



Notice of Proposed Amendment 2018-06(D)

All-weather operations

RMT.0379

EXECUTIVE SUMMARY

The objective of rulemaking task (RMT).0379 is to modernise the European Union (EU) aviation regulatory framework applicable to all-weather operations (AWOs) so it ensures the highest level of safety while enabling efficiency gains based on the latest technological advancements. It addresses in a coordinated manner all relevant disciplines: initial airworthiness, air operations, flight crew licensing and aerodromes. It proposes performance- and risk-based approach, as much as feasible, considering also the appropriate balance between performance-based and prescriptive principles (depending on the type of air operations (CAT, NCC, NCO, and SPO)).

This NPA proposes to update the AWO-relevant rules in many aviation domains such as airworthiness (CS-AWO), air operations (Commission Regulation (EU) No 965/2012), aircrew (Commission Regulation (EU) No 1178/2011) and aerodromes (Commission Regulation (EU) No 139/2014, including CS-ADR.DSN). The main aim has been to allow for a better integration of the regulatory requirements related to the operational use of new, advanced technology — either developed already or to be developed in the future — such as, for example, enhanced flight vision system (EFVS), as well as the application of some advanced new operational procedures, which may support AWOs.

Significant focus has been invested in developing resilient rules, which are not technology-dependent. A particular attention was paid to the development of requirements enabling the use of EFVS to the maximum extent possible (e.g. use of EFVS for landing). A new concept of ‘light operational credits’ for EFVS 200 operations, not requiring the use of specific low-visibility procedures (LVPs), has also been introduced.

The proposed changes are expected to maintain safety, reduce the regulatory burden, increase cost-effectiveness, improve harmonisation (e.g. with the Federal Aviation Administration (FAA)), and achieve as much as feasible alignment with the Standards and Recommended Practices (SARPs) of the International Civil Aviation Organization (ICAO).

NPA 2018-06 is divided in four parts. The present sub-NPA(D) includes:

- the procedural information pertaining to the regulatory proposal; and
- the proposed amendments to aerodromes including CS-ADR.DSN).

The other sub-NPAs are organised as follows:

- sub-NPA(A) – procedural information pertaining to the regulatory proposal; presentation of the issue under discussion; impact assessment as well as the hazard identification and risk assessment; and proposed actions to support implementation;
- sub-NPA(B) – initial airworthiness (CS-AWO); and
- sub-NPA(C) – air operations and aircrew.

Action area:	Airlines, air operators other than airlines		
Affected rules:	AMC/GM to the Air OPS Regulation (Commission Regulation (EU) No 965/2012); AMC/GM to the Aircrew Regulation (Commission Regulation (EU) No 1178/2011); AMC/GM to the aerodromes rules (Commission Regulation (EU) No 139/2014, including CS-ADR.DSN); and CS-AWO		
Affected stakeholders:	Manufacturers, maintenance organisations (MOs), air operators, approved training organisations (ATOs), aerodrome operators, ATM/ANS; Member States		
Driver:	Level playing field	Rulemaking group:	No
Impact assessment:	Light	Rulemaking Procedure:	Standard

• EASA rulemaking process milestones

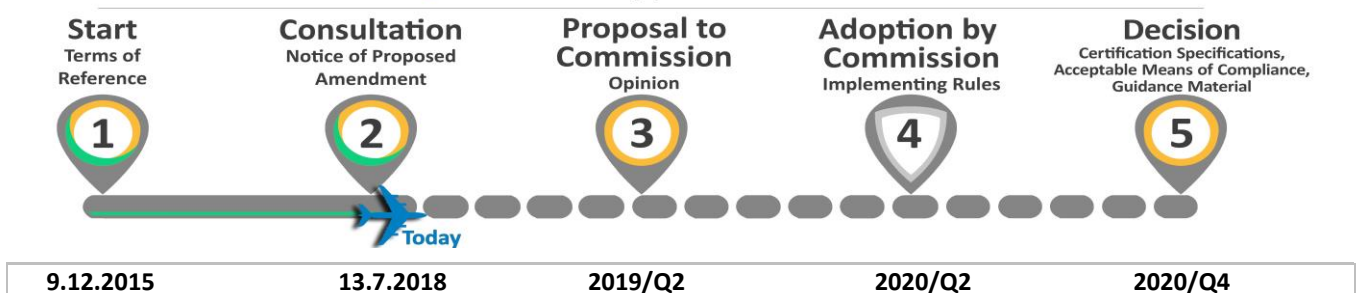


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1. About this NPA

1.1. How this NPA was developed

The European Aviation Safety Agency (EASA) developed this NPA in line with Regulation (EC) No 216/2008¹ (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure². This rulemaking activity is included in the EASA 5-year Rulemaking Programme³ under RMT.0379.

RMT.0379 was initiated with the publication of the related Terms of Reference (ToR) and Concept Paper RMT.0379 Issue 1⁴ on 9 December 2015. For the development of the implementing rules (IRs), the accelerated procedure⁵ is applied; for the development of the acceptable means of compliance (AMC), guidance material (GM) and certification specifications (CSs), the standard rulemaking procedure is followed. As part of the accelerated procedure, EASA has already consulted its Advisory Bodies (ABs) on the regulatory impact assessment (RIA)⁶ and the description of operations (DoOs). In the context of the second consultation phase (focused consultation), EASA consulted on the proposed amendments to the IRs only. In addition, EASA provided responses to the comments received during the AB consultation and presented the subsequent amendments to the RIA and the DoOs.

The text of this NPA has been developed by EASA based on the input of the Experts' Task Force Groups (air operations, airworthiness, and aerodromes). It is hereby submitted to all interested parties⁷ for consultation.

1.2. How to comment on this NPA

Please submit your comments using the automated **Comment-Response Tool (CRT)** available at <http://hub.easa.europa.eu/crt/>⁸.

The deadline for submission of comments is **15 October 2018**.

1.3. The next steps

Following the closing of the public commenting period, EASA will review all comments.

Based on the comments received EASA will:

- update the proposed text of the affected CSs/AMC & GM; and

¹ Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.3.2008, p. 1) (<http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1467719701894&uri=CELEX:32008R0216>).

² EASA is bound to follow a structured rulemaking process as required by Article 52(1) of Regulation (EC) No 216/2008. Such a process has been adopted by the EASA Management Board (MB) and is referred to as the 'Rulemaking Procedure'. See MB Decision No 18-2015 of 15 December 2015 replacing Decision 01/2012 concerning the procedure to be applied by EASA for the issuing of opinions, certification specifications and guidance material (<http://www.easa.europa.eu/the-agency/management-board/decisions/easa-mb-decision-18-2015-rulemaking-procedure>).

