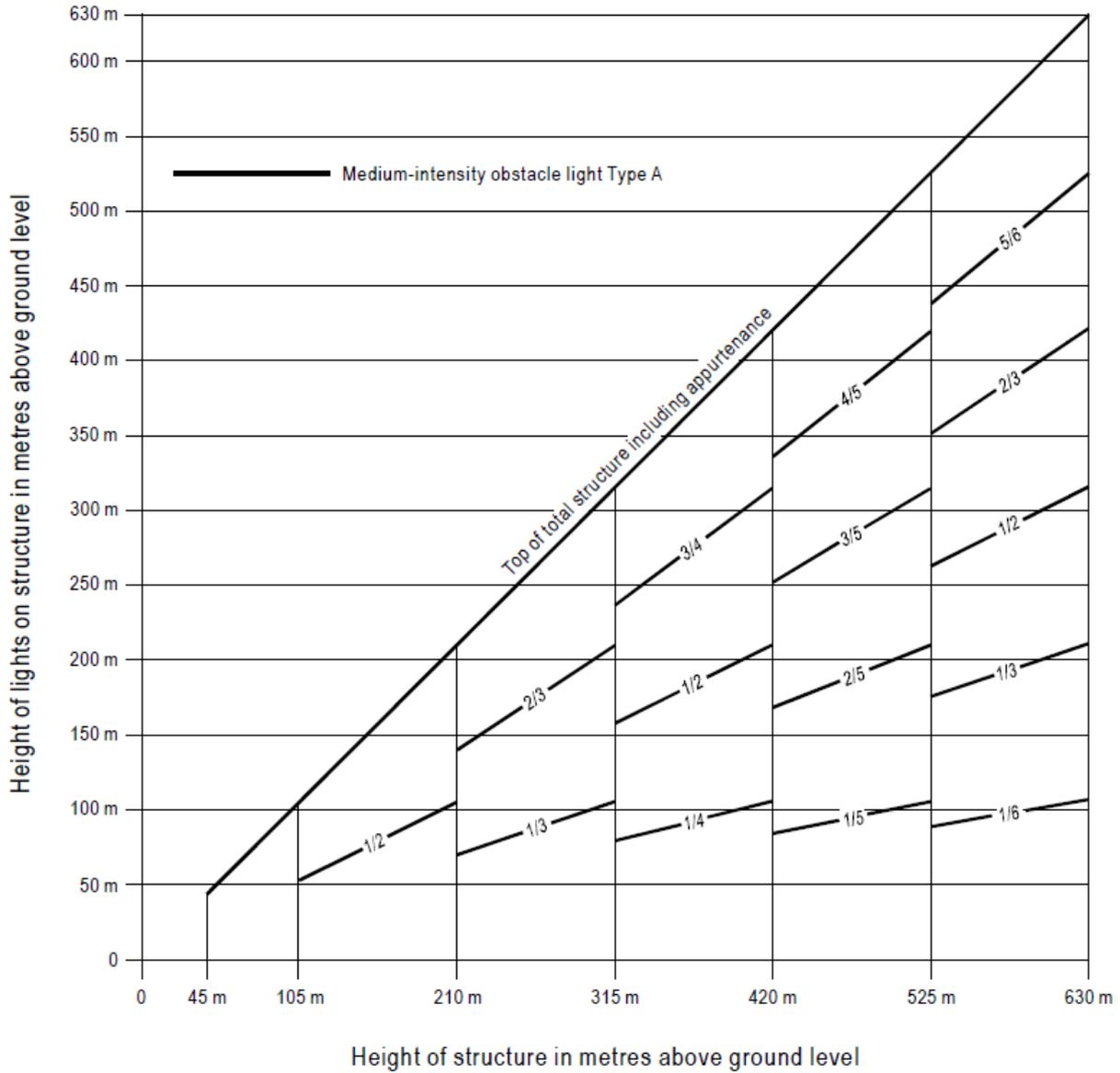
The marking and/or lighting of obstacles is intended to reduce hazards to aircraft by indicating the presence of the obstacles. It does not necessarily reduce operating limitations which may be imposed by an obstacle.

GM1 ADR-DSN.Q.845 Marking of objects

- (a) Orange and white or alternatively red and white are preferably used, except where such colours merge with the background.
- (b) Table Q-3 shows a formula for determining band widths, and for having an odd number of bands, thus permitting both the top and bottom bands to be of the darker colour.
- (c) Against some backgrounds it may be found necessary to use a different colour from orange or red to obtain sufficient contrast.
- (d) A single colour, preferably red or yellowish green for emergency vehicles and yellow for service vehicles, is generally used.
- (e) Alternative spacing may be suitable; priority is to highlight the location and definition of the object.

