European Aviation Safety Agency

Explanatory Note to Decision 2016/026/R

CS-VLR AMENDMENT 2

RELATED NPAS/CRDS: NPA/CRD 2013-04 (RMT.0134 (27&29.029)) & NPA/CRD 2013-21 (RMT.0119 (27&29.003)) — 30.11.2016

This Decision addresses a number of safety and regulatory coordination issues that are not or are only partially addressed in the current CS-VLR.

The specific objective is to update the certification specifications for very light rotorcraft in order to maintain a high level of safety and to provide cost-efficient rules.

This Decision proposes the following main changes:

— to revise AMC VLR.351 to reflect certification experience and to ensure a consistent and safe approach to establishing structural substantiation; and

— to adopt AC 27-1B — Change 4, published by FAA in May 2014 — most changes adopted in this AC were previously developed jointly by FAA and EASA.

The proposed changes are expected to increase safety and cost-effectiveness, and reduce regulatory burden and constitute an improvement in terms of harmonisation with other certification authorities.

Affected rules	CS-VLR				
Affected stakeholders	Manufacturers of very light rotorcraft				
Driver	Safety	**Reference**	N/A		
Rulemaking group	Yes (flight subgroup only	**Impact assessment**	Light	**Procedure**	Standard

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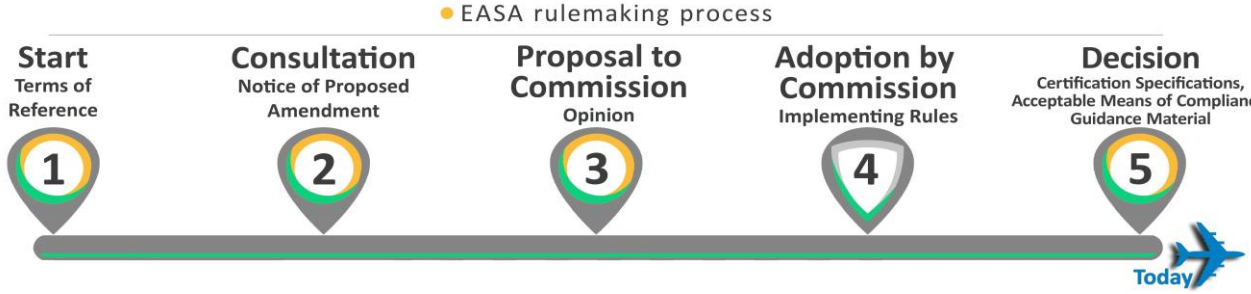

RMT.0119 (Iss.2): 21.10.08 RMT.0134: 20.10.10	NPA 2013-04: 14.3.13 NPA 2013-21: 4.11.13	N/A	N/A	DD.MM.20XX

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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 2016/026/R in line with Regulation (EC) No 216/2008[1] (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure[2].

The rulemaking activities are included in the Agency's 5-year Rulemaking Programme under RMT.0119 (27&29.003) and RMT.0134 (27&29.029). The scope and timescale of the tasks were defined in the related Terms of Reference (ToR) (see 'process map' on the title page).

The draft text of this Decision has been developed by the Agency. In the case of RMT.0119, this was supported by a rulemaking group, and for RMT.0134 by a rulemaking subgroup specifically addressing flight issues. All interested parties were consulted through NPA 2013-21 and NPA 2013-04, respectively[3].

The Agency has reviewed the comments received on both NPAs. The comments received and the Agency's responses thereto are presented in the associated Comment-Response Documents (CRDs)[4].

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

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. Chapter 2.4 summarises the findings from the Regulatory Impact Assessment (RIA). The text of the CS/AMC is annexed to the ED Decision.

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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 N° 18-2015 of 15 December 2015 replacing Decision 01/2012 concerning the procedure to be applied by the Agency for the issuing of opinions, certification specifications, acceptable means of compliance and guidance material ('Rulemaking Procedure').

3 In accordance with Article 52 of the Basic Regulation and Articles 6(3) and 7 of the Rulemaking Procedure.

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

2. Explanatory Note

2.1. Overview of the issues to be addressed

This Decision includes the outcome of two individual rulemaking tasks as described below.

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 this Chapter. Therefore, the specific objectives of this proposal are to:

(a) Review the rationale and acceptability of CS VLR.351 and associated AMC. In the past, different interpretations have been used for showing compliance with the yaw manoeuvre structural design requirements prescribed under CS VLR.351. Certification experience has shown that variations in interpretation and application can have important repercussions on the strength level required for new designs.

(b) Develop and maintain AMC that have been found during certification activities to be incomplete, misleading, outdated or that do not reflect the currently accepted certification practice.