³ <http://easa.europa.eu/rulemaking/annual-programme-and-planning.php>

⁴ <https://www.easa.europa.eu/system/files/dfu/ToR%20and%20Concept%20Paper%20RMT.0379%20Issue%201.pdf>

⁵ In accordance with Article 16 of MB Decision No 18-2015.

⁶ The RIA for the entire NPA is presented in Sub-NPA (A), Chapter 3.

⁷ In accordance with Article 52 of Regulation (EC) No 216/2008 and Articles 6(3) and 7) of the Rulemaking Procedure.

⁸ In case of technical problems, please contact the CRT webmaster (crt@easa.europa.eu).

- issue an opinion (developed on the basis of the focused consultation and taking into account the comments received to the AWO NPA) containing the proposed amendments to Regulations (EU) Nos 965/2012, 1178/2011 and 139/2014; the opinion will be submitted to the European Commission, which will use it as a technical basis in order to prepare an EU regulation; and
- for sub-NPA(B) issue a decision containing CS-AWO to which the related comment-response document (CRD) will be annexed.

Following the adoption of the regulation, EASA will issue the associated decisions containing the related AMC & GM.

The comments received and the EASA responses for sub-NPAs (A), (C) and (D) will be reflected in CRDs. The CRDs will be annexed to the opinion



2. Proposed amendments and rationale in detail

This chapter provides the explanatory note for the proposed amendments to the AWO-related regulatory material presented in Chapter 8 of this NPA.

Note: The regulatory material at IR level presented in Chapter 8 of this NPA is not intended to be again subject to the formal public consultation of this NPA, as the consultation should be focused on the relevant AWO-related soft law changes (AMC/GM and CS). Nevertheless, should it be deemed necessary, commenters may also communicate issues related to the IRs.

2.1. Proposed changes to AMC/GM to Regulation (EU) No 139/2014 — presented together with the proposed amendments to the IRs — and proposed changes to CSs (CS-ADR-DSN) with related GM (Draft EASA decisions)

2.1.1. Annex I ‘Definitions’

New terms

‘decision altitude (DA) or decision height (DH): this term is added for clarity. The term is identical to the definition included in ICAO Annex 6, Part I.

‘low-visibility operations (LVOs)’: this term is added for consistency. It has been developed through RMT.0379. The term is currently not defined by ICAO.

‘operation with operational credits’: the term is added for consistency. The term is the same as the one proposed in the Air OPS Regulation.

Terms amended

‘low-visibility procedures (LVPs)’: the term is amended to align it with the term ‘low-visibility operations’. Furthermore, the use of the term ‘operations’ refers mainly to aircraft, while ‘procedures’ are meant for aerodromes and ATS.

‘low-visibility take-off (LVTO)’: this term is aligned with the term ‘LVO’. Furthermore, the definition does not anymore contain a lower limit of 75 m to enable operations with lower-visibility minima.

Terms deleted

‘lower-than-standard category I operation’: the term is not used anymore in the IR.

‘other-than-standard category II operation’: the term is not used anymore in the IR.

2.1.2. Annex II (Part-ADR.AR)

There are no amendments proposed to the requirements of Part-ADR.AR since the certification and oversight process of an aerodrome and an aerodrome operator remain unchanged.

GM1 ADR.AR.C.035(e) ‘Issuance of certificates’ — MODEL FOR THE TERMS OF THE CERTIFICATE TO BE ATTACHED TO THE CERTIFICATES: The GM is amended to include approach operations with EFVS and SA CAT I approach operations under the type of approaches in the terms of the certificate.

2.1.3. Annex III (Part-ADR.OR)

There are no amendments proposed to the requirements of Part-ADR.OR.

2.1.4. Annex IV (Part-ADR.OPS)

ADR.OPS.A.005 'Aerodrome data'

There are no amendments proposed to the requirements.

AMC/GM to ADR.OPS.A.005 'Aerodrome data'

AMC1 ADR.OPS.A.005 'Aerodrome data': Points (a)(12), (a)(13) and (a)(14) are added. Point (a)(12) is added because EVS technology relies on the infrared heat signature provided by incandescent lights and their replacement with LED currently makes these systems unusable. Point (a)(13) refers to the provision of approach and departure procedures charts. Point (a)(14) refers to the provision of information concerning the non-visual aids (radio or space-based) available to support instrument approach operation. In point (e), category II and III operations have been replaced with operations with a DH of less than 200 ft, in order to include SA CAT I approach operations, where the survey of the pre-threshold area is required. Furthermore, the publication of a precision approach terrain chart is required when electronic terrain and obstacle data are not available, in line with ICAO Annex 15.

ADR.OPS.B.030 'Surface movement guidance and control system'

The current rule text requires the aerodrome operator to ensure that a 'surface movement guidance and control system' (SMGCS) is provided at the aerodrome; the SMGCS ensures the safe manoeuvring of aircraft on the movement area, especially when visibility is limited. The current IR is replaced with new text which specifies the parameters that need to be considered for the design and operation of an SMGCS such as the aerodrome design characteristics, the operational and meteorological conditions at the aerodrome, as well as human factor principles related mainly to flight crew and vehicle drivers; additionally, considering also the ICAO Annex 14 SARPs in Chapter 9.8, the SMGCS shall assist in the prevention of runway incursions and collision between aircraft, as well as collision between aircraft and vehicles and other objects. Furthermore, the IR requires the use of appropriate technical means and procedures for the development of the SMGCS; the associated procedures have to be established in coordination with ATS to ensure the optimum utilisation of the system.

AMC/GM to ADR.OPS.B.030 'Surface movement guidance and control system'

AMC1 ADR.OPS.B.030(b) 'Parameters to be considered for the development of a surface movement guidance and control system': The AMC refers to the design of a surface movement guidance and control system. The first sentence of point (a) is adjusted accordingly.

AMC2 ADR.OPS.B.030(b) 'Use of visual aids for surface movement guidance and control': A subtitle is added to the AMC to provide more clarity. Point (b) is transferred to the corresponding IR, because it is essential that aerodrome operator cooperates for the development of surface movement guidance and control procedures with the air traffic services provider, the latter being one of the main users of the system.

AMC3 ADR.OPS.B.030(b) 'Use of surface movement radar and other surveillance equipment': ICAO Annex 14 Recommendations 9.8.7 and 9.8.8 are transferred from GM1 ADR.OPS.B.030 to this new



AMC. When the RVR falls below 350 m, air traffic services may have difficulties to maintain visual contact with the manoeuvring area or some of its parts. For this reason, the use of a surface movement radar is an acceptable way to maintain operations. Furthermore, a surface movement radar could also be used when there is a need to maintain the regularity of traffic flow when the traffic density is high and there are not alternative procedures and facilities.

