

European Aviation Safety Agency

**Comment Response Document (CRD)
on Consultation paper nr. 9 of 29 July 2003**

**AMC-20
General acceptable means of compliance
for airworthiness of products, parts and appliances**

Foreword to the Comment Response document (CRD)

To give a rapid overview of the CRD, the following keywords were used in responding to comments:

- “Carried”: The proposed amendment is wholly transferred to the revised text.
- “Noted”: The comment is acknowledged and where needed the text has been improved.
- “Deferred”: The comment requires further assessment by the Agency under its future rulemaking programme.
- “Disagreed”: The comment is not shared by the Agency.

General Comments

Para.

14 / CAA Czech Republic

Comment

The proposed text of the whole AMC - 20 contains many terms used for the designation of the competent authority, as for example Authority, Airworthiness Authority, certification Authority, engine Authority, Regulatory Authority, etc. In many cases the allocation of authorities or responsibilities between national authority and EASA is not absolutely evident as there are no definitions of the terms used.

With regard to the above mentioned problem the CAA CZ deems necessary to:

- reduce the number of the terms used for the designation of competent authority, e.g. to the Competent Authority (taking into account the definitions in for example Part 21 and Part M), Authority and Agency;

- include in the AMC - 20, e.g. in the foreword, the definitions or at least clarifications of the terms used to designate the competent authority.

Response

Deferred.

The comment is agreed in principle. 'Tidying up' of all CS and AMC will be done by the Agency in due course.

17 / DGAC France

Comment

Attachment 1 to the explanatory note states : "Some of the AMC's are bordering between the airworthiness and the operations domain and therefore contain a lot of material related to operational requirements. It is realised that these fall outside the current scope of EASA. Because the material is considered equally important for airworthiness certification purposes they are proposed as part of the EASA AMC's." It is considered that such a statement in the explanatory note is not sufficient and that the status of the operational material should be explained in the AMC-20 itself.

It is thus proposed to add a general introductory note to AMC-20, to read as follows:

"Some of the general acceptable means of compliance contained in this document deals with subjects which are bordering between the airworthiness domain and the operations domain. In the absence of basic principles and essential requirements for operations, as envisaged in article 7 of Regulation 1592/2002, and their associated implementing rules it has however been decided to include in the following AMCs material related to operational requirements. This material is only provided for information as recommendation from the Joint Aviation Authorities and is related to the applicable Joint Aviation Requirements."

In addition the AMC-20 should clearly identify such operational material, for which the Agency is not yet competent, by a statement such as "recommendation provided by the JAA" and/or by using a specific font (such as italic letters).

Finally there should be an agreement between EASA and JAA so that JAA is invited to participate in the drafting of these AMCs to provide the operations material so that the EASA AMCs can be used as a sole reference and the JAA do not have to publish additional leaflets.

Response

Carried.

The appropriate place for the proposed text will be determined by the Agency.

47 / CAA Sweden

Comment

With reference to the Consultation Papers concerning certification specifications (CS) mentioned above, we would like to make the following comments.

Since the proposed certification specifications contain regulatory material which, essentially, is identical to the content of the corresponding JARs, we are in favour of the proposed material.

However, should the proposals not have the same content as those JARs, there must be a possibility to rediscuss such items.

Response

Noted.

General Comments

Para. AMC 20 115B

26 / FAA USA

Comment

General Comment for Section 6: AMC 20-115B generally agrees with FAA AC 20-115B, dated 1 Jan. 1993. The exception is with respect to previous versions of ED-12B (i.e., ED-12 and ED-12A). The AMC specifically recognizes acceptance of these previous versions for systems and equipment where these previous versions have been accepted as the basis for approval or certification whereas AC 20-115B is silent on this matter. I do not see this to be an issue unless the intent is that these previous versions will remain as basis for certification irregardless of impact of future changes.

Response

Noted.

Draft NPA 20-14 addresses this issue. It is not mature enough for inclusion in the AMC-20. It will be in the inventory of work to assist the transition to EASA as provided by the JAA.

