



Explanatory Note to Decision 2015/019/R

CS-25 — Amendment 17

RELATED NPA/CRD 2013-11 (RMT.0500) AND NPA/CRD 2014-16 (RMT.0223 (MDM.024) — 15.7.2015

EXECUTIVE SUMMARY

This Decision introduces the following changes to CS-25:

- (1) New certification standards addressing High-Intensity Radiated Fields (HIRF) and lightning hazards on electrical and electronic systems. The new standards reflect the developments made over the last years in this domain, which EASA previously managed through Certification Review Items (CRIs). Associated to these new CS-25 provisions, two new AMC-20 series have been published providing Acceptable Means of Compliance (AMC) against HIRF and lightning hazards.
- (2) The amendment to and the creation of AMCs in the field of cabin safety, reflecting the means of compliance that have been accepted by EASA.
- (3) A new security rule and a corresponding AMC for the design and installation of chemical oxygen generators. This change has been developed to harmonise with an equivalent FAA Part 25 rule and associated Advisory Circular (AC).
- (4) Two new appendices to AMC 25-11 dealing with head-up and weather displays. These appendices have been based on the recommendations of an Aviation Rulemaking Advisory Committee (ARAC) group, in particular the Avionics Systems Harmonization Working Group (ASHWG), in which EASA participated.

The changes will contribute to an updated CS-25 reflecting the available state of the art and AMC (complying with the objective of Article 19 of Regulation (EC) No 216/2008), will facilitate the certification process, and will improve harmonisation with the Federal Aviation Administration (FAA). It is expected that Amendment 17 will increase safety, will have no social or environmental impacts, and may provide a slight economic benefit by streamlining the certification process.

Applicability		Process map	
Affected regulations and decisions:	ED Decision 2003/2/RM of 17 October 2003 'CS-25'	Concept Paper:	No
Affected stakeholders:	CS-25 aeroplane manufacturers and their equipment suppliers	Rulemaking group:	No
Driver/origin:	Safety; EASA Management Board Decision No 01-2012 (Article 3.5 on 'systematic tasks')	Terms of Reference:	26.6.2013 (RMT.0500) & 10.2.2012 (RMT.0223)
Reference:	N/A	RIA type:	Light
		Technical consultation during NPA drafting:	No
		Publication date of NPA 2013-11 & NPA 2014-16:	10.7.2013 & 25.6.2014
		Duration of NPAs' consultation:	3 months
		Review group:	No
		Focussed consultation:	No
		Publication date of the Opinion:	N/A



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1. Procedural information

1.1. The rule development procedure

The European Aviation Safety Agency (hereinafter referred to as the 'Agency') developed ED Decision 2015/019/R in line with Regulation (EC) No 216/2008¹ (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure².

This rulemaking activity is included in the Agency's [Rulemaking Programme for 2013–2016](#) under RMT.0500, and for [2014–2017](#) under RMT.0223 (MDM.024)³. The scope and timescale of the task were defined in the related Terms of Reference (see process map on the title page).

The draft text of this Decision has been developed by the Agency. All interested parties were consulted through NPA 2013-11 and NPA 2014-16⁴. During the public consultation of NPA 2013-11, 22 comments were received from 7 interested parties, including national aviation authorities and industry. For NPA 2014-16 (which addressed other Certification Specifications in addition to CS-25), 28 comments were received from 14 interested parties, including national aviation authorities and industry.

The Agency has reviewed the comments received on these NPAs. The comments received and the Agency's responses thereto are presented in the Comment-Response Documents (CRDs) 2013-11 and 2014-16⁵ respectively.

The final text of this Decision with the Certification Specifications (CSs) and AMC has been developed by the Agency.

The process map on the title page summarises the major milestones of this rulemaking activity.

1.2. Structure of the related documents

Chapter 1 contains the procedural information related to this task. Chapter 2 explains the core technical content. Chapter 2.4 summarises the findings from the Regulatory Impact Assessment. The text of the CS/AMC is annexed to the ED Decision.

¹ Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.3.2008, p. 1).

² The Agency is bound to follow a structured rulemaking process as required by Article 52(1) of the Basic Regulation. Such process has been adopted by the Agency's Management Board and is referred to as the 'Rulemaking Procedure'. See Management Board Decision concerning the procedure to be applied by the Agency for the issuing of opinions, certification specifications and guidance material (Rulemaking Procedure), EASA MB Decision 01-2012 of 13 March 2012.