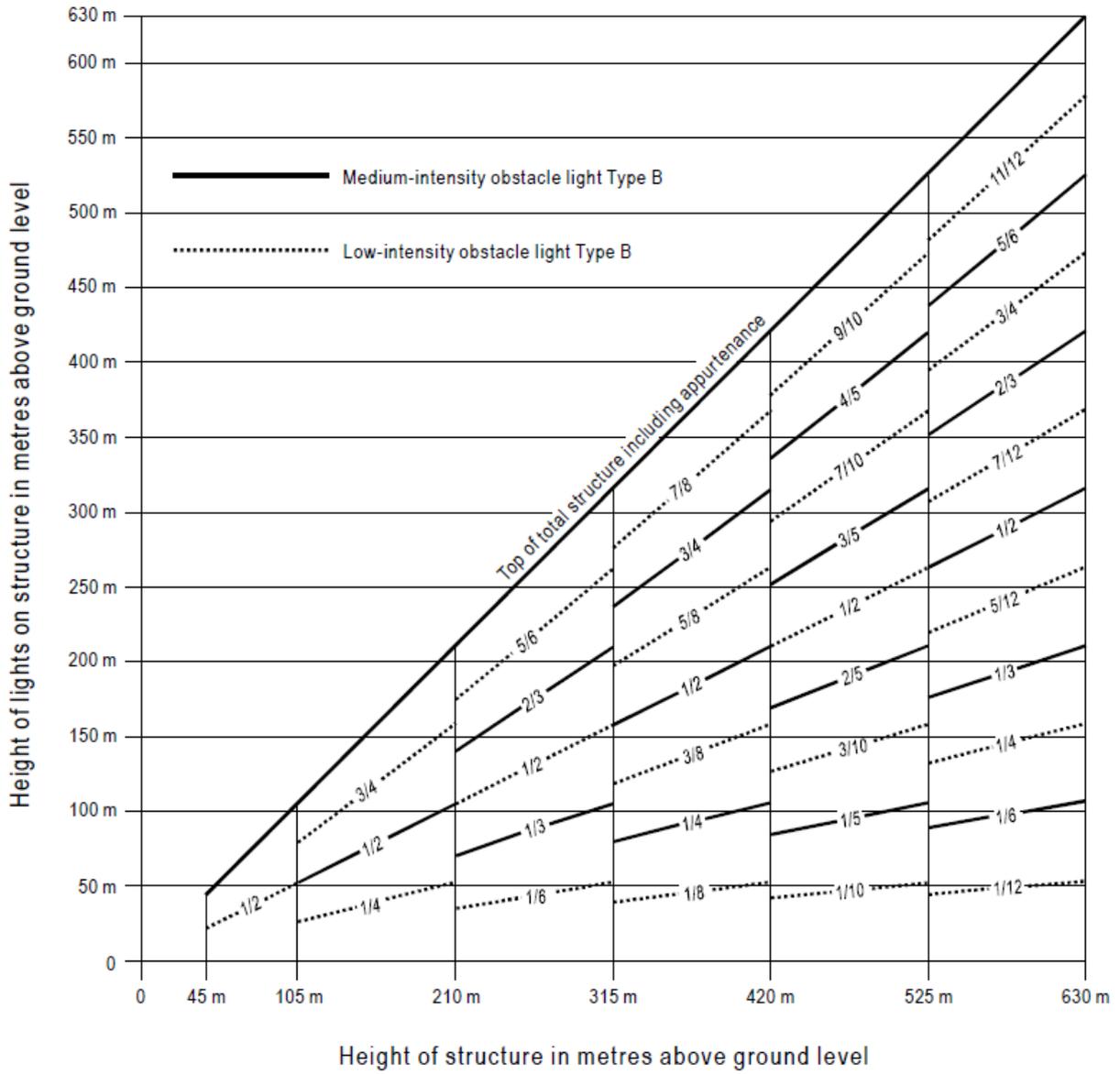
GM1 ADR-DSN.Q.850 Lighting of objects

- (a) High-intensity obstacle lights are intended for day use as well as night use. Care is needed to ensure that these lights do not create disconcerting dazzle or environmental concerns. Guidance on the design, location, and operation of high-intensity obstacle lights is given in the ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids.
- (b) Low-intensity obstacle lights may be used, Type A or B for obstacles higher than 45 m if it is determined to be sufficient.
- (c) A group of trees or buildings is regarded as an extensive object.
Note.— In some cases, this may require locating the lights off the tower.
- (d) Guidance Material on how a combination of low, medium, and/or high-intensity lights on obstacles should be displayed is given in the following Figures:



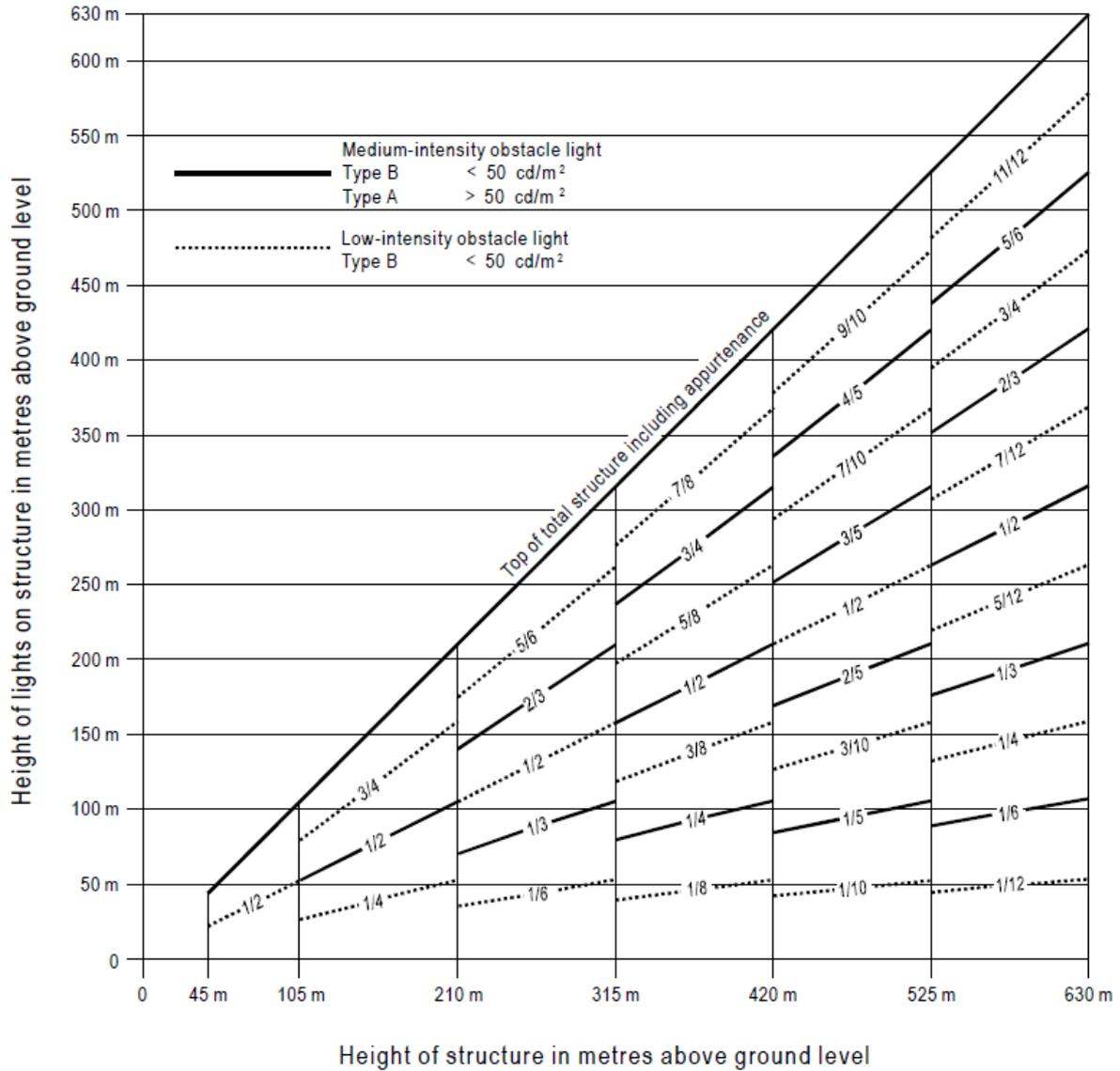
Note.— High-intensity obstacle lighting is recommended on structures with a height of more than 150 m above ground level. If medium-intensity lighting is used, marking will also be required.