Para. CS AMC 20-115B

15 / CAA NL

Comment

The proposed AMC 20-115B only references ED-12B/DO-178B. Use of this document is however significantly improved by also using EUROCAE ED-94B/RTCA DO-248B. It is proposed to replace the text of AMC 20-115B by the one in the attached file "Amc 20-115B rev 1.DOC".

AMC 20-115B rev 1
Recognition of Eurocae ED-12B / RTCA DO-178B

1 PURPOSE :

This advisory material calls attention to the following European Organisation for Civil Aviation Equipment (EUROCAE) documents:

- ED-12B, "Software Consideration in Airborne Systems and Equipment Certification", issued December 1992.
- ED-94B, "Final Report For Clarification of ED-12B", issued October 2001.

It discusses how these documents may be applied to certification programmes administered by the Joint Aviation Authorities.

2 RELATED DOCUMENTS:

- 2.1 EUROCAE document ED-12B is technically equivalent to RTCA Inc. document DO-178B. A reference to one document, at the same revision level, may be interpreted to mean either document.
- 2.2 EUROCAE document ED-94B is technically equivalent to RTCA Inc. document DO-248B. A reference to one document, at the same revision level, may be interpreted to mean either document.
- 2.3 This AMJ is based on FAA AC 20-115B, dated 11 January 1993.

3 RELATED JOINT AVIATION REQUIREMENTS (JARs):

JAR-21, JAR-22, JAR-23, JAR-25, JAR-27, JAR-29, JAR-AWO, JAR-E, JAR-P, JAR-APU, JAR-TSO and JAR-VLA. Existing references to ED-12/DO-178 and ED-12A/DO-178A in the above JARs will be amended, at the next opportunity, to take into the principles spelt out in paragraphs 7 below.

4 BACKGROUND:

4.1 EUROCAE document ED-12B was developed to establish software considerations for developers, installers and users when the aircraft equipment design is implemented using software-based techniques. Current and future avionics designs will make extensive use of this technology. The EUROCAE document provides guidelines for establishing software levels, software life cycle planning, development, verification, configuration management and quality assurance disciplines to be used in software-based systems.

4.2 ED-12B specifies the information to be made available and/or delivered to the certification authority. Guidance is provided also for dealing with software developed to earlier standards, tool qualification and alternative methods which may be used.

4.3 EUROCAE document ED-94B was developed to provide clarification of the guidance material in ED-12B.

5 USE OF EUROCAE ED-12B PROCEDURES:

An applicant for JAA certification for any software-based equipment or system may use the considerations outlined in EUROCAE document ED-12B, as a means, but not the only means to secure approval. The JAA may publish advisory material for specific JARs, stating the required relationship between the criticality of the software-based systems and the software levels as defined in EUROCAE document ED-12B. Such advisory material will take precedence over the application of EUROCAE document ED-12B.

USE OF EUROCAE ED-94B GUIDANCE

An applicant for JAA certification for any software-based equipment or system may use the additional guidance provided in ED-94B to supplement the guidance in ED-12B.

7 USE OF PREVIOUS VERSIONS:

ED-12/DO-178, ED-12A/DO-178A, ED-94 and ED-94A will continue to be accepted for systems and equipment where these have been accepted as the basis for approval or certification.

8 AVAILABILITY OF EUROCAE DOCUMENT ED-12B and ED-94B

Copies may be purchased from EUROCAE, 17 rue Hamelin, 75783 PARIS Cedex 16, France, (Fax : 33 1 4505 7230).

Response

Noted.

Draft NPA 20-14 addresses this issue. It is not mature enough for inclusion in the AMC-20. It will be in the inventory of work to assist the transition to EASA as provided by the JAA.

AMC 20 -115B / 1

Para.

12 / CAA UK

Comment

AMC 20-115B, Section 1, Purpose : Needs updating to reflect additional EUROCAE document : Amend the first sentence to read:

This advisory material calls attention to the following European Organisation for Civil Aviation Equipment (EUROCAE) documents:

- ED-12B, "Software Consideration in Airborne Systems and Equipment Certification", issued December 1992.
- ED-94B, "Final Report For Clarification of ED-12B"

Response

Noted.

