

ETSO Workshop 2022 - Industry session -

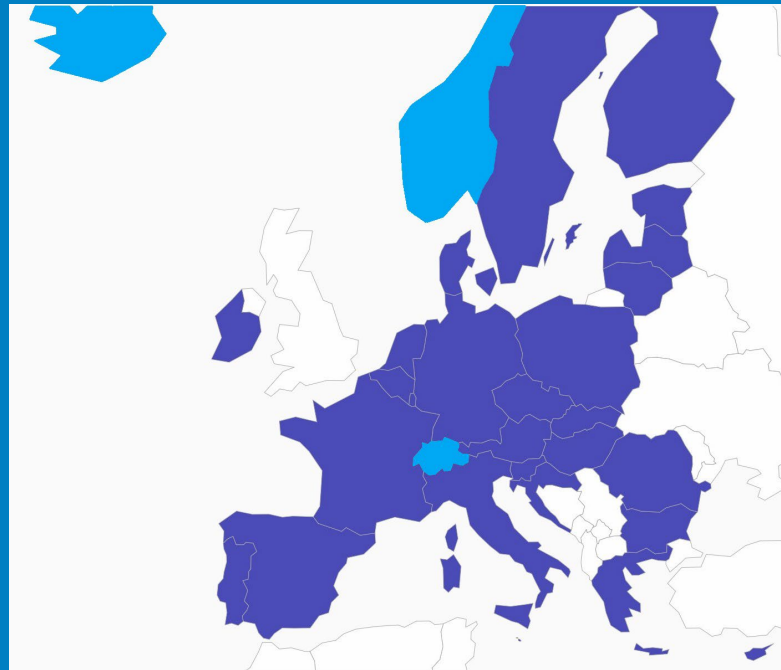
20th – 21st September 2022

**EASA Direktion
Konrad-Adenauer-Ufer 3
D-50668 Cologne**

Your safety is our mission.

CS-ETSO – Subpart A

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ETSO Workshop - September 2022



Agenda

- Introduction of CS-ETSO
- Guidelines
- Subpart A
 - Environmental qualification
 - Software, Airborne Electronic Hardware, Development Assurance
 - Miscellaneous topics
- Conclusion

Introduction on CS-ETSO

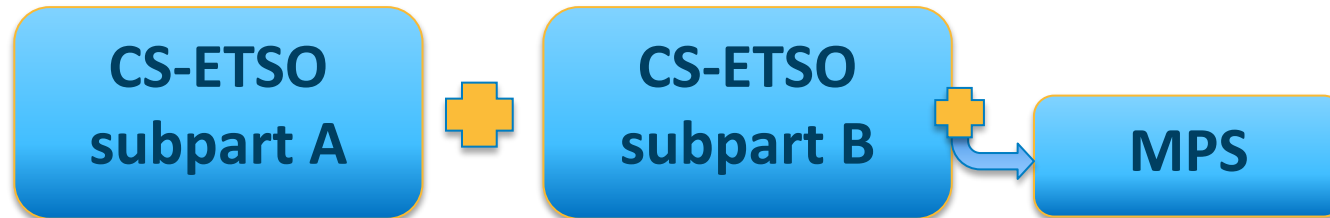
→ Part 21.A.606 (b)

The applicant shall be entitled to have an ETSO authorisation issued by the Agency after:

(...)

(b) demonstrating that the article complies with the technical conditions of the applicable ETSO, and submitting the corresponding statement of compliance;

(...)



