European Aviation Safety Agency

NOTICE OF PROPOSED AMENDMENT

NPA 2011-20 (D)

Regulatory Impact Assessment

RMT.0136 (ADR.001 (a)) & RMT.0137 (ADR.001 (b))
RMT.0140 (ADR.002 (a)) & RMT.0141 (ADR.002 (b))
RMT.0144 (ADR.003 (a)) & RMT.0145 (ADR.003 (b))

Authority, Organisation and Operations Requirements for Aerodromes

NPA 2011-20 (D) — Regulatory Impact Assessment

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Executive summary

(identical to NPA 2011-20 (A), Section IV)

Aerodromes national requirements have been increasingly diverging over the years due to differences in the application of ICAO Annex 14. As a consequence, those different requirements can be interpreted in different ways, creating a difficult operational environment for flight crews. Currently there are no imminent aerodrome safety issues known. However, traffic forecasts indicate an increase from 10 million commercial flights in 2010 to a peak of 15–21 million in 2030 (EUROCONTROL). This traffic increase could lead to safety challenges in the absence of a common approach to safety at aerodrome level. This is referred in the RIA as the 'baseline scenario'.

Challenges

In response to the challenges described above, Regulation (EC) No 1108/2009 provides the basic framework for the development of European Implementing Rules for aerodromes which should address the following issues:

1. Provision of a standardised interpretation of ICAO Annex 14 requirements and other technical requirements to maintain the current high safety level at airports with the future increase of airlines traffic.
2. Development of common requirements for the certification process of European aerodromes ensuring smooth conversion of the national aerodrome certificates without disruption.

Note: 605 aerodromes fall under the scope of Regulation (EC) No 1108/2009; 429 aerodromes are above the threshold of 10 000 commercial passengers per year, and a minimum of 151 aerodromes are under this threshold[1], where they can be exempted from the European rules for aerodrome safety.

Note: Aerodrome certification was introduced 10 years ago in ICAO Annex 14. 78 % of the aerodromes in Europe above 10 000 passengers per year have a national certificate; the remaining 22 % will be certified in the near future (most of them before 2015). On the contrary, only 53 % of the aerodromes below the mentioned exemption threshold will be certified. Member States may exempt these aerodromes from the application of the draft ADR rules.

Objective

The objectives of the draft aerodromes (ADR) Implementing Rules are:

- to ensure that the flexibility required by the Basic Regulation on the conversion of national certificates is achieved;
- to ensure that the authority and organisation requirements can be integrated at NAAs and aerodrome level in a timely manner; and
- to define common requirements for aerodrome design and operation ensuring adequate level of aviation safety.

Development of options to meet the objectives

The development of the options to meet the objectives led to two alternatives to be compared with the baseline scenario (Option 0).

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[1] These 159 aerodromes include 5 military aerodromes open for commercial traffic. 2 aerodromes are not yet in one of these categories due to insufficient information.

Option 1 — The pragmatic approach

Technical harmonisation

The ICAO Standards and Recommended Practices have to be evaluated on a case-by-case basis and be transposed into European law at the appropriate level: Certification Specifications, Implementing Rules, Acceptable Means of Compliance and Guidance Material.

Certification process

If compliance with the new European CSs or the IRs is not met at an aerodrome an Equivalent Level of Safety (ELoS) with mitigation measures or a Special Condition (SC) may be applied to this airport due to its unusual environment.

If an existing aerodrome deviation from design CS could not be justified by using an ELoS or SC, the Member State would only have the remaining solution to send a derogation request to the European Commission (Article 14.6 of the Basic Regulation).

Option 2 — The pragmatic approach with additional flexibility

Technical harmonisation is identical to option 1.

Certification process

In case the certification process described in option 1 reveals some insufficiencies regarding the objective of flexibility (i.e. examples of deviations versus a CS or IR which cannot be justified with an ELoS or a Special Condition), there is the opportunity to develop additional processes to meet the flexibility enshrined in the Basic Regulation and in the safety objective.

To address this case of non-flexibility and to avoid the derogation process, a process leading to a document informally referred to as 'Deviation Acceptance & Action Document' (DAAD) was developed to justify existing deviations. The DAAD requires, as a minimum, a safety assessment to indicate how the situation at the airport (including mitigation measures) satisfies the Essential Requirements (ERs) of Annex Va to the Basic Regulation.

Applied methodology

Having in mind the objectives, the impacts of the rules cannot be directly assessed because it all depends on their application and on making use of their flexibility. The most appropriate methodological approach was therefore to perform case studies on a sample of NAAs and airports to provide examples of the projected application of the rules to assess their impacts.

The global outcome is a qualitative assessment of the different impacts: safety, environmental, social, economic, proportionality issues, and regulatory harmonisation.

Analysis of impacts

Outcome of the case studies

The case studies have shown how the certification process will be flexible in handling deviations from European rules and providing a mechanism to manage safety during the conversion period. However, this process will require resources to identify and manage deviations and carry out actions to mitigate safety risks. The resources required will depend on the scale of such deviations and a proportionate approach will be necessary.

There is not always one way to demonstrate compliance with the draft aerodrome rules. The fundamental outcome of the case study exercise is that it has been always possible to use one of the 'flexibility' tools to justify compliance with the draft aerodrome rules, providing that at least a safety assessment was or will be performed.

It was found that half of the deviations discussed for the selected aerodromes can be easily justified with the current actions already under development or planned by the aerodrome

operator. The remaining half of the deviations would require a safety assessment which should not involve additional extensive studies during the conversion process[2].

Analysis per type of impacts

The options were assessed on several types of impacts: safety, environment, social, economic, proportionality issues, and regulatory harmonisation.

The safety challenges are addressed by option 2 which allows a smooth conversion of the existing national certificate with the adequate consideration to flexibility (thanks to the DAAD), while option 1 delivers slower benefits due to the potential risks of derogation treatments.

Environmental impacts are not relevant for these draft aerodrome rules.

There are no social risks in terms of negative impacts for economic regional development with option 2. On the contrary, in case of derogation request with option 1, the risks of suspension of airport operation would threaten the economic viability of aerodrome operators (and more particularly smaller ones). This would have potential detrimental impacts on regional development.

Option 2 ensures that economic resources are efficiently used by avoiding time spent on justification of derogations which would occur with Option 1. The additional flexibility introduced by Option 2 also allows proportionate rules for smaller aerodromes. Proportionate rules have been ensured by following the ICAO breakdown according to different types of aerodromes. SMS requirements were tailored to the size of aerodrome operators.

Both options are a key step for a smooth aerodrome certification harmonisation of 31 European countries with requirements most identical to ICAO Annex 14. Europe will more effectively coordinate the development of ICAO SARPs.

Conclusion

Option 2 combines a pragmatic approach with additional flexibility and thus ensures that the objectives defined above are met.

Monitoring

Developing rules is one activity; making sure that they are correctly applied is another one. In the case of the draft aerodrome rules, the wide scope of these rules and their flexibility could be factors for misunderstanding unless training is provided and monitoring supports the identification of raising concerns.

[2] Based on the information gathered during the case study exercise.

1 Process and consultation

The draft rules for the European certification process of aerodromes were developed by EASA with the support of rulemaking working groups comprising experts from the Aerodromes, ATM and other stakeholder representatives and Member States. (See Explanatory Note for more details.)

EASA started at the end of 2010 to develop an internal roadmap to tackle the different activities linked with the Regulatory Impact Assessment (RIA). A number of documents and studies were used to develop this RIA[3]. On 9 March 2011 a document was presented to the rulemaking working groups summarising the approach proposed for the development of this RIA, the so-called 'ADR RIA Applied Methodology'.

The methodology included case studies of certain Member States' National Aviation Authorities (NAAs) to assess the impacts of the application of the future rules on some individual aerodromes (performed between March and July 2011). These NAAs and aerodromes were consulted on a preliminary version of the draft rules and their feedback was used to adapt where necessary the draft rules.

2 Issue analysis and risk assessment

This chapter summarises the available information on the different issues that future common requirements of the certification process of European aerodromes should address.

2.1 What is the issue and the current regulatory framework?

With the adoption of Regulation (EC) No 1108/2009, the European Union decided to include into the EASA scope the rules for aerodrome certification to ensure a common approach on safety and a level playing field for all operators involved in aerodrome operations. The rules proposed in this NPA have been drafted between 2010 and 2011: they are in general referred to as the 'draft ADR rules' in the current document.

2.1.1 Baseline scenario

In order to assess the impacts of the draft ADR rules proposed in this NPA, it is necessary to understand how the situation would evolve in the absence of these draft ADR rules. This is the so-called 'baseline scenario'. The baseline scenario essentially describes the future developments if no regulatory change had taken place, i.e. the various national requirements for aerodromes would continue to exist.

National requirements have been increasingly diverging over the years due to differences in the transposition of ICAO Annex 14. As a consequence, those different requirements can be interpreted in different ways, potentially creating hazards and reducing safety margins.

Currently, there is no urgent safety concern for the aerodromes under the scope of the Basic Regulation (EC) No 1108/2009 (see section 2.3). However, traffic forecasts indicate an increase from 10 million commercial flights in 2010 to 15–21 million in 2030[4]. This traffic increase could lead to safety challenges in the absence of a common approach to safety at aerodrome level.

Member States would continue to follow the requirements of ICAO Annex 14 with the possibility to notify differences to ICAO and develop other national legislation, where deemed necessary, for the safe design and operation of an aerodrome.

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[3] EASA Opinion 3-2007 RIA; EU IA report on ATM and ADR (2008); TÜV & Airsight Study on 'ICAO Annex 14 implementation in the EU MS', 2009.

[4] *Source:* EUROCONTROL, Long Term Forecast Flight Movements 2010–2030, edition: 17/12/2010.

In addition to the safety concerns which can be created by a different implementation of ICAO Annex 14, this leads to an inefficient system where countries notifying differences have to maintain rulemaking activities[5].

Problems with the current system of filing of differences are illustrated in Table 1 below. This records the wide variation in differences notified to ICAO by EU Member States, knowing that 12 Member States adopted another approach merely by installing a direct legal reference to ICAO Annex 14. It also suggests that the process of filing of differences is not being implemented in Europe in a consistent manner, so it is difficult to draw any reliable conclusions from this information.

Table 1: List of national differences notified to ICAO per Annex 14 chapter

Country	**Chapter**											**Differences with ICAO***		
	1	2	3	4	5	6	7	8	9	10	**Grand total**	Cat A	Cat B	Cat C
CH	1	0	3	0	3	4	0	0	1		**12**	0	12	0
CZ	5	15	130	10	121	28	10	3	33	12	**367**	337	28	2
DE	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**n/a**	n/a	n/a	n/a
EE	2	1	0	0	1	0	0	0	0	0	**4**	n/a	n/a	n/a
ES	1	0	0	0	0	0	0	0	0	0	**1**	n/a	n/a	n/a
FI	1	0	4	0	7	2	1	0	34	2	**51**	0	45	6
FR	37	24	84	34	274	43	11	15	74	13	**609**	233	200	176
IT	1	1	30	3	44	0	0	0	0	0	**79**	n/a	n/a	n/a
LT	0	0	0	1	0	0	0	0	0	0	**1**	n/a	n/a	n/a
MT	0	0	3	0	3	0	0	0	0	0	**6**	n/a	n/a	n/a
NL	0	7	0	0	6	1	1	0	1	0	**16**	2	10	4
NO	2	5	4	0	4	0	0	0	0	2	**17**	3	11	3
PL	2	1	0	2	1	2	0	0	2	1	**11**	0	0	11
SI	6	0	15	10	10	0	0	0	0	0	**41**	n/a	n/a	n/a
UK	0	1	4		13	0	1	0	3	0	**22**	7	6	9
Grand total	**59**	**56**	**278**	**61**	**488**	**81**	**25**	**19**	**149**	**31**	**1 247**	**582**	**312**	**211**

Legend:

n/a: not available

**Differences with ICAO:*

Category A: National regulation is more exacting or exceeds the ICAO Standard (S) or Recommended Practice (R).

Category B: National regulation is different in character or in other means of compliance.

Category C: National regulation is less protective or partially implemented/not implemented.

Details per country can be found in Appendix C, Table 21.

Note for the reading of this table:

A difference notified by a country to ICAO does not mean necessarily that **each** aerodrome of this country would also have this difference.

[5] EC Impact Assessment 2008 and EASA 'RIA Opinion-3 2007': see Appendix on reference documents.

2.1.2 Key corner stones for developing Implementing Rules from Regulation (EC) No 1108/2009

Having described the baseline scenario without new European rules, this chapter now explores what Regulation (EC) No 1108/2009 provides as a basic framework to develop European Implementing Rules for aerodromes.

Recognising that the continuous growth of aviation is a challenge when trying to maintain a uniform high level of safety, Regulation (EC) No 1108/2009 indicates:

Regulation (EC) No 1108/2009, recital 2

(2) The continuous growth of aviation in Europe leads to many challenges, in particular regarding the key safety factors of aerodromes and ATM/ANS. Therefore, necessary risk mitigation measures need to be established to ensure safety through a harmonised, holistic regulatory approach across the Member States.

Furthermore, Regulation (EC) No 1108/2009 indicates that each aerodrome has its specificities due to various factors (geography, speed and level of ICAO Annex 14 implementation at national level, etc.). In its recital 7 the said Regulation states that:

(7) Taking into account the large variety of aerodromes and their highly individual infrastructures and environments, common aerodrome safety rules should provide for the necessary flexibility for customised compliance, through an adequate balance between implementing rules, certification specifications and acceptable means of compliance.

These rules should be proportionate to the size, traffic, category and complexity of the aerodrome and nature and volume of operations thereon, thereby avoiding unnecessary bureaucratic and economic burdens in particular for smaller aerodromes which only involve very limited passenger traffic.

The scope of the future European aerodrome rules is comprehensive: they shall encompass requirements on authorities and aerodrome operators, aerodrome design and operations.

Based on the above, two main questions were identified for the development of Implementing Rules:

1. How to take into account ICAO Annex 14 and other relevant aerodrome technical requirements (GASR, best practices) into the European legislation given the variety of approaches across Europe; and
2. How to create a European certification system for aerodromes with the necessary flexibility for existing infrastructure based on historical requirements.

These two questions will be further analysed in the following sections.

2.1.3 Common technical requirements for ADR design and operations

ICAO Annex 14 is the starting point for this European rulemaking effort, covering most of the safety-related issues. However, when transposing Annex 14 requirements into European legislation a number of issues need to be addressed:

- Annex 14 does not differentiate between requirements for authorities and requirements for operators.
- Annex 14 differentiates between Standards and Recommended Practices, which need to be translated into the European system with Implementing Rules, Certification Specifications, Acceptable Means of Compliance and Guidance Material (see the summary below). The issue is to both:

- assess in which way to be best in line with ICAO Annex 14 Recommended Practices[6], and
- ensure that the flexibility of the ADR rules for certification do not add irrelevant burdens on Member States or aerodrome industry who follow national rules instead of ICAO Annex 14 Recommended Practices;

- Some rules necessary at EU level are not described in Annex 14 (mainly authority and organisation requirements).
- Diverging implementation of ICAO Annex 14 at Member State level, due to the possibility for a MS to notify differences with its national regulation.

Other sources for aerodrome requirements (GASR, best practices) have also to be considered when relevant.

Many existing aerodromes have their infrastructure based on historical requirements. Any potential changes required under the new legislation cannot be undertaken quickly and could be very resource intensive.

EU and EASA legislation in short

- The EASA rulemaking process can result either in an Opinion to the European Commission containing proposals for Implementing Rules (IRs) or in Decisions of the Executive Director of the Agency containing Acceptable Means of Compliance (AMCs), Certification Specifications (CSs), or Guidance Material (GM).
- IRs are directly applicable and binding on persons (e.g. ATCOs, pilots), organisations (e.g. aerodrome operators, ANSPs, air operators) and competent authorities (e.g. NSAs, NAAs) in their entirety. They are used to specify high and uniform level of safety and uniform behaviour in relation to the subject being regulated.
- AMCs are non-essential and non-binding. AMCs serve as a means by which the requirements contained in the Basic Regulation and in the IRs can be met. The AMCs have the presumption of compliance with the IRs, meaning that, by achieving compliance with the AMC, compliance with the related IR is also achieved. However, applicants may decide to show compliance with the requirements using other means, and competent authorities may also produce their own alternative AMCs (which is used by the competent authority itself to comply with the IRs applicable to them), based on those issued by the Agency or not.
- CSs are non-binding technical standards to meet the requirements of the Basic Regulation and applicable IRs. However, they are made binding through the certification basis.
- GM is non-binding but provides an explanation on how to achieve the requirements in the Basic Regulation or the IRs. It contains information, including examples, to assist the user, regulated persons and organisations in the interpretation of the IRs.

2.1.4 Common requirements for the certification process of European aerodromes

Aerodrome certification was introduced 10 years ago in ICAO Annex 14. 77 % of the aerodromes in Europe, which serve above 10 000 passengers per year have a national

[6] Standards are mandatory with the possibility for a MS to notify a difference to ICAO. Recommendations are not mandatory. However, ICAO requests that State files any differences for Recommended Practices.

certificate; the remaining 23 % will be certified in the near future (most of them before 2015[7]).

Table 2: 'Status of aerodrome certification in 2011 in Europe for aerodromes with more than 10 000 passengers/year'

Certification status	*Number of aerodromes*	*Relative shares*
Certified	344	77 %
Scheduled	70	16 %
In progress	26	6 %
Not scheduled	4	1 %
Grand total	**444**	**100 %**

Source: EASA questionnaire to Member States on estimated number of certified aerodromes.

While Member States follow the same ICAO guidelines[8] in the approach to aerodrome certification, differences remain in the implementation of these guidelines (e.g. indefinite or temporary certificate, etc.).

In this context, two issues have to be considered:

- For the aerodromes already certified, a conversion process for European certification needs to be created.
- This conversion shall allow for the flexibility approach as laid down in Regulation (EC) No 1108/2009:
  - when the existing aerodrome deviates from a CS, alternative measure with an equivalent level of safety (ELoS) or Special Condition (SC) can be defined to justify the existing deviation. The Regulatory Impact Assessment is used to check this flexibility;
  - if any lack in flexibility is found, aerodromes would have either the lengthy process of derogations (Basic Regulation, Article 14.6) or compliance costs to be granted a certificate. In such cases, it has to be studied if an additional flexibility tool could be provided with the following details: content (which types of deviations can be addressed and how), deadline to have the right to use this tool and deadline to correct the deviations, if necessary.

2.2 Who is affected?

2.2.1 Geographical and technical scopes

The 31 EASA Member States will be subject to these new rules. The development of requirements on heliports, apron management and interface equipment between ADR and ATM has been postponed to a later stage.

2.2.2 Type of aerodromes under the scope of the draft regulation

Existing aerodromes

The scope of the new European rules is defined in Basic Regulation (EC) No 1108/2009:

Regulation (EC) No 1108/2009, Article 4, paragraph 3:

[7] If the four potential aerodromes not scheduled for certification are confirmed to be in the scope of the BR and above the exemption threshold, they will have to be certified.

[8] ICAO Docs 9734, 9774, 9859.

3a. 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;

shall comply with this Regulation. Personnel and organisations involved in the operation of these aerodromes shall comply with this Regulation.

3b. By way of derogation from paragraph 3a, Member States may decide to exempt from the provisions of this Regulation an aerodrome which:

— handles no more than 10 000 passengers per year, and

— handles no more than 850 movements related to cargo operations per year.

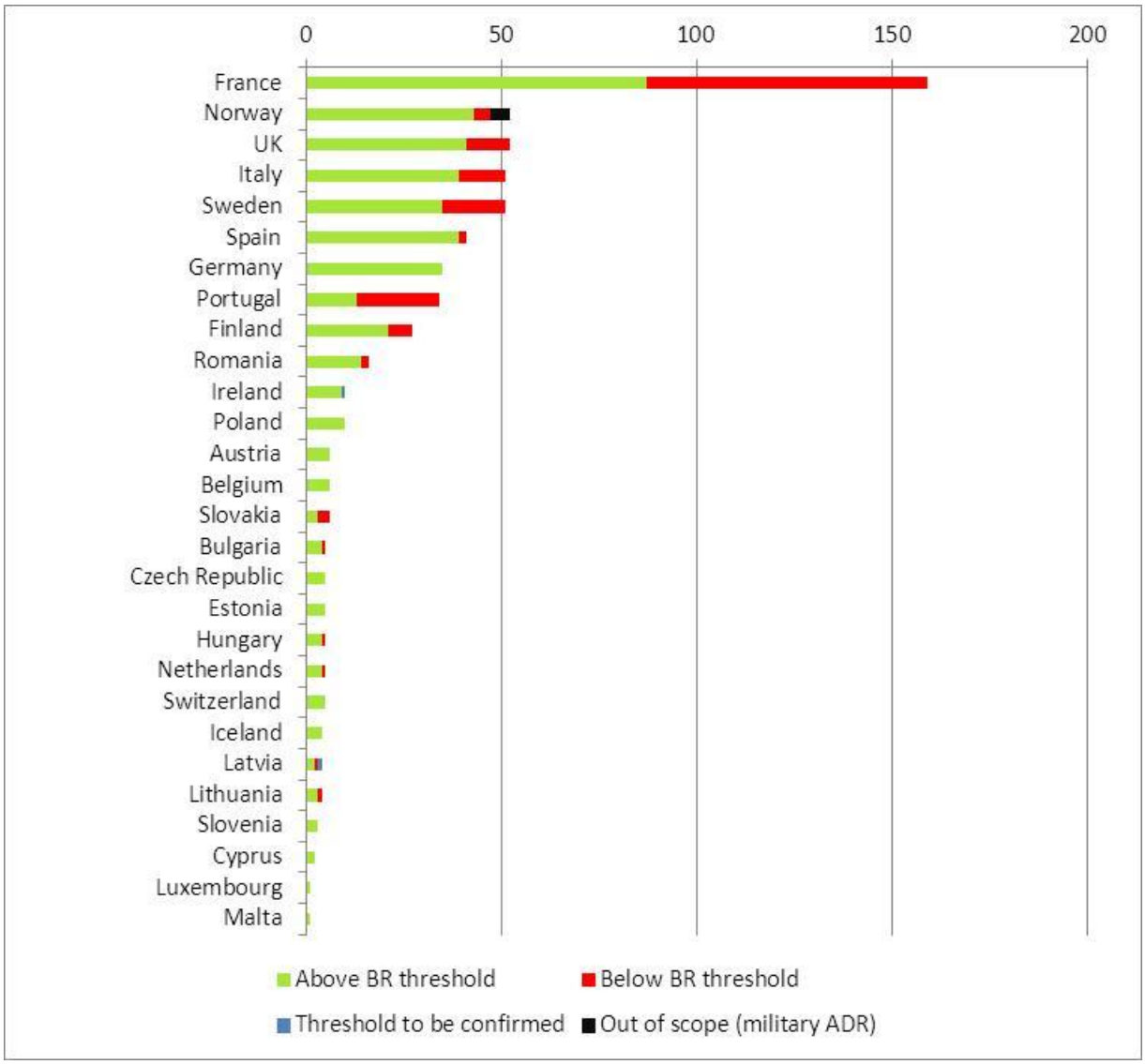
In order to establish how many aerodromes fall under this definition of scope, the Agency launched a questionnaire in 2011. Based on the answers from 29 out of 31 EASA Member States[9], 600 aerodromes are estimated to be in the regulation's scope. Approximately 450 out of those 600 aerodromes are above the exemption clause threshold in Art.4.3b (see above). In other words, 450 aerodromes will definitely have to follow the future European rules, while for some 150 aerodromes European rules may not apply depending on the decision of the Member States.

It has to be mentioned that while the number of aerodromes above the exemption threshold is considered reliable, the number of aerodromes below the threshold and following the definition above could be more than 150.

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 passenger threshold (72, i.e. in relative share 45 %). The United Kingdom, Sweden (31 % below the BR threshold), Italy and Norway follow with approximately 50 aerodromes each. Spain (41), Germany (35), Portugal (34, 61% below the BR threshold) and Finland (27) are next in this list by number of aerodromes. A group of countries have between 10 and 16 aerodromes: Romania (16), Portugal (14), Poland and Ireland (10). The remaining European countries have less than six aerodromes each, Luxembourg and Malta having one and Liechtenstein none.

[9] Answers from Denmark and Greece are missing.

Figure 1: The number of aerodromes by country falling under the future EASA rules[10]

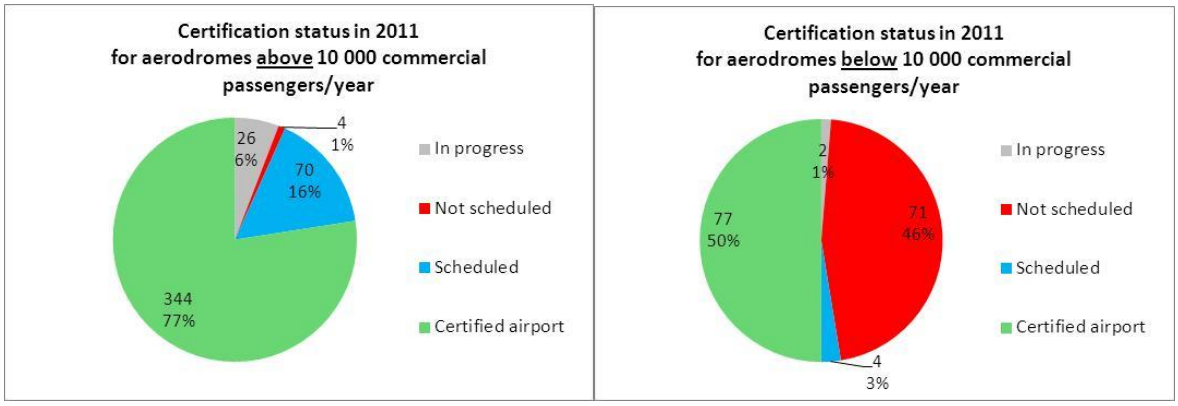


Regulation (EC) No 1108/2009, Article 4.3b, provides ground for aerodrome exemptions according to passenger traffic and freight cargo movements. Member States applying such exemptions do not need to apply the draft ADR rules.

[10] Montenegro indicated that two aerodromes would be under the Basic Regulation scope if they join the EASA system.

Figure 2 shows that the certification status for aerodromes below the Basic Regulation threshold of 10 000 passengers per year is currently significantly lower: 50 % instead of 77 %. Moreover, this 50 % rate will remain stable: only 3 % of the remaining aerodromes below the Basic Regulation threshold are scheduled to get a certification. So, although it can be estimated that 100 % of the aerodromes above the Basic Regulation threshold will be certified in 2015, only 55 % of the aerodromes below the Basic Regulation threshold will be certified.

Figure 2: Status of aerodrome certification in 2011, according to the BR exemption threshold



This indicates that:

- The threshold from the Regulation (EC) No 1108/2009 is in line with a significant number of Member States' approach for certification.
- Any decrease of this threshold would have significant impacts both for aerodromes and NAAs:
  - aerodromes below 10 000 commercial passengers per year have lower financial and human ressources to comply with additional regulation requirements;
  - NAAs could face staffing issue to carry out the certification of these aerodromes (specially for NAAs in countries with a large number of ADR under the BR scope, e.g. France).

More detailed information is available in Appendix C.

New aerodromes and major change in the design of existing aerodromes

The draft ADR rules will apply fully to newly built aerodromes or to major change in design of existing aerodromes (e.g. new runway, new taxiway, etc.). Few cases are foreseen for the future. The possibility to deviate remains, but to a lower extent, because the planning of the infrastructure can integrate the draft ADR rules for design and operations as it is not at an advanced stage of development. This issue is considered to bear a very low significance, so the rest of the document deals only with the conversion of the national certificates of existing aerodromes.

Stakeholders affected

Member States

With the adoption of Regulation (EC) No 1108/2009, the Member States committed to aerodrome legislation at European level. EASA is thus responsible for drafting and proposing rules in line with ICAO Annex 14 requirements into rules which will be directly applicable to all Member States. Certification and implementation will continue to be in the full responsibility of the Member States, albeit based on common rules.

Most of their resources for national rulemaking tasks regarding aerodrome certification will be allocated to other activities. Member States will continue to be fully responsible for rulemaking tasks with regard to aerodromes which are not within the scope described above.[11]

Note: The RIA Opinion 3-2007 already assessed the consequences on NAAs' and EASA's workload.

Aerodrome operators

The Essential Requirements (Basic Regulation (EC) No 1108/2009, Annex Va & Vb) determine the aerodrome operator as responsible for the aerodrome safety. The extent of this responsibility has to be described in the draft ADR rules with a pragmatic approach to clarify the responsibilities between the different actors in the aviation system, notably ATC, flight crew, operations and other operators at an aerodrome.

Third parties and sub-contractors:

Sub-contractors and third party service providers at aerodromes, such as ground handling services, fuel providers, Air Navigation Service Providers and airlines are classified as 'other operators' at an aerodrome. Aerodrome operators will ensure such entities have in place procedures to manage safety in their aerodrome-related operation.

The Basic Regulation (EC) No 1108/2009 introduced a significant change by clarifying the responsibilities for each stakeholder operating at an aerodrome (Essential Requirements in Annex Va and Vb). This major change was accepted by the Member States and the draft ADR rules will supplement these ERs by detailing the conditions which must be complied with in order to implement the Basic Regulation.

Population in the surrounding of aerodrome area:

Monitoring of Obstacle Limitation Surfaces surrounding the aerodrome ensures safe operation of aircraft with regard to preventing collisions with obstacles around aerodromes during the approach, landing and take-off. This is also a protection for the population living around the aerodrome.

2.3 What are the safety risks?

Air safety is very well known to be very high with a very low rate of accidents for commercial air traffic in comparison with the total number of flights or number of passengers (0.01 fatalities per 100 million miles flown, source: ICAO). The common requirements of the ADR rules will help Europe to be better prepared for the future increase in air passenger transport projected by several studies.

Looking at absolute values in Figure 3, i.e. number of accidents, aerodromes can be seen as the critical location where efforts have to be constantly made to maintain a uniform high level of safety with the involvement of different types of actors on the aerodrome platform[12].

More than 80 % of all aircraft accidents in commercial air transport operations occur at or near an aerodrome. The following figure gives a brief overview of the number of accidents per main flight phases: 'approach and landing' as well as 'standing and taxi' provides the most numerous cases of accidents compared to 'take-off'. This means that the aerodrome, as well as its surroundings, is the area which may see the largest proportion of safety events, varying from hazardous events (e.g. non-stabilised approaches of the runway by an aircraft) to fatal accidents.

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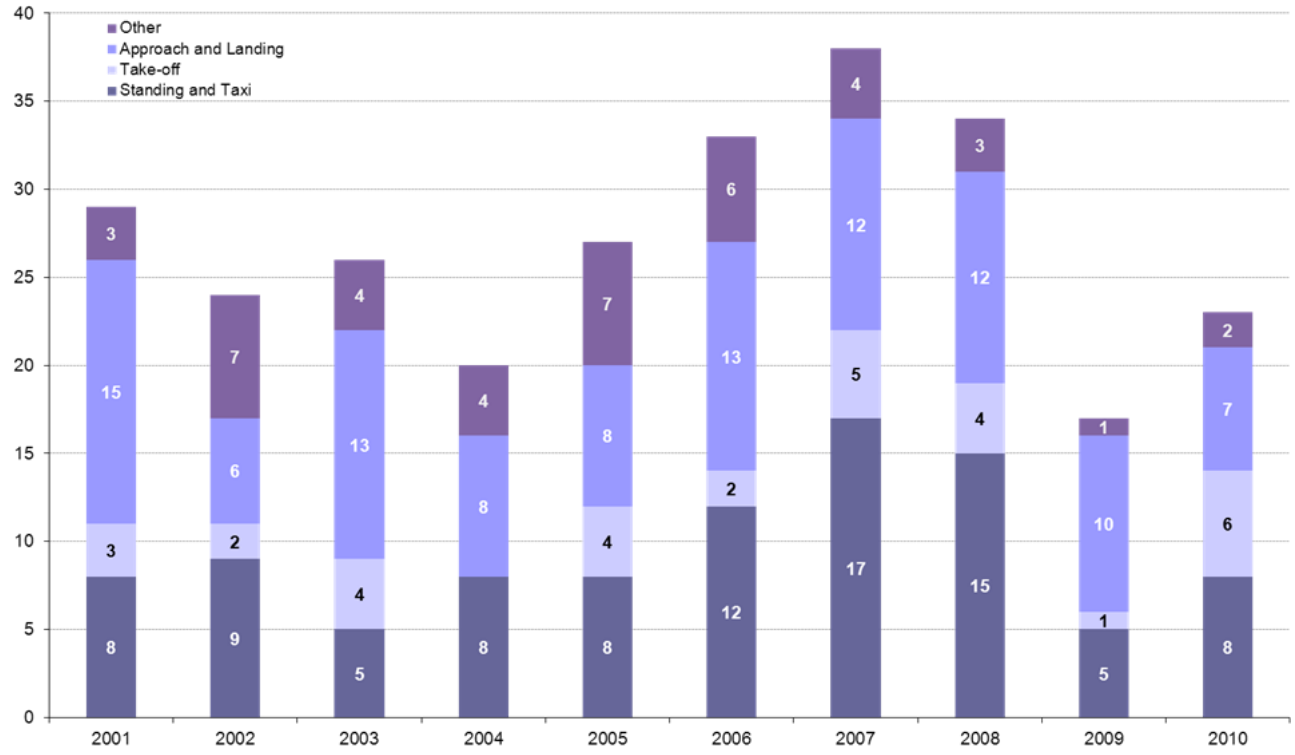
[11] Basic Regulation (EC) No 1108/2009, recital (6): '(6) It would not be appropriate to subject all aerodromes to common rules. In particular, aerodromes which are not open to public use and aerodromes mainly used for recreational flying or …'

[12] The draft aerodrome related regulation proposed by EASA does not of course aim to reduce the number of all accidents as many of them are not directly related to the airport infrastructure.