Draft NPA 20-14 addresses this issue. It is not mature enough for inclusion in the AMC-20. It will be in the inventory of work to assist the transition to EASA as provided by the JAA.

AMC 20 -115B / 2.1

Para.

12 / CAA UK

Comment

AMC 20-115B, Section 2.1 : Needs updating to reflect additional EUROCAE document : Add:

EUROCAE document ED-94B is technically equivalent to RTCA Inc. document DO-248B. A reference to one document, at the same revision level, may be interpreted to mean either document.

Response

Noted.

Draft NPA 20-14 addresses this issue. It is not mature enough for inclusion in the AMC-20. It will be in the inventory of work to assist the transition to EASA as provided by the JAA.

AMC 20 -115B / 4.1

Para.

12 / CAA UK

Comment

AMC 20-115B, Section 4.1 : Needs updating to reflect additional EUROCAE document : Add:

EUROCAE document ED-94B was developed to provide clarification of the guidance material in ED-12B.

Response

Noted.

Draft NPA 20-14 addresses this issue. It is not mature enough for inclusion in the AMC-20. It will be in the inventory of work to assist the transition to EASA as provided by the JAA.

AMC 20 -115B / 4.2

Para.

12 / CAA UK

Comment

AMC 20-115B, Section 4.2 : Editorial : Amend to read; "4.2 Document ED-12B specifies."

Response

Noted.

Draft NPA 20-14 addresses this issue. It is not mature enough for inclusion in the AMC-20. It will be in the inventory of work to assist the transition to EASA as provided by the JAA.

AMC 20 -115B / 6

Para.

12 / CAA UK

Comment

AMC 20-115B, New Section 6 : Needs updating to reflect additional EUROCAE document : Insert new paragraph and renumber subsequent Sections:

USE OF EUROCAE ED-94B GUIDANCE

An applicant for JAA certification for any software-based equipment or system may use the additional guidance provided in ED-94B to supplement the guidance in ED-12B.

AMC 20-115B, (old) Sections 6 and 7 : Needs updating to reflect additional EUROCAE document : Amend to read:

7. USE OF PREVIOUS VERSIONS

ED-12/DO-178, ED-12A/DO-178A, ED-94 and ED-94A will continue to be accepted for systems and equipment where these have been accepted as the basis for approval or certification.

8. AVAILABILITY OF EUROCAE DOCUMENT ED-12B and ED-94B....

Response

Noted.

Draft NPA 20-14 addresses this issue. It is not mature enough for inclusion in the AMC-20. It will be in the inventory of work to assist the transition to EASA as provided by the JAA.

AMC 20 -115B / 7

Para.

12 / CAA UK

Comment

AMC 20-115B, New Section 6 : Needs updating to reflect additional EUROCAE document : Insert new paragraph and renumber subsequent Sections:

USE OF EUROCAE ED-94B GUIDANCE

An applicant for JAA certification for any software-based equipment or system may use the additional guidance provided in ED-94B to supplement the guidance in ED-12B.

AMC 20-115B, (old) Sections 6 and 7 : Needs updating to reflect additional EUROCAE document : Amend to read:

7. USE OF PREVIOUS VERSIONS

ED-12/DO-178, ED-12A/DO-178A, ED-94 and ED-94A will continue to be accepted for systems and equipment where these have been accepted as the basis for approval or certification.

8. AVAILABILITY OF EUROCAE DOCUMENT ED-12B and ED-94B....

Response

Noted.

Draft NPA 20-14 addresses this issue. It is not mature enough for inclusion in the AMC-20. It will be in the inventory of work to assist the transition to EASA as provided by the JAA.

AMC 20 -1 / 2.1

Para. 2.1

5 / TURBOMECA

Comment

Some references to CS-E are incorrect:

-CS-E 150 (c) is no more appropriate. At the origin, up to JAR-E Amendment 11, JAR-E 150(c) addressed "Controls and Adjustments". Now, since JAR-E amendment 12, this subject is addressed by CS-E 140 and CS-E 150.

