CS-E
EXPLANATORY NOTE[1]

I. General

Background

1. On 27 September 2002 Regulation (EC) No 1592/2002 of 15 July 2002 ("Basic Regulation") entered into force.[2] In addition the Commission has adopted the necessary rules (Commission Regulations) for the implementation of the Basic Regulation for the certification and the continuing airworthiness of products, parts and appliances.[3]

2. Pursuant to the Basic Regulation the Agency shall, where appropriate, issue certification specifications, including airworthiness codes and acceptable means of compliance, as well as guidance material for the application of the Basic Regulation and its implementing rules, as part of its regulatory framework. The Commission Regulations specify which certification specifications shall be issued.

Agency measures

3. CS are used to demonstrate compliance with the Basic Regulation and its implementing rules. These include, in particular:

- airworthiness codes, which are standard technical interpretations of the airworthiness essential requirements contained in Annex I to the Basic Regulation; and

- acceptable means of compliance, which are non-exclusive means of demonstrating compliance with airworthiness codes or implementing rules.

4. AMC have thus roughly the same meaning as under the JAA system. They illustrate a means, but not the only means, by which a specification contained in an airworthiness code or a requirement of an implementing rule can be met. Satisfactory demonstration of compliance using a published AMC shall provide for presumption of compliance with the related specification or requirement; it is a way to facilitate certification tasks for the applicant and the competent authority.

5. GM is issued by the Agency to assist in the understanding of the Basic Regulation, its implementing rules and CS.

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[1] This note is for information purposes only;

[2] Regulation (EC) No 1592/2002 of 15 July 2002 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, OJ L240/1 of 7 September 2002;

[3] Commission Regulation (EC) No 1702/2003 of 24 September 2003 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 243, 27.09.2003, p. 6; and Commission Regulation (EC) No xxx/2003 of <date> on the continuing airworthiness of aircraft and aeronautical products, parts and appliances, and on the approval of organisations and personnel involved in these tasks, OJ L <number/date>. These Regulations include Part 21 and the Parts M, 145, 147, 66 respectively.

Consultation on draft proposals

6. This CS has been subject to consultation[4] in accordance with Article 43 of the Basic Regulation and Article 15 of the rulemaking procedure established by the Management Board.[5]

7. The Agency has addressed and responded to the comments received. The responses are contained in a comment-response document (CRD) which has been produced for each proposal and which is available on the Agency's web-site.

General structure and format applicable to all Certification Specifications

8. In general the Agency relied on existing Joint Aviation Requirements-codes in the development of all certification specifications. Where needed, these have been adapted to ensure consistency with Community law and European Union policies. These adaptations represent the minimum necessary to facilitate a timely consultation and adoption of the necessary measures.

9. In addition, JAA NPAs regarded as being mature by the Agency have been incorporated (see section II of this Foreword). Other JAA NPAs will be considered by the Agency at a later stage.

10. The Agency realises that the first issues of the certification specifications show some inconsistency where the structure, format and lay-out are concerned. These will be approved as soon as the Agency has developed its own "drafting convention". It is felt more important to have these CS (most of them in JAR-format) available without further delay.

11. Except for CS-ETSO, all certification specifications consist of two "Books". Book 1 is referred to as "airworthiness code" and contains the Agency's technical interpretation of the essential requirements. Book 2 contains means acceptable to the Agency for the applicant to show compliance with the code. Each Book is then subdivided into "Subparts".

12. Awaiting the establishment of its own drafting convention, the Agency has as much as possible retained in the CS the language applied in the Joint Aviation Requirements. The Agency will further review this matter at a later stage.