Figure GM-Q-1. Medium-intensity flashing-white obstacle lighting system, Type A



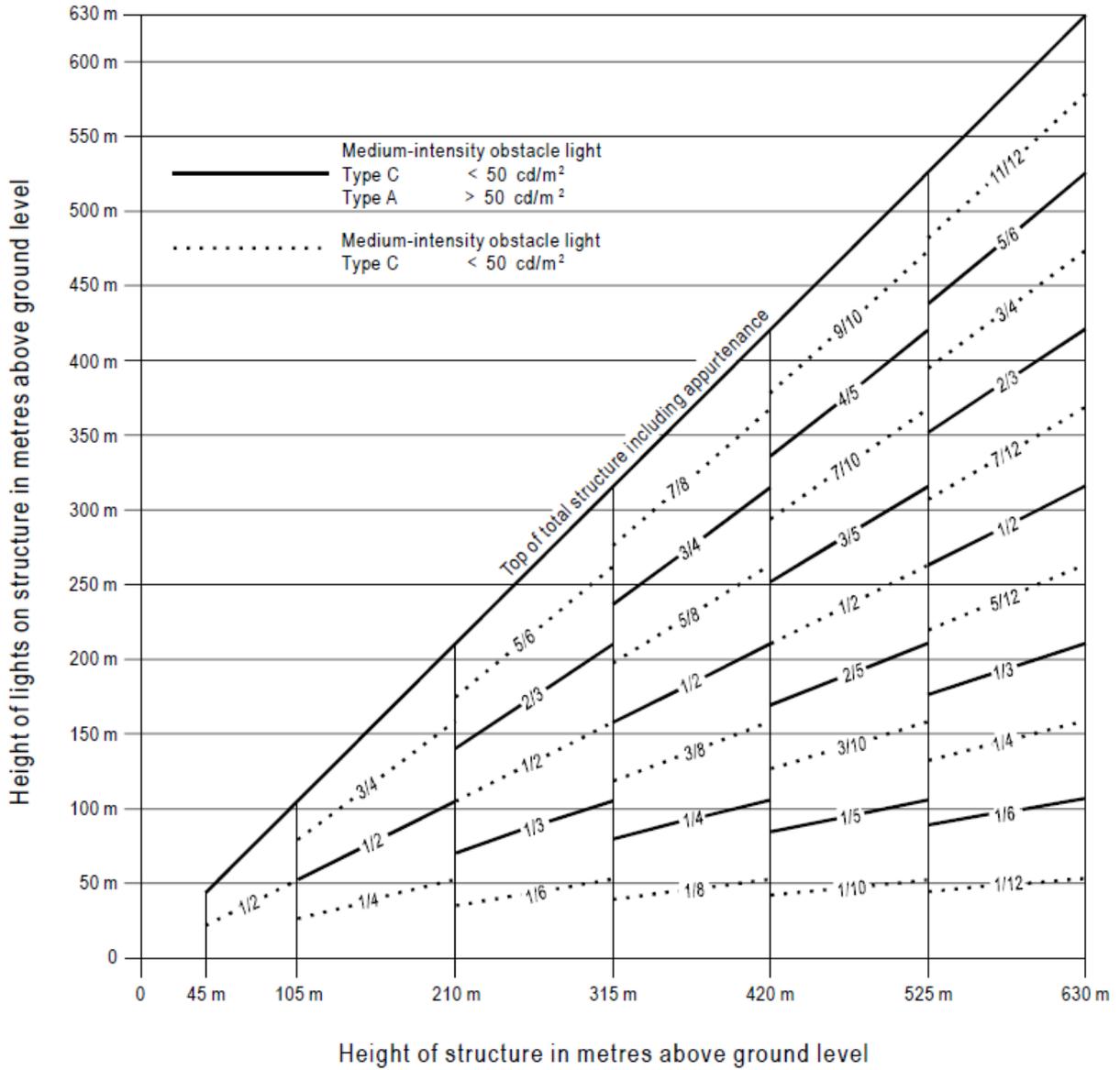
Note.— For night-time use only.

Figure GM-Q-2. Medium-intensity flashing-red obstacle lighting system, Type B



Note.— High-intensity obstacle lighting is recommended on structures with a height of more than 150 m above ground level. If medium-intensity lighting is used, marking will also be required.

Figure GM-Q-4. Medium-intensity dual obstacle lighting system, Type A/Type B



Note.— High-intensity obstacle lighting is recommended on structures with a height of more than 150 m above ground level. If medium-intensity lighting is used, marking will also be required.