³ <https://www.easa.europa.eu/document-library/rulemaking-programmes>

⁴ In accordance with Article 52 of the Basic Regulation, and Articles 5(3) and 6 of the Rulemaking Procedure.

⁵ <https://www.easa.europa.eu/document-library/comment-response-documents>



2. Explanatory Note

2.1. Overview of the issues to be addressed

2.1.1. HIRF

Concern for the protection of electrical and electronic systems in aircraft has increased substantially in the last decades because of:

- (a) the greater dependence on electrical and electronic systems performing functions required for the continued safe flight and landing of the aircraft;
- (b) the reduced electromagnetic shielding afforded by some composite materials used in aircraft designs;
- (c) the increase in susceptibility of electrical and electronic systems to HIRF because of increased data bus or processor operating speeds, higher density integrated circuits and cards, and greater sensitivities of electronic equipment;
- (d) expanded frequency usage, especially above 1 gigahertz (GHz);
- (e) the increased severity of the HIRF environment due to an increase in the number and power of Radio Frequency (RF) transmitters; and
- (f) the adverse effects experienced by some aircraft when exposed to HIRF.

The current CS 25.1309 provides general certification requirements applicable to the installation of all aircraft systems and equipment, but it does not include specific certification requirements for protection against HIRF. Due to the lack of specific HIRF certification requirements, Special Conditions (SCs) have been imposed on applicants seeking the issue of a Type Certificate (TC), or changes to TC (including Supplemental Type Certificates (STCs)), since 1986 in order to address HIRF protection. Applicants have to demonstrate compliance using the external HIRF environment as defined in HIRF SCs and/or categories of the EUROCAE ED-14G Section 20 for critical and essential systems.

2.1.2. Lightning

The current CS-25 provisions for lightning protection (CS 25.1316) focus on the protection of electrical and electronic systems that perform critical and essential functions. They are now considered outdated as they are no longer compatible or consistent with the latest classification concepts, terminology, and practices used in lightning certification.

2.1.3. Cabin safety

Several AMCs need to be created or amended in order to reflect the means of compliance that have been accepted by the Agency.

2.1.4. Security provisions

CS-25 does not provide security requirements for chemical generators. After identifying a security risk, new requirements applicable to chemical oxygen generators have been proposed by the FAA, which the Agency decided to adopt. The FAA published the final rule on the Requirements for Chemical Oxygen Generators Installed on Transport Category Airplanes [Docket No. FAA-2012-0812; Amendment No. 25-138] on 11 March 2014.

2.1.5. Head-up and weather displays

The recently upgraded AMC 25-11 'Electronic Flight Deck Displays' does not contain provisions providing AMC addressing the installation of head-up displays and weather displays.



The ASHWG, chartered by the FAA, has developed and proposed two new appendices to FAA AC 25-11A/EASA AMC 25-11. The Agency participated in this Group, and decided to take into account this proposal to amend AMC 25-11 by creating:

- Appendix 6 for head-up displays, and
- Appendix 7 for weather displays.

2.2. Objectives

The overall objectives of the EASA system are defined in Article 2 of the Basic Regulation. This proposal will contribute to the achievement of the overall objectives by addressing the issues outlined in Chapter 2.1. The specific objective of this proposal is, therefore, to:

- (a) introduce new Certification Specifications for HIRF and lightning protection for electrical and electronic systems;
- (b) create new or upgrade several existing AMCs in the domain of cabin safety;
- (c) introduce new security specifications for chemical oxygen generators;
- (d) introduce two new appendices to AMC 25-11 dedicated to head-up displays and weather displays.

2.3. Outcome of the consultation

NPA 2014-16 'High-intensity radiated fields (HIRF) and lightning': Very few comments were received with regard to CS-25, which were used to make some improvements or clarifications to the proposed text.

NPA 2013-11 'Regular update of CS-25':

Cabin safety: Only one comment was received which did not lead to changes to the proposed text. Two slight changes were made by the Agency to the proposed AMC 25.793 and AMC 25.809.

Chemical oxygen generators: No comments were received. Some changes were made by the Agency to the proposed text in order to harmonise it with the FAA final rule and Advisory Circular.