An advanced surface movement guidance and control system (A-SMGCS) is another way to survey movements of aircraft and vehicles on the manoeuvring area and to optimise traffic flow; however, EASA is awaiting ICAO SARPS as well as European initiatives such as SESAR, in order to include it in the AMC.

GM1 ADR.OPS.B.030 'Surface movement guidance and control system' — General: Point (b) and (c) have been transferred to the new AMC3 ADR.OPS.B.030.

ADR.OPS.B.045 'Low-visibility operations'

As a general rule, and in accordance with ICAO Doc 4444 'Procedures for Air Navigation Services — Air Traffic Management', any operation with an RVR less than 550 m requires LVPs. The revised IR specifies the cases where LVPs are required and extends this requirement to operations with operational credits, where the actual RVR is less than 550 m; the timely application of LVPs is very important for the safety of operations and to avoid unnecessary aircraft diversions and delays. For this reason, the IR requires the aerodrome operator to establish criteria for the preparation, initiation and termination of LVPs. Furthermore, considering the fact that unavailability of aerodrome facilities may have an impact on the operation of aircraft, the IR is revised to require the aerodrome operator to provide this information to the aeronautical information services (AIS) and/or ATS as appropriate; point (d) is revised to require that changes to LVPs require also prior approval by the competent authority.

AMC/GM to ADR.OPS.B.045 'Low-visibility operations'

AMC1 ADR.OPS.B.045 'Low-visibility operations': In point (a), the reference to lower-than-standard category I, other-than-standard category II, category II and III approaches and low-visibility take-offs have been deleted, because they are conducted in RVR conditions less than 550 m and are covered by the definition of 'low-visibility operations'. Point (b) is deleted because it is covered by AMC1 ADR.OPS.A.015. In the existing point (c), a new point (8) is added for the establishment of low-visibility taxi routes. When LVPs are in force, the establishment of specific taxi routes to ensure segregation of traffic is considered appropriate.

GM1 ADR OPS.B.045(a) 'Low-visibility operations' — Visibility conditions

The GM provides information concerning different visibility conditions (e.g. visibility condition 1, visibility condition 2, etc.) and the associated actions required.

AMC1 ADR OPS.B.045(b) 'Low-visibility operations' — Criteria for low-visibility procedures

The extent of the LVPs depends largely on the local conditions. The AMC lists the most important elements (aerodrome layout and its complexity, location of the control tower, and facilities available) that need to be considered when developing LVPs.

AMC1 ADR.OPS.B.045(c) 'Low-visibility operations' — Equipment failures and expected effects on flight operations'

The obligation pertaining to which equipment failures should be reported is stipulated; the availability of certain ground infrastructure is essential to take full benefit of lowest minima; however, failures could occur that may lead to some restrictions in the operations. In the majority of the cases, the restrictions are imposed by the air operators themselves, based on their operational rules. The tables provide information concerning the effects that the most common failures have in the operations.

2.1.5. CS-ADR-DSN and associated GM

CS ADR-DSN.B.205 'Radio altimeter operating area'

Longitudinal slope changes have not been included in the CSs. The new point (d) is added to ensure alignment with ICAO Annex 14 Rec 3.8.4

GM to CS ADR-DSN.B.205 'Radio altimeter operating area'

GM1 ADR-DSN.B.205 'Radio altimeter operating area': In point (a), the part of the sentence *'..except that, when special circumstances so warrant'* is deleted because they cannot be specified. The GM provides information concerning the purpose of the radio altimeter operating area. Although the existence of such area is desirable, it is acknowledged that many aerodromes due to geographical and topographical restrictions are not able to establish such area. The publication of a precision approach terrain chart, or the availability of terrain and obstacle data, especially for category II and III PA runways allows the aircraft operators to evaluate the suitability of the area, therefore point (b) is deleted. Following the deletion of the existing point (b) and the subsequent renumbering of the points of this GM, a new point (c) is inserted, that further clarifies the fact that the radio altimeter operating area is desired on PA category I runway intended to be used for SA CAT I approach operations. This is because currently a DH of 150 ft can only be established by means of a radio altimeter.

CS ADR-DSN.H.445 'Obstacle Free Zone (OFZ)'

'Category I, II and III approach operations' are replaced with 'Type B approach operations'.

CS ADR-DSN.J.480 'Precision approach runways'

The current provisions require the establishment of an obstacle free zone (OFZ) for PA category II and III runways. For PA category I runways that support SA CAT I approach operations, the establishment of the OFZ is necessary, in order to achieve a DH of 150 ft. For this reason, points (a) and (b) have been revised and reference is made to the DH, instead of the category of operation.

CS ADR-DSN.S.880 'Electrical power supply systems for visual aids requirements'

The title of the CS is proposed to be changed because it now includes power supply systems requirements for radio navigation aids as well. In point (d), a new point (7) is added to include the radio navigation aids. In Table S-1, secondary power supply requirements have been added for PA category I runways intended to be used for SA CAT I approach operations. The values selected for the switch-over time for the common elements between PA category I and category II/III runways are the most demanding between the two categories considering that a DH of 150 ft is in the region of CAT II approach operations. In the same table, when the runway is used by aeroplanes utilising EFVS, the

maximum switch-over time for runway edge, threshold and end lights is set to 1 sec, since the operation of this equipment is dependent largely on the visual aids.

A new point (e) and Table S-2 are added for maximum switch-over time for different types of radio navigation aids. The values are based on ICAO Annex 10 and pertain to the most commonly used radio navigation aids. EASA will populate the table when more information is available.

CS ADR-DSN.S.895 'Serviceability levels'

A new point (g) is introduced referring specifically to category I runways intended to be used for SA CAT I approach operations. The proposal is considering the fact that at the DH of 150 ft the requirements should be at least equal with the requirements for category II approach operations, to ensure that the pilot is provided with adequate guidance. Therefore it is proposed to use the stricter requirements for each element that is common between category I and category II/III PA runways.

CS ADR-DSN.S.925 'Radio navigation aids'

EASA is introducing CSs for radio navigation aids, having in mind that any instrument approach operation on a runway depends not only on the runway physical characteristics and available visual aids, but also on the available radio navigation aids. EASA acknowledges the fact that in certain cases the installation and maintenance of the aids may be conducted by another organisation different from the aerodrome operator; however, the aerodrome operator being the certificate holder of the aerodrome has to ensure their existence and proper maintenance. Concerning radio navigation aids to support PA operations, EASA has decided, instead of listing all the available radio navigation aids, to refer to the ILS which has been a well-proved technology since many years. Any other radio navigation aid should meet as a minimum the performance of the corresponding ILS.