Figure GM-Q-5. Medium-intensity dual obstacle lighting system, Type A/Type C

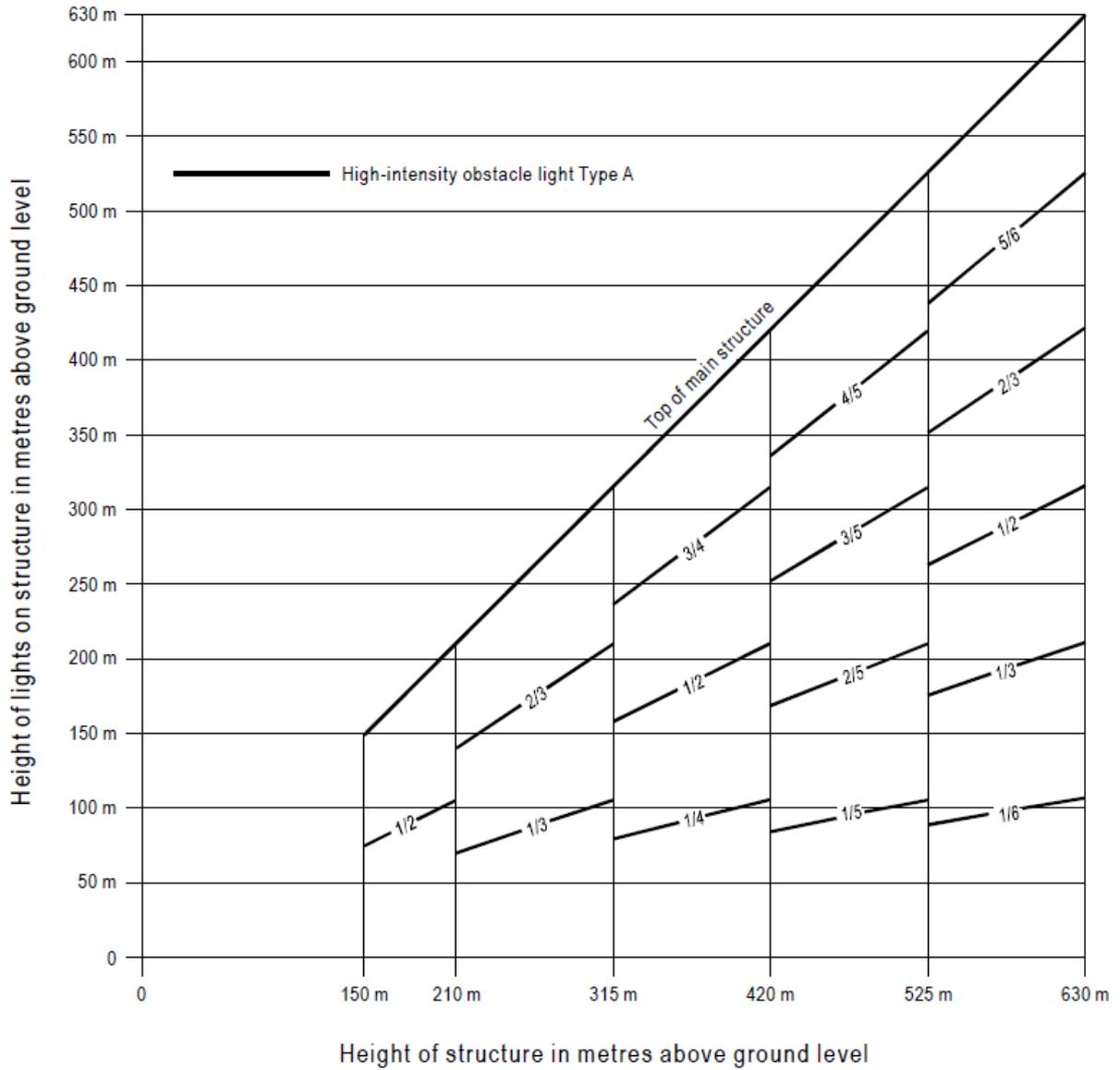


Figure GM-Q-6. High-intensity flashing-white obstacle lighting system, Type A

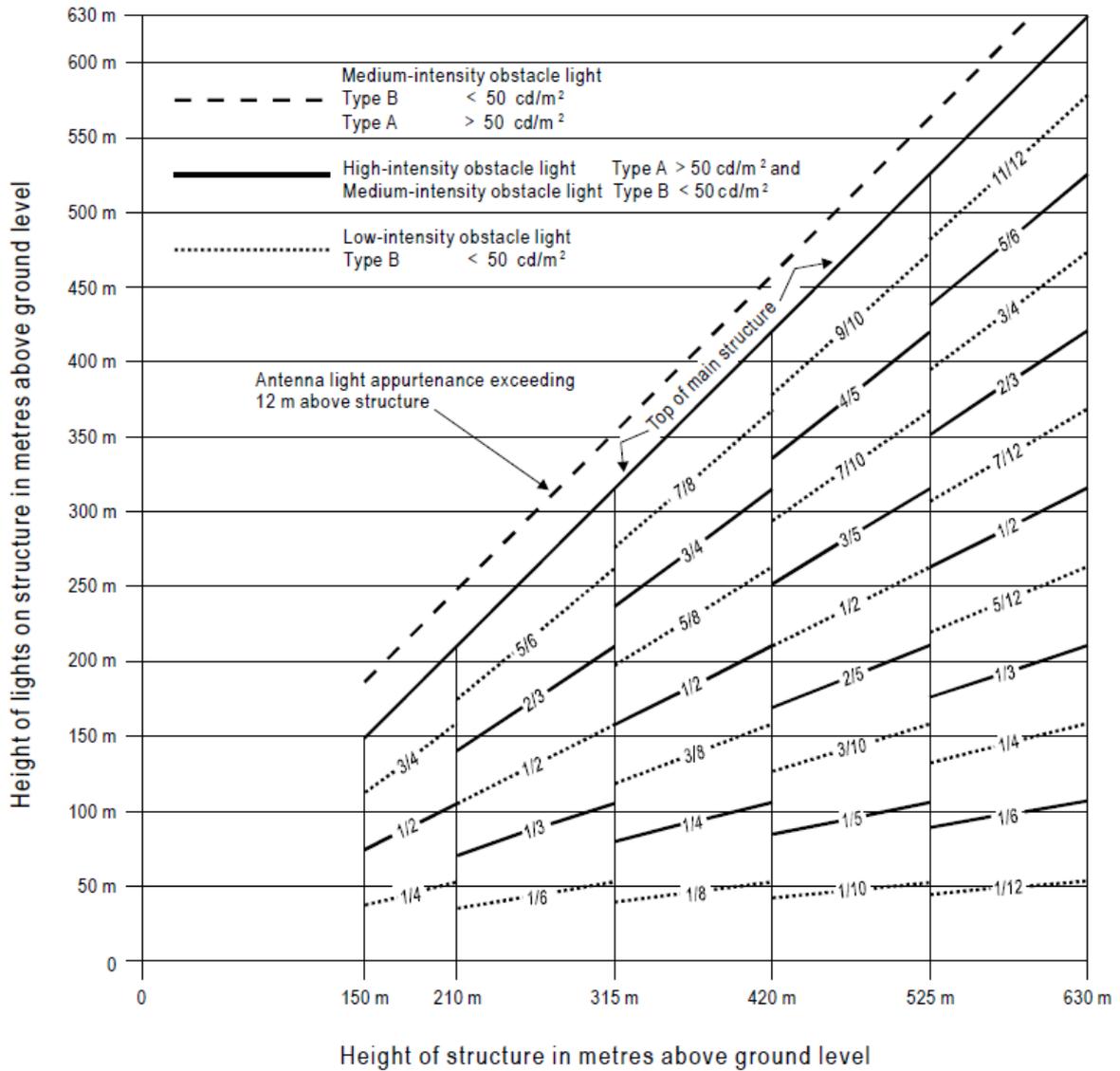


