



Explanatory Note to Decision 2017/015/R

CS-25 amendment 19

RELATED NPA/CRD 2013-07, 2015-19, 2016-07 — RMT.0225, RMT.0264, RMT.0673

EXECUTIVE SUMMARY

This Decision amends CS-25 as follows:

- Amendment of CS 25.571 and Appendix H, and creation of a new AMC 25.571, in order to upgrade damage tolerance and fatigue evaluation of structure and ensure that the safety risks associated with the ‘ageing aircraft’ issues are mitigated (RMT.0225).
- Amendment of several paragraphs in Subparts D and F and creation of a new Appendix S for ‘Low-occupancy aeroplanes’ and ‘non-commercially operated aeroplanes’ (commonly called ‘private-use aeroplanes’), along with new or amended AMC. In addition, new and amended CS-25 requirements are provided, which were found to be fully applicable to any kind of transport category aeroplanes certified under CS-25 regardless of the type of interior arrangement or operation (RMT.0264).
- Amendment of CS 25.1309 and AMC 25.1309 in order to:
 - clarify the interfaces between CS 25.1309 and CS 25.810/CS 25.812; and
 - reflect the current aircraft development practices that make use of the assignment of development assurance levels (DALs).

Overall this amendment of CS-25 is expected to increase safety, reflect the available state of the art and acceptable means of compliance, facilitate the certification process, and improve harmonisation with the Federal Aviation Administration (FAA). It is expected that this amendment will create no social or environmental impacts, and no significant economic impact, except for ‘private-use aeroplanes’ where a significantly positive economic impact is expected.

Action area:	Design and maintenance requirements (RMT.0225), Manufacturers (RMT.0264), Review of rules (ex post evaluation) (RMT.0673)		
Affected rules:	CS-25		
Affected stakeholders:	Manufacturers/DAHs, operators		
Driver:	Safety (RMT.0225), Efficiency/proportionality (RMT.0264, RMT.0673)	Rulemaking group:	RMT.0225: Yes; RMT.0264: Yes; RMT.0673: No
Impact assessment:	RMT.0225: Light; RMT.0264: Light; RMT.0673: None	Rulemaking Procedure:	Standard

EASA rulemaking process



2.5.2007 (RMT.0225)	23.4.2013	12.5.2017
29.2.2012 (RMT.0264)	17.12.2015	
27.4.2015 (RMT.0673)	26.7.2016	



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1. About this Decision

The European Aviation Safety Agency (EASA) developed ED Decision 2017/015/R in line with Regulation (EC) No 216/2008¹ (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure².

These rulemaking activities are included in the EASA 5-year Rulemaking Programme³ under rulemaking tasks RMT.0225, RMT.0264, and RMT.0673. The scope and timescales of the tasks were defined in the related Terms of Reference⁴.

The draft text of this Decision has been developed by EASA, based on the input of rulemaking groups (RMG) RMT.0225 and RMT.0264 (stakeholder-led rulemaking group (SLRG)). All interested parties were consulted through NPA 2013-07 (RMT.0225), NPA 2015-19 (RMT.0264), NPA 2016-07 (RMT.0673)⁵.

RMT.0225: in total the NPA 2013-07 received 674 comments from all interested parties, including industry and national aviation authorities. In addition, a review group meeting has been held since the publication of NPA 2013-07. As the consideration of the comments received during public and focused consultations resulted in a number of substantial changes to the text proposed by NPA 2013-07, EASA allowed further public consultation (reaction) on the proposed resulting text through CRD 2013-07, published on 27.07.2016. In total 120 reactions to the CRD 2013-07 were submitted by stakeholders, 47 comments were related to CS-25 and AMC to CS-25.

RMT.0264: 358 comments were received from all interested parties, including industry and national aviation authorities.

RMT.0673: 58 comments were received from all interested parties, including industry and national aviation authorities.

EASA reviewed the comments received during the consultation, with the support of a review group (RG) for RMT.0225. The comments received and EASA's responses thereto were presented in comment-response document (CRD) 2013-07⁶, CRD 2015-19 (Appendix 1 to ED Decision 2017/015/R), CRD 2016-07 (Appendix 2 to ED Decision 2017/015/R).