Figure 3: Number of accidents in EASA Member States by phase of flight. Aeroplanes in commercial air transport with a MTOM above 5 700 kg.



It is therefore imperative that rules aimed at maintaining and further improving aviation safety at such geographic aerodrome areas, provide adequate safety standards to be met, as well as guidance for their implementation by both the aerodrome operators and the national aviation competent authorities.

As accidents occur on different locations of the aerodrome field, the rules have to cover a wide range of requirements. This fact underlines the necessity to consider the ICAO 'Recommended Practices' in the development of the draft ADR rules.

The issue for the draft ADR rules proposed by EASA is to get European common requirements and certification processes to maintain the above high level of safety and to help Europe to be better prepared for the future increase in air passenger transport.

See Appendix D for more details: it highlights the reasoning, as well as safety issues, behind some of the aerodrome safety rules.

2.4 Conclusions for section 2

The issues identified are:

1. To provide adequate transposition of the ICAO requirements and other technical requirements to maintain the current high safety level at aerodrome with the future increase of airlines traffic.
2. To develop common requirements of the certification process of European aerodromes ensuring smooth conversion of the national aerodrome certificates without disruption.

In order to address these two key issues, the objectives for this rulemaking activity were identified (see following section 3) and the options developed (see section 4).

3 Objectives[13]

3.1 General objective

General objectives are the overall goals of a policy and are expressed in terms of its outcome or ultimate impact. If successful, the intervention should at least induce change in the direction of general objectives. For this policy, the general objective is assessed as being the following:

To maintain the above high level of safety and to help Europe to be better prepared for the expected future increase in air passenger transport.

3.2 Specific objectives

Specific objectives are the immediate objectives of a policy and are the targets that first need to be reached in order to achieve the general objectives. They are expressed in terms of direct and short-term effects of the policy.
Taking into account the established high safety and certification culture of the European aerodromes, the objective is to focus on a smooth transition from a national-based regulation to a harmonised European one.

3.3 Operational objectives

Operational objectives are normally expressed in terms of measurable outputs that intervention should produce. For this policy, the operational objectives are assessed as being the following:

OBJ 01: To ensure that the flexibility enshrined in the Basic Regulation to convert national certificates is achieved.

OBJ 02: To ensure that the authority and organisation requirements can be integrated at the level of the NAAs and the aerodromes in a timely manner.

OBJ 03: To define common requirements for aerodrome design and operation ensuring adequate level of aviation safety.

4 Identification of options

4.1 Main inputs to develop options

The options describe the way the development of the draft rules can meet the objectives from section 3. In the aerodrome field, this development shall consider two different aspects:

- the rules to safely design and operate an aerodrome, hereafter referred to as 'technical content';
- the rules to issue a certificate, hereafter referred to as 'certification process'.

4.1.1 Technical content (i.e. how an ADR should look like)

Regulation (EC) No 1108/2009 defines ICAO Annex 14 as the main reference for technical content; the following options are therefore based mainly on Annex 14.

Basic Regulation (EC) No 1108/2009, recital (4):

(4) The Community should lay down, in line with the Standards and Recommended Practices set by the Convention on International Civil Aviation, signed in Chicago on 7 December 1944

[13] The overall objectives of the Agency are defined in Article 2 of Regulation (EC) No 216/2008 (the Basic Regulation). This proposal will contribute to the overall objectives by addressing the issues outlined in Section 2.

(the Chicago Convention), essential requirements applicable to aeronautical products, parts and appliances, aerodromes and the provision of ATM/ANS; essential requirements applicable to persons and organisations involved in the operation of aerodromes and in the provision of ATM/ANS; and essential requirements applicable to persons and products involved in the training and medical assessment of air traffic controllers. The Commission should be empowered to develop the necessary related implementing rules.

Nevertheless, best practices from other regulatory materials were also assessed during the rule drafting process.

4.1.2 Certification process

As mentioned above, aerodrome certification was introduced 10 years ago in ICAO Annex 14 and remains quite general in this annex. Therefore, on this aspect of the rules, guidelines, current and best practices were the main sources to fit the structure of the European rules (e.g. the difference between Authority Requirements and Organisation Requirements).

4.2 Overview of the full range of options identified

A number of options have been developed. The following sections indicate the different possible approaches to define options (section 4.2.1), the options which have been selected as the most relevant to achieve the objectives set above (section 4.2.2), and the discarded options (section 1.1.1).

The following options are the outcome of an iterative process. Up-to-date developments of the impact assessment were presented and discussed with each joint ADR rulemaking group meetings from January 2011 to July 2011. Specific discussions on impact assessment were carried out with several Member States (see the approach with case studies described in section 5.1.2). This resulted in several inputs to check and refine these options.

4.2.1 The different options

Option 0 — The baseline, i.e. 'No change option'

The baseline describes what would happen if there were no change in the current rules for ADR requirements and certification. This refers to section 2.1.1: the non-harmonised implementation of ICAO Annex 14 leads to safety concerns on the long term as well as to efficiency issues in the short term.

This baseline option is always part of the analysis in order to have a benchmark to compare the options. In this rulemaking activity it is only a theoretical option as the European legislator has already decided to introduce European rules for aerodrome safety.

Potential options introducing a change in the ADR rules for design, operation and certification

Several potential options have been identified for the transposition of existing requirements from ICAO into the new European set of rules:

- ICAO standards for which no difference was notified to ICAO by any EU Member State are transposed into CS or IR.
- ICAO standards with the analysis of the notification sent to ICAO are transposed into CS or IR.
- All ICAO standards are transposed into CS or IR, but no Recommended Practices.
- ICAO standards and all Recommended Practices are transposed into CS or IR.
- A pragmatic approach using expert judgement to choose how each Standard and Recommendation shall be integrated in the EU system.

Analysis of these approaches

Apart from the fact that the Basic Regulation creates a legal obligation to define common European requirements in line with the ICAO Recommended Practices, and with the exception of the pragmatic approach, none of these options will meet the objectives:

- safety trend is not sustained if ADR rules are only restricted to ICAO Standards (nearly all requirements related to design consist of Recommended Practices);

  and

- The transition towards harmonised European ADR rules is:
  - neither achievable if the ADR rules deal only with ICAO standards, and all requirements related to Recommended Practices being out of the technical scope. The outcome is an inefficient European set of aerodrome rules with the continuation of important rulemaking activities at national level.
  - nor adequate if all Recommended Practices are transposed as such into CS or IR. The compliance would be more difficult to prove.

If only the ICAO Standards are transposed into the EU rules, Recommended Practices from ICAO will not be included and can lead to safety concerns.

Conclusion: Be pragmatic!

In conclusion, a pragmatic approach can deliver the highest benefits. The ICAO Standards and Recommended Practices have to be evaluated on a case-by-case basis and taken into account into the European law at the appropriate level:

— CS with GM,

— IR with AMC or GM.

(General explanations on IR, CS, AMC, GM are already provided in section 2.1.3)

In practice, ICAO Standards were in general suggested to be transposed into IR or CS. Recommended Practices were mostly suggested to be transposed into AMC or GM and CS for design matters.

The EASA Opinion No 04/2011 of 1 June 2011 and Opinion No 03/2011 of 19 April 2011 were the main source for the Authority and Organisation Requirements for the aerodrome field.

The ADR rulemaking groups were the forum to discuss the appropriate wording of the Standards and the Recommended Practices. Very often the original ICAO wording was kept, as it is obviously extremely difficult to change in a single year of ADR working groups the years of compromise achieved by ICAO. Nevertheless, the most appropriate wording was taken into account at the right level in the EU legislation (CS or IR or AMC or GM) with the view to ensuring flexibility when it comes to certifications for existing aerodromes. This statement has naturally to be assessed (see section 6 'Analysis of impacts').

The pragmatic approach is chosen as option 1

In addition to the positive effect on safety trend, another advantage to include ICAO Annex 14 Recommended Practices in Option 1 is the lower management costs: NAAs and aerodromes will have to deal only with one package of rules instead of having some provided at European level (the taken into account of ICAO Standards into EU law) and others maintained at national level (the national requirements mirroring the ICAO Recommended Practices). This is a benefit for both the Member States who applied already Annex 14 in full and the Member States who applied it with notifications of differences to ICAO.

Is option 1 sufficient?

The assessment of option 1 in regard to the flexibility introduced in Article 8.a.2 of the Basic Regulation (EC) No 1108/2009 led to consider that furthermore the acceptance of existing deviations (as addressed by Regulation (EC) No 1108/2009 in article 8.a.5) needs to be duly addressed. Therefore, the iterative process of discussing options led to the development of an additional possibility for the aerodromes and Member States which can be used in the conversion of existing national certificates. This outcome is described in option 2.

Options 0, 1, 2 are summarised and the main issues are highlighted in the following section.

4.2.2 Selected options

Option 0 — The baseline

(See section 4.2.1)

The non-harmonised implementation of ICAO Annex 14 leads to safety concerns on the long term as well as to efficiency issues in the short term (see section 2.1.1.).

Option 1 — The pragmatic approach

Technical common requirements

The ICAO Standards and Recommended Practices have to be evaluated on a case-by-case basis and taken into account into the European law at the appropriate level: CS, IR, AMC, GM (see section 4.2.1).

Certification process

Option 1 is the development of rules as strictly envisaged by the Basic Regulation (EC) No 1109/2008: if the compliance with the CS or the IR is not met at an aerodrome, can an Equivalent Level of Safety (ELoS) be found with an alternative measure or can a Special Condition (SC) be applied to this aerodrome due to its infrastructure and/or environment specificities?

ELoS

An ELoS would be installed if the competent NAA found a solution, differing from the CS, reaching the same safety objective.

A safety assessment, supporting this decision by the NAA, would be proportionate to the wide range of ELoS applications from basic to highly sophisticated cases, hereby not necessarily involving quantifiable aspects.

ELoS, like CSs, becomes binding on an individual basis to the applicant as part of an agreed CB.

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 Regulation (EC) No 216/2008. Such inadequacy or inappropriateness may be due to:

- *the design features of the aerodrome; or*
- *where experience in the operation of that or other aerodromes, having similar design features, has shown that safety may be compromised.*

A safety assessment, supporting this decision by the NAA, would be proportionate to the wide range of SC applications from basic to highly sophisticated cases, hereby not necessarily involving quantifiable aspects.

SCs, like CSs, become binding on an individual basis to the applicant as part of an agreed CB.

If an existing aerodrome deviation from design CS could not be justified by using an ELoS or SC, the Member State would only have the remaining solution to send a derogation request to the European Commission (Basic Regulation, Article 14.6). This would threaten the objective of smooth transition for the conversion of national certificate and appears to be inadequate and overly burdensome.

Option 2 — The pragmatic approach with additional flexibility

Technical common requirements

Identical to option 1.

Certification process

In case the certification process described in option 1 reveals some insufficiencies regarding the objective of flexibility, i.e. examples of deviations versus a CS or IR which cannot be justified with an ELoS or a Special Condition, there is the opportunity to develop additional processes to meet the flexibility enshrined in the Basic Regulation (EC) No 1108/2009 and the safety objective.

To address this case of non-flexibility and to avoid the derogation process, a process leading to a document informally referred to as 'Deviation Acceptance & Action Document' (DAAD) was developed. The DAAD requires a safety assessment to indicate how the situation at the aerodrome (including mitigation measures) satisfies the Essential Requirements (ERs) of Annex Va to the Basic Regulation (EC) No 1108/2009.

The validity of the DAAD is not restricted to a specific period, unless this is indicated in the DAAD. In practice, the DAAD implies a safety assessment and, as a minimum, a monitoring action.

Cover ADR Regulation, Article 8, Existing deviations from Certification Specifications:

(1) During the certification process for the issuance of the first certificates in accordance with this Regulation, and without prejudice to the provisions of Annex II, the competent authority may, until the 31st December 2019, accept applications for a certificate including deviations from Certification Specifications, if:

- *(a) such deviations do not qualify as an equivalent level of safety case nor as a case of special condition according to Article ADR.AR.C.020 of Annex I; and*
- *(b) such deviations have existed prior to the entry into force of this Regulation; and*
- *(c) the essential requirements of Annex Va to Regulation (EC) No 216/2008 are respected by such deviations, supplemented by mitigating measures and corrective actions as appropriate; and*
- *(d) a safety assessment for any such deviation has been completed.*

(2) The evidence supporting the conditions under (a), (b), (c), and (d) above shall be compiled in a document. This document shall not form part of the certification basis. The competent authority shall specify the period of acceptance of such deviations and inform the Agency of all such documents it has issued.

(3) The conditions referred to in paragraph (1)(a), (c) and (d) above shall be reviewed and assessed by the aerodrome operator and the competent authority for their continued validity and justification, as appropriate.

As indicated in the article above, The Deviation Acceptance & Action Document (DAAD) has been developed to support the acceptance process only (the impact analysis in section 6.3.4.3 will assess the duration of this period). It should be produced jointly by the NAA and the aerodrome to document those existing deviations and non-compliances that remain after reviewing them with the new aerodrome rules. It should be noted that the EASA will take no part in the acceptance process; it is purely an action between the NAA and the aerodrome.

Remaining deviations and non-compliances included in the DAAD should be accompanied by a safety assessment and an action plan that indicates the conditions appropriate to removing them and/or any possible mitigation measures while they remain on the list. Once agreed, the DAAD will be attached to the new certificate, possibly with caveats requiring review obligations.

As for the ELoS and the Special Conditions, a safety assessment (supporting this decision by the NAA) would be proportionate to the wide range of SC applications from basic to highly sophisticated cases, hereby not necessarily involving quantifiable aspects.

It is intended that the DAAD will be individual to each aerodrome, but may also contain state-wide elements as deemed appropriate by the NAA.

Table 3: Selected policy options

Option No	***Description***	***Comment***
0 'Baseline'	Baseline option (No change in rules; risks remain as outlined in the issue analysis.)	See section 2.1.1.
1 'Pragmatic approach'	**Technical common requirements:** Draft rules in line with current ICAO Annex 14. Draft rules in line with foreseen evolution of ICAO Annex 14. Draft rules above ICAO Annex 14 where deemed necessary to enhance safety. **Certification process:** — Conversion period: 48 months. — Flexibility as indicated in Regulation (EC) No 1108/2009: either the aerodrome meets a CS, or a CS can be met with a different measure providing the same ELoS, or a Special Condition has to be acknowledged for this aerodrome.	Explanation in section 4.2.1 **Certification process:** If the flexibility failed during the conversion process of the national aerodrome certificate into a European harmonised one, the remaining solution for an aerodrome would be to ask for a derogation. This would involve automatically the EASA and the EC. Investments to be compliant with the draft ADR rules or suspension of operation in case of request for derogation are both heavy threats for smaller aerodrome operators and to a certain extent for larger operators.
2 'Pragmatic approach and additional flexibility	**Technical common requirements:** Identical to Option 1. **Certification process:** Additional tools to allow the flexibility ensured by the Basic Regulation (EC) No 1108/2009. The Deviation Acceptance & Action Document (DAAD) is proposed to limit the derogations case as far as possible.	

4.2.3 Non-selected options

The following options were also considered and then discarded with these justifications.

Option No	Description	Comment
3	Draft rules strictly identical with current ICAO Annex 14.	Discarded; not possible in terms of structure of the rules as well as in terms of content. Part of the new requirements are not in ICAO Annex 14 (details on certification). Split between IR vs CS vs AMC vs GM, AR vs OR, to be done.
4	Draft rules in line with foreseen evolution of ICAO Annex 14.	Discarded; it is not possible to foresee which proposed changes to ICAO Annex 14 will be integrated in the next edition.
5	Draft rules above ICAO Annex 14 where deemed necessary to enhance safety.	Discarded; not in line with the Basic Regulation (EC) No 1108/2009 (see above recital 4 of the said Regulation) and will not allow a level playing field compared to other ICAO countries.
6	Draft rules without Recommended Practices from ICAO Annex 14.	Discarded; not acceptable for the potential safety consequences and practicality.

5 Methodology and data requirements

5.1 Applied methodology

Having in mind the objectives proposed in section 3, the most appropriate methodological approach was to perform RIA case studies on a sample of NAAs and aerodromes to assess directly with the affected stakeholders if the future ADR rules will achieve the flexibility objectives. The outcome is a qualitative assessment of the different impacts: safety, environment, social, economic, proportionality issues, and regulatory harmonisation.

The impacts of the rules cannot be directly assessed because they all depend on their application, knowing their flexibility. Therefore, one of the objectives of the case studies is to provide examples of application of the rules to assess their impacts.

5.1.1 Key questions addressed by the case study questionnaire

The case studies provide an illustration for the impacts expected at different levels:

- at NAA level:
  - What is the current status and process of aerodrome certification?
  - What is the impact of the draft European rules on:
    - the staff workload?
    - a number of ADR under the EU scope for certification?
    - the management of deviations?
    - the communication of the new certification process with the aerodromes?
    - training?
- at aerodrome level (aerodromes certified or under certification process):
  - To what extent can existing certification be re-used for the European certification?
  - What are the differences between national certification scheme and the draft European one?
  - Where are the potential problems? How can we solve them?
  - Based on some SARPs selected by the EASA, what are the justifications which were provided/could be provided in case of differences? Can this be re-used with the new European certification process?

5.1.2 Organisation of the case studies

Geographical scope:

A mix of Member States with different sizes of aerodromes under the scope of the Basic Regulation were part of the case study exercise[14]:

- CH: 5 aerodromes under the BR scope,
- CZ: 5 aerodromes under the BR scope,
- FR: 159 aerodromes under the BR scope,
- IT: 51 aerodromes under the BR scope,

[14] No other countries (except from CZ, IT, FR and PL) didn't express their willingness to be part of this RIA activity, presented on 27 January 2011, except from Switzerland on 25 March 2011.

— PL: 10 aerodromes under the BR scope.

Each NAA selected two aerodromes under the Basic Regulation (EC) No 1108/2009 scope (one for Switzerland).[15]

Technical scope

There are approximately 1 000 SARPs in ICAO Annex 14, which makes a comprehensive analysis not feasible. In view of the objectives defined above, it was decided to focus on the aerodrome certification process and about 15 key SARPs. The selected SARPs were proposed by the Agency and agreed with the ADR rulemaking groups as well as with ACI and ERAC.

The selected SARPs are:

- SARPs for Design
  - — Taxiways (width, signs and markings)
    a. 3.9.4 Cockpit over centre line (Standard)
    b. 3.9.5 Width of taxiway (Recommended Practice)
    c. 5.2.8.1 Centre line markings (Standard)
    d. 5.2.16. Mandatory instruction marking (Standard)
    e. 5.4.1.1 Signs (links to 9.8.1 ST) (Standard)
  - — RESA
    a. 3.5.1 Obligation to have RESAs (Standard)
    b. 3.5.2 RESA 90m (Standard)
    c. 3.5.3 RESA 240m (Recommended Practice)
  - — Obstacle limitation surfaces
    a. 4.1 Obstacle limitation surfaces (Standard)
    b. 4.3 Objects outside the OLS (Recommended Practice)
- SARPs for Operations
  - — Monitoring of areas covered by Obstacle Limitation Surfaces
    a. 4.2.14 Category 1 OFZ (Recommended Practice)
    b. 4.2.15 Category 2 and 3 OFZ (Standard)
  - — Aerodrome maintenance
    a. 10.2.1 Maintenance of movement area (Standard)
    b. 10.2.8 Providing good friction characteristics (Standard)
- RFFS
  - 9.2.23 Response time (Standard)

[15] Meetings held in 2011 with Italy on 10–11 May, with the Czech Republic on 23–24 May, with Poland on 31 May – 1 June, with France on 8–10 June, and with Switzerland on 14 July.

5.2 Data requirements

Based on the issues identified in section 2, the following questionnaires have been developed.

Questionnaire to all MS (see Appendix C)

- Number of aerodromes under the Basic Regulation (EC) No 1108/2009.
- MS sending differences to ICAO Annex 14 (with the latest list of differences to be sent to EASA).
- MS keeping record of a list of deviations at NAA headquarter level.
- NAA staffing.

Questionnaire to Case Studies MS

1. NAA related issues:
   - ICAO Annex 14 implementation issues,
   - Comparison between national regulation and selected SARPs,
   - Certification process,
   - Deviations management,
   - NAA training,
   - SMS follow-up.
2. Aerodromes related issues:
   - Differences, if any, between the aerodrome designs and operations with the selected SARPs, national rules, and possible corrective actions.
   - Status of implementation of SMS.
3. Issues with impacts of the draft European rules:
   - Authority and Organisation Requirements
   - Operation Implementing Rules and design Certification Specification.

The mentioned issues 1 and 2 were covered with a 60-page blank questionnaire sent 6 weeks in advance to the selected NAAs before a meeting, and then, with several weeks of exchange to get an answer to the questionnaire understood both by the Agency and the selected NAAs.

The mentioned issue 3 was covered with a 160-page blank questionnaire and discussions were handled by email exchanges and phone conversations.

Note: Aerodromes have a geographical location by nature, which makes them all different. Grouping by type of aerodrome is a very challenging task without proper information easily accessible on this issue. This fact supports also the case study approach.

6 Analysis of impacts

To understand the impact of the options identified, it is proposed to first look at the differences between the draft rules and ICAO Annex 14 as well as the outcome of the case studies and then to assess these results per type of impact (i.e. safety, economic etc.).

Thus, the first section 6.1 will assess the differences between the draft ADR rules and ICAO Annex 14. Main differences with justifications will be outlined; the complete information can be found in each relevant annex attached to the NPA.

Secondly, the outcome of the case studies will be presented in section 6.2 focussing on:

- the certification process;

- the compliances with the selected SARPs at national level;
- the compliances with the selected SARPs for the selected aerodromes. The deviations brought to the knowledge of EASA during this exercise are assessed looking at how these deviations can be justified with the new certification process.

Finally, section 6.3 will assess the overall impacts per option. The following impacts are assessed:

- safety;
- environmental;
- social;
- economic;
- proportionality issues;
- regulatory coordination and common requirements.

6.1 Differences ICAO Annex 14 — European draft rules

Technical common requirements

ICAO Annex 14 was the main input for the rules on design and aerodrome operations. Even if the ICAO SARPs have been reviewed to be accommodated to EU legislation, the requirements are in most of the cases identical. In practice, the principles were that ICAO Standards were taken into account at CS or IR level, and that Recommended Practices were taken into account at AMC or GM level.

The only major change is the designation of responsibilities for stakeholders. The requirements for stakeholder responsibilities were detailed in AMC, when appropriate, to allow Member States to perform them with alternative solutions (e.g. third party's audits, fuel providers, etc.).

The differences and justifications can be found in these documents:

- Design requirements : see NPA Book 1
- Operational requirements : see NPA Annex 3

Certification common requirements

The differences and justifications can be found in these documents:

- Authority Requirement : see NPA Annex 1
- Organisation Requirements : see NPA Annex 2

6.2 Outcome of the case studies

The certification process at MS level was analysed and found to be in line with the draft European rules. The compliance with ICAO Annex 14 from a legislative point of view and at aerodrome level was assessed for the selected SARPs (reference). The check of compliance at aerodrome level allowed getting examples of existing and concrete deviations.

Having this background information, the impact of the draft European rules was assessed:

- on the certification process, and
- on the examples of deviations to check the flexibility of the conversion process.

The persons involved in the case study exercise had also the opportunity to comment on the draft ADR rules, version of July 2011. Feedback was sent between 15 September and 10 October 2011. These comments were answered by EASA and were taken into account when relevant (see Appendix E for the summary of this iterative process between draft rules and impact of the rules).

Note: The case study exercise was a tool to identify facts and relevant information for the RIA. It was not an audit looking for evidence to each question raised. The aim was to gather information following a structured and detailed questionnaire. While a comprehensive set of answers cannot be ensured, the time spent to collect this information and the numerous exchange of questionnaire versions gives confidence on the quality of the answers.

6.2.1 Certification process and the current practice of MS

The case studies gave the opportunity to check that the MS follow the same principles and guidelines when it comes to certification, although there is not yet a complete set of SARPs in ICAO Annex 14. It gave also the opportunity to see that there has been a continuous improvement e.g. in the SMS implementation at aerodrome level and NAA staffing since the TÜV-Airsight Annex 14 study which was performed largely in 2008).

Example from Italy and France for certification process: see Appendix F.

The case studies showed that the remaining main effort would be the gathering of relevant justifications of deviations at NAA headquarters level (currently this information is generally kept at aerodrome level and also in some cases in regional NAA offices). When the selected NAAs have not yet this process to collect this information at central level, there is already identified as an area for improvement (Italy for instance will have at the end of 2011

Other comments received from the selected NAAs and aerodromes were about:

- the issuance of certificates providing that there is a full compliance to the certification basis could be unrealistic. Corrective action plans could be used to grant this certificate. The draft ADR.AR.C.035 (c) Issuance of certificate integrates now this possibility for findings which are not of level 1 category[16]:

  ADR.AR.C.035 Issuance of certificate
  (c) Findings which are not of level 1 category and which have not been closed prior to the date of certification, shall be safety assessed and mitigated as necessary and a corrective action plan for the closing of the finding shall approved by the competent authority.

- temporary aerodrome certificates are the practice for the selected NAAs. Nevertheless, the principle in the draft ADR rules of a certificate issued for an unlimited duration, ADR.AR.C.035 (e), will require minor certification process changes for these NAAs and will allow the other relevant NAAs to continue to issue unlimited duration certificate.

In conclusion, existing certification processes in the Member States are found to be in line with the draft ADR rules. No significant differences with the draft ADR rules were found.

6.2.2 Compliance with national regulation versus ICAO Annex 14

Based on the following table, most of the Member States participating in the case study exercise apply identically the selected ICAO Annex 14 SARPs. Nevertheless, there are several

[16] ADR.AR.C.055 Findings, observations, corrective actions and enforcement measures: '(b) A category 1 finding shall be issued by the competent authority when any significant non-compliance is detected […] which lowers safety or seriously endangers safety.'

different ways of implementation of ICAO Annex 14 for a number of SARPs, which confirms the need of flexibility.

This analysis covers only the selected SARPs for the case study: see section 6.1 for a comprehensive analysis of EU Member State differences notified to ICAO Annex 14.

There are two important considerations to take into account when analysing the below summary table:

1. Having a national difference from ICAO requirement does not mean necessarily that all the aerodromes of this country do not comply with this ICAO requirement.
2. When there is a national difference from ICAO, it is not easy to judge if this difference is significant or not. For instance, the case study Member States explained that there is a formal difference based on the legislative text, but in practice the 'spirit' of the text is implemented (see Italy 5.4.1.1.).

Table 4: Case study comparison between ICAO Annex 14 and national legislation

ICAO Annex 14 requirements	***National legislation compared with ICAO***			
	Identical	***More strict***	***Less strict***	***Different in character or other mean of compliance***
Design				
Taxiways (width, signs and markings)				
a. 3.9.4 ST Cockpit over centre line	CH, CZ, FR, PL	IT		
b. 3.9.5 REC Width of taxiway	CH, CZ, IT, PL	FR		
c. 5.2.8.1 ST Centre line markings	CH, CZ, FR, PL			IT
d. 5.2.16. ST's Mandatory instruction marking	CH, CZ, PL, FR & IT= partially	FR partially	FR partially, IT 5.2.16.4: not implemented	FR partially, IT:5.2.16.3
e. 5.4.1.1 ST Signs (links to 9.8.1 ST)	CH, CZ, FR, PL		IT formally speaking (in practice it is implemented)	FR=9.8.1
RESA				
a. 3.5.1 ST obligation to have RESA's	CH, CZ, PL	IT		FR
b. 3.5.2 ST 90m	CH, CZ, IT, PL		FR	
c. 3.5.3 REC 240m	CH, CZ		PL, FR: this requirement is not in the French regulation	IT
Obstacle limitation surfaces				

ICAO Annex 14 requirements	National legislation compared with ICAO			
	Identical	More strict	Less strict	Different in character or other mean of compliance
a. 4.1 ST's Obstacle limitation surfaces	CH, CZ, PL, IT		FR	
a. 4.3 ST's Objects outside the OLS	CH, IT	CZ, IT, PL, FR		
Operation				
Monitoring of areas covered by Obstacle Limitation Surfaces				
a. 4.2.14 REC Category 1 OFZ	CH, IT	CZ, FR	PL	IT for 4.2.6
b. 4.2.15 ST Category 2 and 3 OFZ	CH, CZ, IT, FR		PL	
Aerodrome maintenance				
a. 10.2.1 ST Maintenance of movement area	CH, CZ, FR, IT, PL			
b. 10.2.8 ST Providing good friction characteristics.	CH, CZ, IT, FR		PL	
RFFS				
9.2.23 Response time	CH, CZ, PL	IT	FR (3mm for extremity of RWY, not any point of the RWY)	

6.2.3 Comparison of selected aerodromes and national/ICAO rules for the selected SARPs

The following question was asked during the case study meetings: if the aerodromes have additional deviations from the selected case study SARPs. 2 aerodromes mentioned 2 additional SARPs (one per aerodrome): length of runway strip and distance between taxiway and runway. None of the other aerodromes mentioned deviations with these 2 additional SARPs. Even if the list of deviations for these aerodromes cannot be fully ensured (see note at the beginning of section 6.2), this information looks reliable enough for the analysis[17].

[17] At the end of the RIA report drafting, only one additional deviation was discovered in Warsaw Chopin Airport in relation with 'Runway Guard Lights': there are some taxiway and runway intersections which are not equipped in accordance to the ICAO Recommendation Annex 14 — 5.3.2.22. This case did not raise changes in the outcomes of this Regulatory Impact Assessment.

SARPs with deviation at aerodrome (case study exercise)

Examples of deviations for selected aerodromes were found for nearly all selected SARPs related to aerodrome design, but none for operations SARPs.

Table 5: Existence of deviations in the selected aerodromes for the ICAO Annex 14 SARPs

Selected ICAO Annex 14 SARPs	***Deviations in selected aerodromes***
SARPs for Design	
Taxiways (width, signs and markings)	
a. 3.9.4 ST Cockpit over centre line	Yes
b. 3.9.5 REC Width of taxiway	Yes
c. 5.2.8.1 ST Centre line markings	Yes
d. 5.2.16. ST's Mandatory instruction marking	
e. 5.4.1.1 ST Signs (links to 9.8.1 ST)	No
RESA	
a. 3.5.1 ST obligation to have RESA's	Yes
b. 3.5.2 ST 90m	Yes
c. 3.5.3 REC 240m	Yes
Obstacle limitation surfaces	
a. 4.1 ST's Obstacle limitation surfaces	Yes
b. 4.3 REC's Objects outside the OLS	No
SARPs for Operations	
Monitoring of areas covered by Obstacle Limitation Surfaces	
a. 4.2.14 REC Category 1 OFZ	No
b. 4.2.15 ST Category 2 and 3 OFZ	No
Aerodrome maintenance	
a. 10.2.1 ST Maintenance of movement area	No
b. 10.2.8 ST Providing good friction characteristics.	No
RFFS	
9.2.23 Response time	No

Deviations per aerodrome (case study exercise)

Table 6: List of deviations per selected aerodrome

Case study aerodromes	*Cockpit over centre line*	*Distance between TXY and RWY*	*Marking 5-2-16*	*No RESA 240m*	*No RESA 90m*	*OFZ (ICAO Annex 14 - 4.1)*	*RWY slope*	*Taxiway centre line marking*	*Width of RWY strip*	*Width of taxi-way*	*Grand total*
Annecy					1						**1**
Bergamo		1		1							**2**
Fiumicino			1	1							**2**
Karlovy Vary									1		**1**
Lyon (LYS)	1			1						1	**3**
Praha										1	**1**
Warsaw			1			1	1	1			**4**
Grand total	**1**	**1**	**2**	**3**	**1**	**1**	**1**	**1**	**1**	**2**	**14**

Note: Selected aerodromes without any differences with ICAO Annex 14: Poznan and Alterhein — St Gallen, information based on an interview.