Figure GM-Q-7. High-/medium-intensity dual obstacle lighting system, Type A/Type B

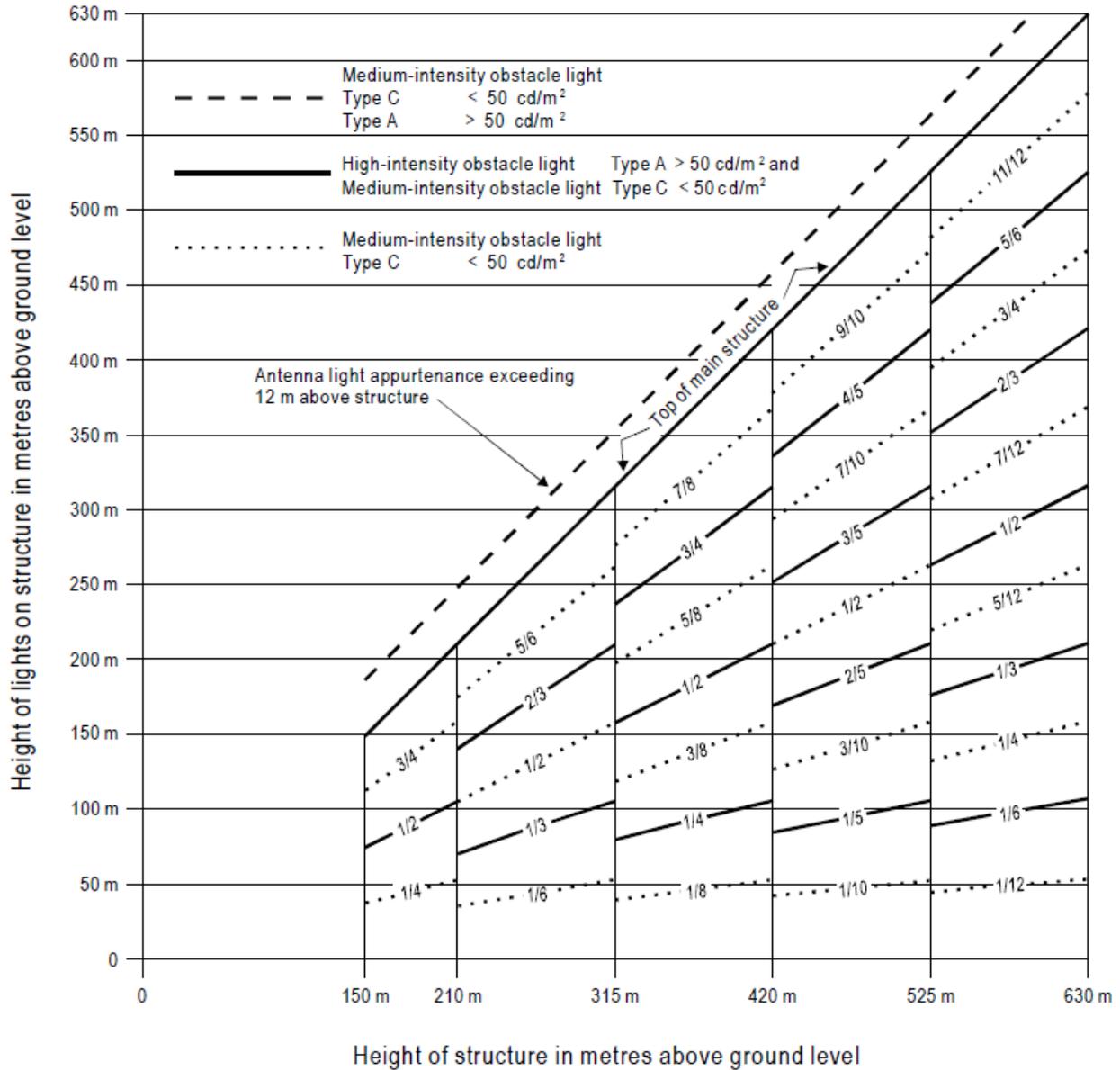


Figure GM-Q-8. High-/medium-intensity dual obstacle lighting system, Type A/Type C

In the cases as stated in CS ADR-DSN.Q.850(c)(7) and (c)(8), normally the spacing would not exceed 52 m.