Introduction on CS-ETSO



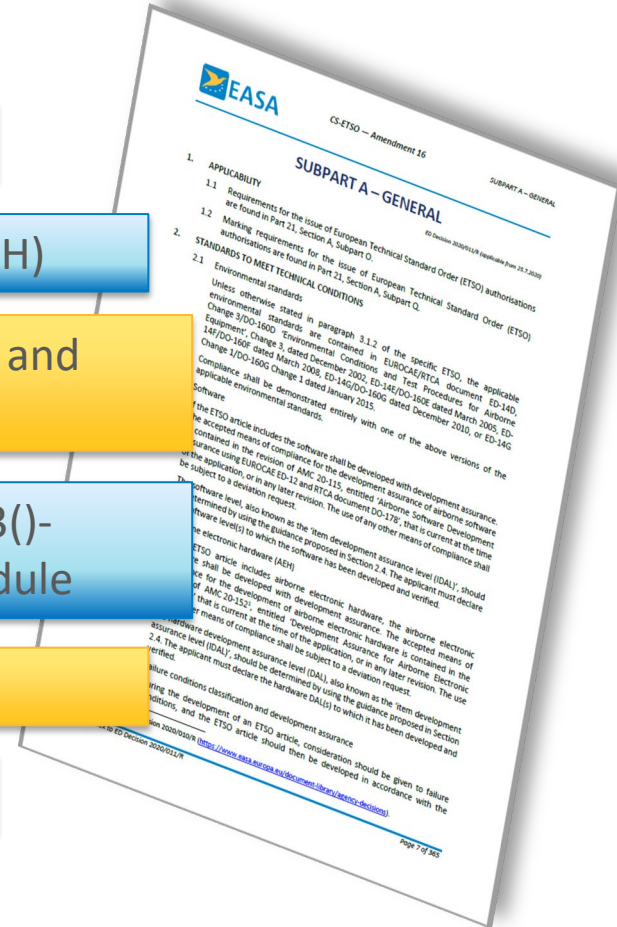
- Both subpart A and subpart B apply
- CS-ETSO requirements prevail over referenced MPS.

CS-ETSO update

- Update of CS-ETSO standards are done in the following manner
1. If any change on subpart A → EASA publish complete subpart A with embedded changes
 2. If changes to specific ETSO standard, EASA publish update of the specific modified standard(s) (but not all standards)

CS-ETSO subpart A

- Environmental standards
- Software
- Airborne electronic hardware(AEH)
- Failure conditions classification and development assurance
- ETSO article using an ETSO-C153()-authorised IMA platform or module
- Information security protection
- Open problem reports (OPRs)
- Embedded batteries



SUBPART A – GENERAL

ED Decision 2020/011/R (applicable from 25.7.2020)

Environmental standards

2.1 Unless otherwise stated in paragraph 3.1.2 of the specific ETSO, the applicable environmental standards are contained in EUROCAE/RTCA document ED-14D, Change 3/DO-160D 'Environmental Conditions and Test Procedures for Airborne Equipment', Change 3, dated December 2002, ED-14E/DO-160E dated March 2005, ED-14F/DO-160F dated March 2008, ED-14G/DO-160G dated December 2010, or ED-14G Change 1/DO-160G Change 1 dated January 2015.

ED-14/DO-160 revision
D, E , F, G
unless otherwise stated
into ETSO standard

SUBPART A – GENERAL

ED Decision 2020/011/R (applicable from 25.7.2020)

Software DA

2.2 The accepted means of compliance for the development assurance of airborne software is contained in

AMC 20-115D.

Use of any other means → deviation request

Airborne Electronic Hardware DA

2.3 The accepted means of compliance for the development assurance of airborne Electronic Hardware is contained in

AMC 20-152A.

Use of any other means → deviation request

Development assurance

2.4 ...The ETSO article **shall be developed according to at least the development assurance level** that is appropriate to the failure condition classifications that are expected for the intended installation...

Multicore Processors

N/A yet> **AMC 20-193** is not yet formally applicable, will be updated at next 'subpart A' update.

Applicant is invited to elect to comply in case of use of multicore processors...



Miscellaneous topics

SUBPART A – GENERAL

ED Decision 2020/011/R (applicable from 25.7.2020)

ETSO article using an ETSOA C153 IMA

2.5... the applicant shall apply for authorisation to the **ETSO-C214** standard, together with the intended functional ETSO standard(s)...

Information security protection

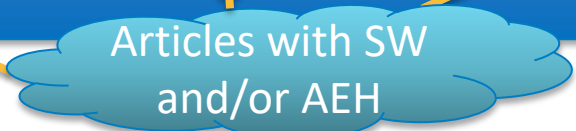
2.6 An ETSO article may be designed with a **security assurance level** (SAL) that is appropriate for specified security measures, according to the procedure provided in **AMC 20-42**.