In conclusion, only two aerodromes do not have deviations. Most of the aerodromes have one or two deviations. One aerodrome has three deviations, one has four deviations. Four deviations is the highest number of deviations per aerodrome in our case study.

6.2.4 Impact of the draft European rules on Member States' case studies

The analysis of the deviations then continues with the comparison of three related aspects for the conversion of the certificate:

- the compliance with the national requirement;
- the compliance with the draft CS;
- the available information to either justify this non-compliance or the actions taken to deal with this non-compliance.

For instance, if an ADR is not compliant with a CS and, in the same time, it was known during the case study exercise that either a safety assessment or a correction action plan or a study is in progress, then it was considered that the draft ADR rules would have no or limited impact because there is already information showing that the ADR is addressing this safety issue.

On the other hand, when there is no safety assessment or no information showing that the issue of the deviation is currently addressed with specific actions (correction action, specific study, etc.), it is then considered that the conversion of the national certificate has a negative impact (additional workload, etc.).

The next table addresses the following questions:

1. Is the ADR compliant with national requirement?
2. Is the ADR compliant with draft CS?
3. Is there a safety assessment or a corrective action plan or a study in progress?

There are three 'yes' or 'no' in each cell: this corresponds to the order of the questions here above.

Table 7: Compliance with rules and potential impacts on the selected aerodromes

Case study aerodromes	Questions	Cockpit over centre line	Distance between TXY and RWY	Marking 5-2-16	No available RESA 240m	No available RESA 90m	OFZ (ICAO Annex 14 - 4.1)	RWY slope	TXY centre line marking	Width of RWY strip	Width of TXY
Annecy	1.In line with national requirement? 2.In line with draft CS? 3.Safety assessment, corrective action plan, …?					Yes No Yes					
Bergamo	1.In line with national requirement? 2.In line with draft CS? 3.Safety assessment, corrective action plan, …?		No No Yes		Yes No No						
Fiumicino	1.In line with national requirement? 2.In line with draft CS? 3.Safety assessment, corrective action plan, …?			Yes No Yes	Yes No No						
Karlovy Vary	1.In line with national requirement? 2.In line with draft CS? 3.Safety assessment, corrective action plan, …?									No No No	
Lyon (LYS)	1.In line with national requirement? 2.In line with draft CS? 3.Safety assessment, corrective action plan, …?	No No Yes			Yes No No						Yes No Yes
Praha	1.In line with national requirement? 2.In line with draft CS? 3.Safety assessment, corrective action plan, …?										No No Yes
Warsaw	1.In line with national requirement? 2.In line with draft CS? 3.Safety assessment, corrective action plan, …?			No No No			No Yes Yes	No No Yes	No No No		

Legend
Green: no impact with draft rules.
Orange: additional action(s) during certificate conversion.

This table is a summary of the examples detailed in Appendix I.

For instance:

Analysis of the RESA issue for the two selected French aerodromes:

Annecy aerodrome has no available space for a 90m RESA (so implementation of a 90m RESA would suppose to reduce significantly the commercial traffic which mainly supports the economic development of Annecy region). LYS has available space for 240m RESA.

There is a compliance with RESA requirement at national level but no compliance with the draft ADR CS. This draft CS requires at least a 90m RESA and a safety assessment when a longer RESA should be available depending on the aerodrome code.

Nevertheless, a study is currently in progress in France to assess how a 90m RESA could be efficiently made available for existing aerodromes. This study is in line with the analysis of safety issue and should come with, if any, appropriate mitigations measures or other proposals. Therefore, it is envisaged that the impact would be minor or not significant for Annecy: the cell is highlighted in green.

Concerning LYS, the aerodrome operator informed that the space for 240m RESA is available and the compliance costs to build these RESAs for each runway are 'not too heavy because nothing obliged to have a tar RESA'[18]. While LYS seems to accept that RESA could be implemented for their aerodrome, the outcome in the RIA is that there is an additional workload with the draft CS: the cell is highlighted in red.

Analysis of the runway strip issue for Karlovy Vary

A deviation without safety assessment was granted by the Transport Ministry to this aerodrome before the setup of the Czech NAA. The deviation is still relevant with the draft CS. In such a case, the conversion process will require a safety assessment, i.e. an additional workload.

The details for these examples of deviations provided in Appendix I show that it is not straightforward to assess if there will be each time additional workload during the conversion process. It can be summarised that, during the conversion process for these nine selected aerodromes:

- four deviations would require additional actions, with in some cases already a certain willingness of the stakeholders to accept to be compliant (e.g. RESA deviation at Lyon Saint Exupéry, LYS).
- nine deviations would be easily justified with the current information showing that the safety issues were analysed and appropriate actions are either in place or will be decided soon or later.

How was the compliance with CS assessed?

Once enough information is gathered on the details of a deviation (previous section), the flexibility of the conversion of national certificate with the draft ADR rules can be assessed. As already mentioned, if the compliance with CS is not achieved, then ELoS, SC or DAAD can be used to support a justification of the deviation.

The most plausible justification of a deviation is proposed in the following table. For more information, refer to Appendix I.

[18] Annex 14 (3.5.11) or Doc 9157 part 1 (§ 5.4.13 and 5.3.22) do not require the RESA to be covered with tar. Statement made by LYS in the case study questionnaire for France.

Table 8: Type of flexibility tools which could use to justify existing deviations

Case study aero-dromes	*Cockpit over centre line*	*Distance between TXY and RWY*	*Marking 5-2-16*	*No RESA 240m*	*No RESA 90m*	*OFZ (ICAO Annex 14 - 4.1)*	*RWY slope*	*TXY centre line marking*	*Width of RWY strip*	*Width of TXY*
Annecy					DAAD or SC					
Bergamo		ELoS		DAAD						
Fiumicino			DAAD	DAAD						
Karlovy Vary									SC	
Lyon (LYS)	DAAD			DAAD						DAAD
Praha										DAAD
Warsaw			ELoS or DAAD			ADR CS*	SC	ELoS		

**ADR CS: the aerodrome design and the measures taken by the aerodrome operator comply with the draft ADR CS.*

Note for DAAD about marking: it is expected that the markings will be changed over the conversion period. If at the deviation remains at the end of the conversion period, the DAAD could be used as a last resort.

It was not always possible to define exactly which tools can support the justification of a deviation, but at least there was always one tool to support the justification of a deviation. In fact, the choice of a specific tool will depend on the information available by the aerodrome and the NAA. As mentioned, the case studies exercise was not an audit, so detailed information on existing safety assessment was not asked.

It should be pointed out at this stage that the NAA is taking the decision how to go about deviations in each individual case.

6.2.5 General outcome of the analysis

The case studies have shown how the certification process will be flexible in identifying deviations from European rules and providing a mechanism to manage safety during the conversion period. However, this process will require resources to identify and manage deviations and carry out any actions to mitigate any safety risks. The resources will be a function of the scale of any deviations and a proportionate approach will be necessary.

Summary of the case study exercise

Table 9: List of deviations for the case study aerodromes and the possible actions to justify them according the draft ADR rules

Issue	*Aerodrome*	*Deviation in the case of national law?*	*Deviation with European law?*	*Basis for justification with the European certification process*	*Draft EU rules Impact*
Cockpit over centerline	Lyon	Yes with a corrective action plan with short and long term measures	Yes	DAAD: for long term measures finishing after the conversion process	None
Distance between TXY and RWY	Bergamo	Yes, with mitigation measure	Yes	ELoS, mitigations measures are already in place	None
Marking 5-2-16	Fiumicino	Not currently, yes with a new amendment to introduce a new ICAO requirement	Yes	Should be resolved before the conversion period, if not DAAD.	None, because the update of the Italian regulation will require Fiumicino ADR to be compliant
Marking 5-2-16	Warsaw	Instead of RWY designation marking on RWY-holding position RUNWAY AHEAD marking are used.	Yes	ELoS or DAAD, both implies a safety assessment	Not significant
No available RESA 240m	Bergamo	No (90m RESA exists), land being purchased gradually	Yes	DAAD with safety assessment	Not significant
No available RESA 240m	Fiumicino	No (90m RESA exists)	Yes	DAAD with safety assessment..	Not significant
No available RESA 240m	Lyon	No, but space available	Yes	DAAD with safety assessment	Not significant
No available	Annecy	No and no space available. A study is being carried out for the installation of	Yes	DAAD with safety assessment	None with the study

Issue	Aerodrome	Deviation in the case of national law?	Deviation with European law?	Basis for justification with the European certification process	Draft EU rules Impact
RESA 90m		REASA at existing aerodromes.		Or Special condition with restriction or mitigations measures for operation	under progress (see left cell)
OFZ (ICAO Annex 14 - 4.1)	Warsaw	Different with justifications based on an aeronautical study and mitigation measure	No	Not applicable, ADR meets the CS	None
RWY slope	Warsaw	Change of RWY slope to be compliant with regulation	No	RWY slope has been corrected during RWY modernisation works	None
Taxiway centerline marking	Warsaw	TWY centre line marking Zulu Blue and Zulu Orange according to ACI recommendation are not according to the yellow colour mandated in ICAO 5.2.1.5	Yes	ELoS or DAAD	Not significant
Width of RWY strip	Karlovy Vary	Yes, no mitigation measure, no safety assessment (agreed by Minister of Transport, before set up of NAA)	Yes	Special Condition with a safety assessment	Not significant
Width of taxiway	Lyon	Yes for all TWYs (10 kms), but accepted for the TWYs built before 2003 and safety assessment in case of rerouting of A380 to LYS aerodrome	Yes	DAAD based on cost objections, with a safety assessment to identify the relevant gear span restriction for aerodrome code D-E-F or without restriction if the safety assessment for A380 can be used for this purpose	Not significant
Width of taxiway	Praha	Yes, approved on a permanent basis	Yes	DAAD with reference to the plan of bring the TWY up to 23m at the next phase of pavement works	None

A total of nine aerodromes were in the scope of the case studies. Two aerodromes were without deviations. 14 deviations were found for 7 aerodromes:

- 43 % (3/7) of these aerodromes have one deviation;
- 29 % (2/7) of these aerodromes have two deviations;
- 11 % (1/7) of these aerodromes have three deviations;
- 11 % (1/7) of these aerodromes have four deviations.

As already mentioned in section 6.2.4, there is not always one way to prove the compliance with the draft ADR rules. The fundamental outcome of the case study exercise is that it was always possible to use one of the 'flexibility' tools to justify the compliance with the draft ADR rules, providing that at least a safety assessment was or will be performed.

7 deviations out of the 14 would not require actions or should be easily justified based on the information gathered during the case study exercise. The remaining 7 deviations would require a safety assessment. Based on the information gathered during the case study exercise, these safety assessments are not deemed to be difficult and should require low resources to justify the current deviations.

Based on the case study exercise, the demonstration of compliance used[19]:

- in three cases an alternative way to demonstrate the ELoS;
- in three cases a special condition;
- in nine cases a DAAD.

In one case, the changes in the draft ADR rule versus the original ICAO SARP were sufficient to show that the national deviation would not be a European one. This was due to the introduction of safety assessment in the draft ADR rules for Obstacle Free Zones (whereas this possibility is not included in ICAO Annex 14 — Standard 4.1).

6.2.6 Principles to analyse deviations

Case 1: This deviation is due to the notification of a national difference versus ICAO Annex 14

1) This difference is considered '<u>Different in character or other mean of compliance</u>'
   - The aerodrome operator wants to continue to use the same requirement as in the past, providing that there were no safety concerns, occurrences, issues raised by stakeholders.
   - Is it allowed with the draft rules?
     - Yes, with ELoS justification based on the fact that a notification of this difference was already done to ICAO and no safety issues arose from it.
   - It is the NAA or the aerodrome operator to make this request?
     - The aerodrome has to provide a safety assessment
2) This difference is considered '<u>Less strict</u>'

[19] This total number of cases is higher than the 14 deviations because there is the possibility to use more than one flexibility tool to justify a deviation. This is the NAA decision to choose one of these tools.

- The aerodrome operator wants to continue to use the same requirement as in the past, providing that there were no safety concerns, occurrences, issues raised by stakeholders
- Is it allowed with the draft rules?
    - MS can justify this with an ELoS because there are no criteria in the law to indicate how to take into account this 'less strict' statement related to ICAO.
    - SC is an alternative depending on the cases.
    - If not yet compliant with CS at the end 2017: DAAD.

3) This difference is considered 'More strict'

- The NAA wants to continue to use the same requirement as in the past to ensure the same level of safety.
- Is it allowed with the draft rules?
    - As the draft ADR rule will in many areas provide a minimum requirement, existing stricter than minimum national requirements are expected to be kept.

Case 2: The deviation is due to lack of national legislation and this deviation has been accepted by the NAA

Note: in such cases, the country has not notified a difference to ICAO.

- The aerodrome operator wants to continue to use its existing requirement as in the past to ensure the same level of safety and for financial reasons (compliance costs, negative impact on operations, etc.).
- Is it allowed with the draft rules?
    - Yes, with ELoS. The aerodrome will show the safety assessment supporting its decision to choose its requirement.

Understanding the DAAD usage

The DAAD mechanism is to support justifications of deviations which 'have existed prior to the entry into force of this Regulation'. The minimum impact is to provide a safety assessment. The minimum action is a regular monitoring of the deviation. The DAAD is not bound by time and can be in existence for as long as required to remove all existing deviations identified at the time of certification (there is no deadline fixed by the draft ADR rules).

Note: For more information, see section 4.2.2 'Option 2'.

Understanding safety assessment meaning

A safety assessment, supporting this decision by the NAA, would be proportionate to the wide range of SC applications from basic to highly sophisticated cases, hereby not necessarily involving quantifiable aspects.

A safety assessment process is provided in text and flow charts with GM to the draft ADR rules. It is intended to be applied in different size scales depending on the safety concern in question. The process provides methods to define a safety concern, analyse root causes and identify hazards related to the concern. It provides a method for risk assessment and mitigation measures.

Once the conversion of national aerodrome certificates is achieved

Once the national aerodrome certificates have been converted into European ones, ELoS and SC will be used to justify potential deviations which could appear when the aerodrome operator will foresee changes in the aerodrome design and operations. The DAAD will not be used anymore because there will not be any more existing deviations.

6.3 Analysis per impact

6.3.1 Safety impact

The implementation of the draft rules will allow coping with the challenging increase in aerodrome traffic.

Table 10: Safety impact

Option	*Safety impacts*	*Outcome*
Baseline (Option 0)	Increasing traffic create potential safety concerns without further *common requirements*	–
Pragmatic approach (Option 1)	**In the short term**, the lack of flexibility can threaten safety either: • by putting priority on works for harmonisation which would increase the safety risks due to a sudden rise of works activities in aerodrome over the conversion period, • or by the length of time to get derogations which could distract the authorities from more urgent safety issues. *This is supported by the case study exercise where the current tools in BR 1108/2009 do not allow to provide a certificate in 5 out of 14 deviations.* **In the long term**, once the national certificates have been converted, common requirements of aerodrome certification process will allow to cope with safety issues in relation with the constant traffic increase.	neutral
Pragmatic approach and additional flexibility (Option 2)	The short term negative impact mentioned for option 1 would not occur with option 2 thanks to the additional flexibility with the DAAD process. A higher number of issues will be dealt quicker and allow to convert the certificates without derogations. *This is supported by the case study exercise: where the current tools in BR 1108/2009 do not allow to provide a certificate in 5 out of 14 deviations, these 5 cases can be treated with the DAAD process.* As the DAAD involves at least a safety assessment to identify the best safe way to continue operation (which could mean no change in operations if already they are safe). The fact that resources will be used in a more efficient way can only benefits for safety.	+

Safety and stakeholders responsibilities

The BR 1108/2009 addresses the need to clarify the different levels of responsibility for aerodrome certification and operations. The draft ADR rules specify now the details of these responsibilities per stakeholder. The various national situations on the contractual relations between stakeholders are an issue when proposing harmonised rules. To answer to this issue:

1) the Implementing Rule ADR.OR.C.005 defines the aerodrome operator responsibilities and requires formal arrangements with organisations which provide services at the aerodrome (see Appendix G, sub-section on ADR.OR.C.005);

2) for specific subjects, IRs specify the general principles and the details set out in AMC or GM. This allows a Member State to propose another approach to comply with the IRs when the AMC or GM is not adequate for its country. (See Appendix G, sub-sections on 'Examples')

The impact of this approach is considered to be beneficial in terms of safety by allocating responsibility to the relevant stakeholders.

6.3.2 Environmental impact

Not applicable

6.3.3 Social impact

No social impacts identified with the current ADR threshold of 10 000 passengers per year.

Social impacts in the case of ADR certification have to consider the benefits provided by small aerodromes to allow the economic development of their regions. With the scope of the BR 1108/2009, Article 4, paragraph 3a, there was no outcome from the draft rules that smaller aerodromes would be subject to closure. A DAAD process can be established up to the end of 2019 with action, if any, that has no time limitation. This ensures that small aerodromes coming above the passenger threshold before the end of 2019 will have the possibility to get a certification while there are existing deviations.

It is the responsibility of the NAAs to use the different ways of flexibility and to plan which aerodromes could benefit from these flexibilities. A quick analysis of the data indicated in Table 19 based on Appendix C shows that a minimum of 25 % of the aerodromes under the European scope are below 10 000 passengers per year, i.e. 151 aerodromes.

Table 11: Social impact

Option	*Social impacts*	*Outcome*
Baseline (Option 0)	No change	neutral
Pragmatic approach (Option 1)	In case of deviation which cannot be justified with an ELoS or a Specific Condition, risks of suspension of aerodrome operation in case of request for derogation are heavy threats to smaller aerodrome operators and to a certain extent to larger operators. Impact on economic regional development would in this case have detrimental social effects. *This is supported by the case study exercise where the current tools in BR 1108/2009 do not allow to provide a certificate in 5 out of 14 deviations.*	– to neutral
Pragmatic approach and additional flexibility (Option 2)	The negative impact mentioned for option 1 would not occur with option 2 thanks to the additional flexibility with the DAAD process. The situation would be identical to Option 0. *This is supported by the case study exercise: where the current tools in BR 1108/2009 do not allow to provide a certificate in 5 out of 14 deviations, these 5 cases can be treated with the DAAD process.*	neutral

6.3.4 Economic impact

In the case of option 0, the national process for aerodrome certification would continue as it exists today, so there would be no impact. This statement is valid for all the sub-sections below.

6.3.4.1 ADR compliance costs during the conversion period

Aerodromes above BR traffic threshold:

All will be certified at the date of entry into force of the draft rules; therefore, the issue is to convert the existing national certificate into a European one with a smooth transition. The RIA examples (section 6.2.5), based on concrete cases, prove that a smooth transition is partially ensured with the tools from BR 1108/2009 (option 1). This is supported by the case study exercise where the current tools in BR 1108/2009 do not allow to provide a certificate in 5 out of 14 deviations. In practice it means that either the aerodrome would need to invest on a non-scheduled plan basis to correct the deviation or to send a request for derogation to the European Commission.

A smooth transition is fully ensured with the option 2 thanks to the DAAD. This is supported by the case study exercise: where the current tools in BR 1108/2009 do not allow to provide a certificate in 5 out of 14 deviations, these 5 cases can be treated with the DAAD process. The DAAD process will always involve a safety assessment and possible action.

It is not possible to estimate the avoided costs at aerodrome level per type of deviation justification (ELoS, SC, DAAD, derogation), e.g. an avoided cost of compliance because a safety assessment with potential mitigations would be less expensive than a strict application of a CS. However, an example can be given based on the case study exercise: the deviation from runway slope in Warsaw Chopin Airport was corrected during heavy modernisation runway works. The cost of these works was approximately 10 M€, knowing that the cost of the correction of the runway slope represents major part of it. As indicated in the Appendix I on examples of deviations, 'runway slope deviations would not typically be expected to be solved

by substantial rework of the runway. This appears to be a Special Condition candidate (rather than a DAAD one)'.

Aerodromes under BR traffic threshold:

Most of them will not be certified in 2013 and there is no plan to certify them. Changing this threshold will have significant economic costs for both the NAAs and ADR operators. On the NAA side, this will require additional resources at least for countries with a high number of aerodromes. On the ADR operator's side, each of them will have to deal with a significant cost impact, knowing that smaller aerodromes have fewer margins than bigger ones to adjust their budget to extra costs and they are more dependent on regional public subsidies.

Economics and stakeholders responsibilities

Following the analysis of the identification of safety responsibilities for the relevant stakeholders in section 6.3.1, the same logic applies to the economic impacts. The structure of the rules IR/AMC/GM allows the aerodromes to continue operations with the type of arrangements available in their country. If the relations between stakeholders change due to the draft ADR rules, there is no proof of adverse impact: therefore, the impact of the draft ADR rules is considered neutral on this aspect.

See the related information provided in section 6.3.1.

6.3.4.2 Administrative burden

The administrative burden was already analysed in details in the 'RIA Opinion 3-2007' and summarised in the EC Impact Assessment 2007. The approval of BR 1108/2009 by the MS implies that these administrative costs with the introduction of new rules are accepted and will be balanced over time by a more efficient overall system. The case study exercise did not indicate an additional impact compared to what was foreseen in the RIA Opinion 3-2007 and the EC Impact Assessment 2007.

By ensuring certification flexibility with the draft ADR rules, the foreseen administrative costs from the previous studies are deemed to be equivalent: time and money are efficiently used during the conversion period and national rulemaking will disappear for the aerodromes under BR 1008/2009 with the implementation of the draft ADR rules.

The option 2 provides better efficiency than option 1 by avoiding the use of derogations.

6.3.4.3 Timeframe for transition

The conversion period of 4 years after entering into force of the draft ADR rules was developed in cooperation with the ADR High Level Group. The draft ADR rules shall be adopted before the 31 December 2013. MS would have faced serious difficulties with shorter deadlines to meet a smooth transition from a national to European aerodrome certificate.

The DAAD mechanism may be used for new applications for certificate up to 31 December 2019, with the lifespan of the individual DAAD solution being decided by the competent authority.

This time window of about 10 years after the entry into force of the Basic Regulation was found to be adequate to let aerodromes, which would enter into the scope of application of the EU requirements only after the entry into force of the future ADR rules, also appropriately benefit from the DAAD mechanism.

It shall be noted, however, that the actual date does not involve a significant impact as only few cases of such aerodromes in need of a DAAD application can be envisaged: see Appendix H.

6.3.4.4 Level playing field for the European aerodrome sector

With the introduction of a harmonised European process for the aerodrome certification, the European Union ensures that all NAAs, aerodromes operators and other stakeholders and third parties will face the same requirements when it comes to ensuring aviation safety with the future increase of traffic.

This should strengthen the competitiveness of the European aerodrome operators by ensuring an efficient approach to safety and an appropriate application of ICAO SARPs. Knowing that an aerodrome operator may manage more than one aerodrome, the implementation of the draft ADR rules should reinforce the credibility for European aerodrome operators willing to manage aerodromes outside Europe.

6.3.4.5 Conclusion for economic impact

Various types of economic impacts have been considered here above. They are summarised in the following table.

Table 12: Economic impact

Option	*Economic impacts — Compliance costs*	*Outcome*
Baseline (Option 0)	No change	neutral
Pragmatic approach (Option 1)	In the short term, there is a burden to send an aerodrome derogation request for existing deviations. To avoid derogations, investment should be carried out with a detrimental impact on aerodrome resources and future development. This would be certainly more difficult to handle for smaller aerodromes than larger aerodromes due to lower resources. Once the conversion is done, full benefits are: efficient use of rulemaking activity at EASA level and aerodrome certification activity at NAA level.	– to +
Pragmatic approach and additional flexibility (Option 2)	The flexibility added by the DAAD is an improvement compared to the burden in option 1. Once the conversion id done, there are full benefits.	+

6.3.5 Proportionality issues

Technical common requirements

ICAO Annex 14 SARPs addressed already the proportionalities issues by breaking down the aerodromes into different categories. The draft rules follow the same logic.

The ICAO SARPs on Safety Management Systems (SMS) required close attention to allow for necessary proportionality for different sizes and complexity of aerodrome operations, mainly due to the fact that the BR threshold for aerodrome certification requires SMS also for smaller aerodromes which before were not in all cases subject to SMS requirements with their national legislation.

The case studies showed that France and Italy have national rules to distinguish SMS requirements according to the size of the aerodrome operators:

- There are no specific SMS requirements for aerodrome below 5 000 annual commercial movements in Italy.

- France considers different SMS requirements for aerodrome below 10 000 annual commercial movements over one of the last 3 years[20].

Therefore, with the feedback from countries having experienced the certification of smaller aerodromes, the draft ARD rules on SMS were adjusted to fit for this category:

SMS requirements in the draft ADR rules

ADR.OR. D.005 Management *(e) The management system shall be proportionate to the size of the organisation and its activities, taking into account the hazards and associated risks inherent in these activities.*

Note:

- *For Italy, the threshold of 10 000 annual commercial passengers for aerodrome certification exemption (BR 1108/2009, Article A4.3b) is below the current threshold of 5 000 annual commercial movements. This implies that several small aerodromes are now subject to the draft ADR rules: this is an impact of the BR 1108/2009, not the draft ADR rules. The draft ADR rules in fact soften the potential impacts as indicated in ADR.OR.005.*

Certification process

With option 1, when derogations are necessary, small aerodromes may either find it more difficult to follow the adoption process or get their NAAs to apply for derogations in the first place.

The option 2 with the introduction of the DAAD promotes a higher proportionality than the option 1 because smaller aerodromes can benefits from the flexibility of this tool (without decreasing the level of safety as already explained).

[20] GUIDE RELATIF A LA MISE EN OEUVRE D'UN SYSTEME DE GESTION DE LA SECURITE PAR LES EXPLOITANTS D'AERODROME, révision 4, 17/06/2011.

Table 13: Impact for proportionality issues

Option	*Impact with proportionality issues*	*Outcome*
Baseline (Option 0)	No change	neutral
Pragmatic approach (Option 1)	Technical common requirements ICAO breakdown according to different types of aerodrome has been reproduced in the draft ADR rules. SMS requirements have been tailored to the size of aerodrome operators. Certification process When derogations are necessary, small aerodromes may either find it more difficult to follow the adoption process or get their NAAs to apply for derogations in the first place.	+ –
Pragmatic approach and additional flexibility (Option 2)	Technical common requirements Identical to option 1 Certification process Introduction of the DAAD mechanism promotes higher proportionality than the option 1 because smaller aerodromes can benefits of the flexibility of this tool	+

6.3.6 Impact on regulatory coordination and harmonisation

The draft ADR rules being created by this NPA to support the common requirements of the certification process of European aerodromes provide the framework that should also help European Member States to show compliance with ICAO Standards and Recommended Practices (SARPs) in a more consistent and systematic manner (see section 6.1). The flexibility provisions should allow a common approach that is both transparent and proportionate. The Agency's role is to coordinate the development of this regulatory framework and the flexibility provisions in a harmonious manner at Member State level.

Once the ADR rules are adopted (by the latest on 31 December 2013), they will replace the national regulations for the aerodromes under BR 1108/2009 Article 4.3. This should ease the burden on those Member States who filed differences to ICAO Annex14. The Agency will notify ICAO of any differences between ICAO Annex 14 and the European ADR rules and will make this available to all Member States.

However, Member States will have to file differences for aerodromes they decided to exempt from the application of the BR 1108/2009 (Article 4.3b).

The new arrangements will also enable Europe to more effectively coordinate the development of new SARPs through ICAO and to promote a more pragmatic approach.

Comparison ICAO Annex 14 — draft ADR rules
See section 6.1

Overall, the changes per option are summarised in the following table.

Table 14: Impact on regulatory harmonisation and coordination

Option	*Impact on regulatory harmonisation: ICAO Annex 14*	*Outcome*
Baseline (Option 0)	No change, divergence will remain.	neutral
Pragmatic approach (Option 1)	**Technical common requirements and relation with ICAO** *General* ICAO Annex 14 was the main input for the rules on design and aerodrome operations. Even if the ICAO SARPs have been reviewed to be accommodated within EU legislation, the requirements are in most of the cases identical. The only major change is the designation of responsibilities for stakeholders. *Future European inputs into ICAO Annex 14* The new arrangements will enable Europe to more effectively coordinate the development of international SARPs through ICAO and to promote a more pragmatic approach. If an ICAO Annex 14 amendment would not be supported by the Agency (after gathering the position of the EU Member States), the Agency would, on behalf of its Member States, notify ICAO of any differences to Annex 14. *Impact of the future ICAO Annex 14 amendments on national regulations* Except for the very few cases of countries that will have to maintain national regulations for the exempted aerodromes under BR 1108/2009 Article 4.3.b, those Member States who currently notified differences will not have to handle these differences anymore. **Certification process common requirements** The comparison with ICAO Annex 14 is not really applicable as this field was not very detailed in ICAO or other international sources. The development of the draft ADR rules is a key step towards a smooth harmonisation of the aerodrome certification process of 31 European countries.	+
Pragmatic approach and additional flexibility (Option 2)	Identical to Option 1	+

7 Conclusion and preferred option

7.1 Comparison of options and preferred option

The overview provided in the following page indicates that the option combining a pragmatic approach with additional flexibility (i.e. option 2) provides a higher support to answer to the objectives defined in section 3.

Table 15: Overview of the options per type of impacts

Baseline (option 0)	***Pragmatic approach (option 1)***	***Practical approach and additional flexibility (option 2)***
Safety		
– Increasing traffic creates potential safety concerns without harmonisation	**0** After the conversion period, harmonisation of an aerodrome certification process will allow a safe traffic increase. During the conversion period, safety issues could arise either: • due to a priority given to compliance works in aerodromes instead of other developments with safety related aspects; • or due to the priority given by authorities to derogation justification which could distract the authorities from more urgent safety issues.	**+** After the conversion period: identical to option 1. During the conversion period, a higher number of deviations will be dealt quicker by means of the DAAD process and allow the conversion of certificates without derogations. The level of safety will benefit from an efficient use of resources. Note: The safety assessment required by the DAAD will identify the best safe way to continue operation.
Social		
0 No change	**– to 0** In case of derogation request, the risks of suspension of aerodrome operation would threaten the economic viability of aerodrome operators (and more particularly smaller ones). This would have potential detrimental impacts on regional development.	**0** The negative impact mentioned for option 1 would not occur with option 2 thanks to the additional flexibility with the DAAD process.
Economic impacts (summary)		
0 No change	**– to +** Derogation request would threaten aerodrome economic viability (airlines operations might be reconsidered, cost resources attached to derogations, etc.). To avoid this, investment could be carried out with a detrimental impact on aerodrome resources and development. After the conversion period, full benefits are: efficient use of rulemaking resources.	**+** The flexibility added by the DAAD is an improvement compared to the burden in option 1. Once the conversion is done, full benefits are: efficient use of rulemaking activity at EASA level and aerodrome certification activity at NAA level.
Proportionality issues		
0 No change	**– to +** Certification process would be more difficult for smaller aerodromes when derogations are necessary. ICAO breakdown according to different types of aerodromes is kept. SMS requirements were tailored to the size of aerodrome operators.	**+** Technical common requirements: identical to Option 1 Certification process: smaller aerodromes can benefits from the DAAD
Regulatory coordination and harmonisation		
– Diversity of the national rules remains	**+** A key step towards smooth aerodrome certification harmonisation of 31 European countries with requirements almost identical to ICAO Annex 14. Europe will more effectively coordinate the development of ICAO SARPs.	**+** Identical to Option 1

7.2 Draft ADR rules … What next?

Developing rules is one activity, making sure that they are correctly applied is another one. In the case of the draft ADR rules, the wide scope of these rules and their flexibility could be factors leading to misunderstanding unless training is provided and monitoring supports the identification of raising concerns.