CHAPTER R — VISUAL AIDS FOR DENOTING RESTRICTED USE AREAS**GM1 ADR-DSN.R.855 Closed runways and taxiways, or parts thereof**

A closed marking should be displayed on a temporarily closed runway, or taxiway, or portion thereof, except that such marking may be omitted when the closing is of short duration and adequate warning by air traffic services is provided.

GM1 ADR-DSN.R.860 Non-load-bearing surfaces

The marking characteristics of runway sides is specified in ADR-DSN.L.550.

A taxi side stripe marking could also be placed along the edge of the load-bearing pavement to emphasise the location of the taxiway edge, with the outer edge of the marking approximately on the edge of the load-bearing pavement.

At intersections of taxiways and on other areas where, due to turning, the possibility for confusion between the side stripe markings and centre line markings may exist, or where the pilot may not be sure on which side of the edge marking the non-load bearing pavement is, the additional provision of transverse stripes on the non-load bearing surface has been found to be of assistance.

As shown in Figure GM-R-1, the transverse stripes should be placed perpendicular to the side stripe marking.

On curves, a stripe should be placed at each point of tangency of the curve and at intermediate points along the curve so that the interval between stripes does not exceed 15 m. If deemed desirable to place transverse stripes on small straight sections, the spacing should not exceed 30 m.

The width of the marks should be 0.9 m, and they should extend to within 1.5 m of the outside edge of the stabilised paving or be 7.5 m long whichever is shorter. The colour of the transverse stripes should be the same as that of the edge stripes, i.e. yellow.

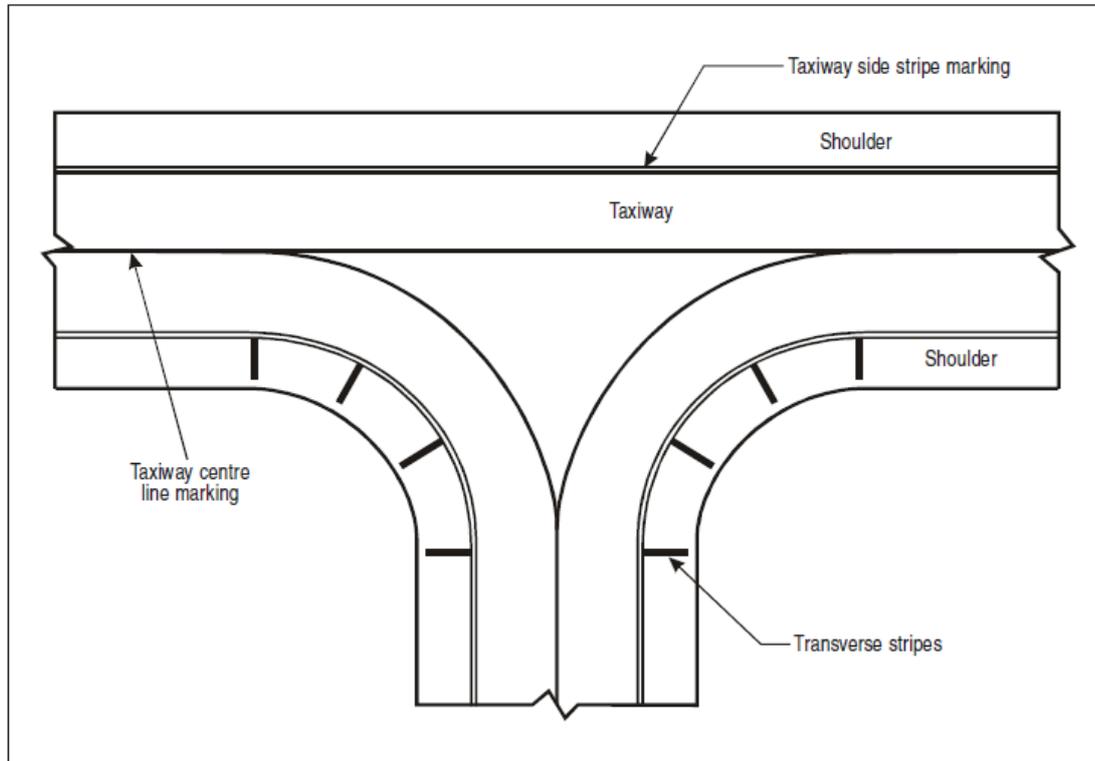


Figure GM-R-1. Marking of non-load bearing paved taxiway surface

More guidance on providing additional transverse stripes at an intersection or a small area on the apron is given in the ICAO Doc 9157, Aerodrome Design Manual, Part 4, Visual Aids).

GM1 ADR-DSN.R.865 Pre-threshold area

For pre-threshold areas shorter than 60 m, markings may be modified or reduced in size so as to present the correct picture to aircrew.

GM1 ADR-DSN.R.870 Unserviceable areas

- (a) Unserviceability markers and lights are used for such purposes as warning pilots of a hole in a taxiway, or apron pavement, or outlining a portion of pavement, such as on an apron, that is under repair. They are not suitable for use when a portion of a runway becomes unserviceable, nor on a taxiway when a major portion of the width becomes unserviceable. In such instances, the runway or taxiway is normally closed.
- (b) The spacing required for marking and lights should take into account visibility conditions, geometric configurations of the area, potential height differences of terrain so that the limits of uncervicable area is readily visible to pilot.
- (c) Where a temporarily unserviceable area exists, it may be marked with fixed-red lights. These lights mark the most potentially dangerous extremities of the area.

