NOTICE OF PROPOSED AMENDMENT (NPA) No 10/2006

DRAFT DECISION OF THE EXECUTIVE DIRECTOR OF THE EUROPEAN AVIATION SAFETY AGENCY,

AMENDING

DECISION NO. 2003/14/RM OF THE EXECUTIVE DIRECTOR OF THE AGENCY of 14 November 2003 on

Certification Specifications, including airworthiness codes and acceptable means of compliance for normal, utility, aerobatic and commuter category aeroplanes (« CS-23 »)

SINGLE ENGINE STALL SPEED

TABLE OF CONTENTS

A EXPLANATORY NOTE

I. General

1. The purpose of this Notice of Proposed Amendment (NPA) is to envisage amending Decision 2003/14/RM of the Executive Director of 14 November 2003[1]. The scope of this rulemaking activity is outlined in ToR 23.001 and is described in more detail below.

2. The Agency is directly involved in the rule-shaping process. It assists the Commission in its executive tasks by preparing draft regulations, and amendments thereof, for the implementation of the Basic Regulation[2] which are adopted as "Opinions" (Article 14(1)). It also adopts Certification Specifications, including Airworthiness Codes and Acceptable Means of Compliance and Guidance Material to be used in the certification process (Article 14(2)).

3. When developing rules, the Agency is bound to follow a structured process as required by Article 43(1) of the Basic Regulation. Such process has been adopted by the Agency's Management Board and is referred to as "The Rulemaking Procedure"[3].

4. This rulemaking activity is included in the Agency's rulemaking programme for 2006. It implements the rulemaking task 23.001: Single Engine Stall Speed.

5. The text of this NPA was originally developed by the JAA General Aviation Steering Group (GASG) and later developed by the Agency. It is submitted for consultation of all interested parties in accordance with Article 43 of the Basic Regulation and Articles 5(3) and 6 of the EASA rulemaking procedure.

II. Consultation

6. To achieve optimal consultation, the Agency is publishing the draft decision of the Executive Director on its internet site. Because the content of this NPA was not agreed for adoption in the Joint Aviation Authorities (JAA) system and was not subject of a full worldwide consultation, the transitional arrangements of article 15 of the EASA rulemaking procedure does not apply. The full standard three months consultation period and full Regulatory Impact Assessment apply.

[1] Decision No 2003/14/RM of the Executive Director of the Agency of 14.11.2003 on Certification Specifications, including airworthiness codes and acceptable means of compliance for normal, utility, aerobatic and commuter category aeroplanes (« CS-23 »).

[2] Regulation (EC) No 1592/2002 of the European Parliament and of the Council of 15 July 2002 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency *(OJ L 240, 7.9.2002, p.1.).*

[3] Management Board Decision MB/7/03 from 27 June 2003 concerning the procedure to be applied by the Agency for the issuing of opinions, certification specifications and guidance material ("rulemaking procedure").

7. Comments on this proposal may be forwarded (preferably by e-mail), using the attached comment form, to:

By e-mail: NPA@easa.europa.eu

By correspondence: Process Support Unit
Rulemaking Directorate
EASA
Ref: NPA 10-2006
Postfach 10 12 53
D-50452 Cologne
Germany

Comments should be received by the Agency before 11 October 2006. If received after this deadline they might not be treated. Comments may not be considered if the form provided for this purpose is not used.

III. Comment response document

All comments received in time will be responded to and incorporated in a comment response document (CRD). This may contain a list of all persons and/or organisations that have provided comments. The CRD will be widely available on the Agency's website.
The review of comments will be made by the Agency unless the comments are of such nature that they necessitate the establishment of a group.

IV. Content of the draft Decision

8. The initial issue of CS-23 was based upon JAR-23 at amendment 1. During the transposition of airworthiness JARs into Certification Specifications the rulemaking activities under the JAA system where not stopped. In order to assure a smooth transition from JAA to EASA the Agency has committed itself to continue as much as possible of the JAA rulemaking activities. Therefore it has included most of it in its own rulemaking programmes. This NPA is a result of this commitment and a transposed version of the JAA draft NPA 23-XX, Single Engine Stall Speed.

V. Regulatory Impact Assessment

9. Purpose and intended effect
CS-23 limits the single engine stall speed to 113 km/h (61 knots). To consider new concepts currently applied in other countries (incl. U.S.A) it is proposed to increase this limit to 120 km/h (65 knots) provided additional occupant protection standards are introduced as compensating factors. JAA NPA 23-XX proposed means, technically agreed by the Steering Group, how to progress with this issue.
The aim is to update CS-23 to incorporate new concepts for the single engine stall speed and occupant protection standards.