Training

The Agency should develop training for NAAs and aerodromes. This training should explain the structure of the ADR rules and the way to apply them. The objective would be for the trainee to understand the process of converting a national aerodrome certificate into a European one.

Monitoring

Monitoring will support the Agency's reaction in case of similar certification issues occurring in different aerodromes.

Key aspects to follow the flexibility

- A number of deviations and the corresponding types of justification (ELoS, SC, DAAD, AltMoC), with an analysis of the correct application of ELoS, SC, etc.
- A number of deviations which are difficult to solve and relation with the corresponding CS, AMC, GM, etc.

Performance indicators:

- Indicators to measure the Agency's activity on clarification of rules implementation (e.g. number of emails).
- Effective period for conversion of the national certificate per aerodrome.

Appendix A: Acronyms and definitions

ADR: Aerodrome

AMC: Acceptable Mean of Compliance

AltMoC: Alternative Means of Compliance

ATM/ANS: Air Traffic Management/Air Navigation Services

BR: Basic Regulation (EC) No 216/2008 as last amended by Regulation (EC) No 1108/2009

CS: Certification Specification

DAAD: Deviation Acceptance & Action Document, draft Regulation on requirements and administrative procedures related to aerodromes, Article 8 'Existing deviations from Certification Specifications'

ELoS: Equivalent Level of Safety

ER: Essential Requirement

GASR: Group of Aerodrome Safety Regulators

GM: Guidance Material

ICAO: International Civil Aviation Organisation

IR: Implementing Rule

MS: Member State

NAA: National Aviation Authority

NPA: Notice of Proposed Amendment

OFZ: Obstacle Free Zone

OLS: Obstacle Limitation Surface

PCN: Pavement Classification Number

REC: Recommended Practice (from ICAO)

RESA: Runway End Safety Area

RWY: Runway

SARP: Standard and Recommended Practices (from ICAO)

SC: Special Condition

SMS: Safety Management System

ST: Standard from ICAO

TWY: Taxiway

Appendix B: References

- EASA RIA Opinion 03/2007 Attachment 2 'Regulatory impact assessment on the extension of the scope of the EASA Basic Regulation to the safety and interoperability of aerodromes'.
- Commission Staff Working Document, Impact Assessment of extending the EASA system to the regulation of aerodromes, Air Traffic Management and Air Navigation Services (ATM/ANS), Brussels, 24.4.2008, COM(2008)
- TÜV & Airsight Study on 'ICAO Annex 14 implementation in the EU MS', 2009.
- Terms of Reference for ADR tasks (18 June 2010).

Appendix C: General data

A questionnaire on general data in the field of aerodrome certification was sent to the 31 EASA Member States on March 2011 (EU-27 + Iceland + Liechtenstein + Norway + Switzerland).
27 countries answered to all the questions, Liechtenstein has no aerodrome under the BR scope.
There were 3 partial answers: Austria, Germany and Hungary did not send the differences notified to ICAO Annex 14.
There were 2 missing answers: Denmark and Greece.

1. *General overview on ICAO implementation, management of deviations, NAA staffing and aerodrome currently certified.*

Table 16: Overview at country level on ICAO implementation, management of aerodrome deviations, NAA staffing and aerodrome certified (year 2011)

Member State	*Did the MS notify differences with ICAO Annex 14?*	*Does the MS have a list of deviations between national rules and airports?*	*NAA staff (based on FTE)*		*Number of ADR under Basic Regulation scope*	
			Total staff	*Staff for airport safety matters*	*Total*	*Certified*
Austria	Yes (1)	In progress			6	6
Belgium	No	Yes	179	4	6	6
Bulgaria	No	No	98	7	5	5
Cyprus	No	No	6	4	2	0
Czech Republic	Yes	Yes	7	7	5	5
Denmark	no answer					
Estonia	Yes	Yes	28	2	5	5
Finland	Yes	Yes	117	4	27	27
France	Yes	No	660	120	159	32
Germany	Yes (1)				35	35
Greece	no answer					
Hungary	No answer	No	105	5	5	5
Iceland	No	No	42	2	4	4
Ireland	No	No	2,5	2	10	10
Italy	Yes	Yes	1006	174	51	45
Latvia	No	No	55	2	3 (3)	3
Liechtenstein	not applicable					
Lithuania	Yes	No	58	4	4	4
Luxembourg	No	No	3	3	1	0
Malta	Yes	No	2	2	1	1
Netherlands	Yes	Yes	175	16	5	5
Norway	Yes	Yes for temporary deviations No for permanent deviations (2)	170	8	47 (4)	47
Poland	Yes	Yes	352	22	10	10
Portugal	No	No	195	5	34	34
Romania	No	Yes	204	18	16	16

Member State	Did the MS notify differences with ICAO Annex 14?	Does the MS have a list of deviations between national rules and airports?	NAA staff (based on FTE)		Number of ADR under Basic Regulation scope	
			Total staff	Staff for airport safety matters	Total	Certified
Slovakia	No	Yes	89	4	6	5
Slovenia	Yes	No	47	4	3	0
Spain	Yes	Yes	633	33	41	1
Sweden	No	Yes	220	9	51	51
Switzerland	Yes	No	281	10	5	4
United Kingdom	Yes	Yes	800	34	52	52

[1] *The list of differences with ICAO was not sent to EASA.*
[2] *Indicated in Aerodrome Certificate and AIP.*
[3] *One potential aerodrome to be considered in the future.*
[4] *Not included: 5 certified military aerodromes with commercial passenger traffic.*

2. *Overview on aerodrome certification status at European level*

Table 17: Status of aerodrome certification in 2011

Certification status	Aerodromes according to the Basic Regulation threshold (*absolute* numbers)				
	Above BR threshold	Below BR threshold	Out of scope	Unknown	Grand total
In progress	26	2	0	0	28
Not scheduled	4	71	0	1	74
Scheduled	70	4	0	0	74
Certified	344	77	5	1	427
Grand total	**444**	**154**	**5**	**2**	**605**

Table 18: Status of aerodrome certification in 2011

	Aerodromes according to the Basic Regulation threshold (percentage shares)				
Certification status	Above BR threshold	Below BR threshold	Out of scope	Unknown	Grand total
In progress	6 %	1 %	0 %	0 %	5 %
Not scheduled	1 %	46 %	0 %	50 %	12 %
Scheduled	16 %	3 %	0 %	0 %	12 %
Certified	77 %	50 %	100 %	50 %	71 %
Grand total	**100 %**	**100 %**	**100 %**	**100 %**	**100 %**

3. *List of aerodromes per country under the BR scope (indicative)*

Table 19: Overview of aerodromes per country under the scope of BR 1108/2009 (year 2011)

Country	*Above BR threshold*	*Below BR threshold*	*Threshold to be confirmed*	*Out of scope (military ADR)*	*Grand total*
France	87	72			159
Norway	43	4		5	52
UK	41	11			52
Italy	39	12			51
Sweden	35	16			51
Spain	39	2			41
Germany	35				35
Portugal	13	21			34
Finland	21	6			27
Romania	14	2			16
Ireland	9		1		10
Poland	10				10
Austria	6				6
Belgium	6				6
Slovakia	3	3			6
Bulgaria	4	1			5
Czech Republic	5				5
Estonia	5				5
Hungary	4	1			5
Netherlands	4	1			5
Switzerland	5				5
Iceland	4				4
Latvia	2	1	1		4
Lithuania	3	1			4
Slovenia	3				3
Cyprus	2				2
Luxembourg	1				1
Malta	1				1
Grand total	429	151	20	5	605

Note: The order of the rows follows the Figure 2.

4. *List of individual aerodromes*

Table 20: Aerodromes under BR 1108/2009: traffic for year 2011 and status of the certification in 2011

Country	*ICAO code*	*Aerodrome*	*Number of passengers carried*	*Volume of freight[21] (tonnes)*	*Total commercial movements*	*Cargo move-ments*	*Certified aerodrome*
Austria	LOWW	Wien Schwecht, Vienna Int. Airport	19 691 206	219 334	246 146	6 253	Yes
Austria	LOWS	Salzburg Airport — W.A. Mozart	1 625 842	154	20 159	8	Yes
Austria	LOWI	Innsbruck Airport	1 033 512	384	21 135	0	Yes
Austria	LOWG	Flughafen Graz	996 382	191	17 387	10	Yes
Austria	LOWL	Blue Danube Airport Linz	698 672	6 571	13 689	972	Yes
Austria	LOWK	Kärnten Airrport	425 933	13	7 482	0	Yes
Belgium	EBBR	Brussels Airport	17 180 606	476 135	225 682	…	Yes
Belgium	EBCI	Brussels South — Charleroi Airport	5 194 841	0	80 007	0	Yes
Belgium	EBLG	Liège Airport	300 032	639 669	48 505	…	Yes
Belgium	EBOS	Ostend Airport	213 368	64 041	37 875	…	Yes
Belgium	EBAW	Antwerp Airport	162 840	4 213	51 703	…	Yes
Belgium	EBKT	Kortrijk Airport	65 897	2	32 020	…	Yes
Bulgaria	LBSF	SOFIA INT AIRPORT	3 287 529	14 503	46 761	3 077	Yes
Bulgaria	LBPV	PLOVDIV INT AIRPORT	26 784	447	5 232	49	Yes
Bulgaria	LBGO	GORNA ORIAHOVITSA INT AIRPORT	1 148	18	902	3	Yes
Bulgaria	LBBG	BOURGAS INT AIRPORT	1 874 563	5 654	15 775	441	Yes
Bulgaria	LBWN	VARNA INT AIRPORT	1 198 956	78	12 577	378	Yes
Cyprus	LCLK	Larnaka	5 475 905	37 454	49 022	…	In progress
Cyprus	LCPH	Pafos	1 646 937	407	12 802	…	In progress
Czech Republic	LKPR	Ruzyne Airport — Prague	11 556 858	52 672 468	156 052	2 186	Yes
Czech Republic	LKTB	Airport Brno — Turany	357 671	5 342 000	25 027	563	Yes
Czech Republic	LKMT	Mosnov Airport — Ostrava	244 214	1 925 000	13 549	2 107	Yes
Czech Republic	LKKV	Airport Karlovy Vary	68 533	0	6 612	0	Yes
Czech Republic	LKPD	Airport Pardubice	61 485	238 859	1 235	22	Yes
Estonia	EETN	Lennart Meri Tallinn	1 384 831	11 960	33 587	1 674	Yes
Estonia	EETU	Tartu	23 504	0	4 809	0	Yes
Estonia	EEKE	Kuressaare	19 702	18	2 036	29	Yes
Estonia	EEKA	Kärdla	10 551	0	1 352	0	Yes
Estonia	EEPU	Pärnu	5 148	75	1 716	45	Yes
Finland	EFHK	Helsinki-Vantaa	12 884 500	158 149	*88 480*	…	Yes
Finland	EFOU	Oulu	700 576	1 922	*11 236*	…	Yes
Finland	EFTP	Tampere-Pirkkala	617 713	669	*18 965*	…	Yes

[21] Freight and mail loaded/unloaded.

Country	*ICAO code*	*Aerodrome*	*Number of passengers carried*	*Volume of freight[21] (tonnes)*	*Total commercial movements*	*Cargo move-ments*	*Certified aerodrome*
Finland	EFTU	Turku	357 259	7 061	*14 455*	…	Yes
Finland	EFRO	Rovaniemi	309 821	174	*10 780*	…	Yes
Finland	EFVA	Vaasa	288 142	26	*5 884*	…	Yes
Finland	EFKU	Kuopio	253 612	39	*10 941*	…	Yes
Finland	EFKT	Kittilä	214 493	12	*1 233*	…	Yes
Finland	EFJO	Joensuu	118 761	46	*3 185*	…	Yes
Finland	EFIV	Ivalo	111 940	22	*853*	…	Yes
Finland	EFKE	Kemi-Tornio	96 562	27	*2 481*	…	Yes
Finland	EFJY	Jyväskylä	88 608	26	*14 812*	…	Yes
Finland	EFKS	Kuusamo	82 497	3	*746*	…	Yes
Finland	EFKK	Kokkola-Pietarsari / Kruunupyy	80 181	27	*3 388*	…	Yes
Finland	EFKI	Kajaani	66 013	60	*978*	…	Yes
Finland	EFLP	Lappeenranta	61 100	1	*1 830*	…	Yes
Finland	EFMA	Mariehamn	48 672	339	*3 053*	…	Yes
Finland	EFPO	Pori	43 185	14	*15 587*	…	Yes
Finland	EFSI	Seinäjoki	33 920	13	*1 497*	…	Yes
Finland	EFET	Enontekiö	16 023	0	*140*	0	Yes
Finland	EFSA	Savonlinna	15 899	8	*840*	…	Yes
Finland	EFVR	Varkaus	8 057	3	*627*	…	Yes
Finland	EFMI	Mikkeli	1 214	0	*1 395*	0	Yes
Finland	EFKA	Kauhava	155	0	*5 900*	0	Yes
Finland	EFHF	Helsinki-Malmi	50	0	*41 570*	0	Yes
Finland	EFHA	Halli	15	0	*1 951*	0	Yes
Finland	EFUT	Utti	14	0	*2 868*	0	Yes
France	NLWF	FUTUNA *	…	…	…		Scheduled
France	SOOA	MARIPASOULA *	…	…	…		Scheduled
France	LFBG	PARIS LE BOURGET	…	…	58 072		Scheduled
France	LFPG	PARIS CHARLES DE GAULLE	58 075 239	2 399 067	491 900		Yes
France	LFPO	PARIS ORLY	25 198 862	102 619	215 645		Yes
France	LFMN	NICE COTE D'AZUR	9 587 928	17 896	146 671		Yes
France	LFLL	LYON SAINT-EXUPERY	7 801 849	37 207	116 121		Yes
France	LFML	MARSEILLE PROVENCE	7 337 897	59 762	97 317		Yes
France	LFBO	TOULOUSE BLAGNAC	6 324 817	52 605	79 848		Yes
France	LFSB	BALE MULHOUSE	4 091 667	43 772	60 451		Yes
France	LFBD	BORDEAUX MERIGNAC	3 612 327	11 410	46 607		Yes
France	LFRS	NANTES ATLANTIQUE	2 954 936	8 343	39 833		Yes
France	LFOB	BEAUVAIS TILLE	2 929 568	0	20 528		Yes
France	FMEE	SAINT-DENIS GILLOT	1 910 937	34 979	14 258		Yes
France	TFFR	POINTE-A-PITRE LE RAIZET	1 836 375	14 307	26 145		Yes
France	TFFF	MARTINIQUE AIMÉ CÉSAIRE	1 556 733	13 707	20 692		Yes
France	NTAA	TAHITI FAA'A *	1 180 835	12 887	25 961		Yes
France	LFMT	MONTPELLIER MEDITERRANEE	1 177 860	7 044	13 785		Yes

Country	*ICAO code*	*Aerodrome*	*Number of passengers carried*	*Volume of freight[21] (tonnes)*	*Total commercial movements*	*Cargo move-ments*	*Certified aerodrome*
France	LFQQ	LILLE LESQUIN	1 149 189	539	17 104		Yes
France	LFKJ	AJACCIO-CAMPO-DELL'ORO	1 110 067	5 909	12 781		Yes
France	LFST	STRASBOURG ENTZHEIM	1 034 367	3 108	25 283		Yes
France	LFKB	BASTIA PORETTA	1 006 525	6 976	13 037		Yes
France	LFBZ	BIARRITZ BAYONNE ANGLET	989 152	—	8 918		Yes
France	LFRB	BREST GUIPAVAS	890 432	1 251	13 572		Yes
France	LFBP	PAU PYRENEES	672 289	1 816	9 425		Yes
France	NWWW	NOUMEA LA TONTOUTA *	479 122	7 277	3 797		Yes
France	LFBT	TARBES LOURDES PYRENEES	436 379	—	5 740		Yes
France	LFKF	FIGARI SUD CORSE	435 809	—	7 253		Yes
France	SOCA	CAYENNE ROCHAMBEAU	419 841	5 492	9 645		Yes
France	LFRN	RENNES SAINT-JACQUES	408 248	10 857	12 952		Yes
France	LFMK	CARCASSONNE SALVAZA	392 940	—	2 676		Yes
France	NWWM	NOUMEA MAGENTA *	367 096	1 382	18 968		In Progress
France	LFLC	CLERMONT-FERRAND AUVERGNE	366 107	2 535	12 669		Yes
France	LFMP	PERPIGNAN RIVESALTES	363 205	—	3 664		Yes
France	LFLS	GRENOBLE SAINT GEOIRS	350 000	—	3 266		Yes
France	LFBL	LIMOGES BELLEGARDE	336 297	511	6 500		Yes
France	FMCZ	DZAOUDZI PAMANDZI	279 932	2 130	5 928		In Progress
France	LFKC	CALVI SAINTE-CATHERINE	273 564	4	4 803		In Progress
France	LFBE	BERGERAC ROUMANIERE	259 723	—	3 375		In Progress
France	LFJL	METZ NANCY LORRAINE	237 488	69	5 650		Scheduled
France	LFLB	CHAMBERY/AIX LES BAINS	231 592	—	3 579		In Progress
France	NTTB	BORA BORA *	222 541	343	6 064		In Progress
France	TFFG	ST MARTIN GRAND CASE	202 077	331	4 188		Scheduled
France	LFBH	LA ROCHELLE	191 429		2 925		In Progress
France	LFTW	NIMES/ARLES CAMARGUE	179 933	12	1 431		Scheduled
France	NTTR	RAIATEA *	162 664	344	5 414		In Progress
France	NWWL	LIFOU (ILES LOYAUTE) *	142 047	515	3 616		In Progress
France	TFFJ	ST BARTHELEMY	139 066	242	27 051		In Progress
France	LFCR	RODEZ MARCILLAC	138 311		3 866		In Progress
France	LFMU	BEZIERS VIAS	130 374		1 109		Scheduled
France	LFRD	DINARD-PLEURTUIT-ST-MALO	122 254	10	2 407		In Progress
France	FMEP	SAINT-PIERRE PIERREFONDS	119 477	42	2 634		In Progress
France	NTTM	MOOREA *	110 590	34	9 249		In Progress

Country	*ICAO code*	*Aerodrome*	*Number of passengers carried*	*Volume of freight[21] (tonnes)*	*Total commercial movements*	*Cargo move-ments*	*Certified aerodrome*
France	LFRG	DEAUVILLE ST GATIEN	106 012	24	2 162		Scheduled
France	LFRQ	QUIMPER PLUGUFFAN	105 767		2 394		In Progress
France	LFBI	POITIERS BIARD	98 079		2 822		Scheduled
France	NTTH	HUAHINE *	88 764	165	4 169		Scheduled
France	NWWE	ILE DES PINS *	78 998	224	2 211		Scheduled
France	LFRK	CAEN CARPIQUET	76 702	52	2 882		Scheduled
France	NWWV	OUVEA (ILES LOYAUTE) *	70 147	293	1 904		Scheduled
France	LFMH	ST ETIENNE BOUTHEON	70 125		9 510		Scheduled
France	NWWR	MARE (ILES LOYAUTE) *	69 586	311	1 932		Scheduled
France	NTTG	RANGIROA *	54 536	220	2 944		Scheduled
France	LFLP	ANNECY MEYTHET	51 644		3 061		Scheduled
France	NLWW	WALLIS HIHIFO *	41 848	290	1 745		Scheduled
France	LFOH	LE HAVRE OCTEVILLE	41 606	0	1 792		Scheduled
France	NTMD	NUKU HIVA *	40 433	170	2 235		Scheduled
France	LFMV	AVIGNON CAUMONT	39 379		8 174		Scheduled
France	LFCK	CASTRES MAZAMET	35 428		2 329		Scheduled
France	LFBV	BRIVE-SOUILLAC	35 243		1 538		Scheduled
France	LFRO	LANNION	32 884		1 435		Scheduled
France	LFBA	AGEN LA GARENNE	31 092		1 443		Scheduled
France	LFVP	SAINT-PIERRE POINTE BLANCHE **	29 945	195	2 018		Scheduled
France	NTGC	TIKEHAU *	24 531	125	1 122		Scheduled
France	NTGF	FAKARAVA *	22 453	93	1 067		Scheduled
France	NTMN	HIVA OA ATUANA *	22 192	83	1 428		Scheduled
France	LFLW	AURILLAC TRONQUIERES	21 891		954		Scheduled
France	LFOK	PARIS-VATRY	21 000	7 887	981		Scheduled
France	NTTP	MAUPITI *	17 823	70	693		Scheduled
France	LFMD	CANNES MANDELIEU	17 078		6 864		Scheduled
France	NTAR	RURUTU *	16 553	116	709		Scheduled
France	NTAT	TUBUAI/MAIAO *	16 419	127	711		Scheduled
France	LFRZ	SAINT-NAZAIRE-MONTOIR	15 618	17 088	1 609		Scheduled
France	NTGI	MANIHI *	14 537	49	858		Scheduled
France	LFLY	LYON BRON	12 020		6 750		Scheduled
France	NTTO	HAO *	11 168	92			Scheduled
France	LFOP	ROUEN VALLEE DE SEINE	4 662	5	616		Scheduled
France	LFBU	ANGOULEME	343		111		Scheduled
Germany	EDDF	Frankfurt Main (FRA)	52 710 228	2 275 106	458 279	23 524	Yes
Germany	EDDM	München (MUC)	34 598 634	286 820	378 919	3 071	Yes
Germany	EDDL	Düsseldorf (DUS)	18 943 720	87 755	209 736	201	Yes
Germany	EDDT	Berlin Tegel (TXL)	14 991 115	21 595	152 948	843	Yes
Germany	EDDH	Hamburg (HAM)	12 962 917	27 203	157 180	557	Yes
Germany	EDDK	Köln/Bonn (CGN)	9 806 270	644 023	121 011	22 239	Yes
Germany	EDDS	Stuttgart (STR)	9 226 546	31 105	119 751	2 316	Yes

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Germany	EDDB	Berlin Schoenefeld (SXF)	7 297 911	9 488	67 801	1 524	Yes
Germany	EDDV	Hannover (HAJ)	5 060 956	16 253	62 575	658	Yes
Germany	EDDN	Nürnberg (NUE)	4 034 071	7 937	55 980	1 372	Yes
Germany	EDFH	Frankfurt-Hahn (HHN)	3 463 571	167 158	35 243	5 407	Yes
Germany	EDLV	Niederrhein (NRN)	2 889 651	0	22 624	0	Yes
Germany	EDDW	Bremen (BRE)	2 676 297	541	38 889	23	Yes
Germany	EDDP	Leipzig/Halle (LEJ)	1 847 193	638 489	57 727	29 920	Yes
Germany	EDDC	Dresden (DRS)	1 803 511	371	27 966	21	Yes
Germany	EDLW	Dortmund (DTM)	1 740 642	33	24 232	101	Yes
Germany	EDDG	Münster/Osnabrück (FMO)	1 312 656	131	30 301	63	Yes
Germany	EDSB	Karlsruhe/Baden-Baden (FKB)	1 177 180	728	28 616	560	Yes
Germany	EDLP	Paderborn/Lippstadt (PAD)	1 007 978	146	25 725	31	Yes
Germany	EDJA	Memmingen (FMM)	902 563	1	10 410	…	Yes
Germany	EDNY	Friedrichshafen (FDH)	590 648	65	15 144	40	Yes
Germany	EDVK	Kassel-Calden (KSF)	540 000	3 000	8 310	1 400	Yes
Germany	EDHL	Lübeck-Blanckensee (LBC)	537 633	1	11 326	2	Yes
Germany	EDDR	Saarbrücken (SCN)	420 101	121	13 759	61	Yes
Germany	EDDE	Erfurt (ERF)	323 742	1 266	6 687	1 089	Yes
Germany	EDRZ	Zweibrücken (ZGW)	264 274	395	11 222	296	Yes
Germany	EDXW	Sylt (GWT)	187 925	0	3 251	0	Yes
Germany	EDAC	Leipzig-Altenburg Airport (AOC)	118 966	4	6 539	10	Yes
Germany	EDVE	Braunschweig-Wolfsburg (BWE)	105 622	46	9 830	104	Yes
Germany	EDFM	Mannheim City (MHG)	51 360	550	10 198	790	Yes
Germany	EDLN	Mönchengladbach (MGL)	25 458	0	33 664	0	Yes
Germany	EDWI	Wilhelmshaven JadeWeserAirport (WVN)	22 738	0	7 372	0	Yes
Germany	EDWE	Emden (EME)	22 345	640	8 686	134	Yes
Germany	EDQM	Hof-Plauen (HOQ)	14 573	0	2 412	0	Yes
Germany	EDWB	Bremerhaven (BRV)	12 141	61	9 900	…	Yes
Hungary	LHBP	Budapest Liszt Ferenc	8 190 089	65 514	105 507	5 808	Yes
Hungary	LHDC	Debrecen	24 000	150	2 200	30	Yes
Hungary	LHSM	FLYBALATON AIRPORT	14 828	264 773	3 088	46	Yes
Hungary	LHPR	Győr-Pér	11.112	528	5.700	866	Yes
Hungary	LHPP	Pécs-Pogány	6 000	0	4 000	0	Yes
Iceland	BIRK	Reykjavík Airport	421 507	162	66 338	…	Yes
Iceland	BIKF	Keflavík International Airport	1 791 000	34 708	52 417	…	Yes
Iceland	BIAR	Akureyri Airport	239 206	333	13 964	…	Yes
Iceland	BIEG	Egilsstaðir Airport	97 628	0	3 282	…	Yes

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Ireland	EIWT	Weston Airport	no scheduled pax	…	…	…	Yes
Ireland	EIDW	Dublin Airport	18 431 393	…	160 327	3 670	Yes
Ireland	EICK	Cork Airport	2 425 131	…	48 366	806	Yes
Ireland	EINN	Shannon Airport	1 460 659	…	27 382	1 507	Yes
Ireland	EIKN	Ireland West Airport, Knock	589 180	…	8 338	…	Yes
Ireland	EIKY	Kerry Airport	387 223	…	4 506	…	Yes
Ireland	EICM	Galway Airport	154 602	…	16 723	…	Yes
Ireland	EIWF	Waterford Airport	105 961	…	15 936	…	Yes
Ireland	EIDL	Donegal Airport	46 825	…	3 049	…	Yes
Ireland	EISG	Sligo Airport	21 692	…	6 872	…	Yes
Italy	LILE	BIELLA	…	…	…	…	Not scheduled
Italy	LIER	ORISTANO	…	…	…	…	Yes
Italy	LIPU	PADOVA	…	…	…	…	Not scheduled
Italy	LIDE	REGGIO EMILIA	…	…	…	…	Yes
Italy	LIET	TORTOLI'	…	…	…	…	In progress
Italy	LIRF	ROMA Fiumicino	35 956 295	164 546	329 252	…	Yes
Italy	LIMC	MILANO Malpensa	18 714 187	432 673	189 580	…	Yes
Italy	LIML	MILANO Linate	8 295 436	19 063	91 907	…	Yes
Italy	LIME	BERGAMO Orio al Serio	7 661 061	106 050	67 167	…	Yes
Italy	LIPZ	VENEZIA Tessera	6 801 941	25 377	72 763	…	Yes
Italy	LICC	CATANIA Fontanarossa	6 301 832	9 286	57 249	…	Yes
Italy	LIRN	NAPOLI Capodichino	5 535 984	3 119	55 914	…	Yes
Italy	LIPE	BOLOGNA Borgo Panigale	5 432 248	28 147	64 193	…	Yes
Italy	LIRA	ROMA Ciampino	4 563 852	18 003	47 749	…	Yes
Italy	LICJ	PALERMO Punta Raisi	4 341 696	2 827	46 569	…	Yes
Italy	LIRP	PISA San Giusto	4 048 068	6 134	36 339	…	Yes
Italy	LIMF	TORINO Caselle	3 541 073	1 187	43 769	…	Yes
Italy	LIEE	CAGLIARI Elmas	3 426 864	3 610	34 510	…	Yes
Italy	LIBD	BARI Palese Macchie	3 371 693	2 390	33 184	…	Yes
Italy	LIPX	VERONA Villafranca	2 975 557	1 153	33 167	…	Yes
Italy	LIPH	TREVISO Sant'Angelo	2 144 338	2 932	18 086	…	Yes
Italy	LICA	LAMEZIA TERME	1 906 224	1 924	16 797	…	Yes
Italy	LIRQ	FIRENZE Peretola	1 724 784	186	24 244	…	Yes
Italy	LICT	TRAPANI	1 682 151	10	14 560	…	Yes
Italy	LIBR	BRINDISI Papola Casale	1 599 533	120	13 909	…	Yes
Italy	LIEO	OLBIA Costa Smeralda	1 591 821	220	23 723	…	Yes
Italy	LIEA	ALGHERO Fertilia	1 385 567	1 440	13 752	…	Yes
Italy	LIMJ	GENOVA Sestri	1 272 048	903	16 763	…	Yes
Italy	LIPQ	TRIESTE Ronchi dei Legionari	723 075	121	10 880	…	Yes
Italy	LIPK	FORLI'	639 853	1 146	6 848	…	Yes

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Italy	LIPR	RIMINI	541 907	404	8 215	…	Yes
Italy	LIPY	ANCONA Falconara	511 417	6 276	12 717	…	Yes
Italy	LICR	REGGIO CALABRIA	474 534	185	5 772	…	Yes
Italy	LIPB	PESCARA	456 104	2 085	5 677	…	Yes
Italy	LIMP	PARMA	238 970	…	4 896	…	Yes
Italy	LICD	LAMPEDUSA	192 306	34	2 837	…	Not scheduled
Italy	LIMZ	CUNEO	175 607	…	2 755	…	Yes
Italy	LIPO	BRESCIA Montichiari	158 265	20 275	6 270	…	Yes
Italy	LICG	PANTELLERIA	139 805	60	4 040	…	Not scheduled
Italy	LIRZ	PERUGIA	111 140	19	2 626	…	Yes
Italy	LIBC	CROTONE	105 040	…	2 472	…	Yes
Italy	LIBF	FOGGIA	70 061	5	4 443	…	Yes
Italy	LIPB	BOLZANO	53 917	…	2 472	…	Yes
Italy	LIRJ	MARINA DI CAMPO	9 112	…	445	…	Yes
Italy	LIRS	GROSSETO	8 421	…	1 094	…	Yes
Italy	LIRI	SALERNO	5 163	…	1 049	…	Yes
Italy	LIMG	ALBENGA	2 201	…	1 137	…	Yes
Italy	LIQS	SIENA	1 503	…	514	…	Yes
Italy	LIBG	TARANTO	369	228	1 814	…	Yes
Italy	LIMW	AOSTA	0	0	0	0	Yes
Italy	LICB	COMISO	0	0	0	0	In progress
Latvia	EVTA	TUKUMS	…	…	…	…	Not scheduled
Latvia	EVRA	RIGA	4 663 647	12 294	68 145	…	Yes
Latvia	EVVA	VENTSPILS	1 446	…	270	…	Yes
Latvia	EVLA	LIEPAJA	569	…	94	…	Yes
Lithuania	EYVI	Vilnius Internat. Airport	1 373 859	3 642	26 102	596	Yes
Lithuania	EYKA	Kaunas Internat. Airport	809 732	4 450	8 753	887	Yes
Lithuania	EYPA	Palanga Internat. Airport	102 528	22	3 151	…	Yes
Lithuania	EYSA	Siauliai Internat. Airport	910	2 149	82	44	Yes
Luxembourg	ELLX	Luxemburg-Findel	1 630 027	705 080	80 494	71 077	In progress
Malta	LMML	Malta International Airport	3 293 524	16 844	32 997	887	Yes
Netherlands	EHAM	Amsterdam Airport Schiphol	45 211 749	1 512 256	402 375	…	Yes
Netherlands	EHRD	Rotterdam Airport	969 480	80	52 644	…	Yes
Netherlands	EHBK	Maastricht Aachen Airport	260 000	90 000	33 307	…	Yes
Netherlands	EHGG	Groningen Airport Eelde	154 000	0	64 000	…	Yes
Netherlands	EHLE	Lelystad Airport	0	0	125 675	…	Yes
Norway	ENGM	Oslo, Gardermoen	19 074 302	85 738	219 352	8 934	Yes
Norway	ENBR	Bergen, Flesland	4 929 060	7 499	96 505	1 654	Yes
Norway	ENZV	Stavanger, Sola	3 665 207	5 199	79 161	2 089	Yes
Norway	ENVA	Trondheim, Værnes	3 518 314	5 322	55 474	1 008	Yes
Norway	ENTC	Tromsø, Langnes	1 584 308	2 636	38 873	2 108	Yes