-CS-E 530 is no more appropriate. At the origin, up to JAR-E Amendment 11, JAR-E 530 addressed "Fire Precautions ". Now, since JAR-E amendment 12, this subject is addressed by CS-E 130.

-At the origin, up to JAR-E Amendment 11, JAR-E 550 addressed "Thrust Reversal Control System ". Now CS-E 550 does not exist.

Therefore replace references to "CS-E 150 (c)" by "CS-E 140 and CS-E 150", and "CS-E 530" by "CS-E 130" and delete reference to "CS-E 550".

Response

Carried.

Para.

4 / MARTINAIR HOLLAND NV

Comment

Para 4

There is a mix of the terms "national authority" and "Agency" here. It is repeated in paras 1 and 10. To whom will reports be sent? It is not clear from the material provided here. My understanding is that all reports should be submitted to the local EASA office (i.e. for MP - IVW/DL). Can this please be made clear in the text.

Response

Disagreed.

Under the Basic Regulation the national aviation authorities (NAAs) still have responsibilities related to the collection of occurrence reports, notably for production, maintenance and operational issues. In some cases there is a shared responsibility between NAAs and the Agency in which case reports to both entities should be furnished. Paragraph 4 clearly states to whom occurrences should be reported.

Other

Para.

12 / CAA UK

Comment

AMC 20-4, Sections 2, 3 and 4 : Need to delete references to LORAN C to be consistent with current EUROCONTROL policy : Section 2: Delete FAA Advisory Circular AC 121A; Section 3: Delete LORAN C from list; Section 4: Delete paragraph 4.4.2.2.

Response

Deferred.

All the possible consequences of this proposal will have to be assessed thoroughly in a proper consultation.

12 / CAA UK

Comment

AMC 20-5, Section 2, Related reading material : List of references need updating : Add the references: FAA TSO -C 145 Airborne Navigation Sensors Using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS).
FAA TSO -C 146 Stand-Alone Airborne Navigation Equipment Using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS).

AMC 20-5, Section 2, Related reading material : List of references need updating : Add: DO-229B Minimum Operational Performance Standards for Global Positioning System/Wide Area Augmentation System Airborne equipment.

AMC 20-5, Section 5.4(a) : Need to add new TSO references Add (iii) to read: (iii) TSO C145 or TSO C146.

Response

Noted.

The references to ETSO-C145 and C146 are added in stead of the reference to the corresponding FAA TSOs. Addition of the reference to DO-229B is deferred. The version B of this document has not yet been incorporated in the JAA documents.

Adding the reference in 5.4(a) is deferred. This issue has not been subject to a consultation process. Anyway applicants may choose to use the referred ETSOs.

37 / ACG

Comment

AMC-20 is acceptable for ACG.

Response

Noted.

Para. **AMC 20-6**

12 / CAA UK

Comment

ACJ 20X6 for ETOPS, - now AMC 20-6, has been amended (in fact replaced in its entirety) by NPA 20. This NPA introduces Changes to JAR-1, JAR-25, JAR-E (now AMC-1, CS-25 and CS-E) and JAR-OPS1. An LROPS approval supplement to GAI 20 ACJ 20X6 (GAI 20 ACJ 20X6 was previously known as JAA Information Leaflet IL 20) has also been produced. The NPA has been published in June 03 and is on the EASA inventory. The proposed new AMC 20 should include the new ACJ 20X6 as a new AMC 20X-6.

Response

Deferred.

The NPA will be added in the inventory by the JAA to assist the transition to EASA. The Agency may consider updates when necessary.

Para. AMC 20-7

12 / CAA UK

Comment

It is not clear why JAA TGL 6 RVSM has not been included as (now) AMC 20-7? Additionally, there are other TGLs that it is believed should have been included, in particular TGL 10 for PRNAV, TGL 12 for TAWS, TGL 13 for certification of Mode S transponder systems for elementary surveillance - planned for introduction into designated European Airspace on 31 March 2004(?) - see also NPA 20-12 . Why have these not been proposed as AMC-20s?

Response

Deferred.

As TGLs are not part of the regulatory framework they have not been considered for inclusion in EASA publications. The Agency may consider to include this material at a later stage.