The final text of this Decision with the certification specifications (CSs) and acceptable means of compliance (AMC) has been developed by EASA, based on the input of the RG RMT.0225 and focused consultation with the SLRG RMT.0264.

The major milestones of this regulatory activity are presented on the title page.

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

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

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

⁴ <https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions>

⁵ In accordance with Article 52 of Regulation (EC) No 216/2008 and 6(3) and 7) of the Rulemaking Procedure.

⁶ <https://www.easa.europa.eu/document-library/comment-response-documents>



2. In summary — why and what

2.1. Why we need to change the CS-25

RMT.0225: This RMT addresses a safety issue related to ageing aircraft structures for large aeroplanes. Several accidents have shown the need to develop a structural ageing aircraft programme. Many transport category aeroplanes were originally certificated according to requirements that allowed continued operation, often for an indefinite period, without adequate provisions to ensure safe operation throughout the aeroplane's life. Nonetheless, continued safe operation of these aeroplanes is possible, providing their structural integrity is maintained by an effective inspection and corrective maintenance programme proven to be valid for a defined period of operation. CS-25 therefore needs to be amended in order to ensure that the safety risks associated with the 'ageing aircraft' issues are mitigated.

RMT.0264: CS-25 is applicable to all turbine-powered large aeroplanes. As most of those aeroplanes are used by airlines, the requirements of CS-25, that were inherited from the Joint Aviation Authorities (JAA JAR 25), have been drafted taking into account large transport aeroplanes, featuring cabin interiors equipped for the commercial carriage of relatively high numbers of passengers; they are not always adequate for cabin interiors installed in so-called business aeroplanes, i.e. those having lower-density interiors that offer a greater level of comfort and amenities (installation of showers, convertible sofas, cooktops, large entertainment displays, etc.) and sometimes being non-commercially operated.

RMT.0673:

- Interfaces between CS 25.1309 and CS 25.810/CS 25.812: The introductory text of CS 25.1309 excepts the functional failures related to function availability from the CS 25.1309(b) provisions. These functional failures were considered to be adequately covered by CS 25.810 and CS 25.812. However, the current wording used does not clearly reflect the initial intent of this exception. The same applies to the corresponding material of AMC 25.1309.
- Relationship between the severity of failure conditions and DALs (AMC 25.1309): Current AMC 25.1309 provides a relationship between the severity of a failure condition and the allowable quantitative probability of such a condition. However, no such relationship is provided between the severity of a failure condition and DALs.

2.2. What we want to achieve — 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 objective of this proposal is, therefore, to:

- RMT.0225: develop the technical elements for an ageing aircraft structure plan and mitigate the risk of ageing for large aeroplanes by mandating actions for future aircraft.
- RMT.0264:
 - clarify CS-25 requirements and interpretations thereof, based on feedback on experience from certification projects, whilst reducing the costs and administrative burden on



applicants and EASA when certifying executive interiors (avoid repetitive issuance of Certification Review Items (CRI)); and

- provide alternative criteria to the ones included in the current CS-25 for certifying executive interiors in large aeroplanes, which will take into account the specificities of low-occupancy aeroplanes' interiors and the intended type of operations of such aeroplanes. The ultimate goal is to maintain a high and uniform level of safety, while facilitating the development and certification of executive interiors.

In addition, both objectives are intended to ensure a level playing field among type certificate (TC) and supplemental type certificate (STC) holders, by harmonising the rules (between the FAA and EASA) and the interpretations thereof.

- RMT.0673: This RMT is dedicated to the regular update of CS-25 based on the selection of non-complex, non-controversial, and mature subjects, with the ultimate goal being to increase safety.

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

- RMT.0225: Amendment of CS 25.571 and Appendix H, and creation of a new AMC 25.571, in order to upgrade damage tolerance and fatigue evaluation of structure. Further guidance will be provided in a separate Decision amending AMC 20-20.
- RMT.0264: Amendment of several paragraphs in Subparts D and F and creation of a new Appendix S for 'Low-occupancy aeroplanes' and 'non-commercially operated aeroplanes' (commonly called 'private-use aeroplanes'), along with new or amended AMC. In addition, new and amended CS-25 requirements are provided, which were found to be fully applicable to any kind of transport category aeroplanes certified under CS-25 regardless of the type of interior arrangement or operation.
- RMT.0673: Amendment of CS 25.1309 and AMC 25.1309 in order to:
 - clarify the interfaces between CS 25.1309 and CS 25.810/CS 25.812,
 - reflect the current aircraft development practices that make use of the assignment of development assurance levels (DALs).