GM to CS ADR-DSN.S.925 'Radio navigation aids'

GM1 CS ADR-DSN.S.925 'ILS classification'

The GM directs towards to ICAO Annex 10 concerning the classification of ILS.

GM2 CS ADR-DSN.S.925 'Specification for ILS'

The GM directs towards to ICAO Annex 10 concerning the specifications of ILS.

CS ADR-DSN.S.930 'Meteorological equipment' — Runway visual range

EASA is introducing CSs for meteorological equipment considering the fact that this equipment in many cases is required to support specific types of operation. The proposed CSs are focusing only on the technical aspects and are consider important elements for the certification of the aerodrome. For the time being, EASA introduces specifications for equipment measuring the RVR. The aerodrome operator, being the certificate holder, is responsible to ensure the installation, proper maintenance and operation of the meteorological equipment.

3. Proposed draft changes to the AWO-related soft law

The main objective of this NPA is to present the newly developed proposals for changes of soft law regulatory material relevant for the AWO content.

For completeness purposes and in order to facilitate the review of the text, a consolidated regulatory text, as applicable, is provided, presenting both the 'hard' and the 'soft' law elements.

Note: In cases where both the hard law and the soft law are affected by the intended change, both are presented; if only either the relevant hard law' or soft law is affected by the intended change, only the proposed change is presented with the note, indicating specifically the intended change (e.g. no changes to the relevant hard law).

The following convention has been applied when drafting the proposed amendments of the regulatory text presented in this Chapter. The text of the amendment is arranged to show deleted text, new or amended text, and unchanged text, as shown below:

- deleted text is marked with ~~strike through~~;
- new or amended text is highlighted in grey;
- an ellipsis '[...]' indicates that the remaining the text is unchanged in front of or following the reflected amendment; and
- the unchanged text is presented in a typical way as non-highlighted or with ~~strike through~~ (when it is found beneficial for the completeness of the meaning of the changed text).



3.1. Proposed changes — aerodromes

Annexes I and IV to Commission Regulation (EU) No 139/2014 are amended as follows:

Annex I ‘Definitions’

Point (16a) is inserted after point (16):

‘(16a) ‘decision altitude (DA) or decision height (DH)’ means a specified altitude or height in a 3D instrument approach operation at which a missed approach must be initiated, if the required visual reference to continue the approach has not been established;

Point (24a) is inserted after point (24):

(24) ‘landing distance available (LDA)’ means the length of runway which is declared available and suitable for the ground run of an aeroplane landing;

‘(24a) ‘low-visibility operations (LVOs)’ means approach or take-off operations on a runway with any RVR less than 550 m or taxiing at an aerodrome at which any RVR is less than 550 m;’

Point (25) is replaced

~~(25) ‘low-visibility procedures’ means procedures applied at an aerodrome for the purpose of ensuring safe operations during lower than Standard Category I, other than Standard Category II, Category II and III approaches and low-visibility take-offs;~~

by the following:

‘(25) ‘low-visibility procedures (LVPs)’ means procedures applied at an aerodrome for the purpose of ensuring safety during LVOs;’

Point (26) is replaced

~~(26) ‘low-visibility take-off (LVTO)’ means a take-off with a runway visual range (RVR) lower than 400 m but not less than 75 m;~~

by the following:

‘(26) ‘low-visibility take-off (LVTO)’ means a take-off with an RVR less than 550 m;’

Point (27) is deleted.

~~(27) ‘lower than Standard Category I operation’ means a Category I instrument approach and landing operation using Category I decision height (DH), with a runway visual range (RVR) lower than would normally be associated with the applicable decision height (DH) but not lower than 400 m;~~

Point (34a) is inserted after the point (34):



(34) 'non-instrument runway' means a runway intended for the operation of aircraft using visual approach procedures;

'(34a) 'operation with operational credits' means operations using specific aircraft or ground equipment, or a combination of aircraft and ground equipment, such that lower-than-standard aerodrome operating minima can be applied for a particular classification of operation;'

Point (35) is deleted:

~~(35) 'other than Standard Category II operation' means a precision instrument approach and landing operation using ILS or MLS where some or all of the elements of the precision approach Category II light system are not available, and with: decision height (DH) below 200 ft but not lower than 100 ft; and runway visual range (RVR) of not less than 350 m.~~

GM1 16a Decision altitude (DA) or decision height (DH)

- (a) Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation.
- (b) The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In Category III operations with a DH, the required visual references is that specified for the particular procedure and operation.

Annex II (Part-ADR.AR)

ADR.AR.C.035 Issuance of certificates

No proposal for a change

GM1 ADR.AR.C.035(e) Issuance of certificates

MODEL FOR THE TERMS OF THE CERTIFICATE TO BE ATTACHED TO THE CERTIFICATES

(...)

⁵ To be specified: approval of the runway for non-instrument, instrument, non-precision approach. In case of precision approach(es), it is to be indicated, which of the following precision approach(es) is (are) approved:

- Approach with EFVS;
- Standard category I;
- Lower-than-standard category I;
- Special authorisation category I
- Precision approach category II;
- Other-than-standard category II;

- Precision approach category III-A;
- Precision approach category III-B;
- Precision approach category III-C.

(...)

Annex III (Part-ADR.OR)

ADR.OR.C.005 Aerodrome operator responsibilities

In ADR.OR.C.005, a new point (c) is inserted as follows:

- (a) The aerodrome operator is responsible for the safe operation and maintenance of the aerodrome in accordance with:
 - (1) Regulation (EC) No 216/2008 and its implementing rules;
 - (2) the terms of its certificate;
 - (3) the content of the aerodrome manual; and
 - (4) any other manuals for the aerodrome equipment available at the aerodrome, as applicable.
- (b) The aerodrome operator shall ensure directly, or coordinate through arrangements as required with the accountable entities providing the following services:
 - (1) the provision of air navigation services appropriate to the level of traffic and the operating conditions at the aerodrome; and
 - (2) the design and maintenance of the flight procedures, in accordance with the applicable requirements.
- (c) The aerodrome operator shall have, directly or under contracts, all the means necessary to ensure safe operation of aircraft at the aerodrome. This shall include visual and non-visual aids, MET equipment and any other equipment commensurate with the type of operations conducted at the aerodrome.
- (ed) The aerodrome operator shall coordinate with the Competent Authority to ensure that relevant information for the safety of aircraft is contained in the aerodrome manual and is published where appropriate. This shall include:
 - (1) exemptions or derogations granted from the applicable requirements;
 - (2) provisions for which an equivalent level of safety was accepted by the Competent Authority as part of the certification basis; and
 - (3) special conditions and limitations with regard to the use of the aerodrome.



