European Union Aviation Safety Agency

Explanatory Note to Decision 2021/013/R

Regular update of CS-22

CS-22 Amendment 3

RELATED NPA/CRD: 2020-13 — RMT.0037

EXECUTIVE SUMMARY

This Decision introduces the following amendments to CS-22:

— amendments following a safety recommendation related to the unintended opening of air brakes,

— amendments following a safety recommendation related to the operation of the cable release mechanism during launch, and

— miscellaneous amendments that have been prepared in coordination with the Sailplane Development Panel (SDP), reflecting the state of the art as regards the certification of sailplanes and powered sailplanes.

The amendments are expected to provide a moderate safety benefit, would have no social or environmental impacts, and would provide some economic benefits by removing redundant details in the certification process.

Action area:	Design and production		
Related rules:	CS-22		
Affected stakeholders:	Sailplane and powered sailplane manufacturers and other design organisations dealing with supplemental type certificates (STCs), repairs or changes to sailplanes or powered sailplanes		
Driver:	Efficiency/proportionality	**Rulemaking group:**	No
Impact assessment:	No	**Rulemaking Procedure:**	Standard

14.1.2016	14.12.2020	15.9.2021

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1. About this Decision

The European Union Aviation Safety Agency (EASA) developed ED Decision 2021/013/R in line with Regulation (EU) 2018/1139[1] (the 'Basic Regulation') and the Rulemaking Procedure[2].

This rulemaking activity is included in the European Plan for Aviation Safety (EPAS) for 2021–2025[3] under rulemaking task (RMT).0037. The scope and timescales of the task were defined in the related Terms of Reference[4].

EASA accepted safety recommendations related to the unintended opening of air brakes and difficulties in the operation of the cable release mechanism during launch and determined that related amendments to the certification specifications were required.

EASA, in coordination with the Sailplane Development Panel (SDP), which is one of the three panels within the *Organisation Scientifique et Technique Internationale du Vol à Voile* (OSTIV), has reviewed and accepted other design developments of a non-complex and non-controversial nature that called for the amendment of the existing certification specifications. The OSTIV has the special status of an international affiliated member of the *Fédération Aéronautique Internationale* (FAI).

The draft text of this Decision has been developed by EASA. All the interested parties were consulted through Notice of Proposed Amendment (NPA) 2020-13 'Regular update of CS-22'[5,6]. 37 comments were received from all interested parties, including industry and national aviation authorities.

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) 2020-13[7].

The final text of this Decision, along with the related certification specifications (CS-22 Amendment 3), has been developed by EASA.

Note: Amendment 3 to CS-22 is published in the new eRules format. Therefore, format/layout changes are not highlighted in the Change Information file; only content changes are shown.

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

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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/sites/default/files/dfu/epas_2021_2025_vol_two_final.pdf

4 https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0037

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-2020-13

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

2. In summary — why and what

2.1. Why we need to amend the CSs — issue/rationale

The aviation industry is evolving. Certification specifications (CSs) and related acceptable means of compliance (AMC) need to be updated regularly to ensure that they are fit for purpose, cost-effective, and can be implemented.

Regular updates are issued to include design developments of a non-complex and non-controversial nature or mature subjects primarily originating from international sailplane stakeholders and expert groups.

Amendment 3 to CS-22 covers the following items:

— Item 1: Address a safety recommendation related to the unintended opening of air brakes,

— Item 2: Address a safety recommendation related to the operation of the cable release mechanism during launch,

— Item 3: Remove the obsolete 45° dive requirement for sailplanes approved for aerobatics,

— Item 4: Add information for winch launch tests to address recent winch launch accidents,

— Item 5: Structure requirements: state-of-the-art aerofoils and materials,

— Item 6: Change the gust load factors,

— Item 7: Change the content of the aircraft flight manual (AFM), and

— Item 8: Editorial corrections.

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 the achievement of the overall objectives by addressing the issues outlined in Section 2.1.

The specific objective of this Decision is to amend CS-22 based on the above-mentioned 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

Item 1: Unintended opening of air brakes

There is no AMC to CS 22.697(b) addressing the risk that air brakes that are not in a locked position could move during a launch or start and cause a substantial performance loss.

EASA, therefore, introduces new AMC to 22.697(b) addressing that risk.

Item 2: The operation of the cable release mechanism should not be limited during launch

CS 22.777(b) states the following: 'The controls must be located and arranged so that the pilot, when strapped in the seat, has full and unrestricted movement of each control without interference from either clothing (including winter clothing) or from the cockpit structure. The pilot must be able to operate all the controls necessary for the safe operation of the aeroplane from the seat designated to be used for solo flying.'

The objective specification is generic, and it was not specifically clear that it should be possible to operate the cable release mechanisms at any stage of the launch without being restricted by the range of movement of any flight controls.

There is also no existing AMC to address this; EASA has, therefore, introduced AMC to 22.777(b) to address this feature.

Item 3: Removal of the obsolete 45° dive requirement for sailplanes approved for aerobatics

The specification was found to be outdated during the SDP meeting in 2016. The use of air brakes during aerobatics is not recommended due to the reduced load factors with the air brakes extended. EASA agrees to this. This specification is, therefore, removed.

Item 4: Additional guidance for winch launch tests, to address recent winch launch accidents

The existing AMC 22.152 does not address scenarios that have been identified to contribute to winch launch accidents.