Units of Measurement Conversion

13. With regard to the use of SI units in Europe, the Agency applies the following policy[6]:

- All units of measurement shall be converted into a "primary unit" listed in table 3-4 of ICAO Annex 5 (if necessary with a prefix for decimal multiples and sub-multiples).
- In general the principle of equivalent tolerance shall be used for rounding off the converted figures, except where the figure serves only as an input to calculations and does not reflect an actual requirement to be met. In such case the converted figure should not be rounded off.
  A review of all figures needs to be done to determine if the tolerance of the original figure as implied by the figure is sufficient for the purpose of the requirement. If necessary the tolerance can be defined by adding a particular tolerance. This will lead to a list of standard conversions to be used in all EASA measures (it should be noted that conversion of the same unit can lead to different results depending on the particular use).
- The "old" figure using the non-SI unit shall be kept between brackets after the converted figure/unit:
  (i) for the ICAO accepted non-SI alternatives until ICAO has established a termination date for the use of these units;

[4] See Consultation paper no. 5 of 29 July 2003;
[5] Decision concerning the Rulemaking procedure, adopted by the Management Board on 17 June 2003;
[6] CS-E, -P and –APU already apply metric system;

(ii) for all the other units during a transition period of 5 years. After this date the units between brackets will have to be removed.

- As a result of the above policy the use of the units between brackets is felt acceptable.

Explanation

14. EC Directive 80/181/EEC mandates the use of SI units in Europe except where international conventions say otherwise. An example of such international convention is ICAO Annex 5, which in principle also mandates the use of SI units, but allows for the use of certain non-SI alternative units (knot, nautical mile and foot).

15. During the initial transposition from JARs into CS, it was decided to convert all units of measurement into S.I. units (or accepted derived units such as km/h for speed). The reasons for converting all units was to retain internal consistency of the airworthiness codes and the notion that safety problems should not be expected knowing that the CS are only used to certify the product, and have no direct implication on the operation.

16. During the consultation on the draft CS, no comments were received objecting to the general idea of converting the units. The comments received on this issue can be split up in four categories:

a. *The non-SI alternative units knot, nautical mile and foot, allowed by ICAO Annex 5, should not be converted in SI unit.* The comment is agreed in principle. However it should be noted that ICAO Annex 5 allows the use of these non-SI alternatives, but lists the SI units as the "primary units" (see table 3-4 of Annex 5). Therefore the conversion to SI units is still valid in these cases, bearing in mind that the non-SI alternative units, quoted between brackets, may continue to be used.

b. *The conversions made are not accurate enough*. The units were converted using the "equivalent tolerance" principle, which is believed to be the right approach in general. It is however noted that some of the figures in the airworthiness codes serve only as an input to calculations and do not reflect an actual requirement to be met (e.g. CS 25.415(a)). In such case the figure has to be treated as a figure with no tolerance, and the conversion should be as accurate as possible.

From some of the comments it is also clear that people have used the figures with "old" units with a tolerance that was not reflected in the figure. There may have been a good reason to do so, but the opposite might be true as well. It will be necessary to review all the figures to check if the tolerance as implied by the figure is sufficient for the purpose of the requirement.

c. *Not all units have been converted*; It is acknowledged that due to lack of time and resources it was not possible to convert the units in certain formula's and in graphics. This is a task which needs to be taken up by the Agency.

d. *Correction of mistakes*; The necessary corrections have been made.

Publication

17. The full text of certification specifications, including airworthiness code and acceptable means of compliance as well as guidance material are for the time being only available in PDF format at "www.easa.eu.int". For more information, contact the Agency :

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II. Certification Specifications for Engines (CS-E)

18. CS-E has been based on amendment 12 of JAR-E (1 May 2003).

The following NPAs which, as a minimum, have all been processed by the JAA system into the formal consultation process until a final version has been prepared together with a comment-response document, have been incorporated into CS-E.

NPA-E-33	Engine Control Systems – Harmonisation
NPA-E-39	Shafts
NPA-E-42	Terminology
NPA-E-44	Engine critical parts
NPA-E-45	Large flocking birds
NPA-E-46	Use of words “hazard” and “hazardous”
NPA-E-47	Environmental and operational specifications
NPA-E-49	Miscellaneous changes
NPA-E-52	Up-date of piston engine specifications

CS-E has been checked, and adapted as necessary, for consistency with the following documents : Part 21, CS-Definitions and CS-34. This effort has not affected the technical content of the texts which remain in CS-E.

It should be noted that certification specifications for engines to be installed in powered sailplanes, very light aeroplanes or very light rotorcraft can be found in CS-22 subpart H and CS-VLR, appendix B.

EASA, 20 October 2003