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Norway	ENTO	Sandefjord, Torp	1 583 078	301	38 686	172	Yes
Norway	ENBO	Bodø	1 463 691	2 058	42 420	712	Yes
Norway	ENRY	Moss lufthavn, Rygge	1 423 809	?	20 988	4	Yes
Norway	ENCN	Kristiansand, Kjevik	838 712	328	17 014	510	Yes
Norway	ENAL	Ålesund lufthavn, Vigra	813 126	985	13 849	179	Yes
Norway	ENHD	Haugesund, Karmøy	558 910	262	8 963	1	Yes
Norway	ENEV	Harstad/Narvik, Evenes	544 074	431	8 894	1 064	Yes
Norway	ENML	Molde, Årø	391 739	2 194	9 237	499	Yes
Norway	ENKB	Kristiansund, Kvernberget	346 934	215	13 892	22	Yes
Norway	ENAT	Alta	325 138	386	10 316	409	Yes
Norway	ENKR	Kirkenes, Høybuktmoen	277 447	584	8 529	32	Yes
Norway	ENDU	Bardufoss	190 351	13	3 074	2	Yes
Norway	ENFL	Florø	159 141	68	8 783	17	Yes
Norway	ENSB	Svalbard, Longyear	125 781	771	6 490	557	Yes
Norway	ENBN	Brønnøysund, Brønnøy	104 004	248	11 718	2	Yes
Norway	ENOV	Ørsta/Volda, Hovden	97 363	36	4 943	0	Yes
Norway	ENSK	Stokmarknes, Skagen	95 717	46	6 007	0	Yes
Norway	ENHF	Hammerfest	95 185	224	10 067	1	Yes
Norway	ENRA	Mo i Rana, Røssvoll	91 613	158	7 616	0	Yes
Norway	ENLK	Leknes	90 512	206	5 628	0	Yes
Norway	ENBL	Førde, Bringeland	79 271	55	7 077	45	Yes
Norway	ENVD	Vadsø	78 654	272	6 431	0	Yes
Norway	ENSH	Svolvær, Helle	68 693	210	4 633	0	Yes
Norway	ENST	Sandnessjøen, Stokka	65 841	234	6 772	2	Yes
Norway	ENSG	Sogndal, Haukåsen	65 773	38	5 436	0	Yes
Norway	ENMS	Mosjøen, Kjærstad	57 733	238	5 953	0	Yes
Norway	ENNA	Lakselv, Banak	53 618	310	3 495	0	Yes
Norway	ENSN	Skien, Geiteryggen	48 068	0	8 683	2	Yes
Norway	ENAN	Andøya, Andenes	39 496	27	3 186	0	Yes
Norway	ENNK	Narvik, Framnes	29 085	20	2 933	8	Yes
Norway	ENRM	Rørvik, Ryum	24 754	26	2 687	0	Yes
Norway	ENNM	Namsos	23 063	15	3 496	0	Yes
Norway	ENSO	Stord/Sørstokken	22 557	18	2 953	35	Yes
Norway	ENSD	Sandane, Anda	18 437	12	1 484	0	Yes
Norway	ENHV	Honningsvåg, Valan	15 734	49	2 500	2	Yes
Norway	ENRO	Røros	15 673	125	4 010	3	Yes
Norway	ENMH	Mehamn	15 183	36	2 808	0	Yes
Norway	ENSR	Sørkjosen	15 065	7	1 919	0	Yes
Norway	ENSS	Vardø, Svartnes	12 896	26	2 370	0	Yes
Norway	ENBS	Båtsfjord	11 099	57	2 572	0	Yes
Norway	ENRS	Røst	10 577	5	1 442	0	Yes
Norway	ENVR	Værøy helikopterhavn (Heliport)	10 459	39	1 294	0	Yes
Norway	ENHK	Hasvik	8 005	34	1 217	0	Yes
Norway	ENOL	Ørland lufthavn	7 117	0	2 143	0	Yes

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Norway	ENFG	Fagernes, Leirin	6 421	0	2 435	8	Yes
Norway	ENBV	Berlevåg	5 720	35	1 853	0	Yes
Norway	ENNO	Notodden, Tuven	3 134	1	3 598	2	Yes
Poland	EPWA	WARSZAWA	8 666 552	55 649	116 693	4 973	Yes
Poland	EPKK	KRAKÓW	2 839 124	4 464	29 769	43	Yes
Poland	EPKT	KATOWICE	2 366 410	11 448	20 599	1 909	Yes
Poland	EPGD	GDANSK	2 210 066	4 487	25 094	1 038	Yes
Poland	EPWR	WROCLAW	1 598 693	878	17 979	0	Yes
Poland	EPPO	POZNAN	1 384 311	2 395	16 780	0	Yes
Poland	EPRZ	RZESZÓW	451 720	465	4 863	63	Yes
Poland	EPLL	LÓDZ	413 662	0	3 245	3	Yes
Poland	EPSC	SZCZECIN	268 563	728	3 235	4	Yes
Poland	EPBY	BYDGOSZCZ	266 480	413	2 101	8	Yes
Portugal	LPPT	LISBOA-PORTELA SACAV	14 038 285	104 895	143 380	3 764	Yes
Portugal	LPFR	FARO	5 282 287	286	40 036	3	Yes
Portugal	LPPR	PORTO-FRANC.SA CARN.	5 228 744	28 663	55 601	3 302	Yes
Portugal	LPMA	FUNCHAL-STA.CATARINA	2 215 568	8 103	22 555	510	Yes
Portugal	LPPD	P.DELG.-JOAO PAULOII	897 083	7 341	15 388	5	Yes
Portugal	LPLA	LAJES	423 138	3 391	9 441	0	Yes
Portugal	LPHR	HORTA	180 682	1 079	5 402	0	Yes
Portugal	LPPS	PORTO SANTO AIRPORT	97 678	252	2 956	11	Yes
Portugal	LPPI	PICO	61 330	379	2 097	0	Yes
Portugal	LPAZ	SANTA MARIA INT.AIRP	59 764	232	2 539	0	Yes
Portugal	LPSJ	SAO JORGE	47 854	241	1 947	0	Yes
Portugal	LPFL	FLORES	42 211	238	2 138	0	Yes
Portugal	LPGR	GRACIOSA	39 329	211	1 970	244	Yes
Portugal	LPBG	BRAGANÇA	4 610	0	1 022	0	Yes
Portugal	LPVR	VILA REAL	4 586	0	1 941	0	Yes
Portugal	LPCR	CORVO	4 537	54	927	0	Yes
Portugal	LPCS	CASCAIS-TIRES	3 128	0	1 043	0	Yes
Portugal	LPBR	BRAGA	2 351	0	1 698	…	Yes
Portugal	LPCH	CHAVES	210	0	92	…	Yes
Portugal	LPCO	COIMBRA	173	704	612	…	Yes
Portugal	LPAV	AVEIRO	52	0	26	…	Yes
Portugal	LPVZ	VISEU	17	0	24	…	Yes
Portugal	LPEV	ÉVORA	14	0	6 451	…	Yes
Portugal	LPPM	PORTIMÃO	9	0	3 229	…	Yes
Portugal	LPBJ	BEJA	0	0	0	…	Yes
Portugal	LPCV	COVILHÃ	0	0	0	…	Yes
Portugal	LPIN	ESPINHO	0	0	0	…	Yes
Portugal	LPLZ	LOUSÃ	0	0	387	…	Yes
Portugal	LPMU	MOGADOURO	0	0	6	…	Yes
Portugal	LPMT	MONTIJO	0	0	0	…	Yes

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Portugal	PROENÇA-A-NOVA	PROENÇA-A-NOVA	0	0	0	…	Yes
Portugal	LPSC	SANTA CRUZ	0	0	0	…	Yes
Portugal	LPSR	SANTARÉM	0	0	942	…	Yes
Portugal	LPVL	VILAR DA LUZ	0	0	0	…	Yes
Romania	LROP	BUCUREŞTI HENRI COANDĂ	4 927 142	23 171	78 080	…	Yes
Romania	LRBS	BUCUREŞTI BANEASA AUREL VLAICU	2 117 668	265	29 719	…	Yes
Romania	LRTR	TIMIŞOARA TRAIAN VUIA	1 136 064	2 273	25 838	…	Yes
Romania	LRCL	CLUJ NAPOCA	1 028 907	56	16 408	…	Yes
Romania	LRSB	SIBIU	199 142	50	6 498	…	Yes
Romania	LRIA	IASI	159 615	3	4 991	…	Yes
Romania	LRCK	CONSTANŢA MIHAIL KOGALNICEANU	75 307	419	3 819	…	Yes
Romania	LRTM	TÂRGU MUREŞ TRANSILVANIA	74 535	133	2 035	…	Yes
Romania	LROD	ORADEA	40 439	0	1 809	0	Yes
Romania	LRSV	SUCEAVA ŞTEFAN CEL MARE	34 590	0	1 671	0	Yes
Romania	LRCV	CRAIOVA	23 629	39	2 121	…	Yes
Romania	LRBC	BACAU GEORGE ENESCU	20 788	36	4 337	…	Yes
Romania	LRBM	BAIA MARE	19 189	1	834	…	Yes
Romania	LRSM	SATU MARE	18 856	0	1 059	0	Yes
Romania	LRAR	ARAD	8 261	673	1 181	…	Yes
Romania	LRTC	TULCEA DELTA DUNARII	1 698	0	3 240	0	Yes
Slovakia	LZIB	Bratislava (data 2010)	1 665 704	17 777	27 220	0	Yes
Slovakia	LZKZ	Košice (data 2009)	352 460	269	10 674	0	Yes
Slovakia	LZTT	Poprad (data 2010)	27 693	134	7 595	…	Yes
Slovakia	LZZI	Žilina (data 2010)	9 912	2	15 190	0	Yes
Slovakia	LZPP	Piešťany (data 2009)	638	1	0	0	Yes
Slovakia	LZSL	Sliač (data 2009)	212	25	0	0	Yes
Slovenia	LJMB	Maribor Edvard Rusjan Airport	19 520	184	544	88	In progress
Slovenia	LJPZ	Portorož Airport	15 382	0	5 676	0	In progress
Slovenia	LJLJ	Ljubljana Jože Pu?nik Airport	1388 651	17 310	42 569	2 771	In progress
Spain	LEMD	Madrid	49 632 904	372 588 193	426 734	…	Yes
Spain	LEBL	Barcelona	29 172 157	103 938 865	271 307	…	In Progress
Spain	LEPA	Palma de Mallorca	21 098 297	17 243 972	170 272	…	Scheduled
Spain	LEMG	Málaga	11 996 139	3 063 929	99 778	…	Scheduled
Spain	LEAL	Alicante	9 369 762	3 112 660	73 016	…	Scheduled
Spain	GCLP	Gran Canaria	9 285 125	24 432 760	95 584	…	Scheduled
Spain	GCTS	Tenerife Sur	7 184 562	4 288 338	46 584	…	Scheduled
Spain	LEIB	Ibiza	5 012 690	3 196 183	51 024	…	In Progress

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Spain	LEVC	Valencia	4 915 838	11 427 693	62 251	…	Scheduled
Spain	LEGE	Girona	4 840 560	62 218	35 127	…	Scheduled
Spain	GCRR	Lanzarote	4 826 979	3 786 791	43 892	…	In Progress
Spain	LEZL	Sevilla	4 211 853	5 453 357	42 107	…	Scheduled
Spain	GCFV	Fuerteventura	4 110 512	1 700 734	37 471	…	Scheduled
Spain	GCXO	Tenerife Norte	4 045 087	15 912 981	56 022	…	Scheduled
Spain	LEBB	Bilbao	3 875 999	2 547 519	46 825	…	Scheduled
Spain	LEMH	Menorca	2 493 280	2 400 234	26 895	…	Scheduled
Spain	LEST	Santiago	2 158 039	1 957 474	18 770	…	Scheduled
Spain	LERS	Reus	1 402 969	241 626	10 137	…	Scheduled
Spain	LEAS	Asturias	1 349 913	110 645	15 163	…	Scheduled
Spain	LEVX	Vigo	1 092 874	901 192	13 159	…	Scheduled
Spain	LECO	Coruña	1 085 593	244 819	11 494	…	Scheduled
Spain	LEJR	Jerez	989 694	98 465	8 710	…	In Progress
Spain	GCLA	Palma	969 197	959 007	17 971	…	Scheduled
Spain	LEGR	Granada	966 238	37 596	9 348	…	Scheduled
Spain	LEXJ	Santander	917 751	2 207	12 935	…	Scheduled
Spain	LEAM	Almería	775 956	14 074	11 514	…	Scheduled
Spain	LEZG	Zaragoza	603 597	42 531 166	8 462	…	Scheduled
Spain	GEML	Melilla	288 369	340 714	8 602	…	Scheduled
Spain	LEPP	Pamplona	284 383	42 095	6 854	…	Scheduled
Spain	LESO	San Sebastián	278 045	18 809	6 571	…	Scheduled
Spain	GCHI	Hierro	169 894	145 443	3 693	…	Scheduled
Spain	LEDA	Lleida	54 858	0	2.500	0	Yes
Spain	LEVT	Vitoria	40 400	12 912 140	8 058	…	Scheduled
Spain	LERL	Ciudad Real	33 469	1 100	1 006	…	Scheduled
Spain	GCGM	Gomera	31 699	9 199	1 372	…	Scheduled
Spain	Ceuta	Ceuta	29 521	1 128	3 432	…	Scheduled
Spain	LEBG	Burgos	28 746	1 766	1 361	…	Scheduled
Spain	LERJ	Logroño	16 751	0	800	0	In Progress
Spain	LEAG	algeciras	10 999	0	1 340	0	Yes
Spain	LEHC	Huesca	5 606	0	158	0	Scheduled
Spain	LEBA	Córdoba	1 729	0	677	0	Scheduled
Sweden	ESSA	Stockholm Arlanda	16 948 127	101 267	190 882	2 311	Yes
Sweden	ESGG	Göteborg Landvetter	4 126 467	49 299	61 176	2 803	Yes
Sweden	ESKN	Stockholm Skavsta	2 507 772	18	30 572	131	Yes
Sweden	ESSB	Stockholm Broma	2 037 382	256	64 840	0	Yes
Sweden	ESMS	Malmö	1 597 164	32 628	36 922	4 699	Yes
Sweden	ESPA	Luleå	979 135	1 292	17 684	2	Yes
Sweden	ESNU	Umeå	846 083	4 816	20 960	4	Yes
Sweden	ESGP	Göteborg City	714 798	13	53 980	45	Yes
Sweden	ESDB	Ängelholm	376 234	19	12 518	1	Yes
Sweden	ESNZ	Åre Östersund	356 093	78	9 184	0	Yes
Sweden	ESSV	Visby	308 145	867	20 676	739	Yes
Sweden	ESNN	Sundsvall Härnösand	256 132	2 165	10 574	0	Yes

Country	*ICAO code*	*Aerodrome*	*Number of passengers carried*	*Volume of freight[21] (tonnes)*	*Total commercial movements*	*Cargo move-ments*	*Certified aerodrome*
Sweden	ESNS	Skellefteå	224 477	29	6 304	0	Yes
Sweden	ESDF	Ronneby	208 790	11	9 254	0	Yes
Sweden	ESNQ	Kiruna	199 146	457	5 878	2	Yes
Sweden	ESMQ	Kalmar	166 461	0	15 138	1	Yes
Sweden	ESMX	Växjö Kronoberg	162 875	773	7 546	56	Yes
Sweden	ESOW	Stockholm Västerås	150 793	5 291	28 840	946	Yes
Sweden	ESSP	Norrköping	115 660	149	16 616	10	Yes
Sweden	ESMT	Halmstad	93 640	17	10 152	0	Yes
Sweden	ESSL	Linköping	91 521	0	18 756	0	Yes
Sweden	ESNO	Örnsköldsvik	86 283	133	3 654	1	Yes
Sweden	ESOK	Karlstad	82 423	786	6 252	1	Yes
Sweden	ESGJ	Jönköping	73 000	4 647	13 992	1 324	Yes
Sweden	ESOE	Örebro	68 517	6 310	8 606	675	Yes
Sweden	ESNX	Arvidsjaur	42 494	0	9 830	1	Yes
Sweden	ESGT	Trollhättan Vänersborg	39 603	2	8 230	1	Yes
Sweden	ESMK	Kristianstad	38 394	0	9 192	0	Yes
Sweden	ESNG	Gällivare	34 106	534	3 124	1	Yes
Sweden	ESSD	Borlänge	33 811	0	2 947	0	Yes
Sweden	ESNK	Kramfors	21 634	0	2 874	0	Yes
Sweden	ESNL	Lycksele	21 460	4	4 950	1	Yes
Sweden	ESNV	Vilhelmina	13 908	0	2 024	0	Yes
Sweden	ESMO	Oskarshamn	11 742	11	1 668	0	Yes
Sweden	ESUT	Hemavan	10 733	0	806	0	Yes
Sweden	ESKM	Mora	8 144	0	3 068	0	Yes
Sweden	ESND	Sveg	5 697	0	1 068	0	Yes
Sweden	ESOH	Hagfors	3 392	0	1 720	0	Yes
Sweden	ESST	Torsby	2 955	0	1 336	0	Yes
Sweden	ESUD	Storuman	2 818	2	356	0	Yes
Sweden	ESUP	Pajala	2 641	0	888	0	Yes
Sweden	ESGR	Skövde	985	0	654	0	Yes
Sweden	ESSK	Gävle Sandviken	303	0	974	0	Yes
Sweden	ESSU	Eskilstuna	60	0	4 031	0	Yes
Sweden	ESKV	Arvika	0	0	2 000	0	Yes
Sweden	ESGK	Falköping	0	0	3 947	0	Yes
Sweden	ESGL	Lidköping Hovby	0	0	309	0	Yes
Sweden	ESCF	Linköping Malmen	0	0	18 012	0	Yes
Sweden	ESTL	Ljungbyhed	0	0	14 245	0	Yes
Sweden	ESIB	Såtenäs	0	0	0	0	Yes
Sweden	ESNY	Söderhamn	0	0	1 200	0	Yes
Switzerland	LSZH	Zürich	22 910 504	313	268 630	404	Yes
Switzerland	LSGG	Geneva	11 845 379	40	177 391	1 590	Yes
Switzerland	LSZA	Lugano	169 082	0	21 309	0	Yes
Switzerland	LSZB	Bern	100 704	0	55 583	0	Yes
Switzerland	LSZR	St.Gallen-Altenrhein	81 113	0	28 952	0	Yes
United Kingdom	EGKB	Biggin Hill	...	...	49 830	...	Yes
United	EGTG	Bristol Filton	...	...	...	...	Yes

Country	ICAO code	Aerodrome	Number of passengers carried	Volume of freight[21] (tonnes)	Total commercial movements	Cargo move-ments	Certified aerodrome
Kingdom							
United Kingdom	EGNC	Carlisle	...	...	18 419	...	Yes
United Kingdom	EGBE	Coventry	...	...	6 648	...	Yes
United Kingdom	EGTC	Cranfield	...	...	...	...	Yes
United Kingdom	EGLF	Farnborough	...	...	...	...	Yes
United Kingdom	EGNR	Hawarden	...	...	17 731	...	Yes
United Kingdom	EGLL	London Heathrow	65 881 660	1 551 308	454 823	2 414	Yes
United Kingdom	EGKK	London Gatwick	31 375 290	108 587	240 500	139	Yes
United Kingdom	EGSS	London Stansted	18 573 803	230 089	155 140	9 770	Yes
United Kingdom	EGCC	Manchester	17 759 015	116 558	159 114	1 844	Yes
United Kingdom	EGGW	Luton	8 738 717	28 743	94 575	1 588	Yes
United Kingdom	EGPH	Edinburgh	8 596 715	44 083	108 997	5 203	Yes
United Kingdom	EGBB	Birmingham	8 572 398	21 659	95 454	736	Yes
United Kingdom	EGPF	Glasgow	6 548 865	2 933	77 755	56	Yes
United Kingdom	EGGD	Bristol International	5 747 604	3 498	69 134	955	Yes
United Kingdom	EGGP	Liverpool	5 013 940	276	68 164	15	Yes
United Kingdom	EGNT	Newcastle	4 356 130	11 712	66 677	1 406	Yes
United Kingdom	EGNX	East Midlands	4 113 501	304 028	69 452	17 753	Yes
United Kingdom	EGAA	Belfast International	4 016 170	43 878	60 742	3 516	Yes
United Kingdom	EGLC	London City	2 780 582	...	68 640	...	Yes
United Kingdom	EGPD	Aberdeen	2 763 708	4 258	102 396	1 406	Yes
United Kingdom	EGNM	Leeds Bradford	2 755 110	235	52 284	...	Yes
United Kingdom	EGAC	Belfast City	2 740 341	155	40 324	...	Yes
United Kingdom	EGHI	Southampton	1 733 690	116	45 350	...	Yes
United Kingdom	EGPK	Prestwick	1 662 744	12 163	33 087	811	Yes
United Kingdom	EGFF	Cardiff	1 404 613	38	25 645	2	Yes
United Kingdom	EGCN	Doncaster Sheffield	876 153	251	11 030	12	Yes
United Kingdom	EGHH	Bournemouth	751 331	9 688	41 539	1 884	Yes
United Kingdom	EGTE	Exeter	744 957	3 755	33 740	483	Yes
United Kingdom	EGPE	Inverness	530 213	144	28 155	...	Yes
United Kingdom	EGSH	Norwich	425 821	266	36 864	287	Yes
United	EGAE	City of Derry	339 432	...	9 948	...	Yes

Country	*ICAO code*	*Aerodrome*	*Number of passengers carried*	*Volume of freight[21] (tonnes)*	*Total commercial movements*	*Cargo move-ments*	*Certified aerodrome*
Kingdom							
United Kingdom	EGDQ	Newquay	315 107	...	11 432	...	Yes
United Kingdom	EGNJ	Humberside	283 160	601	32 813	857	Yes
United Kingdom	EGPM	Scatsta	279 482	766	13 841	61	Yes
United Kingdom	EGNH	Blackpool	235 340	41	50 905	...	Yes
United Kingdom	EGNV	Durham Tees Valley	226 209	...	20 756	...	Yes
United Kingdom	EGPA	Kirkwall	141 399	109	14 535	15	Yes
United Kingdom	EGPB	Sumburgh	140 129	268	11 118	3	Yes
United Kingdom	EGHD	Plymouth	128 603	...	18 495	...	Yes
United Kingdom	EGPO	Stornoway	113 680	192	10 952	2	Yes
United Kingdom	EGPN	Dundee	70 398	...	37 169	...	Yes
United Kingdom	EGPL	Benbecula	30 406	195	4 402	...	Yes
United Kingdom	EGPC	Wick	22 710	...	4 754	...	Yes
United Kingdom	EGBJ	Gloucestershire	16 533	...	67 788	...	Yes
United Kingdom	EGMH	Kent International	15 580	28 103	16 260	491	Yes
United Kingdom	EGMC	Southend	3 583	3	27 320	2	Yes
United Kingdom	EGTK	Oxford	2 186	...	38 382	...	Yes
United Kingdom	EGSC	Cambridge	916	11	24 304	17	Yes
United Kingdom	EGKA	Shoreham	886	...	60 218	...	Yes
United Kingdom	EGMD	Lydd	485	...	20 527	...	Yes

5. *List of national differences notified to ICAO*

The table in section 2.1.1 gives an overview of the national differences notified to ICAO Annex 14. This table is analysed more in depth per chapter and per type of difference 'A — more strict', 'B — different' or 'C — less protective or partially implemented …' in the next table.

Table 21: List of national differences notified to ICAO Annex 14 — Status in 2011.

Note: only the countries which provided information are included in this table.

Legend
Differences with ICAO:
A: National regulation is more exacting or exceeds the ICAO Standard (S) or Recommended Practice (R).
B: National regulation is different in character or other means of compliance.
C: National regulation is less protective or partially implemented/not implemented.

ICAO Annex 14		Type of difference			
Chapter	Country	A	B	C	Grand total
1	CH		1		1
	CZ	3	2		5
	FI		1		1
	FR	8	15	14	37
	NO		2		2
	PL			2	2
1 Total		11	21	16	48
2	CZ	14		1	15
	FR	8	3	13	24
	NL		4	3	7
	NO	1	3	1	5
	PL			1	1
	UK			1	1
2 Total		23	10	20	53
3	CH		3		3
	CZ	128	2		130
	FI		4		4
	FR	39	33	12	84
	NO	2	1	1	4
	UK		1	3	4
3 Total		169	44	16	229
4	CZ	10			10
	FR	17	15	2	34
	PL			2	2
4 Total		27	15	4	46
5	CH		3		3
	CZ	112	8	1	121
	FI		7		7
	FR	116	51	107	274
	NL	1	5		6
	NO		4		4
	PL			1	1
	UK	4	5	4	13
5 Total		233	83	113	429
6	CH		4		4

ICAO Annex 14		Type of difference			
Chapter	Country	A	B	C	Grand total
	CZ	19	9		28
	FI		2		2
	FR	3	34	6	43
	NL	1			1
	PL			2	2
6 Total		23	49	8	80
7	CZ	6	4		10
	FI		1		1
	FR	9	1	1	11
	NL		1		1
	UK	1			1
7 Total		16	7	1	24
8	CZ	3			3
	FR	6	9		15
8 Total		9	9		18
9	CH		1		1
	CZ	30	3		33
	FI		28	6	34
	FR	24	32	18	74
	NL			1	1
	PL			2	2
	UK	2		1	3
9 Total		56	64	28	148
10	CZ	12			12
	FI		2		2
	FR	3	7	3	13
	NO		1	1	2
	PL			1	1
10 Total		15	10	5	30
Grand total		582	312	211	1 105

Appendix D: Safety considerations in the aerodrome field

Introduction

Air safety is well known to be very high with a very low rate of accidents for commercial air traffic in comparison with the total number of flights or number of passengers (0.01 fatalities per 100 million miles flown). The common requirements for the ADR rules will help Europe to be better prepared for the future increase in air passenger transport projected by several studies.

A first brief overview with the following figure shows that approximately 20 % of the worldwide commercial accidents[22] occur in the EASA Member States, which is a relatively low number.

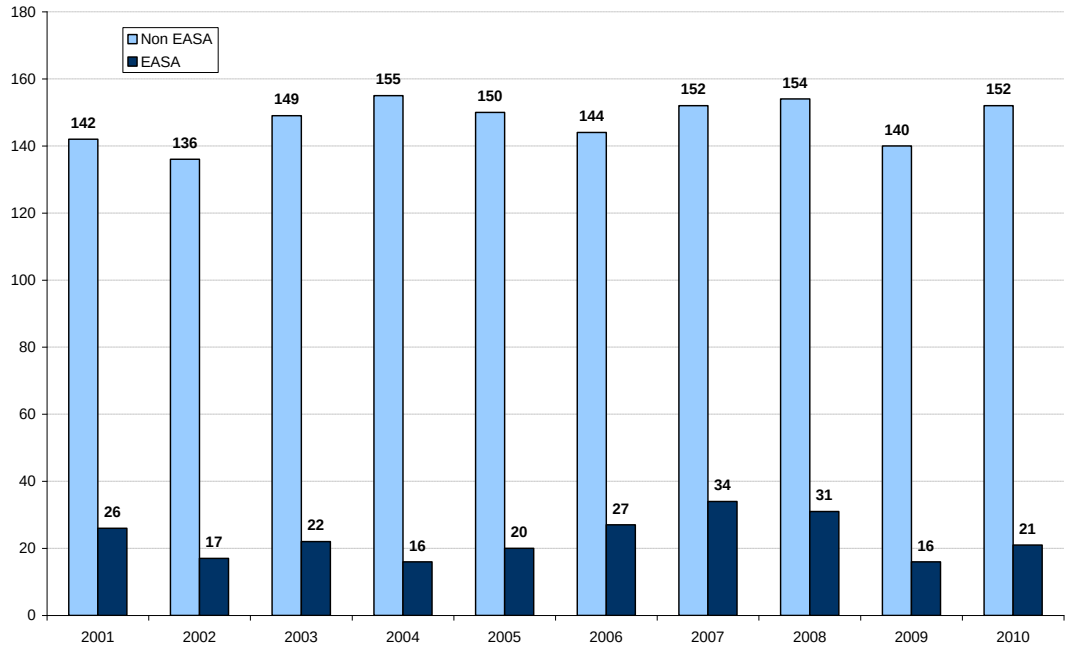

Figure 4: Number of accidents by world regions

Looking at absolute values by phase of flights, aerodromes can be seen as the critical location where efforts have to be constantly performed to maintain a uniform high level of safety with the involvement of different types of actors on aerodrome platform[23] (figure 3).

More than 80 % of all aircraft accidents in commercial air transport operations occur at or near an aerodrome. The following figure gives a brief overview of the number of accident per main flight phases: 'approach and landing' as well as 'standing and taxi' provides the most numerous cases of accidents compared to 'take-off'. This means that the aerodrome, as well as its surroundings, is the area which may see the largest proportion of safety events, varying from hazardous events (e.g. non-stabilised approaches of the runway by an aircraft) to fatal accidents.

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22 Aeroplanes in commercial air transport with a MTOM above 5 700 kg.

23 The draft aerodrome related regulation proposed by the Agency does not of course aim to reduce the number of all accidents as many of them are not directly related to the airport infrastructure.

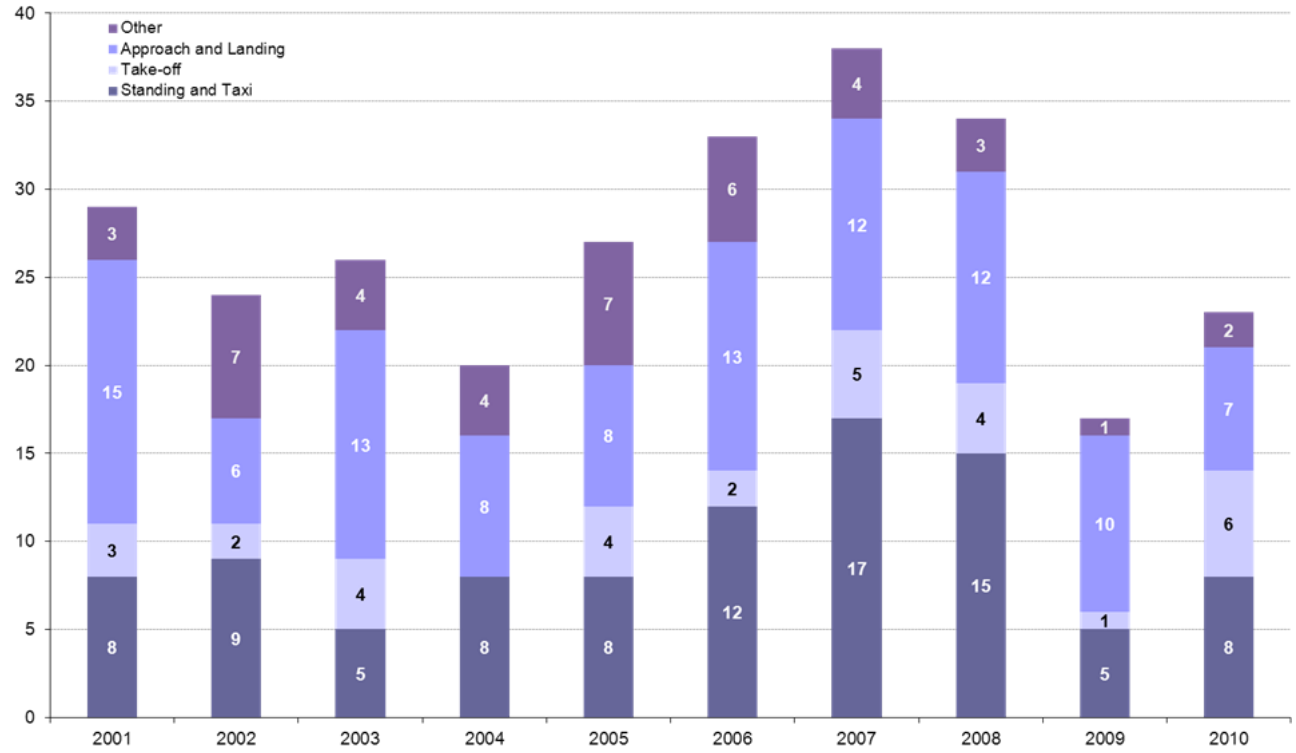

Figure 5: Number of accidents in EASA MS by phase of flight.
Aeroplanes in commercial air transport with a MTOM above 5 700 kg.

