European Union Aviation Safety Agency

Explanatory Note to Decision 2022/001/R

Regular update of AMC-20

AMC 20-136

Aircraft electrical and electronic system lightning protection

AMC 20-158

Aircraft electrical and electronic system high-intensity radiated fields protection

AMC 20-193

Use of multi-core processors

RELATED NPA/CRD: 2020-09 — RMT.0643

EXECUTIVE SUMMARY

The objective of this Decision is to provide state-of-the-art means for showing compliance with the applicable airworthiness requirements with regard to the following:

— EASA AMC 20-136 *Aircraft electrical and electronic system lightning protection*;

— EASA AMC 20-158 *Aircraft electrical and electronic system high-intensity radiated fields (HIRF) protection*; and

— EASA AMC 20-193 *Use of multi-core processors (MCPs)*.

These amendments to AMC-20 are expected to facilitate the certification process while maintaining an adequate level of safety. They will also improve harmonisation with the equivalent FAA ACs.

Overall, they would have an economic and safety benefit, without any environmental or social impacts.

Domain:	Design and production		
Related rules:	AMC-20: General Acceptable Means of Compliance for Airworthiness of Products, Parts and Appliances		
Affected stakeholders:	Aircraft and equipment designers and manufacturers		
Driver:	Efficiency/proportionality	**Rulemaking group:**	No
Impact assessment:	No	**Rulemaking Procedure:**	Standard

EASA rulemaking procedure milestones

Start Terms of Reference	**Public consultation** NPA 2020-09	**Decision** Certification Specifications, Acceptable Means of Compliance, Guidance Material
20.7.2015	2.10.2020	26.1.2022

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1. About this Decision

The European Union Aviation Safety Agency (EASA) developed Decision 2022/001/R in line with Regulation (EU) 2018/1139[1] (the 'Basic Regulation') and the Rulemaking Procedure[2].

This Rulemaking Task (RMT).0643 is included in the European Plan for Aviation Safety (EPAS) for 2021-2025[3]. The scope and timescales of the task were defined in the related Terms of Reference (ToR)[4].

EASA developed the *draft* text of this Decision. All the interested parties were consulted[5] through Notice of Proposed Amendment (NPA) 2020-09[6]. 229 comments were received from interested parties, including industry and national competent authorities (NCAs). EASA reviewed the comments received during the public consultation. The comments received and EASA's responses to them are presented in Comment-Response Document (CRD) 2020-09[7].

EASA developed the *final* text of this Decision with the acceptable means of compliance (AMC) and guidance material (GM), based on the input collected during the public consultation, and published the Decision on the Official Publication[8] of EASA.

The major milestones of this RMT are presented on the cover page.

1 Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91 (OJ L 212, 22.8.2018, p. 1) (https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1535612134845&uri=CELEX:32018R1139).

2 EASA is bound to follow a structured rulemaking process as required by Article 115(1) of Regulation (EU) 2018/1139. Such a process has been adopted by the EASA Management Board (MB) and is referred to as the 'Rulemaking Procedure'. See MB Decision No 18-2015 of 15 December 2015 replacing Decision 01/2012 concerning the procedure to be applied by EASA for the issuing of opinions, certification specifications and guidance material (http://www.easa.europa.eu/the-agency/management-board/decisions/easa-mb-decision-18-2015-rulemaking-procedure).

3 https://www.easa.europa.eu/document-library/general-publications/european-plan-aviation-safety-2021-2025

4 ToR RMT.0643 'Regular update of AMC-20' Issue 1 (https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0643).

5 In accordance with Article 115 of Regulation (EU) 2018/1139, and Articles 6(3) and 7 of the Rulemaking Procedure.

6 https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2020-09

7 https://www.easa.europa.eu/document-library/comment-response-documents

8 https://www.easa.europa.eu/official-publication

2. In summary — why and what

2.1. Why we need to amend the AMC and GM — issue/rationale

AMC-20 groups airworthiness requirements for various systems that can be installed on aircraft of different categories. As the state of the art in designing products, parts and appliances is constantly evolving, EASA develops the necessary related guidance for its applicants. This is intended to maintain a high level of safety and avoid unnecessary cost by preventing the development of unacceptable designs at an early stage.