2.3. Outcome of the consultation

The Agency received public comments on both of the NPAs forming part of this amendment. For a full list of comments and the Agency's responses, please refer to the associated CRDs, where the comments are published for information:

(a) CRD 2013-21 — Yawing Conditions: none; and

(b) CRD 2013-04 — Rotorcraft AMC Revision:

As adoption of Federal Aviation Authority (FAA) Advisory Circular (AC) 27-1B — Change 4 will automatically adopt Change 3, which was not previously part of a joint FAA/EASA development process, stakeholders were specifically requested to provide comments on the acceptability of this material for direct adoption.

2.4. Summary of the Regulatory Impact Assessment (RIA)

Safety: the proposed changes will provide clear and unambiguous means of compliance to further enhance rotorcraft safety, as well as a consistent approach to certification.

Environment: none.

Social: none.

Economic: these changes should result in economic benefits as they will enable applicants to predetermine the Agency's expectations and thus avoid unnecessary cost and time delays during a certification project. For some manufacturers, these proposals may require additional effort and/or a change in compliance methodology and associated tools and procedures. However, the cost of such changes is likely to be low.

Proportionality issues: in yawing conditions, the option to substantiate structural strength using 'the line' has been retained in recognition of the limited capabilities of the very light rotorcraft industry.

Impact on regulatory harmonisation: none.

2.5. Overview of the amendments

The main changes introduced in this CS-VLR Amendment 2 are summarised as follows:

— Adoption of FAA AC 27-1B — Change 4 to be included into CS-VLR Book 2. To ensure that AMC remain relevant to the certification of modern rotorcraft, there is a need to maintain and update AMC on a regular basis so that they reflect the latest technological developments and accepted certification practice. A list of changes introduced is detailed in the following table. Additionally, changes introduced by FAA at Change 3 will be automatically adopted.

Section	***Title of section***	***Description***
27.29	Empty weight and corresponding centre of gravity	Clarification of empty weight.
27.45	General (performance)	The allowable wind speed for HV testing is increased from 0–3 kts to 0–5 kts. When the wind velocity is very low, the direction and speed are very often variable, and past experience has shown that even a slight tailwind during HV trials can lead to a hard landing. With an increase in wind speed, the direction is more established and a change of direction is less likely. The change will, therefore, improve safety without modifying the relevance of the test.
27.79	Limiting height — speed envelope	Included guidance material on extrapolation of HV data. Applying a penalty of 3 % per 1 000 ft on the W/sigma curve beyond 2 000 ft has previously been used by authorities. Providing explicit guidance will standardise this approach for all applicants who may wish to use this methodology.
27.141	General (flight characteristics)	Revised guidance material to address pilot control forces as a result of hydraulic boost system failure as well as the testing required to tackle controllability and pilot fatigue concerns.
27.143	Controllability and manoeuvrability	Revised guidance material to include procedures for yaw controllability flight testing.
27.151	Flight controls	Revised guidance material to include qualitative methods for evaluating flight control characteristics.

27.561	General (emergency landing conditions)	Included rearward load factor note for doors and emergency exit design.
27.1093	Induction system icing protection	Included guidance material for inadvertent operation in falling and blowing snow conditions with one mile or less visibility.
27.1309	Equipment, systems, and installations	Revised AC to remove the obsolete software guidance material reference to DO-178A.
27.1337	Power plant instruments	Revised AC to include guidance material associated with fuel quantity indication for fuel tanks that are interconnected and use gravity for fuel transfer between them.
27.1357	Circuit-protective devices	Revised AC material to clarify the use of a circuit breaker.
27.1543	General (instrument markings)	Editorial corrections.

— Revision to AMC No 1 to CS VLR.351. This AMC identifies compliance issues which the Agency wishes to retain (i.e. consensus was not reached during RMT.0119). The specific issue where a difference remains for VLR is the following:

Aerodynamic loads: Compliance with FAA AC 27-1B and the limited yawing envelope may be inadequate for the design of rotorcraft structural components that are principally subjected in flight to significant aerodynamic loads (e.g. vertical empennage, fins, cowlings and doors). RMT.0119 identified a gap in the regulations regarding aerodynamic design loads and has recommended the development of a new rule. However, until the aerodynamics rule is in place, the Agency will ensure that all structural loads are fully accounted for.

— Since publication of CS-VLR Amendment 1, a number of typographical errors have been identified in Book 1, Subpart B. As these are minor in nature, they are corrected in this Amendment 2. Paragraphs affected are CS VLR.21, CS VLR.25 and CS VLR.45. The changed text is indicated in the 'change information' document accompanying this amendment.

3. References

3.1. Related regulations

— Regulation (EU) No 748/2012 of 3 August 2012 laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations (OJ L 224, 21.8.2012, p.1).

3.2. Affected decisions

Decision No. 2003/17/RM of the Executive Director of the Agency of 14 November 2003 on certification specifications for very light rotorcraft ('CS-VLR').

3.3. Reference documents

Federal Aviation Administration (FAA) Advisory Circular (AC) 27-1B — Change 4 'Certification of normal category rotorcraft', 1 May 2014.