It is, therefore, imperative that rules aimed at maintaining and further improving aviation safety at such geographic areas provide adequate safety standards to be met, as well as guidance for their implementation by both the aerodrome operators and the national aviation competent authorities. The current standards and recommended practices (SARPs) contained in Annex 14 to the Chicago Convention prescribe several elements of the aerodrome system, while they constitute the minimum requirements that signatory States to the Chicago Convention agree to meet.

As accidents occur on different locations of the aerodrome field, the rules have to cover a wide range of requirements. This fact makes it worth considering if ICAO 'recommendations' have to be considered in the development of the draft ADR rules.

Also, the Chicago Convention allows for national differences from these SARPs, which may lead to seriously or otherwise differentiated aerodrome operating environments at aerodromes. However, given the need for interoperability and the undisputable relation between the various components of the aviation system, it is only for the benefit of safety that such SARPs are harmonised throughout Europe, thus aiming, to the extent possible, at creating a seamless aerodrome operating environment and therefore contribute to the provision of a harmonised and high level of safety along all European regions.

The issue of the draft aerodrome rules proposed by the Agency is to get European common requirements and certification process to maintain the above high level of safety and to help Europe to be better prepared for the future increase in air passenger transport projected (section 2.1.1).

This brief report aims to highlight the reasoning, as well as safety issues, behind some of the aerodrome safety rules. In some cases an accident is used as an example and in others the frequency or a number of accidents. The choice of these accidents was based on the amount of information available in the ADREP accident records.

Taxiway markings and taxiway width

The SARPs contained in Annex 14 describe design requirements for the physical characteristics of an aerodrome. These include the width of taxiways, the clearances of the wheels of the aircraft from the edges of taxiways, the separation distances between taxiways and runways, other taxiways as well as objects, etc. It is worth stating that the vast majority of these requirements have the form of recommended practices.

Such requirements intend to satisfy the need for the safety, as well as the regularity of aircraft movement around an aerodrome, taking into account the physical and operational characteristics (dimensions, turning capabilities, etc.) of the aircraft for which the aerodrome facilities are intended. On the other hand, these requirements need to provide the necessary safety margin for avoiding events that could otherwise lead to damage of individual aircraft or collisions between aircraft, mainly as a result of deviations from their intended ground route, which may be caused by factors such as human error, system malfunction, slipperiness of the pavements, lack of visual cues, etc.

The provision of the necessary markings in taxiways is of equal importance. The markings are part of the visual aids (lights, markings, signs and markers) at an aerodrome, which provide flight crews, as well as other parties (e.g. car drivers) with the necessary visual cues for their safe movement. These visual aids are of primary safety importance especially under adverse weather conditions, or at night or at aerodromes with a complex layout. It is worth noting that visual aids, along with other parameters, are considered to be essential for the avoidance of runway incursions, which in some cases have caused deadly accidents.

Markings are therefore used for many purposes at an aerodrome, such as to identify the routes to be followed by the aircraft while taxiing, the points where they have to stop, to provide mandatory instructions or information to aircraft flight crew or drivers, to identify permanently of temporarily closed operational areas of the aerodrome, etc. However, the lack of appropriate markings or additional markings necessitated by the individual aerodrome design (e.g. multiple runway ends in the same location) may result in the entry of the aircraft on the wrong runway and the consequent departure from there. In an FAA ASIAS report on 'Wrong Runway Departures' published in 2007, almost 700 events were found which related to aircraft entering a runway other than the one intended.

It follows that flight crews, as well as other personnel, rely significantly on the information provided by such visual aids. Given the international character of aviation, these visual aids have to be harmonised in all respects in order to provide unambiguous and accurate safety-related information and meet the expectations of the aerodrome users in terms of the aerodrome operating environment. Such common requirements of the markings need to cover all aspects, such as colours, dimensions, location, etc. This is already achieved in the SARPs contained in Annex 14.

On the other hand, the lack of such requirements for aerodrome design or the non-proper operation of such aerodrome facilities alone can make impossible the development of the necessary certification basis of an aerodrome, or even lead to accidents.

As an example, on 8 August 2005 an aircraft was taxiing behind a row of parked aircraft. The taxiing aircraft's crew was instructed to park between the 5th and 6th parked aircraft in the row. According to the accident report, the aerodrome operator had failed to provide adequate clearance between taxiing and parked aeroplanes, as there were no markings (parking limit lines) installed between the parking block and the adjacent taxiway. As the aircraft was on the taxiway centre line, its right wing struck the tails of the two first aeroplanes in the row.

This accident shows that the provision of the appropriate taxiway width, as well as the appropriate taxiway markings are important for aviation safety, especially considering the fact that in most modern large jet aircraft the wingtips are not visible from the flight crew position.

It is for these reasons that the proposed CSs contain the current ICAO Annex 14 SARPs with regard to the physical characteristics of the taxiways, as well as the aerodrome markings.

Markings are also necessary in the apron of an aerodrome to provide the necessary guidance to the aircraft and the personnel operating in the apron, as well as the necessary safety distances from other aircraft and objects, during ground operations. Lack of such guidance may lead or contribute to accidents.

As an example, on 19 January 2004, the wing of an Airbus A320 collided with an apron light pylon during taxiing out of an apron stand, under its own power. The impact caused the lighting tower to collapse with the light array impinging on the upper aft section of the aircraft's fuselage and the upper surface of the wing causing fuel to leak from the outer fuel tank. The aircraft had been parked in a general aviation's stand, for which the previous day the pilot of another A320 had reported that the taxiing instructions were confusing, given that no detailed chart of the parking position existed and there were no clear ground and taxi markings. The accident investigation report found that the apron did not have clear and adequate markings providing guidance and wing tip clearance during taxi-out, in accordance with Annex 14 SARPs. It also identified, amongst others, the operation of the aircraft on an apron that lacked the necessary facilities to accommodate code C aircraft and the fact that there was a misjudgement of the wing-tip clearance by the crew exacerbated by the absence of appropriate apron surface lead-out and taxi markings, as factors to the accident.

Currently, with the exemption of one standard, all other relevant requirements contained in Annex 14 in relation to apron markings are in the form of recommended practices. Given the importance of the apron markings for the safety of aircraft in this area of the aerodrome, and therefore the compelling need to establish the certification basis of each aerodrome in a way that takes into account these important elements, the Agency has decided to include these Annex 14 SARPs, as proposed in CSs, in apron markings.

Visual aids — Runway lights

As already stated, Annex 14 contains requirements regarding the necessary visual aids, including the lights to be provided at an aerodrome.

Thus, depending on their type of operations, aerodromes are provided with approach lighting systems, visual approach indicator systems, runway threshold identification lights, runway edge lights, runway centre line lights, runway end lights, runway touchdown zone lights, stopway lights, taxiway centre line lights taxiway edge lights, stop-bars, etc.

The lights provided at an aerodrome are used, always in conjunction with other visual aids, by the flight crew during all phases of the flight.

The configuration of the lighting system provides guidance information to the flight crews, while the colour of the lights provides information concerning the location of the aircraft within each aerodrome system. In addition, the intensity and coverage of the lighting system play an important role in the configuration and colour of the lighting system of an aerodrome.

Given the above, it does not need to be emphasised again that the characteristics of the lighting systems must be harmonised in order to provide a uniform aerodrome operating environment that anticipates the operational expectations and needs of the aerodrome users.

Put reversely, a difference in the colours of the lights or the lack of appropriate lights for certain types of operations, or the use of lights that do not have the appropriate characteristics or the non-standardised configuration of the lighting systems, may take away valuable operational information from the flight crews, or may lead to a loss of situational awareness and inappropriate decisions.

For instance, on 15 January 2009 a Learjet 35 lined up the runway for take-off. The runway lighting had a non-standard layout. The runway edge lighting was actually 75' in from each edge of the paved surface, delineating a runway of the standard 150' width. The pilot flying thought had lined up on the centre line lighting for take-off, given that the position of the edge lighting was 75' from the pavement edge. 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. The significance of the damage became evident upon landing at the destination airport.

This accident shows that a standardised layout of runway lights can be critical in ensuring safety, especially if crew are unfamiliar with an aerodrome and are expecting the same standards in all aerodromes they operate.

Therefore, given the significance of providing uniform aerodrome lighting systems, the decision was made to elaborate common requirements for CSs based on the ICAO Annex 14 SARPs. The CSs are included, as appropriate, in the certification basis of each aerodrome.

Obstacle Free Zones (OFZ) and Limitation Surfaces (OLS)

Annex 14 SARPs require that the area around an aerodrome, and more specifically a runway, is free from high obstacles in order to allow safe operations to and from the aerodrome. These zones are comprised of notional surfaces of specific inclination and length, depending on the runway characteristics, the operation or the area they aim to protect. The obstacle free zone aim to safeguard the direct vicinity of the runway, ensuring the safety of flight operations. This zone ensures that safety is maintained in cases where an aircraft deviates from the runway or, in general, is not aligned with the runway centre line.

On 1 March 2008 an Airbus A320 made an off-centre line landing under strong gust and crosswind conditions, which brought great part of the aircraft wings outside of the runway shoulders. The aircraft sustained only minor damage due to scraping on the runway, but no damage from any obstacles or structures near the runway.

Aerodromes have to be safeguarded through these zones and surfaces against other developments such as high wind turbines or other structures. A uniform standard needs to be maintained while time taking into account special local conditions and geography. This will aim to ensure the highest level of safety with minimum impact on restricting aerodrome operations.

Numerous unstabilised approaches or near-CFIT accidents would have severe consequences had it not been for these OLS prescribing areas free from any obstacles.

Rescue and Fire-Fighting (RFFS) response time

Annex 14 SARPs require the provision of rescue and fire-fighting equipment and services at an aerodrome. It is necessary to underline that in the same Annex it is stated that *'the principal objective of a rescue and fire-fighting service is to save lives in the event of an aircraft accident or incident occurring at, or in the immediate vicinity of, an aerodrome. The rescue and fire-fighting service is provided to create and maintain survivable conditions, to provide egress routes for occupants and to initiate the rescue of those occupants unable to make their escape without direct aid. […] The most important factors bearing on effective rescue in a survivable aircraft accident are: […] and the speed with which personnel and equipment designated for rescue and fire-fighting purposes can be put into use'.*

To this end, Annex 14 contains SARPs related to the level of rescue and fire-fighting protection to be provided, the vehicles and extinguishing agents to be used, the rescue and fire-fighting personnel and their training, the response time of rescue and fire-fighting services, etc.

In particular, currently the relevant SARPs of Annex 14 require that *'the rescue and fire-fighting service shall […] achieve a response time not exceeding three minutes to any point of each operational runway, in optimum visibility and surface conditions',* while at the same time it recommends that the response time should be two minutes.

The reason for such response times is obvious: if an aircraft is on fire, then very high temperatures develop quickly, while the smoke produced reduces the visibility of the people on

board and their ability to efficiently move and evacuate the aircraft, and additionally they may face respiratory problems[24].

Thus, in order to prevent such situations, the rescue and fire-fighting services should be able to respond as soon as possible in order to prevent the spreading of and finally, if possible, extinguish the fire, while making the evacuation of the aircraft and the rescue of the people on board possible. It is also evident that this requires suitably trained personnel and adequate organisation and coordination between all persons and organisations involved in the provision of the rescue and fire-fighting services.

In commercial air transport operations worldwide, post crash fires, which have an effect on the severity of an accident occurred, on average in 5 % of all accidents every year during the decade between 2001 and 2010. Since the majority of accidents occur at or near an aerodrome, it is important for rescue and fire-fighting services to be adequately in force as well as effective in combating such fires.

Moreover, in 2009, a study conducted by the FAA Technical Centre, focusing on commercial aircraft accidents between 1967 and 2009, showed that out of the 147 selected accidents, 101 were considered as 'survivable', out of which 70 involved fire, while 36 of them were classified as 'ground pool fire' accidents[25].

A late intervention of the rescue and fire-fighting services may lead to complete destruction of the aircraft or even cause deadly accidents.

For instance, on 6 March 2008 a Transall C-160 completed the landing roll with the brakes having been overheated during the landing, due to the inability to use engine reverse. Smoke was identified from ATC Unit and soon the crew stopped the aircraft on the taxiway. The rescue and fire-fighting service arrived at the scene approximately 10 minutes after the aircraft stopped and fire retardant was applied another 5 minutes thereafter. The aircraft was finally consumed by the fire. The accident report determined that there was no Emergency Response Plan at the aerodrome and that the rescue and fire-fighting service's delay in applying fire suppressant, resulted in the fire engulfing the aircraft.

Had the rescue and fire-fighting arrived at the scene within the response times stipulated in Annex 14, it is most likely that the aircraft would not have been destroyed by the fire.

In another case, on 7 March 2007, a Boeing 737-497 aircraft overran the departure end of the runway and impacted an embankment before stopping 252 meters from the departure end of the runway. The aircraft was destroyed by the impact forces and an intense, fuel-fed, post impact fire. There were 119 survivors, 1 cabin crew member and 20 passengers were fatally injured, while 1 cabin crew member and 11 passengers were seriously injured. The accident report concluded that the RFFS vehicles could not reach the aircraft to combat the fire due to the lack of emergency access roads, which combined with inadequate/insufficient

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[24] To increase survivability of accidents, additional requirements related to aircraft certification and operation exist, including crew emergency evacuation training, access to emergency exits, emergency evacuation guidance, fire protection, passenger briefings, etc.

[25] Ground pool fires involve rapture of the aircraft fuel tanks or aircraft fuelling systems and the fuel leak creates an ignited fuel pool on the ground. In cases of pool fires:

i) 50 % of the aircraft evacuations are initiated within 20'' and 90 % within 40'';

ii 50 % of the evacuations are completed within 130'' and 90 % within 325'';

iii) in 50 % of the occasions the RFFS arrive within 4 minutes (240'') and in 90 % of occasions within 12 minutes (720''); and

iv) in 50 % of the occasions the RFFS establish control within 10 minutes (600 seconds) and 90 % of the occasions within 42 minutes (2520'').

Source: *Transportation Research Board, ACRP report; 'Risk Assessment of Proposed ARFF Standards', 2011. ibid at 2.*

foam agent on the off-airport fire vehicles, the non-coordinated RFFS response, '[…] may have resulted in increasing the number of fatalities and injuries […]' [26]

In another case, on 12 December 2007, the wing of a 767 Boeing's collided with an apron light pylon during the parking manoeuvres, causing a 1½ metre long section of the wing to break off. Although there was no fire or fuel leak, the accident report considered that '[…] the fire-fighting vehicle's delayed arrival at the accident site must be considered unreasonably high (16 min after the a/c was brought to a stop) […]'. Had a fire started in this case, it is likely that the consequences of this accident would have been different.

Thus, it is understood that although rescue and fire-fighting services at aerodromes are seldom needed, when their intervention is required, it should be in a timely manner and of the appropriate level.

To this end, the Agency has decided to adopt the existing SARPs of Annex 14, with regard to the emergency planning and the provision of rescue of fire-fighting services, including the response time to be met.

Foreign Object Damage

Aerodrome rules describe the process which has to be undertaken by aerodrome operators with regard to preventive maintenance of the movement area of an aerodrome. In this context, Annex 14 foresees that the aerodrome operator should inspect all surfaces of the movement area of an aerodrome, *'with the objective of avoiding and eliminating any loose objects/debris that might cause damage to aircraft or impair the operation of aircraft systems'*. Such objects or any other kind of objects irrespective of its size, or the material it is made of, known as Foreign Object Damage (FOD), may cause damage to aircraft.

Such damage may be caused either to the engines, the propellers of the aircraft, or other aircraft parts, or even to other aircraft, vehicles or people as a result of FOD 'thrown away' by engine blast. The damage caused by an FOD may differ depending on each case.

The presence of the FOD may be the result of many factors, such as strong winds, aircraft engine or propeller blast that have thrown debris into the runway or taxiway, damaged pavements, pieces of aircraft tire, wildlife that have been hit by aircraft, etc. In the apron, due to the different kind of activities that take place, the situation may be different, as mostly the FOD tend to include *'bottles, cans, stoppers, bottle caps, lost hand tools, personal belongings, nails, screws, bolts, paper, rubber, wire, plastic material, wooden, textile, synthetic and metal parts of all sizes from boxes, cases, pallets, containers and other packing devices'*[27].

Due to the significance of the consequences of such events, Annex 14 contains also requirements regarding the frequency of such inspections, and guidance on the implementation of such preventive maintenance.

However, as with almost all safety risks, the FOD issue may not be addressed simply by operational measures. Another way to address it is through several aerodrome infrastructure design requirements which exist in Annex 14. For instance, the emergency access roads should *'[…] be surfaced to prevent surface erosion and the transfer of debris to the runway […]'*. Again, training of all personnel operating airside an aerodrome is another effective way of addressing this issue.

There are not many accidents that have occurred due to FOD. Probably the most well known one is the destruction of a Concorde in 2001 during the take-off phase which was primarily the

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[26] 'A reasonable estimate would be that one fourth of the fatalities and injuries might have been *prevented by an ARFF response that met ICAO standards'.*

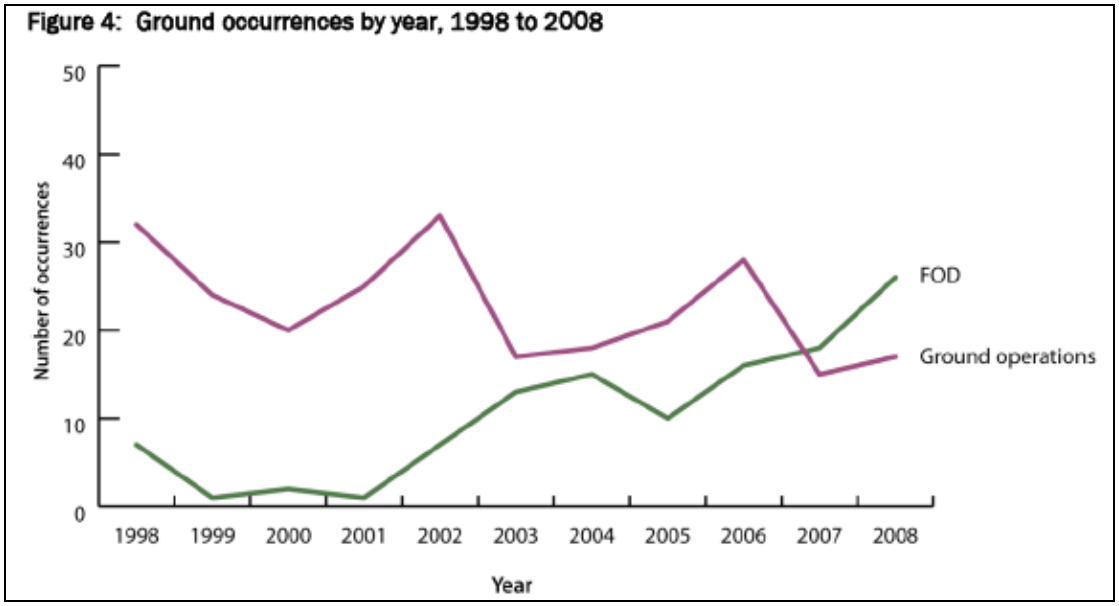
[27] ICAO, Airport Services Manual, Part 2, Pavement Surface Conditions.

result of FOD. Nonetheless, most of the FOD events are incidents which may damage engines, aircraft tyres, or the aircraft body, and result in flight returns and delays for repairs[28].

A global view for Europe is provided by the European Central Repository (ECR) for air safety occurrences: more than 800 FOD have been found in 2010 in European aerodromes. The relative short historical FOD series in the ECR does not allow for more in-depth analysis, but it is interesting to consider this analysis on Australian data.

In Australia, in the period between 1998 and 2008, 116 FOD occurrences (30 % of all reported occurrences) had been reported to the Australian Air Transport Safety Bureau, which affected high capacity air transport aircraft[29]. The number of FOD occurrences increased from 7 in 1998 to 26 in 2008.

Figure 4: Ground occurrences by year, 1998 to 2008



Aircraft damage from foreign objects is an issue which has to be tackled by the aerodrome operators in cooperation with several of their stakeholders. However, the primary and coordinating role in this belongs to the aerodrome operators themselves.

To address this issue, the Agency has therefore included in its draft rules all relevant ICAO SARPs at two different levels in order to encompass all available means and methods to address this issue. Therefore, the draft rules move firstly at the level of the necessary CSs, and secondly at the level of the implementing regulations, which have both an operational (maintenance procedures, etc.), as well as organisational dimension (coordination between all parties, as well as training of personnel).

Runway friction characteristics and runway contamination

There are numerous accidents in which runway surface condition played a role in accidents as well as incidents. In a report prepared by the NLR for Eurocontrol in 2011, contaminated

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[28] Apart from the direct cost that is associated with the FOD occurrences, one should also take into account the associated indirect costs, such as: loss of business, damage to reputation, lost time and overtime, insurance premiums, fuel, airport operating disturbances, hotels, aircraft rescheduling, etc.

[29] Source: Australian Air Transport Safety Bureau, *'Ground operations occurrences at Australian airports 1998 to 2008'*, 2010. The Australian Air Transport Safety Bureau defines a high capacity aircraft as one with a maximum payload exceeding 4,200 kilograms or having more than 38 seats.

runways are identified as a causal factor in almost 37 % of all occurrences involving a landing veer-off and almost 59 % for landing overruns.

In an EASA report, it has been identified that the rate of runway excursion accidents and serious incidents has overall increased in the years between 2000 and 2009.

In one of these accidents on 6 January 2003 a DHC-8-100 an aircraft exerted the runway during landing due to poor breaking action on a slippery and ice-covered runway.

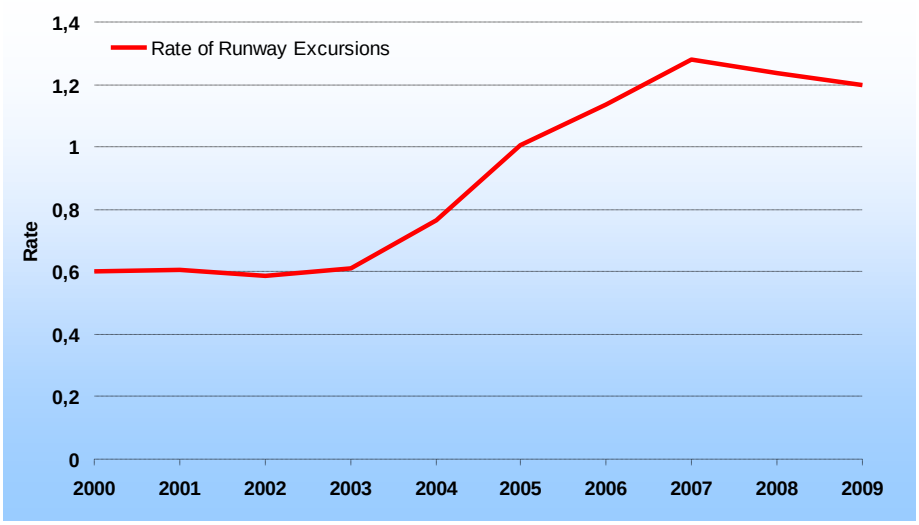


Figure 5: Rate of runway excursions in commercial air transport 2000–2009 per million movements.

Given the importance of this issue, the proposed rules contain operational requirements to address it.

Appendix E — Iterative process case study/draft ADR rules

The first draft of the ADR rules was sent in July 2011 to the Member States involved in the case study exercise. The Member States sent back their comments between mid-September and mid-October 2011.

The Agency took them into account when relevant and there were exchanges of emails to clarify these comments.

Overall, the comments can be grouped in 5 categories:

1) Aerodrome operator responsibility: clarifications were provided by the Agency on the understanding of the aerodrome operator responsibility

2) The conversion process for existing certified aerodromes: the length of the conversion period (48 months) was confirmed and the DAAD was indicated as a beneficial solution to facilitate the conversion of the existing national aerodrome certificate.

3) Administrative workload: some MS pointed out the increase in administrative workload. This is already recognised in the previous impacts assessments done by the Agency and EU when the scope of the BR was extended to aerodromes. These reports indicated that this workload increase (mainly) during the conversion of the aerodrome certificates will be balanced with a better efficiency regulation process overtime. The case studies did not find counter-examples to the outcomes of these reports.

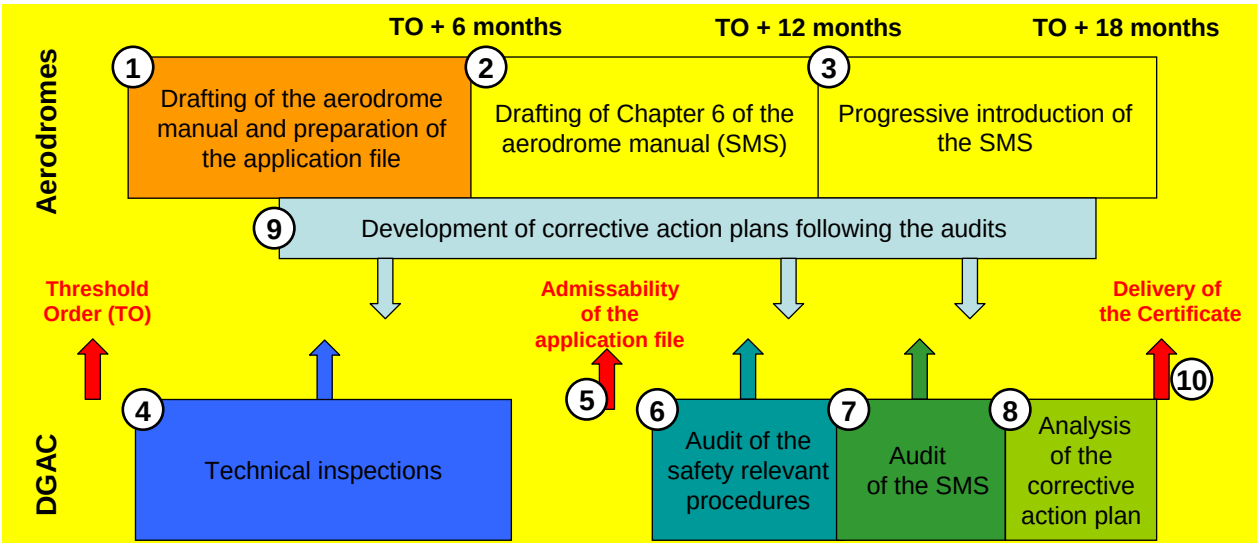
4) Comments on the CSs and IR.OPS in relation with the selected ICAO Annex 14 SARPs: clarifications were provided by the Agency on how to apply these CS and IR.OPS.

5) Some MS identified impacts on small aerodromes which are below the BR passenger threshold exemption: the fact that these aerodromes are impacted is inherited from the BR threshold and the draft ADR rules have been proportionate by providing flexibility, for instance on the SMS implementation on smaller aerodromes.

Appendix F — Examples of existing national certification process

France

Figure 6: Aerodrome certification process in France (year 2009)



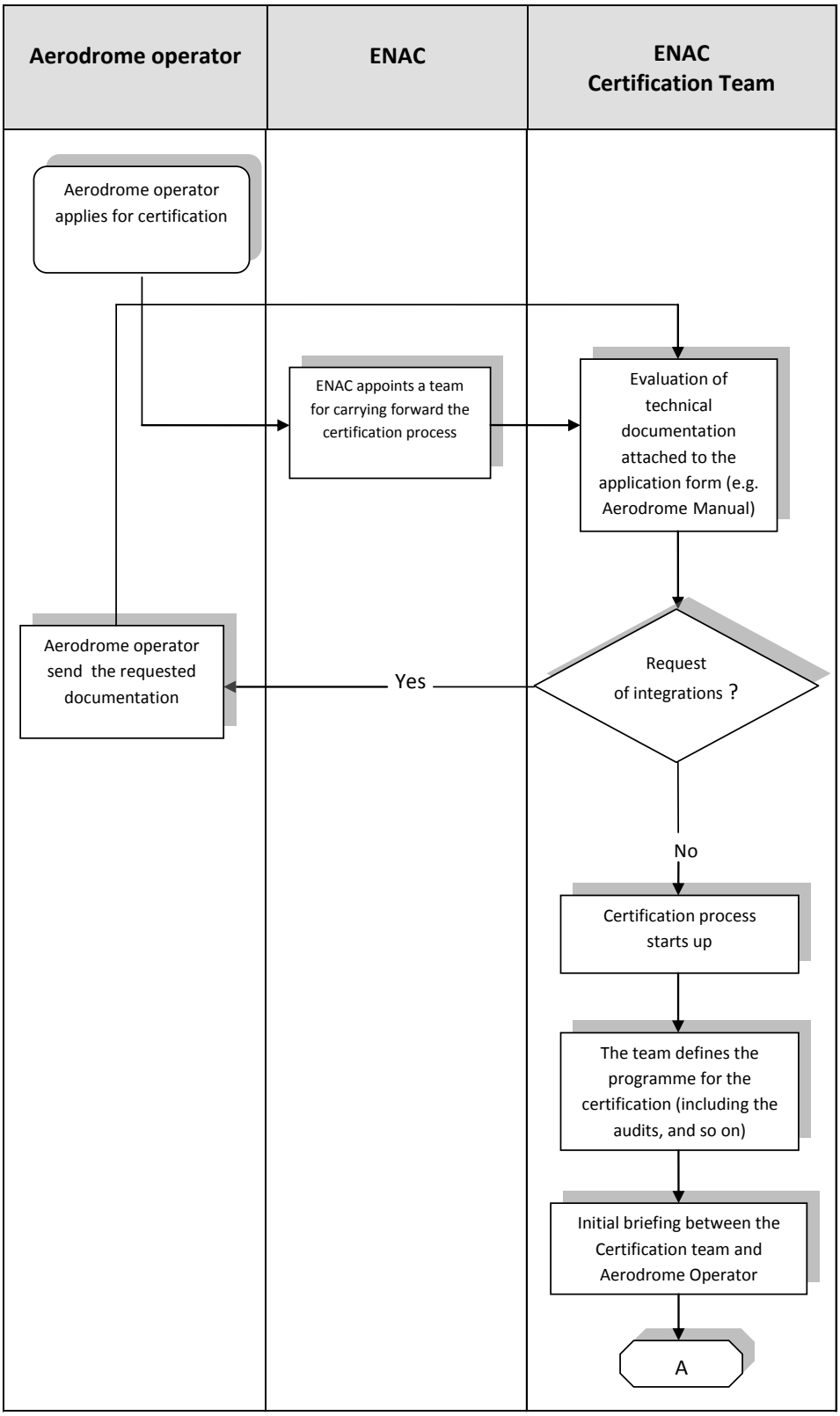
Note for the Figure 6: Update of the process in 2011

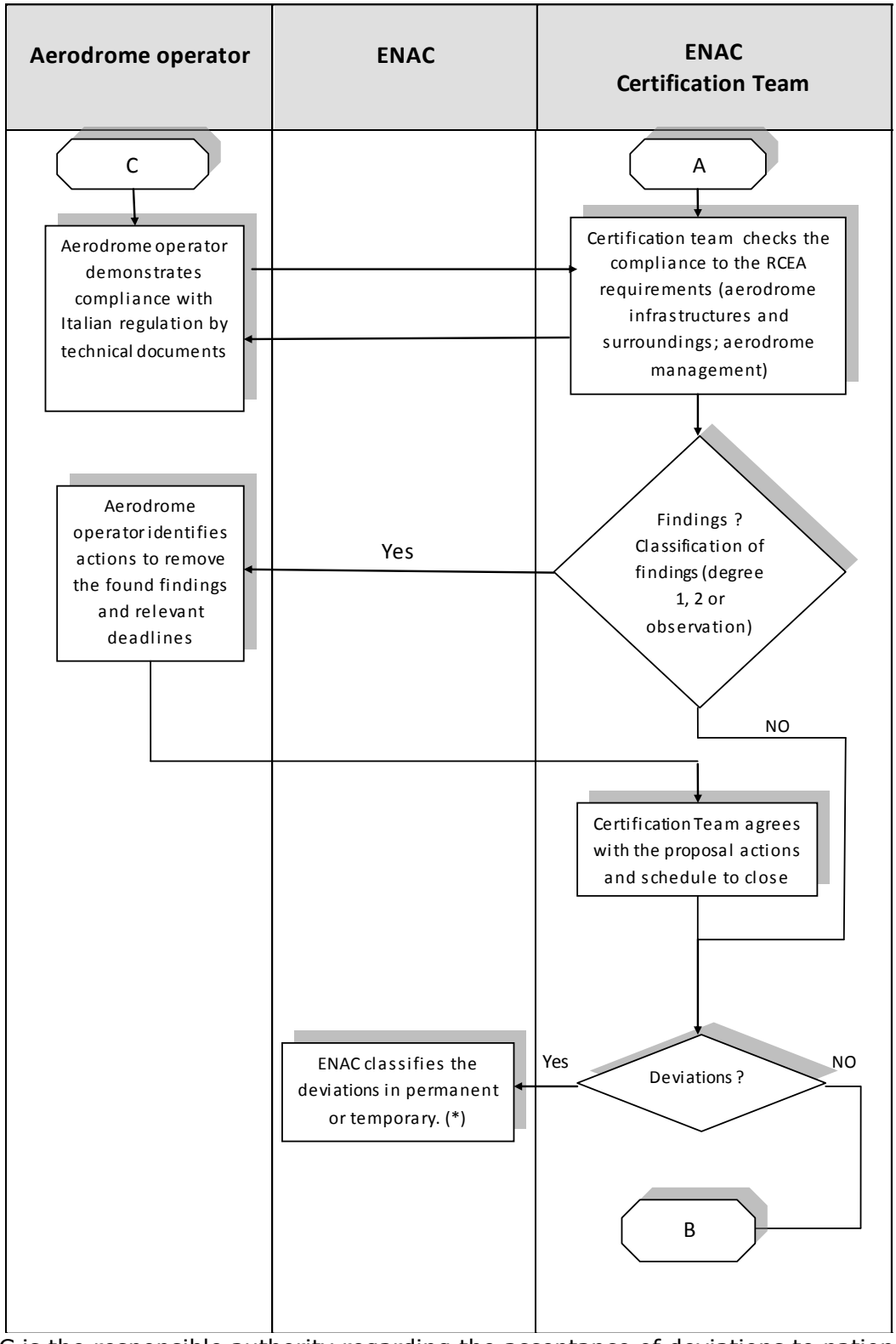
- The period between 1 and 3 on the flowchart is now requested at TO + 8 months, and not anymore TO + 12 months.
- The step 6 on the flowchart is now included in the step 7, this is performed at TO + 14 months.