Para. AMC 20-8

12 / CAA UK

Comment

1. The term "Authority " is used extensively within the AMC 20-8 material, is this meant to be taken as meaning the Agency or the National Aviation Authority or both. It is suggested that consistent terms are used to ensure that occurrence reports are always passed to the correct organisation. An example of this is : Page 20-8-2 Para 4 (b); first sentence.

2. Page 20-8-32 Para 6 (c) (i) it is suggest to change "Agency and/or national authority" to Agency and national authority.

3. Page 20-8-11 Para G (2) there is a spurious letter "t "after the word in.

4. It is not certain that it is correct to include occurrences related to flight operations when this aspect is not under EASA' s competence at the moment.

Response

1. Noted.

Under the Basic Regulation the national aviation authorities (NAAs) still have responsibilities related to the collection of occurrence reports, notably for production, maintenance and operational issues. In some cases there is a shared responsibility between NAAs and the Agency in which case reports to both entities should be furnished.

Paragraph 4 clearly states to whom occurrences should be reported.

Where the term 'authority' is used this can mean the Agency or a National Authority.

2. Disagreed. See above.

3. Carried.

4. Noted.

See Explanatory memorandum.

Para. AMC 20-8 General

4 / MARTINAIR HOLLAND NV

Comment

General

The deletion of references to the JARs has left the original ACJ less user-friendly. For example, whereas in para 2 a clear reference to JAR-OPS was made, there is now the text "specific operating requirements". A similar example exists in para 2(a). The inclusion of clear cross-references is desirable.

Response

Noted.

The cross-references will be added as soon as the operational rules are issued.

Para. CS AMC 20-8

17 / DGAC France

Comment

1. Propose different text:

"(g) List of examples of Reportable occurrences

A list of reportable occurrences is given in Directive 2003/42/EC of the European Parliament and of the Council of 13 June 2003 on occurrence reporting in civil aviation. Not all examples are applicable to each reporting organisation. Therefore each organisation should define and agree with the Agency and/or national authority a specific list of reportable occurrences or a list of more generic criteria, tailored to its activity and scope of work (see also 10.e above). "

SEE HARDCOPY

A direct reference instead of a copy will avoid incoherence with the Occurrence Reporting Directive (This gives also the benefit of having the list of the Directive available in all EU languages).

2. We propose to delete the third sentence which may give the impression that an organisation may decide to report only some of the occurrences.

Response

1 Noted.

The purpose and the scope of the Directive is different from the purpose and scope of this AMC.

Both lists were developed in parallel and are similar. Both lists are not exhaustive and may be subject to changes. To allow rapid introduction of such changes the Agency should retain flexibility, therefore reference to the Directive is not felt needed. In general the Agency has the responsibility to act within the limits set by the Community legal framework.

2. Carried.

Para. section 2

12 / CAA UK

Comment

AMC 20-4, Section 2, ETSOs/TSOs : List of references need updating : Add the references:

FAA TSO -C145 Airborne Navigation Sensors Using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS).

FAA TSO -C146 Stand-Alone Airborne Navigation Equipment Using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS).

AMC 20-4, Section 2, EUROCAE/RTCA Documents : List of references need updating : Add: DO-229B Minimum Operational Performance Standards for Global Positioning System/Wide Area Augmentation System Airborne equipment.

Response

Noted.

The references to ETSO-C145 and C146 are added in stead of the reference to the corresponding FAA TSOs.

Addition of the reference to DO-229B is deferred. The version B of this document has not yet been incorporated in the JAA documents.

Para. section 3

12 / CAA UK

Comment

AMC 20-4, Section 3 : OMEGA no longer available : Delete redundant Note 2 of Section 3.

Response

Carried.

Para. section 4

12 / CAA UK

Comment

AMC 20-4, Section 4 : Add new TSO reference : Amend 4.4.2.3 GPS to read: "...approved to TSO C129(), TSO-145, or TSO-C146 and which include...".

Response

Noted.

The references to ETSO-C145 and ETSO-C146 are added instead of the TSO references.