10. Options
The identified options for this subject would be to continue using the presently available Certification bases and special conditions as a certification basis, harmonise with the current FAR regulation or to follow the JAA General Aviation Steering Group advice, providing a limited increase in stall speed.

11. Sectors concerned

This NPA concerns applicants of new Type Certificates or Supplemental Type Certificates with a CS-23 certification basis for single-engined aeroplanes, and those multi-engined aeroplanes of 2722 kg (6000 lbs) or less maximum weight with a stall speed between 113 km/h (61 knots) and 120 km/h (65 knots).

12. Impacts

Safety

Safety will not be impacted if the compensating factors are introduced simultaneously with the limited increase of the stall speed limit. It is however beneficial to safety to have, as proposed in this NPA, clear defined specifications for both the extension of the stall speed upper limit, and the compensating factors.

Economic

A positive economic impact is anticipated because an extended applicability range of CS-23.49 "Stalling speed" to type design with a stall speed up to 120 km/h (65 knots) will reduce the need for issuing Special Conditions when an aeroplane exceeds the current maximum stalling speed.

Other aviation requirements outside EASA scope

There are no impacts on other aviation requirements outside the scope of EASA, such as security, Air Traffic Management or airports.

Foreign comparable regulatory requirements

A disharmony has existed between FAR/JAR 23, and therefore CS-23, since the publication of the first issue of JAR-23 in 1994 and FAR Amendment 23-50. This NPA follows the JAA General Aviation Steering Group advice to reduce this disharmony.

13. Summary and Final Assessment

Based on this Regulatory Impact Assessment, the proposal of this NPA 10/2006 is considered as having no safety, and a reasonable positive economic impact. Therefore the progress of the proposal is justified.

B. PROPOSALS

The text of the amendment is arranged to show deleted text, new text or a new paragraph as shown below:

1. ~~Text to be deleted is shown with a line through it.~~
2. New text to be inserted is highlighted with grey shading.
3. New paragraph or parts are not highlighted with grey shading, but are accompanied by the following box text:

Insert new paragraph / part *(Include N° and title)*, or replace existing paragraph/ part

4. ….
   Indicates that remaining text is unchanged in front of or following the reflected amendment.
   ….

The following amendments should be included in Decision No. 2003/14/RM of the Executive Director of the Agency of 14 November 2003:

I. Draft Decision CS-23

Book 1

SUBPART B FLIGHT

CS 23.49 Stalling Speed.

….

(c) Except as provided in sub-paragraph (d) of this paragraph, V_{SO} at maximum weight must not exceed 113 km/h (61 knots) for –

(1) Single-engined aeroplanes; and

(2) Twin-engined aeroplanes of 2722 kg (6 000 lbs) or less maximum weight that cannot meet the minimum rate of climb specified in CS 23.67 (a)(1) with the critical engine inoperative.

Insert new paragraph CS 23.49(d) following CS 23.49(c)

(d) A maximum V_{SO} of 120 km/h (65 knots) is permissible for all single-engined aeroplanes, and those multi-engined aeroplanes of 2722 kg (6000 lbs) or less maximum weight, with a V_{SO} of more than 113 km/h (61 knots) that do not meet the requirements of CS 23.67(a)(1), that comply with CS 23.562(d).

SUBPART C STRUCTURE

CS 23.562 Emergency landing dynamic conditions
(SEE AMC 23.562)

Insert new paragraph CS 23.562(d) and re-designate existing CS 23.562(d) as CS 23.562(e)

(d) For all single-engined airplanes with a V_{SO} between 113 and 120 km/h (61 and 65 knots) at maximum weight, and those multi-engined airplanes of 2722 kg (6 000 lbs) or less maximum weight with a V_{SO} between 113 and 120 km/h (61 and 65 knots) at maximum weight, that do not comply with CS 23.67(a)(1);

(1) The ultimate load factors of CS 23.561(b) and 23.787(a) and (b) must be increased by multiplying the load factors by 1.14, except that the sideward factor of (b)(2)(iii) must be increased to 3g. The upward ultimate load factor for acrobatic category airplanes need not exceed 5.0 g.

(2) A downward inertia factor of 7g must also be addressed in addition to the conditions of CS 23.561(b)(2) and (3)

(3) The seat/restraint system test required by sub-paragraph (b)(1) of this paragraph must be conducted in accordance with the following criteria:

(i) The change in velocity may not be less than 9.4 m (31 feet) per second.