2.4. What are the stakeholders' views

- RMT.0225: The majority of the comments were submitted on Part-26 topics, which had been consulted in parallel and which was subject to EASA Opinion 12/2016. Several comments received on CS-25 included requests to change some wording used in CS 25.571 and the corresponding AMC 25.571 to align with the 14 CFR Part 25.571 (e.g. the use of 'contribute to' versus 'cause' when referring to catastrophic failure). Therefore, overall the CS-25 amendment proposal was well received by stakeholders. Refer to CRD 2013-07 Issue 1 for more details. A second consultation of the NPA resulting text was made through CRD 2013-07 issue 1 because of some substantial changes made on the other elements of the regulatory changes proposal. A CRD 2013-07 Issue 2 was later published to summarise the comments and reactions and the responses of EASA.

Stakeholders' views are reported in Opinion 12-2016.



Regarding the proposed amendments to CS-25, many of the comments received during the reaction period were repeating comments already submitted during the NPA consultation and have been responded within CRD 2013-07 issue 2.

The remaining reactions related to CS-25 and the associated EASA position are summarised in the following table:

Reference	Summary of comments	EASA position
AMC 25.571 Chapter 4, paragraph a	<p>Some stakeholders asked to change the definition of damage tolerance by removing reference to detrimental in relation to structural deformation.</p> <p>According to the commentators this wording would be a complete new part of the traditional definition and it would provide unnecessary dis-harmonisation with FAA definition.</p>	<p>Consideration of deformation is consistent with other requirements linked to CS 25.571 such as CS 25.629, which is dependent on the understanding of structural deformation following failures that need to be considered in compliance with both requirements.</p> <p>EASA notes that the definition is harmonised FAA AC 120-104</p>
AMC 25.571 Chapter 6, paragraph a	<p>Some commentators questioned the need to include in the ALS all the inspections and other procedures that are necessary to prevent a catastrophic failure due to fatigue, up to the LOV.</p> <p>According to these commenters, the need to include inspections and other procedures in the ALS up to the LOV should be limited widespread fatigue damage.</p>	<p>EASA noted that the FAA provides the same text in their AC 25.571-1D Chapter 5 paragraph A2.</p> <p>The proposal of these commenters would create non-compliance with CS/FAR 25.571 both on the EU and the US side as all inspections and procedures should be in the ALS of the ICA.</p>
AMC 25.571 Chapter 6, paragraph d	<p>Some commentators sought clarification regarding the need to test at least two times the LOV in order to obtain information on crack initiation times and locations.</p>	<p>EASA agreed to change the text to reflect the technical intent of the comment</p>
AMC 25.571 Chapter 8 paragraph (b)	<p>Some commentators were concerned about the use of fleet leader programmes to verify the continued validity of the certification assumptions with respect to AD and ED.</p> <p>Also a concern was raised on the need to include certain AD and ED inspection into ALS when not solely linked to safety.</p>	<p>The need for fleet leader or sampling programmes is dependent on the scope and conservatism of the baseline maintenance programme and the extent of experience with the product.</p> <p>The decision to place inspection requirements in the ALS is always based on safety concerns.</p>
AMC 25.571 Appendix 3	<p>Some commentators questioned the need to have the specific crack size defined in the Appendix to establish the threshold for fatigue inspections as required by the relevant paragraphs of the CS.</p> <p>It was also commented that the specific crack size does not appear in the FAA AC.</p>	<p>According to EASA's experience, applicants have not always properly understood how to comply with the relevant paragraph of the CS.</p> <p>While providing additional guidance, the text remains harmonised with the FAA AC.</p>

Reference	Summary of comments	EASA position
CS 25.571(b)	Some commentators questioned the requirements that consider residual stress in the damage tolerance (DT) analysis as it potentially leads to additional work load.	EASA recognises that the late introduction of residual stress considerations in the requirement for damage tolerance evaluation may not have been sufficiently covered by the original impact assessment nor by the proposed text. Therefore, it is removed and will be considered in the frame of future CS-25 amendments.