- (de) If an unsafe condition develops at the aerodrome, the aerodrome operator shall, without undue delay, take all necessary measures to ensure that those parts of the aerodrome found to endanger safety are not used by aircraft.

AMC/GM to ADR.OR.C.005 Aerodrome operator responsibilities

AMC1 ADR.OR.C.005(c) 'Aerodrome operator responsibilities' is changed to AMC1 ADR.OR.C.005(d).

AMC1 ADR.OR.C.005(ed) Aerodrome operator responsibilities

PUBLICATION OF INFORMATION TO THE AERONAUTICAL INFORMATION PUBLICATION

A description of cases involving exemptions, derogations, cases of equivalent level of safety, special conditions, including limitations with regard to the use of the aerodrome, should be published in the Aeronautical Information Publication (AIP), after coordination with the Competent Authority.

Annex IV (Part-ADR.OPS)

ADR.OPS.A.005 Aerodrome data

No proposal for a change (*referenced text provided for readers' convenience*):

The aerodrome operator shall as appropriate:

- (a) *determine, document and maintain data relevant to the aerodrome and available services;*
- (b) *provide data relevant to the aerodrome and available services to the users and the relevant air traffic services and aeronautical information services providers.*

AMC1 ADR.OPS.A.005 Aerodrome data

- (a) Data relevant to the aerodrome and available services should include, but may not be limited to, items in the following list:
 - (1) aerodrome reference point;
 - (2) aerodrome and runway elevations;
 - (3) aerodrome reference temperature;
 - (4) aerodrome dimensions and related information;
 - (5) strength of pavements;
 - (6) preflight altimeter check location;
 - (7) declared distances;
 - (8) condition of the movement area and related facilities;
 - (9) disabled aircraft removal;
 - (10) rescue and firefighting; ~~and~~
 - (11) visual approach slope indicator systems;
 - (12) parts of the aerodrome lighting system which are converted to LED;



- (13) approach and departure procedures charts; and
 - (14) measured ILS classification and performance data.
- (...)
- (e) Electronic terrain and obstacle data should be provided for Area 4 for terrain and obstacles that penetrate the relevant obstacle data collection surface, for all runways where precision approach PA Category II or III operations with a DH of less than 200 ft have been established and where detailed terrain information is required by operators to enable them to assess the effect of terrain on the decision height DH determination by the use of radio altimeters. When electronic terrain and obstacle data are not provided, a Precision Approach Terrain Chart — ICAO, should be provided.
 - (f) The aerodrome operator should establish arrangements with the Air Traffic Services providers and the Competent Authority for the provision of obstacles and terrain data outside of the aerodrome boundary.
 - (g) The aerodrome operator should make available measured ILS classification and performance data to interested air operators.

ADR.OPS.B.030

~~ADR.OPS.B.030 Surface movement guidance and control system~~

~~The aerodrome operator shall ensure that a surface movement guidance and control system is provided at the aerodrome.~~

is replaced by the following:

ADR.OPS.B.030 Surface movement guidance and control system

- (a) The aerodrome operator shall ensure that a surface movement guidance and control system (SMGCS) is provided at the aerodrome.
- (b) The SMGCS shall:
 - (1) take into account the design characteristics and the operational and meteorological conditions of the aerodrome, as well as human factor principles;
 - (2) be designed to assist in the prevention of:
 - (i) inadvertent incursions of aircraft and vehicles on an active runway; and
 - (ii) collisions between aircraft as well as between aircraft and vehicles or objects on any part of the movement area; and
 - (3) be supported by appropriate technological means and procedures.
- (c) The aerodrome operator shall coordinate with the air traffic services provider for the development of the surface movement guidance and control procedures.



AMC1 ADR.OPS.B.030(b) Surface movement guidance and control system**GENERAL PARAMETERS TO BE CONSIDERED FOR THE DEVELOPMENT OF A SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM**

(a) The design of an ~~surface movement guidance and control system~~ SMGCS should take into account:

- (1) the density of air traffic;
- (2) the visibility conditions under which operations are intended;
- (3) the need for pilot orientation;
- (4) the complexity of the aerodrome layout; and
- (5) movements of vehicles.

(...)

AMC2 ADR.OPS.B.030(b) Surface movement guidance and control system**USE OF VISUAL AIDS FOR SURFACE MOVEMENT GUIDANCE AND CONTROL**

~~(a)~~ Where an SMGCS is provided by selective switching of stop bars and taxiway centre line lights, the following requirements should be met:

- ~~(1a)~~ taxiway routes which are indicated by illuminated taxiway centre line lights should be capable of being terminated by an illuminated stop bar;
- ~~(2b)~~ the control circuits should be so arranged that when a stop bar located ahead of an aircraft is illuminated, the appropriate section of taxiway centre line lights beyond it is suppressed; and
- ~~(3c)~~ the taxiway centre line lights are activated ahead of an aircraft when the stop bar is suppressed.

~~(b) The aerodrome operator should develop the surface movement guidance and control system (SMGCS) procedures in cooperation with the aerodrome air traffic services provider.~~

AMC3 ADR.OPS.B.030(b) Surface movement guidance and control system**USE OF SURFACE MOVEMENT RADAR AND OTHER SURVEILLANCE EQUIPMENT**

- (a) Surface movement radar or any other suitable surveillance equipment for the manoeuvring area should be provided at an aerodrome intended for use in runway visual range (RVR) conditions less than a value of 350 m;
- (b) Surface movement radar or any other suitable surveillance equipment for the manoeuvring area should be provided at an aerodrome other than that in (a), when the traffic density and operating conditions are such that regularity of traffic flow cannot be maintained by alternative procedures and facilities.

GM1 ADR.OPS.B.030 Surface movement guidance and control system**GENERAL**

~~(a)~~ The SMGCS should comprise an appropriate combination of visual aids, non-visual aids, procedures, control, regulation, management and information facilities. Systems range from the very simple at small aerodromes, with light traffic operating in good visibility conditions, to the complex systems necessary at large aerodromes with heavy traffic operating in low-visibility



conditions. The system selected for an aerodrome will be appropriate to the operational environment in which that aerodrome will operate.