Note: the step 4 'Technical inspections' consists mainly of a re-check of the results of the 'Homologation'. This homologation is similar to a pre-certification step and gives certain rights for aerodrome operations.

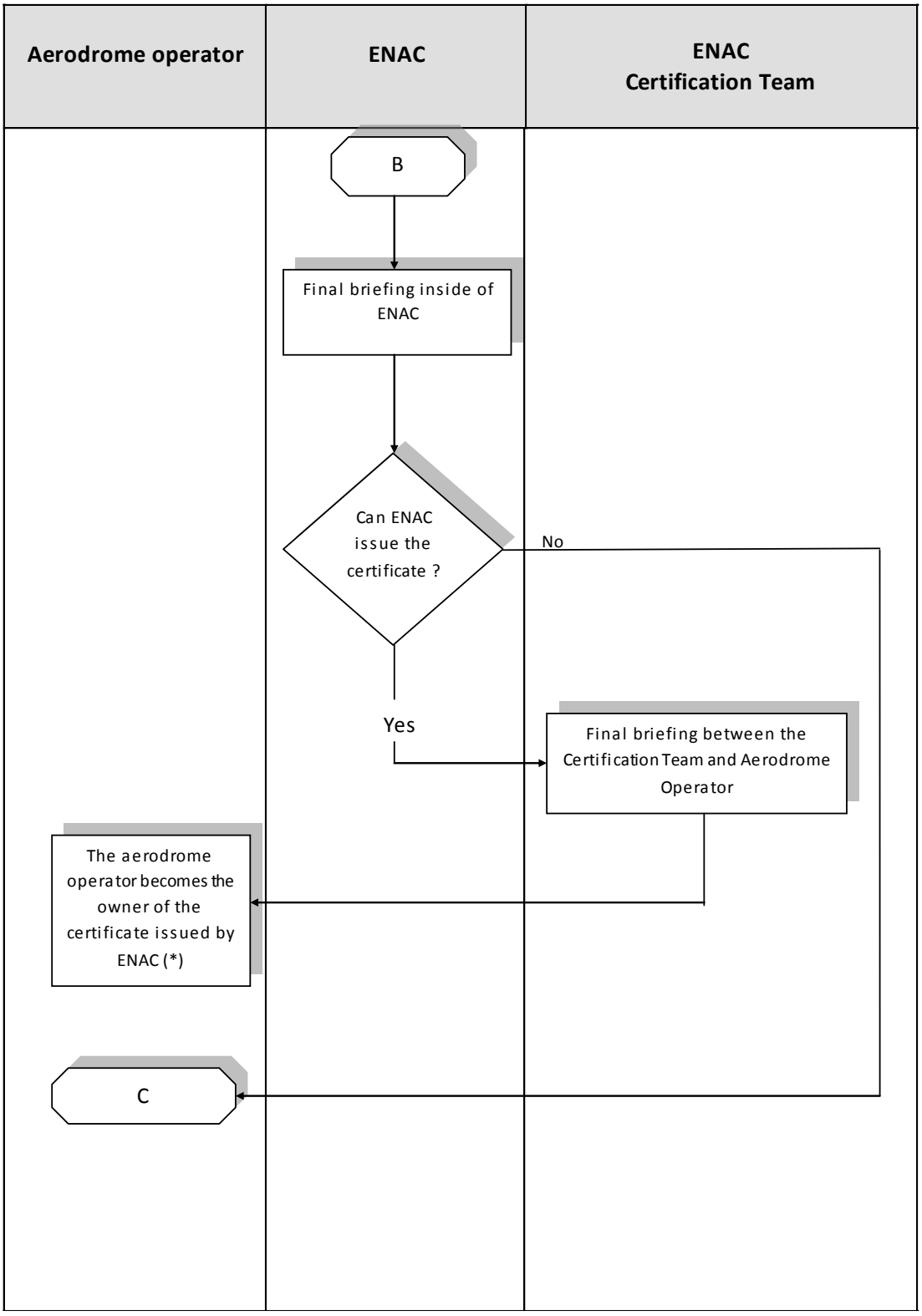
Italy

Figure 7: Aerodrome certification process in Italy (year 2011)





(*) ENAC is the responsible authority regarding the acceptance of deviations to national rules.



(*) The validity period of a certificate is three (3) years.

Appendix G — Aerodrome operator and stakeholders responsibilities

(in relation with section 6.3.1)

The BR (EC) No 1108/2009 addresses the need to clarify the different levels of responsibility for aerodrome certification and operations. The draft ADR rules specify the details of these responsibilities per stakeholder.

The responsibilities for each stakeholder acting in an aerodrome are defined at two different levels in the draft ADR rules:

- in the Implementing Rule (IR) for Organisation: ADR.OR.C.005,
- in the relevant Implementing Rules for Operation and/or Acceptable Mean of Compliance and/or Guidance Material.

ADR.OR.C.005 — Operator responsibilities

(a) The aerodrome operator is responsible for the operation and maintenance of the aerodrome in accordance with:

(1) Regulation (EC) No 216/2008 and its Implementing Rules;

(2) the terms of approval of its certificate;

(3) the content of the aerodrome manual; and

(4) any other manual for the aerodrome equipment available at the aerodrome, as applicable.

(b) The aerodrome operator shall have formal arrangements in place with organisations that provide services at the aerodrome, including, but not limited to:

(1) air traffic services;

(2) aeronautical information services;

(3) communication, navigation and surveillance services;

(4) meteorological services;

(5) design and maintenance of the flight procedures;

(6) ground handling services;

(7) security services;

unless such services are provided directly by the aerodrome operator itself.

(c) An aerodrome operator shall coordinate with the competent authority to ensure that relevant information for the safety of aircraft is published, and is contained in the aerodrome manual, including where appropriate:

(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.

Examples:

The aerodrome operator ensures that service providers and other third parties at the aerodrome have in place procedures to manage safety adequately in their aerodrome-related operations.

Third parties:

The audit of third parties, even though it is the key element of the aerodrome operator's internal audit process, is proposed in an AMC in order to provide flexibility for alternative solutions in monitoring the safety performance.

Fuel providers:

ADR-OPS.B.055 — Fuel quality

The aerodrome operator shall ensure that organisations involved in storing and dispensing of fuel to aircraft have procedures to verify that aircraft are provided with uncontaminated fuel and of the correct specification.

AMC — ADR-OPS.B.055 — Fuel quality

(a) The aerodrome operator should ensure, either by itself or though formal arrangements with third parties, that organisations involved in storing and dispensing of fuel to aircraft, implement procedures to:

- *a. maintain the installations and equipment for storing and dispensing the fuel in such condition so as not to render unfit for use in aircraft;*
- *b. mark such installations and equipment in a manner appropriate to the grade of the fuel;*
- *c. take fuel samples at appropriate stages during the storing and dispensing of fuel to aircraft, and maintain records of such samples;*
- *d. use adequately qualified and trained staff in storing, dispensing and otherwise handling fuel on the aerodrome.*

GM — ADR.OPS.B.055 — Fuel quality

The aerodrome operator, in order to ensure compliance, may use:

1. audit reports to organisations involved in storing and dispensing of fuel to aircraft, or

2. relevant national procedures providing for the assurance of fuel quality.

Appendix H — Case of aerodromes fluctuating around the BR passenger threshold

The potential certification burden for existing aerodromes fluctuating around the Basic Regulation aerodrome traffic threshold (BR 1108/2009, Article 4.3b) was analysed in detail:

- Case 1) aerodrome exempted by a Member State from traffic threshold consideration which would then exceed this threshold, and this after the possibility to use the DAAD mechanism.
- Case 2) certified aerodrome falling under the traffic threshold after the conversion period.

France being the largest country in terms of aerodromes under the BR scope with also the highest share of potential exempted aerodromes, passenger traffic series for French aerodromes were used for the period between 2001 and 2010.

Case 1

Over a 10-year period for France, Table 22 shows that 20 % of the aerodromes below the annual 10 000 passengers threshold exceeded at least one year this threshold, but only 6 % of the aerodromes below the annual 10 000 passengers threshold exceeded this threshold for more than 3 consecutive years. This would mean that 4 small aerodromes would have to follow the certification process. By the end of 2019, it is envisaged that most of the aerodromes with potential traffic growth will have the chance to undertake this certification process and so be able to use the DAAD mechanism.

This factor of 3 consecutive years above 10 000 passengers has been included in the draft ADR rules to define whenever an aerodrome certificate shall be requested.

Case 2

Aerodromes between 10 and 30 000 annual passengers in 2010 are 88 % to have more than 3 consecutive years above the 10 000 annual passengers threshold, but 63 % were below this threshold at least one year. The fluctuation around the threshold looks much more important for this range of aerodrome traffic size. Nevertheless, in terms of number of aerodromes, there are only 5 out of 8 aerodromes with traffic between 10 and 30 000 passengers falling down the passenger threshold at least one over a 10-year period, and this for a country that has 3 times more aerodromes under BR scope than the following one.

Out of these 5 aerodromes, only one is not subject to the certification process because its traffic was only above 10 000 passengers during the year 2010 and only one aerodrome is below the passenger threshold for 60 % of the period analysed.

Therefore, it is considered that the impact of maintaining certification for aerodromes fluctuating around the 10 000 passenger threshold is very limited for France, and not significant or even not existing for other countries. Also, it has to be considered that by the end of 2019 several small aerodromes fluctuating around the BR threshold will be certified, thus the potential numbers of aerodromes fluctuating around this threshold will be even lower from 2020.

Table 22: Aerodromes traffic fluctuation around the 10 000 passenger threshold[30]

Country: France	*Aerodrome per size of commercial passenger traffic, according to year 2010*			
	< 10000	[10 to 30 000]	[30 to 120 000]	> 120 000
	(Basic Regulation threshold)			
Number of aerodromes	71	8	12	35
The following analysis is based on a period of 10 years (2001–2010)				
Aerodromes with at least 3 consecutive years above BR threshold	4	7	12	35
Percentage of aerodromes with at least 3 consecutive years above BR threshold	6 %	88 %	100 %	100 %
Aerodromes fluctuating around the BR threshold	14	5	12	35
Percentage of aerodromes fluctuating around the BR threshold	20 %	63 %	17 %	100 %

[30] Percentage values are rounded.

Appendix I — RIA case studies examples of deviation and conversion process

Overview

The case studies gave the opportunity to get information on current deviations versus national rules or ICAO Annex 14. Some of the past deviations are now solved: they are mentioned when they are relevant to demonstrate what could have been done in the past if the draft European rules would have been in place.

An overview table is available in section 6.2.5.

Example of deviations — details

Example of deviation — CZ — Karlovy Vary — Width of RWY strip

1 Current situation (with national rules)

1.1 Facts

Total width of runway strip = 178 m (instead of 300 m). This is not compliant with ICAO Standard 3.4 Runway Strip.

1.2 Issue(s)

Width of the runway strip is too short.

1.3 Type of ADR operator measures to mitigate the issue

No mitigation measure.

1.4 Approval of these measures in the current national ADR certification process

This official exemption was published by the Ministry of Transport , the only government body empowered to issue regulations providing for exemptions from the environment of aerodromes on the implementation of Annex 14 to the Chicago Convention. Exception is accepted on a permanent basis without any mitigation measures.

Note from NAA (July 2011):

From the position of authority as a subordinate body is there is no opportunity to review individual decisions of the Ministry of Transport.

The deviation is inherited from Ministry of Transport decision done in the past. With the future European rules on aerodrome certification, NAA will re-assess these deviations.

For LKKV, NAA will certainly request a safety analysis on the deviation for width of runway strip and any mitigating procedure in place.

2 Future situation (with draft European rules)

2.1 CS 'Runway strip'

CS-ADR.B.140 — Runway strip to be provided

(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:

(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.

CS-ADR.B.145 — Length of runway strip

(a) A strip should extend before the threshold and beyond the end of the runway or stopway for a distance of at least:

(1) 60 m where the code number is 2, 3 or 4;
(2) 60 m where the code number is 1 and the runway is an instrument one; and
(3) 30 m where the code number is 1 and the runway is a non-instrument one.

CS-ADR.B.150 — Width of runway strip

(a) A strip including a precision approach runway should, wherever practicable, 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.

(b) 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.

(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.

2.2 Status of deviations with the draft European rules

The ADR deviates from the CS.

2.3 Example of a possible answer to accept the ADR deviation

Under the new European process, a possible way to justify the current deviation(s) would be supported by a 'Special Condition':

The NAA will need to determine with the aerodrome operator special conditions, based on a safety assessment, that provide a satisfactory and safe operation with the reduced width runway strip. The conditions to be applied will include: type of aeroplane operation; limiting ground movement of aeroplanes on taxiways when there is an aeroplane on approach within a specified range; limiting aeroplane approaches when the crosswind component exceeds a specified value.

The 2 other ways would be discarded for the following reasons:

- ELoS: the infrastructure constraints on the south side of the runway preclude the full width strip being available, therefore an equivalent level of safety cannot be achieved (ELoS not available);
- DAAD (Deviation Acceptance and Action Document): this is a deviation from the CS that while accepted cannot have an action to remove the deviation (infrastructure).

2.4 Conclusion: impacts for NAA and aerodromes

A safety assessment has to be provided. This is already the intention of the CZ NAA.

Example of deviation — CZ — Praha — Width of taxiway

1 Current situation (with national rules)

1.1 Facts

ICAO Annex 14 - 3.9.5 Width of taxiway

The width of 22.5 is not compliant with the ICAO Annex 14 3.9.5 requirement (23 m for Aerodrome Code E).

1.2 Issue(s)

The aerodrome operator considers that they are nevertheless compliant with the ICAO requirement on taxiway design for Aerodrome Code E (ICAO Annex 14 - SARP 3.9.4)

'The design of a taxiway shall 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 shall be not less than 4,5 meter'

The biggest wheel track of the aircraft using the aerodrome is the one from B-777. Its wheel track is 12,9 m. It means that the required 4,5 m distance is assured on the 22,5 m width TWY.

1.3 Type of ADR operator measures to mitigate the issue

No need of mitigation measures.

1.4 Approval of these measures in the current national ADR certification process

For the NAA, this is derogation which is approved on a permanent basis and this is document in the Aerodrome Manual.

2 Future situation (with draft European rules)

2.1 CS to be considered

EASA CS on width of taxiways

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

EASA CS on the clearance distance between the outer main wheel of the aeroplane and the edge of the taxiway

CS ADR-DSN.D.240 — Taxiways General

Unless otherwise indicated, the requirements in this Subpart 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

2.2 Status of deviations with the draft European rules

The width of the taxiway is a deviation from the regulation.

2.3 Example of a possible answer to accept the ADR deviations

The most appropriate approach is to make it a DAAD, as the operator of Prague airport indicated that the next phase of pavement works would include bringing the taxiways up to the full standard width (23 m); this would be the 'action' element of the DAAD.

Until this work is carried out, use of the 22.5 m wide taxiway will be limited to aeroplanes with an outer main wheel span of less than 13.5 m (giving the required 4.5 m clearance to the taxiway edge on both sides; i.e. 2 x 4.5 = 9 + 13.5 = 22.5 in accordance with the CS ADR-DSN.D.225).

The 'action' part of the DAAD should include publishing the limitation in use in the Aerodrome Manual and AIP. The aerodrome operator should be required by the NAA to carry out and report a periodic (say annual) review of the situation until such time as the remedial work is carried out.

2.4 Conclusion: impacts for NAA and aerodromes

As Prague indicated that they will increase the width of the taxiway up 23 m, there is no impact.

Example of deviation — FR — Annecy — RESA

1 Current situation (with national rules)

1.1 Facts

There is no Runway End Safety Area (RESA).

There is no space to create a RESA and continue the aerodrome operation as today (see an aerodrome map and surroundings configuration).

1.2 Issue(s)

The aerodrome design is less strict than the French regulation because:

- the French regulation was amended in the early 2000s with a requirement to have a RESA of 90 m for new aerodromes (Annecy airport was created in 1939).
- The implementation of a 90 m RESA is incompatible with the commercial operation of the aerodrome. A 90 m RESA would imply to close the commercial operations, which are fundamentals for the CEOs of Annecy region.

1.3 Type of ADR operator measures to mitigate the issue

There are no mitigation measures as a RESA is not mandatory in French regulation for aerodromes existing before the introduction of RESA in the French Regulation.

1.4 Approval of these measures in the current national ADR certification process

Annecy airport is currently under the process of being certified.

Generally, it was preferred to avoid reducing declared distances to provide a safety area at the end of the runway. This safety area is nevertheless recommended for existing aerodromes. A study is currently being done for the installation of RESA at existing French aerodromes.

2 Future situation (with draft European rules)

2.1 CS related to RESA

CS-ADR-DSN.C.210 — Runway End Safety Areas

(a) 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, 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.

(b) Where a RESA exceeding the minimum distance, but less than the distance in (a)(1) and

(a)(2) is considered necessary, the aerodrome 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.

GM-ADR-DSN.C.210

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 a suitable level of safety is achieved.

2.2 Status of deviations with the draft European rules

The aerodrome will have a deviation when the European CSs come into force.

2.3 Example of a possible answer to accept the ADR deviations

Under the new European process, a possible way to manage, if so decided by the NAA, the current deviation could be accepted by using the DAAD mechanism which requires a safety assessment.

Another approach would be to use the special condition mechanism with restriction or additional measures for operation.

2.4 Conclusion: impacts for NAA and aerodromes

In the case of France, it has to be noted that the French NAA is already carrying out a study to assess the safety risks for aerodromes without RESA and to propose possible actions. Depending on the depth of this study, this could constitute a safety assessment which could be reused for each relevant aerodrome. As a consequence, this could reduce the additional need for safety assessment to be carried out at these aerodromes on the basis of the draft European rules.

The study initiated by France to assess the safety risks for aerodromes without RESA being already in line with the future European certification process asking for safety assessment (requested in this CS, in the DAAD, etc.), it is deemed that the draft European rules do not have a significant impact.

Example of deviation — FR — Lyon St-Exupéry (LYS) — Cockpit over centre line

1 Current situation (with national rules)

1.1 Facts

ICAO Annex 14 — ICAO 3.9.4 Cockpit over centre line: no compliance for some TWY.

Note: the ICAO requirement is enforced from 20 November 2008.

1.2 Issue(s)

LYS refers to the French regulation 'CHEA (28/08/03 modified in 2007)' and the 'arrêté TAC (10/07/06)'. Requirements in CHEA comply with ICAO Annex 14. (Clearance of 4.50 m).

LYS: some junction on TWY and some curves at LYS do not comply with the 4.50 m clearance.

Knowing that the compliance would require heavy infrastructure, LYS requested a derogation, based on the following justifications:

- the non-compliant shoulder PCN was checked. The PCN is sufficient for occasional rolling;
- the lateral visual aids are built-in;
- works on clearance each time the situation allows is.

DGAC accepted a corrective action plan with short and long-term actions.

The procedure to cope with code F aircraft takes into account this difference on clearance.

DGAC comment: the NAA prefers to grant few derogations and focus on corrective actions.

1.3 Type of ADR operator measures to mitigate the issue

DGAC accepted a corrective action plan with short and long-term actions.

Regular visual inspection of the shoulders, once per week.

Note: in reality, no damages were observed, no negative feedback from pilots, no events[31] recorded by the aerodrome operator.

1.4 Approval of these measures in the current national ADR certification process

DGAC accepted a corrective action plan with short and long-term actions and the mitigations measures above.

2 Future situation (with draft European rules)

2.1 CS related to 'Cockpit over centre line'

CS-ADR-DSN.D.240 Taxiways General

Unless otherwise indicated, the requirements in this Subpart are applicable to all types of taxiways.

(b) 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:

[31] I.e. no 'Fiche de Notification d'Evènement' recorded.

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

2.2 Status of deviations with the draft European rules

Explain if the existing ADR deviations are still relevant with the draft European rules (and indicate the changes, if any, compared to the current national rules).

2.3 Example of a possible answer to accept the ADR deviations

If the corrective actions are not fulfilled at the end of the conversion period, a DAAD mentioning the remaining corrective actions will have to be issued.

2.4 Conclusion: impacts for NAA and aerodromes

No impacts with the European certification process, all actions have been already decided by FR NAA.

Example of deviation — FR — Lyon St-Exupéry (LYS) — RESA

1 Current situation (with national rules)

1.1 Facts

ICAO Annex 14 — 3.5.1 ST obligation to have RESA's + 3.5.3 REC 240 m.

LYS Airport does not respect these ICAO Standards and Recommended Practices, as the requirements for RESA were introduced recently in the French aerodrome regulations and are mandatory for new aerodromes or in case of runway extension. Nevertheless, the space required for a runway end safety area is available at the end of each runway.

In addition, though none of the French regulations are applicable at Lyon Airport on this matter, the regional Civil Aviation Safety Department ensures that these ICAO SARPs are fulfiled, and that no new objects are placed within the mentioned areas.

1.2 Issue(s)

No compliance with ICAO. LYS has available space for a RESA 240 m and the financial impact would not be too heavy because nothing obliged to have a tar RESA (LYS statement).

1.3 Type of ADR operator measures to mitigate the issue

The regional Civil Aviation Safety Department ensures that no new objects are placed within the mentioned areas.

1.4 Approval of these measures in the current national ADR certification process

LYS is compliant with the French regulation.

Generally, it was preferred to avoid reducing declared distances to provide a safety area at the end of the runway. This safety area is nevertheless recommended for existing aerodromes. A study is currently being done for the installation of RESA at existing French aerodromes.

2 Future situation (with draft European rules)

2.1 CS related to RESA

CS-ADR-DSN.C.210 — Runway End Safety Areas

(a) 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, 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.

(b) Where a RESA exceeding the minimum distance, but less than the distance in (a)(1) and (a)(2) is considered necessary, the aerodrome 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.

GM-ADR-DSN.C.210

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 a suitable level of safety is achieved.

2.2 Status of deviations with the draft European rules

The ADR deviates from the required CS.

2.3 Example of possible answer to accept the ADR deviations

As the aerodrome has the required space available (for at least the 90 m minimum), it can be brought into compliance with the future EU CSs within the conversion period (likely to be 48 months) by installing a suitable RESA and providing a safety assessment.

If no RESA is provided at the aerodrome after the end of the conversion period, the aerodrome can be certified but a DAAD would have to be developed and be based on a safety assessment. The action plan may include the installation of a suitable RESA.

2.4 Conclusion: impacts for NAA and aerodrome

In the case of France, the French NAA is already carrying out a study to assess the safety risks for aerodromes without RESA and to propose possible actions. This could constitute a safety assessment which could be reused for each relevant aerodrome. As a consequence, this could reduce the additional need for safety assessment to be carried out at these aerodromes on the basis of the draft European rules.

This study is already in line with the future European certification process asking for safety assessment (requested in this CS, in the DAAD, etc.). It is deemed that the draft European rules do not have a significant impact.

Here are the possible cases for LYS regarding to RESA and compliance with the future European ADR certification rules:

RESA charac-teristics at LYS airport	Today situation	If the situation changes, different cases:			
	No RESA, but space available	Creation of RESA lower than 90 m and without RWY extension	90 m RESA without safety assessment	90 m RESA + safety assessment	240 m RESA
Status of compliance with:					
1 — French regulation	Compliance because 90 m RESA is asked only for new aerodromes or doing RWY extension Ongoing French study to assess risks on existing aerodromes and possible actions	Compliance because 90 m RESA is asked only for new aerodromes	Compliance	Compliance	Compliance

2 — Draft European ADR rules	DAAD with safety assessment to be compliant	DAAD with safety assessment to be compliant	safety assessment to be provided	Compliance	Compliance

Example of deviation — FR — Lyon St-Exupéry (LYS)— Width of taxiway

1 Current situation (with national rules)

1.1 Facts

ICAO Annex 14 — 3.9.5 Width of taxiway

LYS is a code E aerodrome.

All TWYs have a width of 22.5 m because they were built before 2003, date when French regulation took over the ICAO requirement of 23 m for aerodrome code D and E.

Note from DGAC: Aeronautical information chapter 2 and Attachment 5, table A5-5 foresees a tolerance of 1 m for the survey on taxiway width.

1.2 Issue(s)

If LYS would need to comply with the 23 m requirement, 10 km of taxiways would need to be renovated and this would have a very significant cost impact for LYS

1.3 Type of ADR operator measures to mitigate the issue

A safety assessment conducted for the rerouting of the A380 at LYS provided a positive conclusion.

1.4 Approval of these measures in the current national ADR certification process

The NAA approved that the TWYs built before 2003 can keep a width of 22.5 m

2 Future situation (with draft European rules)

2.1 CS Width of taxiways

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

2.2 Status of deviations with the draft European rules

This is a deviation from the CS.

2.3 Example of a possible answer to accept the ADR deviations

If Lyon St-Exupéry operator is unwilling to meet the specification and wishes to use the taxiway for Code D (second condition), E or F aeroplanes, the aerodrome could get a certificate by developing for this deviation a DAAD.

The 'acceptance' part of the DAAD shall include a safety assessment which should look at necessary measures on main gear span restriction. An input for the safety assessment could be the study on the rerouting of the A380.

The 'action' part of the DAAD should include publishing the limitation on use in the Aerodrome Manual (e.g. if the safety assessment finds that a mitigation measure should be related to restriction main gear span) and AIP. The aerodrome operator should be required by the NAA to carry out and report a periodic (say annual) review of the situation until such time as the remedial work is carried out.

Note:

This cannot be a Special Condition, as there is a solution to the non-compliance, based on cost rather that infrastructure or topographical constraints.

2.4 Conclusion: impacts for NAA and aerodromes

It depends on the depth of the safety assessment conducted for the rerouting of the A380 at LYS: if there is enough available information to show that there is no need of main gear span restriction, the impact is nil.

Example of deviation — IT — Bergamo — RESA

1 Current situation (with national rules)

1.1 Facts

The Runway End Safety Area of 90 m length is provided, but there is no RESA of 240 m in length. The arresting system is also not installed.

1.2 Issue(s)

No issue in regard to Italian regulation. The provision of the 240 m length of RESA is mandatory for new aerodromes and in a case of runway extension or reconstruction works during the foreseen aerodrome development.

1.3 Type of ADR operator measures to mitigate the issue

None. No safety assessment was performed, in accordance with the Italian regulation RCEA, chap. 3 — § 5.4.

1.4 Approval of these measures in the current national ADR certification process

According to Italian regulation (Ref. RCEA, chap. 3 — § 5.3) a RESA longer than 90 m (120 m where the code is 1 or 2; 240 m where the code is 3 or 4) is required for:

a) new aerodromes, and

b) in case of existing RWY extension or reconstruction.

Only in the cases a) and b) if RESA is longer than 90 m but less than 120 m or 240 m (depending on the aerodrome code), a safety assessment is required (Ref. RCEA, chap. 3 — § 5.4).

The NAA approved the conclusions from section 1.3 in the following manner:

The provision of RESA 240 m in length is mandatory for new aerodromes and in the case of runway extension or reconstruction works during the foreseen aerodrome development.

2 Future situation (with draft European rules)

2.1 CS related to RESA

CS-ADR-DSN.C.210 — Runway end safety areas

(a) 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, 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.

(b) Where a RESA exceeding the minimum distance, but less than the distance in (a)(1) and

(a)(2) is considered necessary, the aerodrome 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.

GM-ADR-DSN.C.210

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 a suitable level of safety is achieved.

2.2 Status of deviations with the draft European rules

The ADR complies with the minimum requirement of the particular CS, i.e. RESA distance of 90 m, but as it is less than the RESA distance of 240 m, the ADR does not comply with the CS requirement that the safety assessment is undertaken. The ADR is in the process of purchasing the land outside the aerodrome boundary in order to extend the RESA to 240 m.

2.3 Example of possible answer to accept the ADR deviations

The ADR is not fully compliant with the particular CS. The ADR complies with the required minimum distance of 90 m, but as it is less than the distance of 240 m, the safety assessment has to be done to identify the hazards and appropriate actions to reduce the risk. The ADR is in the process of purchasing the land necessary to extend the length of the RESA to 240 m. This deviation may be noted in the DAAD, which should also include the action plan describing the conditions and the time frame when it will be possible to extend RESA to the distance of 240 m and to fully comply with the CS requirement.

2.4 Conclusion: impact

By the Italian regulation, the provision of 240 m length of RESA is mandatory for new aerodromes and in a case of runway extension or reconstruction works during the foreseen aerodrome development.

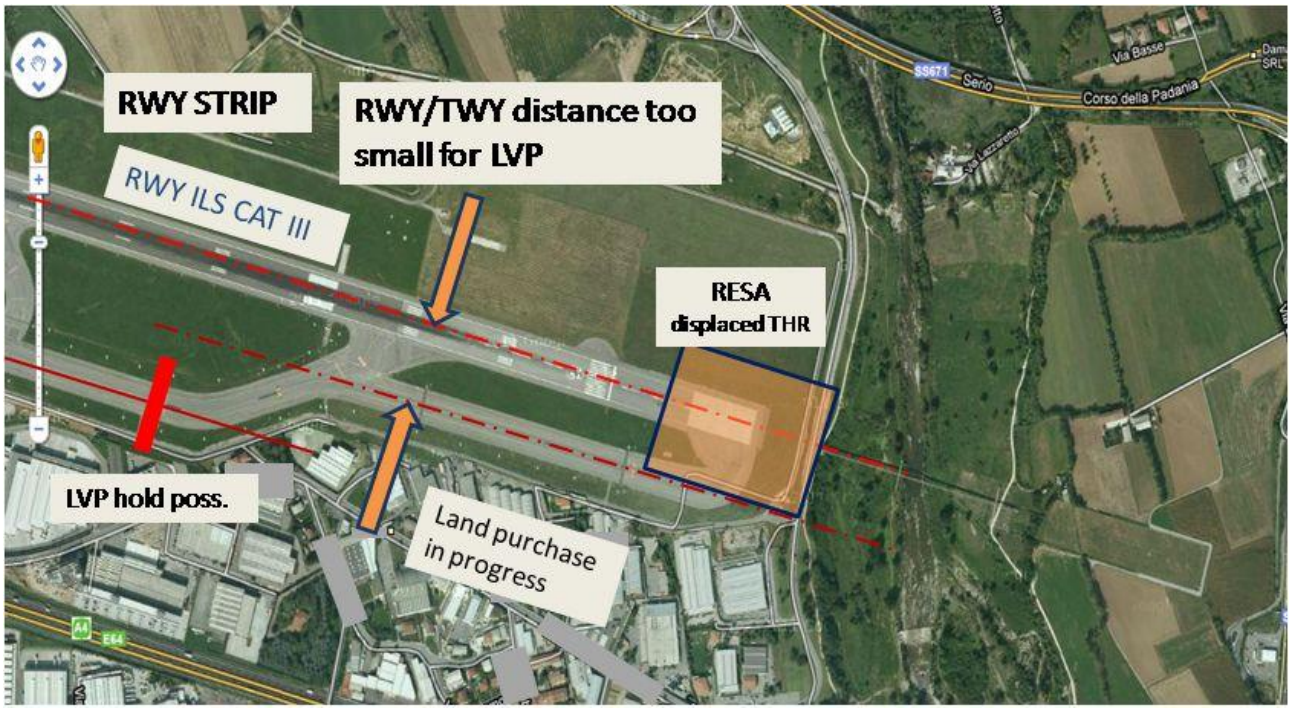
The aerodrome is not fully compliant with the European rules and it shall undertake a safety assessment to identify the hazards and appropriate actions to reduce the risk. As the ADR is already in the process of purchasing the land to extend RESA to the distance of 240 m in length, the exact plan and time frame to fulfill with the European rule may be develop and noted in a DAAD.

