



Explanatory Note to Decision 2015/018/R

CS-23 — AMENDMENT 4

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

EXECUTIVE SUMMARY

This Decision addresses a safety and regulatory coordination issue related to the type-certification of electrical and electronic systems susceptible to the effects of High-Intensity Radiated Fields (HIRF) and lightning.

The specific objectives are to maintain a high uniform level of safety, to reflect the state of the art in certification practice, and to cooperate with third countries in order to provide cost-efficient rules.

This Decision proposes:

- to create a new CS 23.1306 ‘Electrical and electronic system lightning protection’;
- to create a new CS 23.1308 ‘High-Intensity Radiated Fields (HIRF) protection’;
- to amend CS 23.1309 ‘Equipment, systems and installations’; and
- to create a new CS-23 Appendix K ‘HIRF environments and equipment HIRF test levels’.

The proposed changes are an adoption of existing Special Conditions into the CS’s that will reduce the administrative burden and improve transparency of the existing requirements. At the same time harmonisation is improved with the FAA Part 23 amendment 62 requirements. Postponement of this change to CS-23 has been considered because of the ongoing rulemaking task for the reorganisation of CS-23 (Rulemaking task RMT.0498), however, it was concluded that the subject of this change is already under consideration of that task and will not disturb that process. Consideration was also given to the principles of the GA Roadmap. As this rulemaking task formalises existing Special Conditions (SCs), it is considered that this new specifications (that will apply only to future Type Certificates (TC) and to changes to TC via Part 21.A.101) should actually reduce the burden on certification projects as Special Conditions and associated Certification Review Items (CRIs) will not need to be raised. .

Note: AMC 20-136 and AMC 20-158, which provide the Acceptable Means of Compliance to CS 23.1306 and CS 23.1308 respectively, are being introduced concurrently to AMC-20 Amendment 13 by Decision 2015/017/R.

Applicability		Process map	
Affected regulations and decisions:	CS-23 (Decision 2003/14/RM)	Concept Paper:	No
Affected stakeholders:	Applicants for Type Certificates (TC), Supplemental Type Certificates (STC) (or changes thereto)	Rulemaking group:	10.2.2012
Driver/origin:	Safety; regulatory coordination	Terms of Reference:	No
Reference:	JAA INT POL 23/1 and 23/3	RIA type:	Light
		Technical consultation during NPA drafting:	No
		Publication date of the NPA:	3 months
		Duration of NPA consultation:	No
		Review group:	No
		Focussed consultation:	No



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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 this ED Decision 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 [4-year Rulemaking Programme](#) 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 2014-16⁴. 28 comments were received from interested parties, including industry and national aviation authorities.

The Agency has reviewed the comments received on the NPA. The comments received and the Agency's responses thereto are presented in the Comment-Response Document (CRD) 2014-16⁵.

The final text of this Decision with the Certification Specifications (CS-23) has been developed by the Agency taking into account the comments received.

The process map on the title page summarises the major milestones of this regulatory 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 of the task. The consolidated text of CS-23 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 No 01-2012 of 13 March 2012.

³ <http://www.easa.europa.eu/document-library/rulemaking-programmes/revised-2014-2017-rulemaking-programme>

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

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



2. Explanatory Note

2.1. Overview of the issues to be addressed

Aircraft electrical and electronic equipment can be susceptible to adverse effects from electromagnetic radiation and lightning. With the increased use of critical and essential electrical/electronic systems on aircraft, coupled with the development and use of non-metallic structural materials that are more 'transparent' to electromagnetic radiation and have low electrical conductivity, it has been recognised for many years that High-Intensity Radiated Field (HIRF) and lightning standards must be enhanced to counter the growing threat.

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. The specific objectives of this proposal are:

- to create a new CS 23.1306 'Electrical and electronic system lightning protection';
- to create a new CS 23.1308 'High-Intensity Radiated Fields (HIRF) protection';
- to amend CS 23.1309 'Equipment, systems and installations'; and
- to create a new CS-23 Appendix K 'HIRF environments and equipment HIRF test levels'.

2.3. Outcome of the consultation

28 comments were received from 14 commentators on NPA 2014-16 and the individual responses to each of them were published in CRD 2014-16.

As NPA 2014-16 proposed changes to multiple CSs as well as to AMC-20, not all comments and responses are directly linked to this Decision.

Those accepted or partially accepted have resulted in changes to the text of CS-23.

2.4. Summary of the Regulatory Impact Assessment (RIA)

The following four options were considered in the RIA:

- (0) **Do nothing.** The baseline option, where existing certification practices would continue.
- (1) **Amend Special Conditions (SCs).** Amend the SCs to allow the use of more recent standards.
- (2) **Amend CS-25 and publish AMC 25.1316 and AMC 25.1317.** Create CS 25.1317 and publish AMC material in Book 2 of CS-25, and introduce Guidance Material for HIRF & lightning protection.
- (3) **Amend CS-23, CS-25, CS-27, CS-29 & AMC-20.** Add new requirements for all the products and publish AMC 20-136 and AMC 20-158 which are applicable to all products.

The four options were comparatively assessed using the Multi-Criteria Analysis (MCA) methodology. Of the four options, Option 3 provided the largest positive benefit from a safety, economic, proportionality and harmonisation standpoint. No negative impacts were identified.

The absence of harmonised regulation between the Agency and the FAA could lead to an increase of costs and time for the applicants/authority in validating Type Certificates (TCs) and Supplemental Type



Certificates (STCs). Furthermore, the reference in a type certification basis to Agency standard CRIs, which are dated in excess of 10 years ago, increases the risk of obsolescence.

2.5. Overview of the amendments

The current requirements of CS-23/25/27/29.1309 provide general certification requirements applicable to the installation of all aircraft systems and equipment, but they do not include specific certification requirements for protection against HIRF and lightning. As a result, SCs have been imposed on applicants seeking issuance of a TC or change to a TC since 1986.

The proposed changes will create dedicated certification specifications that reflect the state of the art in certification practice, and will improve harmonisation.



3. References

3.1. Related regulations

None.

3.2. Affected decisions

ED Decision 2003/14/RM on certification specifications, including airworthiness codes and acceptable means of compliance for normal, utility, aerobatic and commuter category aeroplanes (« CS-23 »). Decision as last amended by ED Decision 2012/012/R.

3.3. Reference documents

JAA INT POL 23/1 and 23/3.