- ~~(b) Surface movement radar for the manoeuvring area could be provided at an aerodrome intended for use in runway visual range conditions less than a value of 350 m.~~
- ~~(c) Surface movement radar for the manoeuvring area could be provided at an aerodrome other than that in (b) above when traffic density and operating conditions are such that regularity of traffic flow cannot be maintained by alternative procedures and facilities.~~

ADR.OPS.B.045

ADR.OPS.B.045 Low visibility operations

- ~~(a) The aerodrome operator shall ensure that means and procedures are established and implemented for providing safe conditions for aerodrome operations in low visibility conditions.~~
- ~~(b) Low visibility procedures shall require prior approval by the Competent Authority.~~

is replaced by the following:

ADR.OPS.B.045 Low-visibility operations

- (a) The aerodrome operator shall ensure that an aerodrome intended to be used for:
- (1) take-off operations with visibility conditions less than 550 m RVR;
 - (2) approach operations with visibility conditions less than 550 m RVR and/or a DH less than 200 ft (60 m);
 - (3) operations with operational credits where the actual RVR is less than 550 m; or
 - (4) taxiing operations with visibility conditions less than 550 m RVR,
- is provided with the appropriate aerodrome equipment and facilities, and that appropriate procedures are established and implemented. Such procedures shall coordinate the movement of aircraft and vehicles on the movement area, and restrict or prohibit activities on the movement area.
- (b) The aerodrome operator shall establish the criteria for the preparation, initiation and termination of low-visibility procedures. The criteria shall be based on the RVR and cloud ceiling.
- (c) When low-visibility procedures are in effect, the aerodrome operator shall make available to aeronautical information services and/or air traffic services, as appropriate, information on the status of the aerodrome equipment and facilities.
- (d) Low-visibility procedures, and any changes thereto, shall require prior approval by the competent authority.'

AMC/GM to ADR.OPS.B.045 'Low-visibility operations'

AMC1 ADR.OPS.B.045 Low-visibility operations

GENERAL



- (a) The aerodrome operator should, in collaboration with the air traffic services provider and the provider of apron management services, if applicable, establish procedures to support for low-visibility operations when lower than Standard Category I, other than Standard Category II, Category II and III approaches and low visibility take-offs are conducted.
- (b) When low visibility procedures (LVP) are in effect, the aerodrome operator should make available to aeronautical information services and/or air traffic services, as appropriate, information on the status of the aerodrome facilities.
- (c) The aerodrome operator should establish and implement procedures to ensure that when low-visibility procedures (LVPs) are in effect, persons and vehicles operating on an apron are restricted to the essential minimum.
- (d) The procedures to be established by the aerodrome operator to ensure safe aerodrome operations during low-visibility conditions support low-visibility operations should cover the following subjects:
- (1) physical characteristics of the runway environment, including pre-threshold, approach and departure areas;
 - (2) obstacle limitation surfaces;
 - (3) surveillance and maintenance of visual aids;
 - (4) safeguarding of non-visual aids essential to LVPs;
 - (5) secondary power supplies;
 - (6) movement area safety;
 - (7) RFFS; and
 - (8) establishment of low-visibility taxi routes.
- (e) When LVPs are applied, any maintenance activities in the proximity of aerodrome electrical systems should be restricted.

GM1 ADR OPS.B.045(a) Low-visibility operations**VISIBILITY CONDITIONS****Visibility condition 1**

- (a) Visibility sufficient for the pilot to taxi and to avoid collision with other traffic on taxiways and at intersection by visual reference, and for air traffic control (ATC) to exercise control over all traffic on the basis of visual surveillance.
- (b) No additional requirements for the protection of ground operations by aircraft are necessary during visibility condition 1.

Visibility condition 2

- (a) Visibility sufficient for the pilot to taxi and to avoid collision with other traffic on taxiways and at intersections by visual reference, but insufficient for ATC to exercise control over all traffic on the basis of visual reference.

- (b) Actions required in visibility condition 2 are dependent on the dimensions of the manoeuvring area and the position of the control tower. Procedures and visual aids will allow the pilot to determine the position of the aircraft and follow the required route.
- (c) In the lower ranges of visibility condition 2, the necessary measures might limit the movement rate unless some additional aids are available, such as SMGCS. Adequate safeguards against runway incursions should be in place, such as limited taxi routes, surface movement radar and stop-bars or physical barriers at runway access points.

Visibility condition 3

- (a) Visibility sufficient for the pilot to taxi but insufficient to avoid collision with other traffic on taxiways and at intersections by visual reference, and insufficient for ATC to exercise control over all traffic on the basis of visual surveillance. For taxiing, this is normally taken as visibilities equivalent to an RVR of less than 400 m but more than 75 m.
- (b) In such visibility conditions, it is likely further ATC measures, such as block control, to assist aircraft and vehicle movement including RFF vehicles, should be considered.

Visibility condition 4

- (a) Visibility insufficient for the pilot to taxi by visual guidance only. This is normally taken as an RVR of 75 m or less.
- (b) During visibility conditions 3 and 4, advanced surface movement guidance and control systems (A-SMGCSs), where available, may be used to determine the position of vehicles on the manoeuvring area.

AMC1 ADR OPS.B.045(b) Low-visibility operations

CRITERIA FOR LOW-VISIBILITY PROCEDURES

When establishing the criteria for the preparation of LVPs, the aerodrome operator should consider:

- (a) the aerodrome layout and its complexity;
- (b) the location of the control tower; and
- (c) the facilities available.

AMC1 ADR.OPS.B.045(c) Low-visibility operations

EQUIPMENT FAILURES AND EXPECTED EFFECTS ON FLIGHT OPERATIONS

The following equipment failures should be reported:

EQUIPMENT FAILURE TO BE REPORTED — LOW-VISIBILITY DEPARTURE OPERATIONS		
SYSTEM CONSIDERED	FAILURE TO BE REPORTED	EXPECTED EFFECT ON FLIGHT OPERATIONS
ILS (Where used for guided take-off)	ILS localiser downgraded to CAT II	No take-off guidance. Guided take-off not permitted
	ILS localiser downgraded to CAT I	No take-off guidance. Guided