Example of deviation — IT — Bergamo — Distance between taxiway and RWY

1 Current situation (with national rules)

1.1 Facts

The distance between taxiway A centre line and RWY centre line is less than required by the Italian regulation and ICAO Annex 14 SARP (right side of picture).



1.2 Issue(s)

Bergamo text:

Following a runway incursion hazard identification, a past risk evaluation made in coordination with national CAA (ENAC) highlighted the need of a mitigating action to prevent a possible runway incursion from Main Apron and T taxiway through C taxiway.

The Agency's remark:

Even though the aerodrome is certified for the operation under CAT II/III conditions, the taxiway A is considered to operate as in CAT I conditions, with the support of radar surveillance, to ensure that there is only one aircraft in this area during the operation. The holding position is installed at the end of the taxiway T which has required RWY/TWY centre line distance for the operation under CAT II/III conditions to ensure that aircraft will not go further on taxiway A without ATC authorisation. Taxiway C is closed.

1.3 Type of ADR operator measures to mitigate the issue

Considered the taxiway C tight radius of curvature (serviceable only for aircraft up to Fokker F27) and the consequent low rate of use for runway vacating and lining up, the responsible Post Holders agreed to the closure of C taxiway using markings and visual aids fully compliant with RCEA and ICAO Annex 14.

1.4 Approval of these measures in the current national ADR certification process

The NAA approved the mitigations measures following the risk evaluation assessed in cooperation with Bergamo Airport.

2 Future situation (with draft European rules)

2.1 CS related to RWY/TWY distances

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 less than the appropriate dimension specified in Table ADR-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 ADR-D-1. Taxiway minimum separation distances

	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	37.5	—	—	23.75	16.25	12
B	87	87	—	—		42	42	—	—	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	95	55	50.5

Note 1 — The separation distances shown in columns (2) to (9) represent ordinary combinations of runways and taxiways. The basis for development of these distances is given in the Aerodrome Design Manual (Doc 9157), Part 2.

Note 2 — The distances in columns (2) to (9) do not guarantee sufficient clearance behind a holding aeroplane to permit the passing of another aeroplane on a parallel taxiway. See the Aerodrome Design Manual (Doc 9157), Part 2.

2.2 Status of deviations with the draft European rules

The ADR deviates from the CS.

The ADR is in the process of purchasing the land south of the taxiway A in order to remove the taxiway T to the required distance from the RWY.

2.3 Example of a possible answer to accept the ADR deviations

The ADR does not comply with the required CS regarding the RWY/TWY separation distance for the instrument runways. The holding position is placed at the taxiway T and the operational restrictions on taxiway A are in place during LVP operations. The ADR is in the process of purchasing the land necessary to remove the taxiway A at the required distance from the RWY.

Taxiway A is not meeting the required RWY/TWY distance for the instrument runways. The holding position is installed at the taxiway T to monitor and limit the movements at the

taxiway A. For this procedure the safety assessment is performed (according to the information received from aerodrome operator and NAA) showing that equivalent level of safety (ELoS) is met.

2.4 Conclusion: impact

According to the Italian regulation and European rules the ADR does not comply with the required distance between the RWY/TWY centre lines for the instrument runways.

The holding position is installed at the taxiway T and operational restrictions are in place on taxiway A when operating in low visibility conditions. The procedures are confirmed by the safety assessment and approved by the NAA.

The deviation for the taxiway A that does not meet the RWY/TWY separation distance for the instrument runway can be accepted as 'ELoS' with the operational restrictions and performed safety assessment. There is no impact on the aerodrome with new European rules.

Example of deviation — IT — Fiumicino — Mandatory instruction marking

1 Current situation (with national rules)

1.1 Facts

ICAO Annex 14 — 5.2.16. Mandatory instruction marking

According to the Italian Regulation ('RCEA') a mandatory instruction marking shall be placed on the left side only of the CL of the taxiway.

1.2 Issue(s)

5.2.16. 3 ST Mandatory instruction marking Ref. RCEA 03.10.21 (amdt V — 08.09.23) chap. 7 — § 4.3.6.2. When the Italian regulation will be updated according to the last amendment of ICAO Annex 14, it will be identical to ICAO.

5.2.16.4 ST not implemented in RCEA. This ST was not in the amdt No 9 of Annex 14; it will be inserted in the next amdt of RCEA.

1.3 Type of ADR operator measures to mitigate the issue

None

1.4 Approval of these measures in the current national ADR certification process

According to the Italian national rules a mandatory instruction marking has to be placed on the left side of the CL of the taxiway. When the Italian regulation will be updated according to the last amendment of ICAO Annex 14, this requirement will be identical to ICAO. As long as the Italian regulation is not updated, the aerodrome is compliant.

2 Future situation (with draft European rules)

2.1 CS 'Mandatory instruction marking'

CS-ADR.L.605 — Mandatory instruction marking

(a) Applicability: Where operationally required, such as 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 ADR-L-10 (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 ADR-L-10 (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.

GM

Location: Except where operationally required, a mandatory instruction marking should not be located on a runway.

2.2 Status of deviations with the draft European rules

The ADR deviates from the required CS.

2.3 Example of a possible answer to accept the ADR deviations

The non-compliance with the above mentioned CS cannot be treated as an ELoS or as a special condition.

As soon as the European CSs are issued, a 4-year time-window will be given for certification of the individual aerodrome. The deviation like the one in subject could be rectified during this period.

The Agency assumes that there would be no need to invoke the European acceptance process (DAAD) because these minor deviations could be resolved during routine painting. Nevertheless, a DAAD could be used theoretically by mentioning that this deviation will be solved within an agreed time scale (e.g. at the next routine painting).

2.4 Conclusion: impact

For the countries that decided to update their national rules before the entry into force of the draft European ADR rules, i.e. the case of Italy:

As the Italian NAA will change this requirement from the national regulation with the new ICAO requirement, the requirement with the new European rule will be also fulfilled. In the case of Italy and for this SARP/CS, the changes at Fiumicino airport will not be due to the future European regulation, but simply because Italy decided to update its national regulation in line with the latest version of ICAO.

For countries that do not comply with this ICAO requirement at the entry into force of the draft European ADR rules:

The Agency assumes that there would be no need to invoke the European acceptance process (DAAD) because these minor deviations could be resolved during routine painting. Nevertheless, a DAAD could be used theoretically through mentioning that this deviation will be resolved within an agreed time scale (e.g. at the next routine painting).

Example of deviation — IT — Fiumicino — RESA

1 Current situation (with national rules)

1.1 Facts

The Runway End Safety Area of 90 m in length is provided, but there is no RESA of 240 m length. The arresting system is also not installed.

1.2 Issue(s)

No issue in regard to Italian regulation. The provision of RESA 240 m length is mandatory for new aerodromes and in a case of runway extension or reconstruction works during the foreseen aerodrome development.

1.3 Type of ADR operator measures to mitigate the issue

None. No safety assessment was performed, in accordance with the Italian regulation RCEA, chap. 3 — § 5.4.

1.4 Approval of these measures in the current national ADR certification process

According to Italian regulation (Ref. RCEA, chap. 3 — § 5.3) RESA longer than 90 m (120 m where the code is 1 or 2; 240 m where the code is 3 or 4) is required for:

c) new aerodromes, and

d) in case of existing RWY extension or reconstruction.

Only in the cases a) and b) if RESA is longer than 90 m but less than 120 m or 240 m (depending on the aerodrome code), a safety assessment is required (Ref. RCEA, chap. 3 — § 5.4).

The NAA approved the conclusions from section 1.3 in the following manner:

The provision of RESA 240 m in length is mandatory for new aerodromes and in the case of runway extension or reconstruction works during the foreseen aerodrome development.

2 Future situation (with draft European rules)

2.1 CS related to RESA

CS-ADR-DSN.C.210 — Runway end safety areas

(a) 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, 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.

(b) Where a RESA exceeding the minimum distance, but less than the distance in (a)(1) and (a)(2) is considered necessary, the aerodrome 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.

GM-ADR-DSN.C.210

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 a suitable level of safety is achieved.

2.2 Example of possible answer to accept the ADR deviations

The ADR is not fully compliant with the particular CS. The ADR complies with the required minimum distance of 90 m, but as it is less than the distance of 240 m, the safety assessment must be done to identify the hazards and appropriate actions to reduce the risk.

If there is no safety assessment, this deviation may be noted in the DAAD, and the action part of the DAAD is the safety assessment.

2.3 Conclusion: impact

By the Italian regulation, the provision of 240 m length of RESA is mandatory for new aerodromes and in a case of runway extension or reconstruction works during the foreseen aerodrome development.

The aerodrome is not fully compliant with the European rules and it shall undertake a safety assessment to identify the hazards and appropriate actions to reduce the risk.

Impact for the Fiumicino aerodrome: safety assessment.

Example of deviation — PL — Warsaw — Mandatory instruction marking

1 Current situation (with national rules)

1.1 Facts

The Warsaw airport is a code E aerodrome. It does not follow ICAO Annex 14 - SARP 5-2-16 'Mandatory instruction marking' due to lack of national regulation on this subject. Instead of RWY designation marking on RWY-holding position, the 'RUNWAY AHEAD' marking is used.

Note: This RUNWAY AHEAD marking was implemented before the 5th edition of Annex 14 was adopted.

Location of these markings:

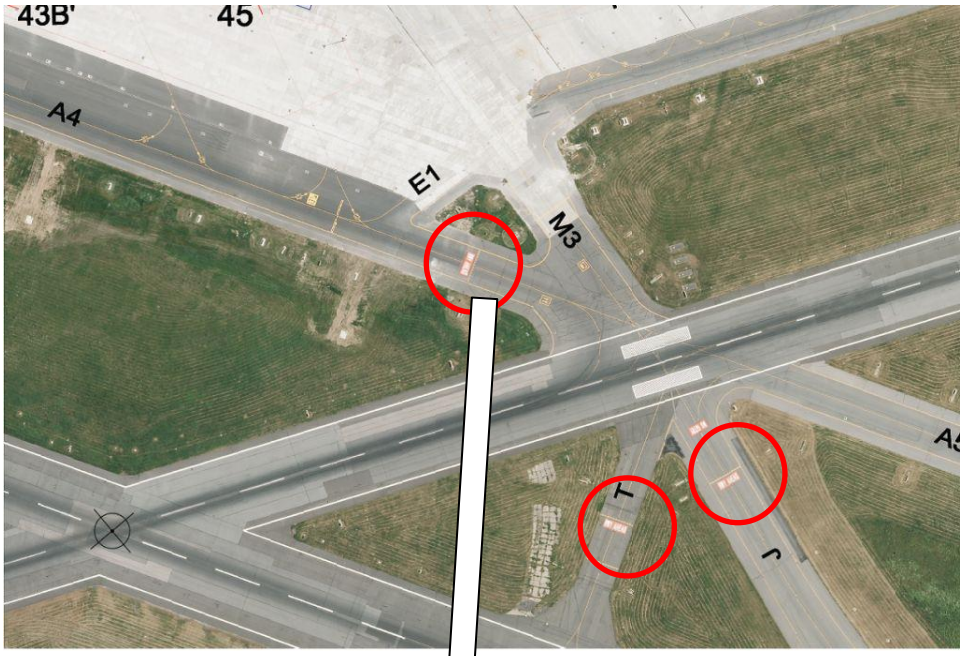


Figure 1 — TWY A4-J-T — RWY 11/29

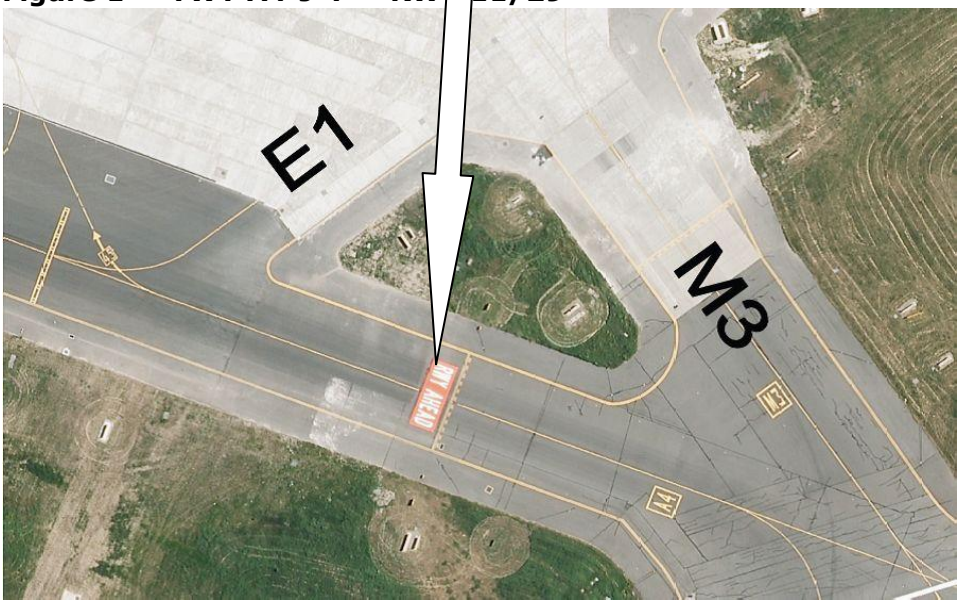


Figure 2 — TWY A4-RWY11/29

1.2 Issue(s)

Mandatory instruction marking RWY AHEAD still exist on TWYs.

1.3 Type of ADR operator measures to mitigate the issue

This marking is only on a hot spot to address RWY incursion (based on Runway Safety Team inputs). This is considered by the aerodrome operator to be safer than the ICAO requirement. Note: this decision was not documented. A safety assessment report is missing.

1.4 Approval of these measures in the current national ADR certification process

The President of Civil Aviation Office according to certification processes granted a certificate to aerodrome operator (the process includes mandatory instruction marking area).

Note: this deviation is not supported by a safety assessment report, while there was Warsaw Airport Runway Safety Team inputs to decide on the type of marking.

2 Future situation (with draft European rules)

2.1 CS 'Mandatory instruction marking'

CS-ADR.L.605 — Mandatory instruction marking

(a) Applicability: Where operationally required, such as 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-11 (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-11 (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 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.

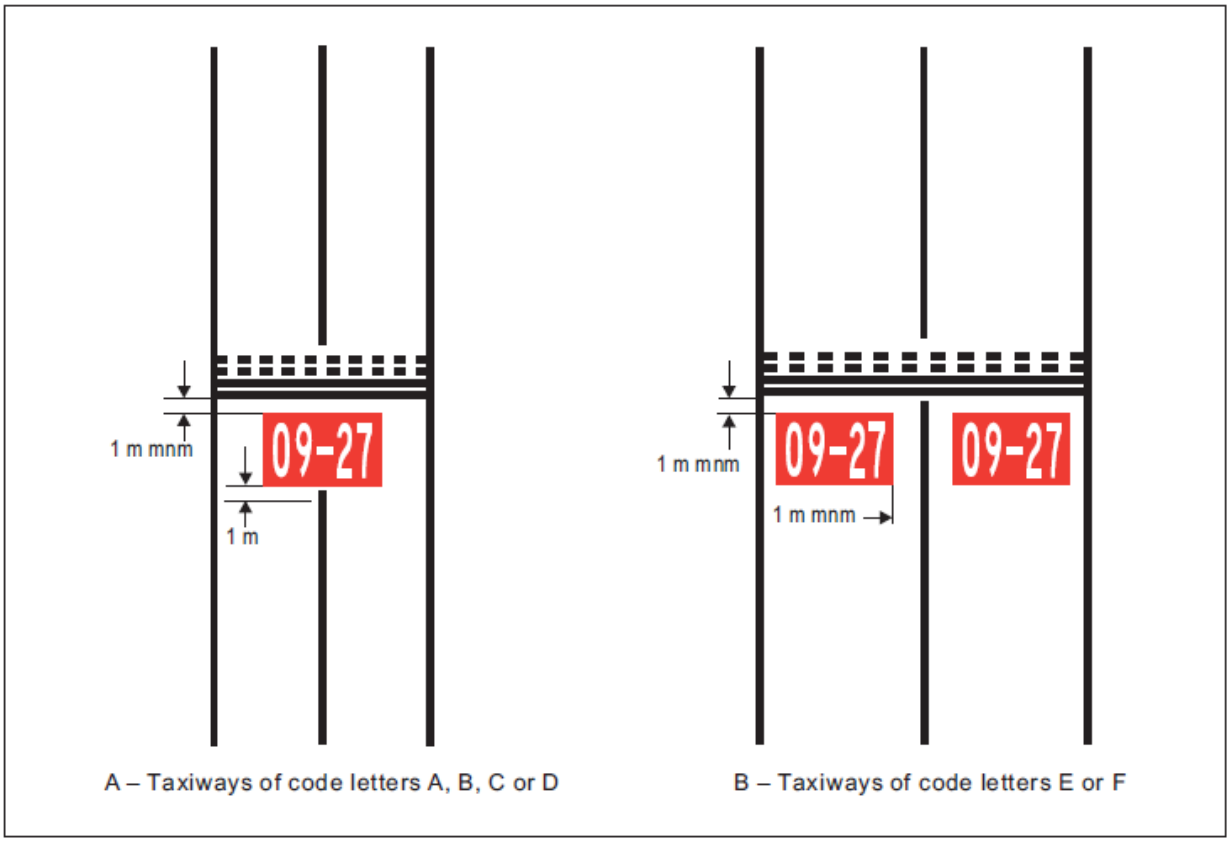


Figure L-11 (B)

GM

Location: Except where operationally required, a mandatory instruction marking should not be located on a runway.

2.2 Status of deviations with the draft European rules

There is a deviation.

2.3 Example of a possible answer to accept the ADR deviations

Under the new European process and before conversion of the national certification into a European one (a 48-month period after the adoption of the draft ADR rules by the Member States), this deviation could:

- be considered like an alternative way with an equivalent level of safety. The demonstration of equivalent level of safety shall be supported by a safety assessment;

or

- be justified by using the DAAD mechanism, requiring a safety assessment and any appropriate actions.

2.4 Conclusion: impacts for NAA and aerodromes

Due to the lack of documentation on this deviation and based on the section 2.3, the aerodrome operator could justify the deviation with an ELoS or a DAAD. This is a matter of discussion with the NAA that accepts this deviation and the supporting documents.

1) Safety assessment to demonstrate the Equivalent Level of Safety

The following elements can be used:

- the current practice does not raise any concern (list of negative feedback and safety events);
- the marking meets the objective of the CS a) 'Where operationally required, such as 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';
- the characteristics of the existing marking (size, colours ,etc.) and their compliance with the CS;
- the visibility conditions at the Warsaw airport;
- if any, the fact that these markings are used in other airports (in such cases, a list of these aerodromes and comparison of their types of operation with operations in Warsaw aerodrome)
- the AIP information on this deviation

2) The DAAD can be justified by using the following elements:

- Background: the deviation was granted by the NAA;
- A safety assessment taking into account the number of negative feedback and safety events. This safety assessment should confirm that:
  - the current practice does not raise any concern
  - the marking meets the objective of the CS a) 'Where operationally required, such as 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';
  - the characteristics of the existing marking (size, colours ,etc.) meets the CS;
  - the visibility conditions at the Warsaw airport
  - if any, the fact that these markings are used in other airports (in such cases, a list of these aerodromes and comparison of their types of operation with operations in Warsaw aerodrome).
- Actions such as:
  - the deviation is indicated in the AIP;
  - there will be a monitoring of the deviation with a special focus when related safety events are recorded;
  - the marking will be made compliant at their next scheduled repainting.

Example of deviation — PL — Warsaw — Colours for taxiway centre line marking

1 Current situation (with national rules)

1.1 Facts

ICAO Annex 14 - 5.2.1.5 is a standard requiring the colour yellow for taxiway markings.

Colours used for taxiway centre lines marking Zulu are blue and orange.

- TWY Z1 and Z2 is accessible for aeroplanes with wingspan 65 m.
- TWY Z Orange 1, 2 and Blue 1 and 2 is accessible for aeroplanes wingspan up to 36 m.
- During taxiing a/c on TWY Z, taxiways Z Orange and Blue are out of order for taxiing, however it is allowed to conduct simultaneously a/c taxiing with wingspan up to 36 m on TWY ZB and ZO.
- Centre line lights TWY ZO1 and ZO2 omnidirectional, orange colour.
- Marking of TWY ZO1 and ZO2 is orange colour line width 15 cm, bordered with black colour.
- Centre line TWY ZB1 and ZB2 bidirectional, green in colour. Centre line lights TWY ZB1 and ZB2 — omnidirectional, blue in colour, installed alternate with centre line lights spaced between them no more than 30m.
- Marking TWY ZB1 and ZB2 is in blue line colour width 15 cm, bordered with black colour.
- TWY Z can be used in LVP conditions without any restrictions for RVR, whereas TWY ZO and ZB — RVR not lower than 350 m, or lower when RVR 350 centre line lights are off.

1.2 Issue(s)

Lack of national regulation regarding an enhanced TWY centre line marking.

The ACI recommendation was chosen to enhance the taxiway capacity on the apron.

ICAO Annex 14 — 5.2.1.5 was not applied because it would have limited the taxiway capacity on the apron and the requirements are lower from the ADR operator point of view.

1.3 Type of ADR operator measures to mitigate the issue

No mitigation measure. The project of TWY Z meets ACI requirements.

ACI APRON MARKINGS & SIGNS HANDBOOK, Second Edition 2007, page 14:

3.5. MULTIPLE USEABLE AIRCRAFT STAND TAXILANE

To increase flow of traffic in aircraft stand taxilanes it may be helpful to use them multiple (e.g. two aircraft with maximum wingspan 36m or one aircraft with maximum wingspan 65m). Minimum distances from the centre lines to centre lines and/or to objects can be found in ICAO Annex 14, Volume 1.

Current best practice on many aerodromes has shown, that colour coding of centre lines is recommended to guarantee safe operations and to provide proper guidance.

Due to lack of possibilities the colours blue and orange should be used. In addition the maximum wingspan for the restricted taxilane centre lines shall be marked in the same colour. If installed, taxilane centerline lights shall be in the same colour as the markings alternating with green lights.

To increase visibility of centerline markings and 'MAX SPAN' markings because of the colour of the pavement, they should have a border/background in a contrasting colour.

Note: the aerodrome operator considered their markings achieve more strict requirements than ICAO Annex 14 — 5.2.8.1

1.4 Approval of these measures in the current national ADR certification process

TWY Z (TWY Z Blue, TWY Z Orange) has been approved by the President of Civil Aviation Office for aircraft movement.

Note: Nevertheless, there is a lack of documentation to support this deviation even if the aerodrome claims that they used the ACI recommendations in the absence of national regulation.

2 Future situation (with draft European rules)

2.1 CS 'Colour and conspicuity'

CS-ADR-DSN.L.525 — 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.

2.2 Status of deviations with the draft European rules

There is a deviation.

2.3 Example of possible answer to accept the ADR deviations

Under the new European process, this deviation could be considered like an alternative way with an equivalent level of safety. The demonstration of equivalent level of safety shall be supported by a safety assessment.

2.4 Conclusion: impacts for NAA and aerodrome

There are 2 ways to conclude:

Possible outcome No 1:

The compliance with the ACI APRON MARKINGS & SIGNS HANDBOOK, Second Edition 2007, section 3.5 (also installed on several other major European aerodromes) is accepted as a proof of an alternative way with an ELoS.

Possible outcome No 2:

Due to the lack of documentation on this deviation, the aerodrome operator will have to produce a safety assessment to demonstrate the equivalent level of safety of the type colours for taxiway centre line marking implemented at the Warsaw airport.

The ELoS can be justified using the following elements:

- the current practice does not raise any concern (list of negative feedback and safety events);
- the markings meet the objective of the CS : 'Markings should be of a conspicuous colour and contrast with the surface on which they are laid.';
- the visibility conditions at the Warsaw airport;
- the markings meet the ACI requirements (ACI APRON MARKINGS & SIGNS HANDBOOK, Second Edition 2007, section 3.5);
- these ACI requirements are in use in several aerodromes (list of these aerodromes and comparison of their type of operation with operations in Warsaw aerodrome);
- the AIP information on this deviation;

The outcome No 1 does not appear to be sufficient because an ELoS has to be granted for an individual aerodrome. Based on the given conditions, the NAA will take their decision.

Example of deviation — PL — Warsaw — OFZ

1 Current situation (with national rules)

1.1 Facts

ICAO Annex 14 - SARP 4-1: implementation is different with justification (aeronautical study).

Note: Some parameters of obstacle limitation surfaces are more strict in the Warsaw Chopin Airport than in ICAO Annex 14 e.g. on RWY 33.

1.2 Issue(s)

OFZ implemented for CAT II. There was a lack of national regulation concerning inner approach surface, inner transitional surface and balked landing surface.

1.3 Type of ADR operator measures to mitigate the issue

Based on an aeronautical study on possibility of infringement of OLS (Southern Station 180 AMSL and Zawisza Square 410 AMSL), the minimum radar vectoring altitude was increased.

1.4 Approval of these measures in the current national ADR certification process

Justification and mitigation measures are accepted.

2 Future situation (with draft European rules)

2.1 CS '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.

GM-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 must 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 impacts 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 will be free from obstacles but when a surface is infringed, any safety measures required will 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 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.

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 1 860 m or more in length and to a minimum radius of 10 000 m where the main runway is 1 100 m or more but less than 1 860 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.

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.

(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.

CS-ADR-DSN.H.455 — Inner transitional surface ***ICAO***

(a) Applicability: A surface similar to the transitional surface but closer to the runway.

(b) 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.

(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.

(d) The slope of the inner transitional surface should be measured in a vertical plane at right angles to the centre line of the runway.

GM-ADR-DSN.H.455 — Inner transitional surface ***ICAO***

(a) It is intended that the inner transitional surface be the controlling obstacle limitation surface for navigation aids, aircraft and other vehicles that must 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.

2.2 Status of deviations with the draft European rules

Providing that the aeronautical study on possibility of infringement of OLS is in line with the safety measures mentioned in the CS, there is no deviation.

2.3 Example of possible answer to accept the ADR deviations

Not applicable.

2.4 Conclusion: impacts for NAA and aerodromes

No impact.

Example of deviation — PL — Warsaw — RWY slope

1 Current situation (with national rules)

1.1 Facts

There are two intersecting runways (RWY11/29 and RWY15/33) at the Warsaw Airport of very uneven pavement characteristics, varying in both their cross-section and their longitudinal profile. The recent reconstruction of the runways took place in 1992–1993 and consisted in placing a top layer on the existing pavement with no crack filling or application of a pavement stress scattering layer, which resulted in a considerable number of reflective cracks.

Currently RWY11/29 does not meet the required technical standard, also in respect of the shape of the runway longitudinal profile recommended in ICAO Annex 14 Volume I item 3.1.16 and set out in § 27 para. 5 of the Regulation of the Minister of Transport and Maritime Economy of 31.08.1998 on technical and building regulations for civil airports (Journal of Laws No 130, item 859 with later amendments) according to which the transition from one slope to another has to be accomplished by a curved surface with minimum radius of curvature not less than 30 000 m for code 4 (which corresponds to rate of change of 0.1 % every 30 m).

Before starting the reconstruction works, the radius of curvature was approximately 12 000 m instead of 30 000 m.

1.2 Issue(s)

The correction of this deviation was ensured during the modernisation of the RMW 11/29. The total cost impact was approximately 10M€. The specific costs related to the deviation are included in these 10 M€ and certainly form a major part of these costs.

Therefore, the issue is that the application of RWY slope requirement has to be proportionate to the size of an aerodrome and the potential hazards when there is non-compliance. This cost impact would certainly be too demanding for a smaller aerodrome.

1.3 Type of ADR operator measures to mitigate the issue (before starting the works)

The deviation was indicated in AIP. No safety-related occurrences reported.

1.4 Approval of these measures in the current national ADR certification process

In the aerodrome certification processes carried out in the years 2003–2004 and 2007 the Civil Aviation Office pointed out that RWY11/29 did not meet the aforementioned requirements. The recommendations of the Civil Aviation Office made in conclusion of the certification processes provided for the next reconstruction of RWY 11/29 to be aimed at reaching the parameters set out in relevant international and Polish regulations.

The works connected with the modernisation of RWY 11/29, carried out with the purpose of improving its technical conditions, are scheduled for a period of 14 months in the years 2010–2011. The scope of works includes a general reconstruction of the runway and adjacent taxiways as well as technical roads. ICAO Annex 14 recommendations concerning the adjustment of the runway in compliance with reference code 4 and fulfilment of code E aircraft requirements were taken into account. Transverse slopes and the longitudinal profile will be corrected along the whole length of the runway, the pavement bearing strength will be upgraded to PCN 77/R/C/X/T (currently PCN 57), better surface water run-off will result in more even pavements.

2 Future situation (with draft European rules)

2.1 CS 'Runway Slope'

CS-ADR-DSN.B.060 — Longitudinal slopes of runways

(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.

GM-ADR-DSN.B.060 — Longitudinal slopes of 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 to minimise impact on aircraft and not to hamper the operation of aircraft. Precision approach runways, slopes in a specified area from the runway end, and including the touchdown area, should be designed so that they will correspond to the characteristics needed for such type of approach.

2.2 Status of deviations with the draft European rules

There will be no deviation for the Warsaw Airport once the works are achieved.

2.3 Example of a possible answer to accept the ADR deviations

If no works would have occurred, there would have been a deviation regarding to RWY slope.

As a consequence, this section provides an answer on this theoretical case for the Warsaw Chopin Airport. This issue still remains valid for several other aerodromes.

Under the new European process, a possible way to justify this RWY slope deviation could have been supported by a Special Condition or a DAAD.

Possible justification for a special condition:

The deviation appears in response to the given terrain at the aerodrome, and a rework of this terrain only for this reason appears overly demanding with the given information (obviously major works in line with aerodrome development plans give the best opportunity to deal with existing deviations). Please note that given terrain is a very typical case for a need of a special condition. This always follows the notion of 'compelling need', which means that the CS would be inadequate or inappropriate, equalling disproportionate and overly burdensome in the given case.
A solution within this remit could therefore be to accept the given non-compliance with the CS, and to potentially insert mitigating means such as pilot awareness, publication in AIP, etc.
The solution as it was put in place by PL (acceptance and publication in AIP) appears as 'standard case' for such a special condition.

Possible justification for DAAD:

Only if a special condition could not be agreed, as a 'compelling need' could not be seen, a DAAD solution could be followed. This would mean to accept the given deviation for any period of time, as decided by the authority, requiring a safety assessment (which would have to conclude that the deviation can be accepted), and possibly subject to review requirements, and also subject to restrictions as found necessary.

2.4 Conclusion: impacts for NAA and aerodromes

Warsaw Airport

The compliance with CS is expected due to the works carried out at the Warsaw airport. There is no impact of the draft ADR rules in this case.

General case: existing RWY slope deviations
As referred to above, however, RWY slope deviations would not typically be expected to be solved by a substantial rework of the runway. It appears to be a 'special condition' candidate rather than a DAAD one.