CHAPTER R — VISUAL AIDS FOR DENOTING RESTRICTED USE AREAS

- (d) A minimum of four such lights may be used, except where the area is triangular in shape, in which case a minimum of three lights may be used.
- (e) The number of lights may be increased when the area is large or of unusual configuration. At least one light should be installed for each 7.5 m of peripheral distance of the area.
- (f) If the lights are directional, they should be orientated so that as far as possible, their beams are aligned in the direction from which aircraft or vehicles should approach.
- (g) Where aircraft or vehicles should normally approach from several directions, consideration should be given to adding extra lights or using omnidirectional lights to show the area from these directions.
- (h) Unserviceable area lights should be frangible. Their height should be sufficiently low to preserve clearance for propellers and for engine pods of jet aircraft.

CHAPTER 5 — ELECTRICAL SYSTEMS**GM1 ADR-DSN.S.875 Electrical power supply systems for air navigation facilities**

- (a) The safety of operations at aerodromes depends on the quality of the supplied power. The total electrical power supply system may include connections to one or more external sources of electric power supply, one or more local generating facilities, and to a distribution network including transformers and switchgear. Many other aerodrome facilities supplied from the same system need to be taken into account while planning the electrical power system at aerodromes.
- (b) The design and installation of the electrical systems need to take into consideration factors that can lead to malfunction, such as electromagnetic disturbances, line losses, power quality, etc. Additional guidance is given in the ICAO Doc 9157, Aerodrome Design Manual, Part 5, Electrical Systems).
- (c) Switchover time is the time required for the actual intensity of a light measured in a given direction to fall from 50 % and recover to 50 % during a power supply changeover, when the light is being operated at intensities of 25 % or above.

GM1 ADR-DSN.S.880 Electrical power supply for visual aids

- (a) Specifications for secondary power supply for radio navigation aids and ground elements of communications systems are given in ICAO Annex 10, Volume I, Chapter 2.
- (b) Requirements for a secondary power supply should be met by either of the following:
 - (1) independent public power which is a source of power supplying the aerodrome service from a substation other than the normal substation through a transmission line following a route different from the normal power supply route and such that the possibility of a simultaneous failure of the normal and independent public power supplies is extremely remote; or
 - (2) standby power unit(s) which are engine generators, batteries, etc. from which electric power can be obtained.
- (c) Guidance on electrical systems is included in the ICAO Doc 9157, Aerodrome Design Manual, Part 5, Electrical Systems.
- (d) The requirement for minimum lighting may be met by other than electrical means.

GM1 ADR-DSN.S.885 System design

Guidance on means of providing this protection is given in the ICAO Doc 9157, Aerodrome Design Manual, Part 5, Electrical Systems.

GM1 ADR-DSN.S.890 Monitoring

Guidance on this subject and on air traffic control interface and visual aids monitoring is included in the ICAO Doc 9157, Aerodrome Design Manual, Part 5, Electrical Systems.

GM1 ADR-DSN.S.895 Serviceability levels

- (a) Serviceability levels are intended to define the maintenance performance level objectives. They are not intended to define whether the lighting system is operationally out of service.
- (b) Guidance on preventive maintenance of visual aids is given in the, ICAO Doc 9137, Airport Services Manual, Part 6, Airport Maintenance Practices.
- (c) With respect to barrettes, crossbars and runway edge lights, lights are considered to be adjacent if located consecutively and:
 - (1) laterally: in the same barrette or crossbar; or
 - (2) longitudinally: in the same row of edge lights or barrettes.
- (d) In barrettes and crossbars, guidance is not lost by having two adjacent unserviceable lights.

**CHAPTER T — AERODROME OPERATIONAL SERVICES, EQUIPMENT AND
INSTALLATION****GM1 ADR-DSN.T.900 Emergency and service access roads**

- (a) Air side service roads are installed to support all apron processes. Furthermore, service roads can be used as aerodrome perimeter service roads, providing access to navigation aids, as temporary roads for construction vehicles, etc.
- (b) Some general considerations in the planning of roads are described as follows:
- (1) Every effort should be made to plan air side service roads so that they do not cross runways and taxiways.
 - (2) The planning of the aerodrome road layout should take into account the need to provide emergency access roads for use by rescue and firefighting vehicles to various areas on the aerodrome, and, in particular, to the approach areas. Service roads to navigation aids should be planned in such a manner as to present minimal interference to the function of the aids. If it is necessary for a service road to cross an approach area, the road should be located so that vehicles travelling on it are not obstacles to aircraft operations.
 - (3) The air side service road system should be designed to account for local security measures. Access points to the system should, thus, need to be restricted. Should ground vehicle movements affect surface movement of aircraft on runways and taxiways, it should be required that the ground vehicle movements be coordinated by the appropriate aerodrome control. Control is normally exercised by means of two-way radio communication although visual signals, such as signal lamps, are adequate when traffic at the aerodrome is light. Signs or signals may also be employed to aid control at intersections.
 - (4) At intersections with runways consideration should be given to providing runway guard lights or road holding position lights as part of the aerodrome's runway incursion prevention programme. Runway guard lights should conform to the specifications provided in CS ADR-DSN.M.745.
 - (5) Roads should be designed and constructed to prevent FOD transfer to the runway and taxiways.
 - (6) Roads within 90 m of a runway generally should be surfaced to prevent surface erosion, and the transfer of debris to the runway and taxiways.
 - (7) To facilitate the control and maintenance of the fencing, a perimeter service road should be constructed inside the aerodrome fencing.
 - (8) Perimeter service road is also used by security patrols.
 - (9) Where a fence is provided, the need for convenient access to outside areas should be taken into account. These access points should be of a suitable size to accommodate the passage of the largest RFFS vehicle in the aerodrome's fleet.
 - (10) When greater security is thought necessary, a cleared area should be provided on both sides of the fence or barrier to facilitate the work of patrols, and to make trespassing more difficult.
 - (11) Special measures should be required to prevent the access of an unauthorised person to runways or taxiways which overpass public roads.