	<p>ILS out of service</p>	<p>take-off not permitted</p> <p>No take-off guidance. Guided take-off not permitted</p>
<p>MLS (Where used for guided take-off)</p>	<p>MLS downgraded to CAT II</p> <p>MLS downgraded to CAT I</p> <p>MLS out of service</p>	<p>No take-off guidance. Guided Take-Off not permitted</p> <p>No take-off guidance. Guided Take-Off not permitted</p> <p>No take-off guidance. Guided Take-Off not permitted</p>
<p>RVR</p>	<p>Touchdown RVR system unserviceable</p> <p>Other RVR systems unserviceable</p>	<p>Restrictions depending on flight operations rules</p> <p>Restrictions depending on flight operations rules</p>
<p>LIGHTING SYSTEMS</p>	<p>Runway lighting unserviceable</p> <p>Standby power supply unserviceable</p> <p>Runway centre line lighting unserviceable</p> <p>Runway edge lighting unserviceable</p> <p>Taxiway lighting system unserviceable</p>	<p>Restrictions depending on flight operations rules</p> <p>Restrictions depending on flight operations rules</p> <p>Restrictions depending on flight operations rules</p> <p>Restrictions depending on flight operations rules</p> <p>Restrictions depending on flight operations rules</p>
<p>ANCILLARY</p>	<p>Stop bars unserviceable</p> <p>Ceilometer unserviceable</p> <p>Anemometer unserviceable</p>	<p>No effect if runway protection is ensured by other means</p> <p>No effect</p> <p>No effect if other sources available; otherwise, restriction depending on flight operation rules</p>





EQUIPMENT FAILURE TO BE REPORTED — APPROACH AND LANDING OPERATIONS		
ILS	<p>ILS downgraded to CAT II</p> <p>ILS downgraded to CAT I</p> <p>ILS out of service</p> <p>Outer marker unserviceable</p> <p>Glide path out of service</p>	<p>Flight operations limited to CAT II</p> <p>Flight operations limited to CAT I</p> <p>Restricted to non-precision approach (or other precision approach aid if available)</p> <p>No limitation if replaced by published equivalent position; otherwise, restricted to non-precision approach</p> <p>Restricted to non-precision approach (e.g. localiser only)</p>
MLS	<p>MLS downgraded to CAT II</p> <p>MLS downgraded to CAT I</p> <p>MLS out of service</p>	<p>Flight operations limited to CAT II</p> <p>Flight operations limited to CAT I</p> <p>Restricted to non-precision approach (or other -precision approach aid if available)</p>
DME	<p>DME (as alternative to marker beacons) unserviceable</p>	<p>No limitation if replaced by published equivalent position; otherwise, restricted to non-precision</p>
RVR	<p>Touchdown RVR system unserviceable</p> <p>Other RVR systems unserviceable</p>	<p>Restriction depending on flight operations rules</p> <p>Restriction depending on flight operation rules</p>
LIGHTING SYSTEMS	<p>Approach lighting unserviceable</p> <p>Runway lighting unserviceable</p> <p>Standby power supply unserviceable</p>	<p>Restriction depending on flight operation rules</p> <p>Restriction depending on flight operation rules</p> <p>Restriction depending on flight operation rules</p>



	<p>Runway centre line lighting unserviceable</p> <p>Runway edge lighting unserviceable</p> <p>TDZ lighting unserviceable</p> <p>Taxiway lighting system unserviceable</p>	<p>Restriction depending on flight operation rules</p> <p>Restriction depending on flight operation rules</p> <p>Restriction depending on flight operation rules</p> <p>Restriction depending on flight operation rules</p>
<p>ANCILLARY</p>	<p>Stop bars unserviceable</p> <p>Ceilometer unserviceable</p> <p>Anemometer unserviceable</p>	<p>No effect if runway protection is ensured by other means</p> <p>No effect</p> <p>No effect if other sources available; otherwise, restriction depending on flight operation rules</p>



CS-ADR-DSN — CS Aerodrome Design with related GM**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 category II and III, and where practicable, in the pre-threshold area of a precision approach runway category I.

(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. The distance may be reduced to no less than 30 m if a safety assessment indicates that such reduction would not affect the safety of operations of aircraft.

(d) Longitudinal slope changes

Slope changes should be avoided or kept to a minimum. Where slope changes cannot be avoided, they should be as gradual as practicable. In addition, abrupt changes or sudden reversals of slopes should be avoided.

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 PA 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 a safety assessment indicates that such reduction would not affect the safety of operations of aircraft. ~~This is~~ The radio altimeter operating area is desirable because these for aeroplanes which 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.~~

(be) With a radio altimeter operating area in the pre-threshold area of a precision approach PA runway, the margin to calculate the decision altitude (DA) should be smaller and the usability of the adjacent runway may be enhanced.

~~(d)~~ For precision approach category I runways intended for SA CAT I approach operations, the establishment of a radio altimeter operating area may enhance the usability of the adjacent runway and maximise the benefits of reduced DH and RVR minima.

- (ed) Further ~~Additional~~ 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 altimeters is given in ~~the~~ ICAO, PANS-OPS, Volume II, Part II, Section 1.

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~~ ~~Type B approach~~ operations when approaches are continued below the decision height (DH), and during any subsequent missed approach or bailed 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) bailed landing surface.

CS ADR-DSN.J.480 Precision approach runways

- (a) The following obstacle limitation surfaces should be established for a precision approach runway ~~Category I~~ intended to be used for approach operations with a DH not less than 200 ft:
- (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~~ intended to be used for approach operations with a DH less than 200 ft:
- (1) conical surface;
 - (2) inner horizontal surface;
 - (3) approach surface and inner approach surface;
 - (4) transitional surfaces and inner transitional surfaces; and
 - (5) bailed 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 J-1, except in the case of the horizontal section of the approach surface in paragraph (d) below.
- (d) 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 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 safety assessment, 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 safety assessment, it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

CS ADR-DSN.S.880 Electrical power supply systems

- (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~~ **RVR** 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 S-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.750(a) and CS ADR-DSN.M.755(a); ~~and~~

- (6) illumination of apron areas over which passengers may walk-; and
- (7) radio navigation aids.

Runway	Lighting aids requiring power	Maximum switch-over time
Non-instrument	Visual approach slope indicators ^a Runway edge ^{b, e} Runway threshold ^{b, e} Runway end ^{b, e} Obstacle ^a	See CS ADR-DSN.M.875(d) and CS ADR-DSN.M.880(d)
Non-precision approach	Approach lighting system Visual approach slope indicators ^{a, d} Runway edge ^{d, e} Runway threshold ^{d, e} Runway end ^{d, e} Obstacle ^a	15 seconds 15 seconds 15 seconds 15 seconds 15 seconds 15 seconds
Precision approach category I	Approach lighting system Runway edge ^{d, e} Visual approach slope indicators ^{a, d} Runway threshold ^{d, e} Runway end ^e Essential taxiway ^a Obstacle ^a	15 seconds 15 seconds 15 seconds 15 seconds 15 seconds 15 seconds 15 seconds
Precision approach category I intended to be used for SA CAT I	Inner 300 m of the approach lighting system Other parts of the approach lighting system Obstacle Runway edge Runway threshold Runway end	1 second 15 seconds 15 seconds 15 seconds 15 seconds



Table

S - 1 . S e c o n d a r y p o w e r s u p p l y r e q u i r e m e n t s		Runway centre line (if installed)	1 second
		Runway touchdown zone (if installed)	1 second
			1 second
			1 second
P r e c i s i o n a p p r o a c h c a t e g o r y I I I	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 TDZ	1 second
		All stop bars	1 second
Essential taxiway	15 seconds		
R u n w a y m e a n t f o r t a k e - o f f i n r u n w a y v i s u a l r a n g e c o n d i t i o n s l e s s t h a n a v a l u e o f 8 0 0 m	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. b. c. d. (e) e.	<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> <p>(e) .</p> <p>e. One second where approaches are conducted using EFVS</p>		

power supply switch-over times for radio navigation aids should be dependent on the type of runway and aircraft operations to be supported. Table S-2 indicates representative switch-over times to be met by power supply systems currently available.