EASA has, therefore, amended the existing AMC.

Item 5: Structure requirements: adjustments to state-of-the-art aerofoils and materials

Item 5.1 Vertical tail surfaces — Rolling Moments for T-tails

A limitation on the formulas of induced rolling moment in AMC 22.441 and AMC 22.443 has been introduced during the transition from JAR 22 to CS-22. Since designs beyond the limitation have been designed with these formulas and have been successfully operated, EASA has amended the scope of AMC 22.441 and AMC 22.443 to reflect that the formulas are appropriate for new designs of vertical tail surfaces. This will improve the consistency across load cases for sailplane designs.

Item 5.2 Vertical tail surfaces — Flick Manoeuvres

CS 22.441 concretely defines the vertical tail manoeuvring load cases. While this is appreciated for the Category U design, it might not suffice for the Category A design. EASA introduces a paragraph in AMC 22.441 to draw attention to the specific aerobatic load cases that could be applicable for a design.

Item 5.3 Ground loads

The OSTIV Sailplane Development Panel (SDP) proposed during its 2019 meeting to readjust the four factors of ground load, descent velocity, energy absorption, and c.g. acceleration. EASA agreed that the combination of these changes provides an improved level of safety while taking into account heavier sailplanes and a greater amount of water ballast carried.

EASA has, therefore, amended CS 22.473, 22.723 and 22.725.

Item 5.4 Tow hook attachments and cable loads

In Joint Aviation Authority (JAA) NPA 22C-85, the maximum cable loads for a sailplane in aerotow from JAR 22.581(b) have been reduced from 1.2×Qnom to 1.0×Qnom, assuming the use of a textile rope. The limit load for the towing hook attachment (JAR 22.585), however, was not changed.

Therefore, a factor for the ratio between cable load and attachment loads has been introduced in CS 22.585.

Furthermore, the use of weak links in winch launching has led to the situation where the additional cable load factor of 1.2 is not fully usable in operations. Modern winches with higher acceleration of the sailplane would require slightly higher weak links.

EASA has, therefore, amended this factor for that purpose and introduced a new maximum level for the maximum weak link strength in CS 22.581 and CS 22.583.

Item 6: Change of gust load factors

The calculation of gust load factors in CS 22.341 is based on a certain gust length and its ramp. The formula for gust load factors is modified to account for the latest insights about gust length in real meteorological conditions. It has not yet been demonstrated, however, that this covers the most severe turbulent conditions to be expected in the operation of sailplanes. Consequently, a correction factor is applied to the new formula in order to achieve the same structural reserves.

EASA has, therefore, amended the formula in CS 22.341.

Item 7: Changes to the content of the aircraft flight manual (AFM)

EASA has amended AMC 22.1585 to put emphasis on the limits that sailplanes are designed for.

Consistently, EASA has specified the related operational limitations, data and procedures in CS 22.1583 and CS 22.1585.

Item 8: Editorial corrections

EASA has made various editorial corrections in:

CS 22.331(d)(2),

CS 22.335(f), and

CS 22.375(b)(2),

and has removed AMC 22.1(a) since it was not relevant to the scope of CS-22.

2.4. What are the stakeholders' views

The consultation of the draft amendments provided a total of 37 comments from 9 stakeholders, among which 5 national aviation authorities. There were no unfavourable comments on the proposed amendments.

2.5. What are the benefits and drawbacks

The proposed amendments contribute to reflect the state of the art of CS-22 for the certification of sailplanes and powered sailplanes. Overall, this will provide a moderate safety benefit, will have no social or environmental impacts, and will provide some economic benefits by removing redundant details in the certification process. There is no need to develop a regulatory impact assessment (RIA).

3. How do we monitor and evaluate the rules

As the amendments result from the selection of non-complex, non-controversial and mature subjects, there is no need to monitor or evaluate the rules.

4. References

4.1. Related regulations

n/a

4.2. Related decisions

— Decision No. 2003/13/RM of the Executive Director of the Agency of 14 November 2003 on certification specifications, including airworthiness codes and acceptable means of compliance, for sailplanes and powered sailplanes (« CS-22 — Initial Issue »)

4.3. Other reference documents

— Accident report (Schlussbericht Nr. 2155 der Schweizerischen Unfalluntersuchungsstelle SUST)

— AAIB Bulletin: 7/2013 (includes Safety Recommendation 2013-008)

— Joint Aviation Authorities (JAA) - NPA 22C-85 'Aerotowing'

— 'A Revised Gust-Load Formula and a Re-Evaluation of V-G Data Taken on Civil Transport Airplanes From 1933 to 1950', by K.G. Pratt, W.G. Walker, NACA Report 1206, 1955

— 'On the Gust Loads of Sailplanes', by L.M.M. Boermans, E. Lasauskas, OSTIV SDP abstract, 2019

— 'REVISED OSTIV GROUND LOADS STANDARDS' by Cedric O. Vernon, published in TECHNICAL SOARING, Vol. XX, No. 3

— 'Forschungsvorhaben L-5/84' sponsored by the German Ministry of Transport

— 'Rolling Moments on T-Tails', Paper No. 22C-78, JAR 22 Study Group, Issue 2, 29. Nov. 1999

5. Related document

CRD to NPA 2020-13 'Regular update of CS-22' (RMT.0037)[8]

[8] Published separately at https://www.easa.europa.eu/document-library/comment-response-documents.