CS ADR DSN — BOOK 2

CHAPTER T — AERODROME OPERATIONAL SERVICES, EQUIPMENT AND INSTALLATION

- (c) Emergency access roads should be considered on an aerodrome so as to facilitate achieving minimum response times for RFF vehicles.
- (d) Particular attention should be given to the provision of ready access to approach areas up to 1 000 m from the threshold, or at least within the aerodrome boundary.
- (e) Emergency access roads are not intended for use for the functions of aerodrome service roads. Therefore, it is possible to provide different access control which should be clearly visible for all service ground traffic. Road holding position markings, lights, or runway guard lights are not necessary if the access to an emergency access road is ensured for RFF only.
- (f) Aerodrome service roads may serve as emergency access roads when they are suitably located and constructed.
- (g) Emergency access roads should be capable of supporting the heaviest vehicles which should use them, and be usable in all weather conditions. Roads within 90 m of a runway should be surfaced to prevent surface erosion and the transfer of debris to the runway. Sufficient vertical clearance should be provided from overhead obstructions for the largest vehicles.
- (h) When the surface of the road is indistinguishable from the surrounding area, or in areas where snow may obscure the location of the roads, edge markers should be placed at intervals of about 10 m.

GM1 ADR-DSN.T.905 Fire stations

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GM1 ADR-DSN.T.910 Equipment frangibility requirements

- (a) Equipment and supports required to be frangible should be designed and constructed so that they should break, distort, or yield in the event that they are accidentally impacted by an aircraft. The design materials selected should preclude any tendency for the components, including the electrical conductors, etc., to 'wrap around' the colliding aircraft or any part of it.
- (b) Guidance on design for frangibility is contained in the ICAO Doc 9157, Aerodrome Design Manual, Part 6, Frangibility).

GM1 ADR-DSN.T.915 Siting of equipment and installations on operational areas

- (a) The design of light fixtures and their supporting structures, light units of visual approach slope indicators, signs and markers is specified in CS ADR-DSN.M.615, CS ADR-DSN.M.640, CS ADR-DSN.N.775, and Book 1 Chapter P respectively.
- (b) Guidance on siting of equipment and installations on operational areas is given in ICAO Doc 9157, Aerodrome Design Manuals, Part 2, Taxiways, Aprons and Holding Bays and Part 6, Frangibility).
- (c) Guidance on the frangible design of visual and non-visual aids for navigation is given in the ICAO doc 9157, Aerodrome Design Manual, Part 6, Electrical Systems).

CS ADR DSN — BOOK 2

CHAPTER T — AERODROME OPERATIONAL SERVICES, EQUIPMENT AND
INSTALLATION

- (d) Requirements for obstacle limitation surfaces are specified in Book 1, Chapter J.

GM1 ADR-DSN.T.920 Fencing

- (a) The fence or barrier should be located so as to separate the movement area and other facilities or zones on the aerodrome vital to the safe operation of aircraft from areas open to public access.
- (b) When greater security is thought necessary, a cleared area should be provided on both sides of the fence or barrier to facilitate the work of patrols, and to make trespassing more difficult. Consideration should be given to the provision of a perimeter road inside the aerodrome fencing for the use of both maintenance personnel and security patrols.
- (c) Special measures may be required to prevent the access of an unauthorised person to runways or taxiways which overpass public roads.
- (d) A fence or other barrier provided for the protection of civil aviation and its facilities may be illuminated at a minimum essential level.
- (e) Consideration should be given to locating security lights so that the ground area on both sides of the fence or barrier, particularly at access points, is illuminated.
- (f) Fencing can vary in design, height, and type depending on local needs. Generally, it is recommended that the fencing be galvanized steel, chain link fabric installed to a height of 2,5 m, and topped with a three-strand barbed wire overhang. The latter should have a minimum 15 cm separation between strands and extend outward at 45-degree angle from the horizontal. Fence posts should be installed at no greater than 3 m intervals and be located within 5 cm of any wall or structure forming part of the perimeter. Gates should be constructed with material of comparable strength and durability, and open to an angle of at least 90 degrees. Hinges should be such as to preclude unauthorised removal.
- (g) Top and bottom selvages of the fence having a twisted and barbed finish. The bottom of the fence installed to within 5 cm of hard surfacing or stabilised soil. However, in areas where unstable soil conditions are prevalent, the fabric installed to extend at least 5 cm below the surface or imbedded in concrete curbing. All fencing should be grounded. Care should be taken that metallic fencing is not installed when it should interface with the operation of navigation aids. The fence itself is low maintenance, provides clear visibility.
- (h) The number of gates should be limited to the minimum required for the safe and efficient operation of the facility. Access points should need to be made in the fence to allow the passage of authorised vehicles and persons. While the number of access points should be kept to a minimum, adequate access points should be planned for routine operations, maintenance and emergency operations.

**CHAPTER U — COLOURS FOR AERONAUTICAL GROUND LIGHTS, MARKINGS, SIGNS
AND PANELS (APPENDIX 1)****GM1 ADR-DSN.U.925 General**

It is not possible to establish specifications for colours such that there is no possibility of confusion. For reasonably certain recognition, it is important that the eye illumination be well above the threshold of perception, that the colour not be greatly modified by selective atmospheric attenuations and that the observer's colour vision be adequate. There is also a risk of confusion of colour at an extremely high level of eye illumination such as may be obtained from a high-intensity source at very close range. Experience indicates that satisfactory recognition can be achieved if due attention is given to these factors.

GM1 ADR-DSN.U.930 Colours for aeronautical ground lights

Where dimming is not required, or where observers with defective colour vision should be able to determine the colour of the light, green signals should be within the following boundaries:

- (1) Yellow boundary $y = 0.726 - 0.726x$
- (2) White boundary $x = 0.650y$
- (3) Blue boundary $y = 0.390 - 0.171x$

GM1 ADR-DSN.U.935 Colours for markings, signs and panels

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GM1 ADR-DSN.U.940 Aeronautical ground light characteristics

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