Type of runway	Aids requiring power	Maximum switch-over times (seconds)
Instrument approach	SRE	15
	VOR	15
	NDB	15
	D/F facility	15
Precision approach category I	ILS localiser	10
	ILS glide path	10
	ILS middle marker	10
	ILS outer marker	10
	PAR	10
Precision approach category II	ILS localiser	0
	ILS glide path	0
	ILS inner marker	1
	ILS middle marker	1
	ILS outer marker	10
Precision approach category III	Same as category II	

Table S-2 Power supply switch-over times for ground-based radio aids used at aerodromes

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 550 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 550 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 precision approach category I runway intended to be used for SA CAT I approach operations should have as its objective that, during



any period of SA CAT I approach operations, all approach and runway lights are available and that, in any event:

- (1) at least 95 % of the lights are serviceable in each of the following particular significant elements:
 - (i) the inner 450 m of the precision approach category I lighting system;
 - (ii) runway centre line lights, if installed;
 - (iii) runway threshold lights; and
 - (iv) runway edge lights;
- (2) at least 85 % of the lights are serviceable in the approach lighting system beyond 450 m;
- (3) at least 85 % of the lights are serviceable in the runway end lights;
- (4) 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; and
- (5) 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.

(gh) 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.

(hi) The system of preventive maintenance employed for a runway meant for take-off in runway visual rang 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.

Light type	CAT II/III Approach	SA CAT I Approach	CAT I Approach	RVR<550 m take-off	RVR>550 m take-off
Approach inner 450 m	95 %	95 %	85 %	-	-

Approach outer 450 m	85 %	85 %	85 %	-	-
Runway threshold	95 %	95 %	85 %	-	-
Runway centre line	95 %	95 %	85 %	95 %	85 %
Runway edge	95 %	95 %	85 %	95 %	85 %
Runway end	75 %	85 %	85 %	75 %	85 %
Touchdown zone	90 %	90 % ^a	(85 %) ^a	-	-
<i>Note (a): If touchdown zone lights are available.</i>					

Table S-23. Allowable percentages of serviceable lights

CS ADR-DSN.S.925 Radio navigation aids(a) **Applicability**

Instrument runways should be supported by radio navigation aids to provide vertical and/or lateral guidance up to the MDA/H or the DA/H, whichever is applicable.

(b) **Non-precision approaches are supported by:**

- (1) non-directional beacon (NDB);
- (2) LOC;
- (3) VHF omnidirectional radio range (VOR); and
- (4) global navigation satellite system (GNSS) lateral navigation (LNAV).

(c) **Approach procedures with vertical guidance (APV) are supported by GNSS with Baro or SBAS vertical guidance.**(d) **Precision approach procedures CAT I are supported by:**

- (1) a facility performance Category I ILS; or
- (2) any other radio navigation aid that has performance characteristics at least equivalent to an ILS mentioned in point (1) above.

(e) **Precision approach procedures CAT II are supported by:**

- (1) a facility performance Category II ILS; or
- (2) any other radio navigation aid that has performance characteristics at least equivalent to an ILS mentioned in point (1) above.

- (f) Precision approach procedures CAT III are supported by:
- (1) a facility performance Category III ILS; or
 - (2) any other radio navigation aid that has performance characteristics at least equivalent to an ILS mentioned in point (1) above.
- (g) Where two separate ILS facilities serve opposite ends of a single runway, an interlock should ensure that only the localiser serving the approach direction in use radiates, except where the localiser in operational use is facility performance category I ILS and no operationally harmful interference results.
- (h) At locations where ILS facilities serving opposite ends of the same runway or different runways at the same aerodrome use the same paired frequencies, an interlock should ensure that only one facility should radiate at a time. When switching from one ILS facility to another, radiation from both should be suppressed for not less than 20 seconds.

GM1 CS ADR-DSN.S.925 Radio navigation aids**ILS SPECIFICATIONS AND CLASSIFICATION**

The ILS specifications and classification system is specified in ICAO Annex 10, Volume I.

CS ADR-DSN.S.930 Meteorological equipment**RUNWAY VISUAL RANGE**

- (a) Instrumented systems based on transmissometers or forward-scatter meters should be used to assess the runway visual range (RVR) on runways intended for approach and landing operations at runway visual ranges (RVRs less than 550 m.
- (b) Siting
- (1) The Runway visual range (RVR) should be assessed at a height of approximately 2.5 m (7.5 ft) above the runway
 - (2) The system should be located at a lateral distance from the runway centre line of not more than 120 m
 - (3) The site for observations to be representative of the touchdown zone should be located about 300 m along the runway from the threshold
 - (4) The sites for observations to be representative of the midpoint and stop end of the runway should be located at a distance of 1 000 to 1 500 m along the runway from the threshold and at a distance of about 300 m from the other end of the runway.
 - (5) The exact position of these sites and, if necessary, additional sites should be decided after considering aeronautical, meteorological and climatological factors, such as long runways, swamps and other fog-prone areas.
- (c) Display
- (1) One display or more, if required, should be located in the meteorological station with corresponding displays in the appropriate air traffic services units.



- (2) The displays in the meteorological station and in the air traffic services units shall be related to the same sensors, and where separate sensors are required, the displays shall be clearly marked to identify the runway and section of runway monitored by each sensor.



(d) Averaging

Where instrumented systems are used for the assessment of the runway visual range (RVR), their output should be updated at least every 60 seconds to permit the provision of current, representative values. The averaging period for RVR values should be:

- (1) 1 minute for local routine and special reports and for RVR displays in air traffic services units; and
- (2) 10 minutes for meteorological terminal air report (METAR) and special weather report (SPECI), except that when the 10-minute period immediately preceding the observation includes a marked discontinuity in runway visual range (RVR) values, only those values occurring after the discontinuity should be used for obtaining mean values.