Open problem reports (OPRs)

2.7 ...The accepted means of compliance for the management of OPRs is contained in the revision of **AMC 20-189** 'Management of Open Problem Reports' ...
Use of any other means → deviation request

Embedded batteries

2.8 ... if article meets the condition...the article shall also be approved in accordance with the applicable battery ETSO.
+ contact EASA if no ETSO standard exists for the type of battery



Articles with SW and/or AEH



All articles

Examples on use of CS-ETSO subpart A & B

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Example 1

- Example where subpart B-ETSO standard amends some of the standard MOPS ED-112A
- Subpart B – ETSO standard adds additional requirement to the generic section 2.4 of subpart A

ETSO-2C123c

ED Decision 2020/011/R (applicable from 25.7.2020)

COCKPIT VOICE RECORDER SYSTEMS

3.1.1 Minimum Performance Standard

The applicable standards are those provided in EUROCAE ED-112A, MOPS for Crash Protected Airborne Recorder Systems, dated September 2013, that pertain to the CVR type, except Chapters I-1 and I-6, and Sections 2-1.1, 2-1.5, 2-1.6, 2-1.11, 2-1.12, 2-3.1, 2-5, 3, Annex I-A, Annex I-C, and other ED-112A requirements related to installation, flight testing, aircraft maintenance as amended by Appendix 1 to this ETSO.

3.2 Specific

3.2.1 Failure Condition Classification

See CS-ETSO, [Subpart A](#), paragraph 2.4.

A failure of the function defined in paragraph 3.1.1 of this ETSO is a minor failure condition.

A loss of the function defined in paragraph 3.1.1 of this ETSO is a minor failure condition.

The applicant must develop the system to be at least the development assurance level that is commensurate with these failure conditions.

Example 2

- ETSO standard in subpart B is older and does not properly cover the SW, AEH, equipment development assurance requirements.
- Anyway subpart A §2.2 and §2.3 are applicable and overload subpart B.

**European
Aviation
Safety
Agency**

ETSO-C4c
Date : 24.10.03

European Technical Standard Order

Subject: BANK AND PITCH INSTRUMENTS

5.1.3 – Computer Software
None
3.2 - Specific
None

Example 3

- Associated MOPS of the ETSO standard in subpart B imposes a DO-160 revision
- Unless otherwise stated within subpart B, subpart A 2.1 is applicable and the offered flexibility can be used

ETSO-C209

ED Decision 2018/002/R (applicable from 20/2/2018)

ELECTRONIC FLIGHT INSTRUMENT SYSTEM (EFIS) DISPLAY

1 Applicability

This ETSO provides the requirements which electronic flight instrument system (EFIS) displays that are designed and manufactured on or after the date of this ETSO must meet in order to be identified with the applicable ETSO marking.

2 Procedures

2.1 General

Applicable procedures are detailed in CS-ETSO, [Subpart A](#).

2.2 Specific

None.

3 Technical Conditions

3.1 Basic

3.1.1 Minimum Performance Standard

Standards set forth in SAE AS6296, Electronic Flight Instrument System (EFIS) Display, dated March 2016, and AS8034B, Minimum Performance Standard for Airborne Multipurpose Electronic Displays, dated 27th June 2011.

*SAE document references DO-160G
but subpart A offers **D, E, F or G***

Example 4

- Subpart B prevails over referenced MPS
 - Referenced MPS amended by Appendix 1 of the ETSO

ETSO-C142a
Date: 28/11/2008

European Aviation Safety Agency

European Technical Standard Order (ETSO)

Subject: **NON-RECHARGEABLE LITHIUM CELLS and BATTERIES**

3 - Technical Conditions

3.1 - Basic

3.1.1 - Minimum Performance Standard

RTCA DO-227 "Minimum Operational Performance Standard for Lithium Batteries" from June 1995 unless otherwise specified by **Appendix 1** of this ETSO

Conclusion

- Subpart A offers the flexibility to update generic requirements for all ETSO standards at once!
- Don't forget to document within Certification Programme
 - It should be clear on the selected certification basis , covering subpart A and subpart B aspects.
 - Deviations and limitations should be informed as soon as known, to ease the decision/coordination process.
 - Deviations are subject to EASA assessment and publication for comments. Acceptance of deviations is finally formal at time of certification.

Any question?

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