EASA identified the need to amend AMC-20 to cover the following:

(a) aircraft electrical and electronic system lightning protection and aircraft electrical and electronic system high-intensity radiated fields (HIRF) protection:

— The current indirect effects of lightning and HIRF requirements are open to interpretation by authorities and industry. A task group of the Certification Authorities for Transport Airplanes (CATA), composed of EASA, the FAA, Transport Canada Civil Aviation (TCCA) and the Brazilian Civil Aviation National Agency (ANAC), was convened to propose a harmonised position on the intent and interpretation of these requirements. It was decided to update existing EASA AMCs on HIRF and lightning, taking into account the result of the report from this task group and the follow-up discussion.

(b) the use of multi-core processors (MCPs):

— The current guidance on the use of MCPs is available in the form of a Certification Review Item (CRI) that was harmonised between EASA and the FAA in 2015. Based on the positive experience gained with this material in certification projects, it was decided to turn this guidance into joint EASA AMC and FAA AC material for the use of MCPs, replacing the material currently available through the generic EASA MCP CRI Issue 3 and other documents.

2.2. What we want to achieve — objectives

The overall objectives of the EASA system are defined in Article 1 of the Basic Regulation. This Decision will contribute to achieving the overall objectives by addressing the issues described in Section 2.1.

The specific objectives of this Decision are to improve safety while reflecting the current state of the art in aircraft certification, and to improve harmonisation with the equivalent FAA guidance.

2.3. How we want to achieve it — overview of the amendments

In order to improve the cost-efficiency of the certification process as regards the protection of aircraft electrical and electronic systems against lightning and high-intensity radiated fields:

— ‘AMC 20-136’ is amended to ‘AMC 20-136A’, and

— ‘AMC 20-158’ is amended to ‘AMC 20-158A’.

In order to improve the cost-efficiency of the certification process as regards the use of MCPs:

— AMC 20-193 on the use of MCPs is added.

2.4. What are the stakeholders' views — outcome of the consultation

During the public consultation of NPA 2020-09, 229 comments were submitted by 20 stakeholders from national competent authorities, organisations, industry companies and associations, and certification service providers.

The commentators were in general supportive of the proposed new AMC 20-193 and the proposed amendments to AMC 20-136 and AMC 158, and of the EASA–FAA harmonisation effort.

None of the comments expressed any disagreement with the proposal nor created any controversy.

Further to the comments received, the text proposed in the NPA has been modified in some parts, mostly for improvement or clarification purposes.

2.5. What are the benefits and drawbacks of the amendments

Overall, the amendments are expected to increase safety by providing up-to-date guidance for the protection of aircraft against HIRF and lightning, and for the use of MCPs. They would improve harmonisation with the FAA and would have positive economic benefits by streamlining the certification process, while reflecting industry state of the art in certification. No social or environmental impacts are expected.

3. How we monitor and evaluate the amended AMC-20

EASA continuously monitors the implementation of CSs, AMC and GM through feedback from stakeholders and its Advisory Bodies (ABs).

Both new and updated AMC-20 material will be subject to future monitoring activities, for which a robust framework is currently being developed.

In addition, it might be subject to an interim or ex post evaluation. The evaluation would assess its performance, taking into account predictions made in the impact assessment of the related NPA (NPA 2020-09). The decision as to whether an evaluation is necessary will depend on the monitoring results.

4. References

4.1. Related EU regulations

n/a

4.2. Related EASA decisions

— Decision No. 2003/12/RM of the Executive Director of the European Aviation Safety Agency of 5 November 2003 on General Acceptable Means of Compliance for Airworthiness of Products, Parts and Appliances (« AMC-20 »), as amended.

4.3. Other reference documents

— CS-23 Normal Category Aeroplanes

— CS-25 Large Aeroplanes

— CS-27 Small Rotorcraft

— CS-29 Large Rotorcraft

— CS-ETSO European Technical Standard Orders

5. Related document(s)

— CRD to NPA 2020-09 ‘Regular update of AMC-20’ (RMT.0643)[9]

9 https://www.easa.europa.eu/document-library/comment-response-documents