(ii) The peak deceleration of 19g must be increased to 21.7g and must occur in not more than 0.044 seconds.

(iii) The peak deceleration of 15g must be increased to 17.1g and must occur in not more than 0.056 seconds.

(~~d~~e) An alternative approach that achieves an equivalent, or greater, level of occupant protection to that required by this paragraph may be used if substantiated on a rational basis.

….

C. ORIGINAL JAA NPA PROPOSALS JUSTIFICATION

FAA published Amendment 23-44 on the 19th July 1993 that introduced an amendment to the stalling speed requirements applicable to single engined aeroplanes and to certain multi-engined aeroplanes of less than 2722 kg (6000 lbs) maximum weight. This rule change allowed those aeroplanes to have a stall speed greater than 113 km/h (61 knots) provided they met additional occupant protection standards. This change to FAR 23 has been the subject of JAA review on a number of occasions resulting in the conclusion that the range and extent of such changes, that would permit a/c with unlimited stall speed increase, could not be supported for inclusion in JAR-23. It was also identified that in introducing any text change to JAR-23 that a FAR/JAR harmonised position would be preferred. A disharmony has therefore existed between FAR/JAR 23 since the publication of the first issue of JAR-23 in 1994.

Subsequent discussion with industry has identified a need to further consider the existing JAA limiting criterion of a 61 knots stall speed on single engined aeroplanes and the possibility of reducing the level of disharmony with FAR 23. The main concern of the General Aviation Steering Group is the effect that any changes would have on the overall airworthiness standards being achieved by the fleet of small aeroplanes certificated to JAR-23. It is therefore felt that any change in stall speed should be strictly limited and should be accompanied by adequate compensating features. The JAR 23 Steering Committee has therefore agreed a package of proposed changes that includes a limited increase in stall speed and associated changes to the structural standards of 23.562 whilst accepting that other aspects of aircraft safety affected by this change such as undercarriage strength, braking ability, and fuel system integrity are adequately dealt with by the existing standards of JAR-23.

Specialist advice identified that the incremental increase in inertia factors in the current text of FAR 23 is over complicated for the small speed range now accepted by the JAA General Aviation Steering Group and proposed for JAR-23. Therefore, to avoid the need to retest existing seats during aircraft development and a subsequent small increment in stall speed; it is recommended that the values of inertia for 23.561 and 23.562(b)(1) are amended for all affected aircraft with stall speeds between 113 and 120 km/h (61 and 65 knots) as follows:

- 23.562(b)(1) peak deceleration conditions be increased from 19g and 15g to "$((65/61)^2$*peak g) = 1.14*peak g", giving 21.7g and 17.1g respectively.

- 23.561(b) and 23.787(a) and (b) similarly factored by 1.14, except for the 1.5g sideward condition for the occupant, for which an increase to 3g is recommended. This addresses an existing deficiency in the requirements dealing with the under floor structure capability relative to the dynamic seat capability in a yawed condition and for compatibility with JAR25. It is noted that the maximum sideward inertia load for seats in the horizontal (10° yawed) dynamic test 23.562(b)(2) would be "Sin(10°)*26 = 4.5 g and . sin(10°)*21 = 3.64 g" respectively for a 113 km/h (61 knot) stall speed.

- In addition, a downward inertia of 7g is introduced, based on "1.14*6g". A value for downward inertia has not previously been addressed in JAR 23 as it would be typically addressed through compliance with the ultimate flight load conditions for these aircraft. However, to ensure a common approach and the

possibility that the flight load values may now be exceeded it is recommended here. The starting point of 6g is consistent with JAR 25 and the proposed commuter rule.

Additional advice from the structures specialists included concern that other unusual design features such as changes that may cause the intent of JAR 23.561 and 23.562 to be substantially undermined, should be dealt with by the Certification Standardisation Process (CSP) and addressed by special conditions. For example it is expected that aircraft in this class retain some crushing capability in the sub floor. Furthermore, seat attachments should be protected from the direct consequences of impact of the lower fuselage with the ground by mounting them well within the structure thereby avoiding the effects of local disruption. Proposals to develop harmonised FAA/JAA standards concerning the overall survivability of occupants and the integrity of occupant compartments and the behaviour of under floor structure are therefore to be proposed as an FAA/JAA Harmonisation Management Team (HMT) Term of Reference (TOR). Future FAA/JAA policy on stall speed limits should be based on such a TOR and any associated research.