The consideration of these comments has led to some improvements on the text of AMC 25.571

- RMT.0264: As the NPA was based on the proposal of an SLRG, the proposed CS-25 amendments were overall supported. Meanwhile, most commented segments of the NPA, resulting in the most significant changes to the proposed amendments, were the following:
 - New requirement S25.10(b) of Appendix S to CS-25 and associated AMC, related to the installation of interior doors in the cabin of commercially operated aeroplanes; and
 - New requirement S25.20(b) of Appendix S to CS-25 and associated AMC, related to the in-flight obstruction (more than minor) of Type III or IV emergency exits.

Refer to CRD 2015-19 for more details.

- RMT.0673: Some stakeholders consider that introducing the level of confidence of the development assurance processes as a ‘safety objective’ is controversial. Therefore, the proposed new text under Chapter 8.a of AMC 25.1309 has been withdrawn. Otherwise, the other changes proposed in the NPA are either unchanged or improved/clarified based on the comments received. Refer to CRD 2016-07 for more details.

2.5. What are the benefits and drawbacks

- RMT.0225: As assessed in the RIA to NPA 2013-07, this amendment ensures that appropriate requirements are mandated and the objective of mitigating the risk of ageing aircraft structures is clearly met. This will lead to the prevention of accidents and incidents related to fatigue and corrosion. It achieves to a large extent, although not completely, harmonisation with the FAA and TCCA. No significant economic impact is envisaged for new type designs, as implementation of the current EASA requirements necessitates full-scale fatigue testing and fatigue and damage tolerance analysis. The additional focus the new requirements bring on widespread fatigue damage (WFD) is in reality a very small part of the overall costs of fatigue and DT evaluation.
- RMT.0264: As assessed in the RIA to NPA 2015-19, the economic impact will be significantly positive by reducing costs and administrative burden on applicants and EASA when certifying executive interiors (avoid repetitive issuance of CRIs). Partial harmonisation with the FAA (SFAR No. 109) is reached.
- RMT.0673: As assessed in the RIA to NPA 2016-07, this amendment does not introduce new requirements for applicants. Some clarifications of CS 25.1309 and AMC 25.1309 are provided, based on common certification practices and recognised international standards.

2.6. How do we monitor and evaluate the rules

- RMT.0225: Monitor in the long term the number of occurrences of fatigue cracking and corrosion, and the number of related accidents and incidents. It is envisaged that the specifications and AMC of this CS-25 amendment will be used to demonstrate compliance with the relevant Part-26 requirements (through reference in CS-26) when they become applicable. The need to monitor and evaluate them is, therefore, best addressed in conjunction with Part-26.

Part-26 will include a requirement that ensures the continued validity of the structural maintenance programme. Through monitoring of compliance with this requirement it will be possible to identify any concerns or shortcomings with the associated regulations and certifications specifications.

- RMT.0264: In order to ensure that the specific objective of reducing certification costs has been met, EASA intends to monitor the average working hours spent (by EASA) and the number of CRIs issued on executive interior certification projects.
- RMT.0673: No specific monitoring is deemed required.



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')

3.3. Other reference documents

- Federal Aviation Administration (FAA) Notice of Proposed Rulemaking (NPRM) No. 07-13, 'Special Requirements for Private Use Transport Category Airplanes' (72 FR 38732), 13 July 2007.
- Special Federal Aviation Regulation (SFAR) No. 109 'Special Requirements for Private Use Transport Category Airplanes', Docket No. FAA-2007-28250, 8 May 2009.
- European Organisation for Civil Aviation Equipment (EUROCAE) ED-79A — Guidelines for Development of Civil Aircraft and Systems, November 2011.
- Society of Automotive Engineers (SAE) Aerospace Recommended Practice (ARP) 4754A, Guidelines for Development of Civil Aircraft and Systems, 21 December 2010.



4. Appendices

Appendix 1 to Decision 2017/015/R 'CS-25 – Amendment 19' — CRD 2015-19

Appendix 2 to Decision 2017/015/R 'CS-25 – Amendment 19' — CRD 2016-07