Avionics (AMC 25-11): The proposed new appendices to AMC 25-11 (head-up displays and weather displays) attracted most of the comments. These comments, together with the consideration of the final FAA AC 25-11B, were used to make some clarifications and improvements to the proposed text. Few differences remain compared to the FAA AC, which reflect some rule differences.

2.4. Summary of the Regulatory Impact Assessment (RIA)

NPA 2014-16 'High-intensity radiated fields (HIRF) and lightning': A light RIA has been conducted. Overall, the proposal will have no significant impact on safety and will not create any social or environmental impacts. The proposal will ensure that CS-25 reflects the state of the art, will provide greater harmonisation with the FAA, and will streamline the certification process thus reducing the burden on both the Agency and applicants.

NPA 2013-11 'Regular update of CS-25': A light RIA has been conducted. Overall, the proposal will bring about a moderate safety benefit, will create no social or environmental impacts, and may provide a slight economic benefit by streamlining the certification process.



2.5. Overview of the amendments

The main changes brought about by this CS-25 Amendment 17 are summarised below.

HIRF and lightning:

- CS 25.1316 is amended to align with the most recent wording and to suppress subparagraph (c) related to means of compliance.
- CS 25.1317(a) is created for Level A systems exposed to HIRF.
- CS 25.1317(b) is created for Level B systems exposed to HIRF.
- CS 25.1317(c) is created for Level C systems exposed to HIRF.
- CS-25 Appendix R is created to introduce the HIRF environments and equipment test levels.

Cabin safety:

- Creation of AMC 25.562 to refer to FAA AC 25.562-1B and FAA AC 20-146.
- Creation of AMC 25.785 to refer to FAA AC 25-17A and FAA AC 25.785-1B.
- Deletion of AMC 25.785(d) on ‘Seats and Safety belts’. The usage of this AMC is considered extremely rare, if not unheard of. It is not compatible with FAA AC 25-17A which is proposed as the AMC reference for CS 25.785. AMC 25.785(d) is deleted in order to avoid dis-harmonisation and inconsistency with FAA AC 25-17A.
- Amendment of CS 25.809(g) to correct a typo.
- Creation of AMC 25.793, AMC 25.810, AMC 25.811, and AMC 25.819 to include a reference to FAA AC 25-17A in each.
- Amendment of AMC 25.809 to include a reference to FAA AC 25-17A. The content of the existing AMC 25.809, dealing with outside viewing aspects, is then transferred into a new AMC 25.809(a) entitled ‘Emergency exit outside viewing’.
- Amendment of AMC 25.813 ‘Emergency Exit Access’. In the second paragraph, the text ‘For Assist Spaces’ is deleted, and ‘CS 25.813(b)’ is replaced by ‘CS 25.813’. Based on experience from certification projects, it has been concluded that the reference to the acceptability of AC 25-17A does not need to be limited to ‘Assist Spaces’.
- Amendment of AMC 25.853 ‘Compartment interiors’. Inclusion of a reference to FAA AC 20-178. This AC has been accepted on several EASA STC projects.
- Amendment of Appendix F as follows:
 - Appendix F Part I (b)(4): Correct an editorial error. ‘The burn length determined in accordance with subparagraph (7) of this paragraph...’; the burn length subparagraph is (8), not (7).
 - Appendix F Part II (a)(3): Correct an editorial error. The paragraph should refer to CS 25.853(a) instead of CS 25.853(c).



Security provisions:

CS 25.795 is amended, and AMC 25.795(d) is created to introduce new security specifications for chemical oxygen generators.

Avionics:

AMC 25-11 is amended to add two new appendices:

- Appendix 6 for head-up displays, and
- Appendix 7 for weather displays.

Other typo corrections:

- CS 25.21: one typo is corrected in paragraph (g)(3);
- AMC 25.1322, Appendix 1: one typo is corrected in paragraph 1.a.



3. References

3.1. Related regulations

N/A

3.2. Affected decisions

- Decision No. 2003/2/RM of the Executive Director of the Agency of 17 October 2003 on certification specifications, including airworthiness codes and acceptable means of compliance, for large aeroplanes (CS-25 — Initial issue)

3.3. Reference documents

- FAA AC 25.562-1B and FAA AC 20-146
- FAA AC 25-17A and FAA AC 25.785-1B
- FAA AC 20-178

