

## SUBPART A – GENERAL

ED Decision 2022/018/R

### 1. APPLICABILITY

- 1.1 The requirements for the issue of European Technical Standard Order (ETSO) authorisations are found in Part 21, Section A, Subpart O.
- 1.2 The marking requirements for the issue of European Technical Standard Order (ETSO) authorisations are found in Part 21, Section A, Subpart Q.

### 2. STANDARDS TO MEET TECHNICAL CONDITIONS

#### 2.1 Environmental standards

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.

Compliance shall be demonstrated entirely with one of the above versions of the applicable environmental standards.

#### 2.2 Software

If the ETSO article includes software, the software shall be developed with development assurance. The accepted means of compliance for the development assurance of airborne software is contained in the revision of AMC 20-115, entitled 'Airborne Software Development Assurance using EUROCAE ED-12 and RTCA Document DO-178', which is current at the time of the application, or in any later revision. The use of any other means of compliance shall be subject to a deviation request.

The software level, also known as the 'item development assurance level (IDAL)', shall be determined according to the failure conditions to which it contributes; see Section 2.4 for guidance. The applicant must declare the software level(s) to which the software has been developed and verified.

#### 2.3 Airborne electronic hardware (AEH)

If the ETSO article includes airborne electronic hardware, the airborne electronic hardware shall be developed with development assurance. The accepted means of compliance for the development of airborne electronic hardware is contained in the revision of AMC 20 152<sup>1</sup>, entitled 'Development Assurance for Airborne Electronic Hardware' that is current at the time of the application, or in any later revision. The use of any other means of compliance shall be subject to a deviation request.

The hardware development assurance level (DAL), also known as the 'item development assurance level (IDAL)', shall be determined according to the failure conditions to which it contributes; see Section 2.4 for guidance. The applicant must declare the hardware DAL(s) to which the item has been developed and verified.

<sup>1</sup> Refer to ED Decision 2020/010/R (<https://www.easa.europa.eu/document-library/agency-decisions>).

## 2.4 Failure conditions classification and development assurance

During the development of an ETSO article, consideration should be given to failure conditions, and the ETSO article should then be developed in accordance with the possible effects of those failure conditions at the system and aircraft levels (for further guidance see AMC material to related aircraft level requirements in the applicable certification specification (CS), for instance, AMC 25.1309 or AMC 23.2500/2510).

If the effects at the system or aircraft level are not known, due to the non-availability of aircraft or system design data, the applicant should make and declare an assumption for the failure classification. The assumed failure classification should be at least as high as the minimum hazard classification level required in the ETSO.

The classification of failure conditions at the level of the ETSO article may change as a result of particular aircraft installation architectures and characteristics.

Depending on the intended aircraft installation, EUROCAE/SAE Document ED-79A/ARP4754A, 'Guidelines for Development of Civil Aircraft and Systems', dated December 2010, or ASTM Document F3061M-17, 'Standard Specification for Systems and Equipment in Small Aircraft', dated November 2017, provide guidance to assign the development assurance levels of the ETSO article, software and airborne electronic hardware.

When the article implements software or airborne electronic hardware, the ETSO article shall be developed according to at least the development assurance level that is appropriate for the failure condition classifications that are expected for the intended installation.

EUROCAE/SAE Document ED-79A/ARP4754A should be used as guidance to ensure that a proper development, validation and verification process is followed for the ETSO article and its functional requirements.

## 2.5 ETSO article using an [ETSO-C153\(\)](#)-authorised IMA platform or module

If the ETSO article implements one (or several) [ETSO-C153\(\)](#)-authorised integrated modular avionics (IMA) platforms/modules and the applicant seeks compliance credit from this (these) ETSOA authorisation(s) to demonstrate compliance with one or several functional ETSO standard(s), the applicant shall apply for authorisation to the ETSO-C214 standard, together with the intended functional ETSO standard(s).

Note: A functional ETSO standard is any ETSO standard of CS-ETSO that describes an 'aircraft' function, i.e. typically any ETSO standard, except [ETSO-C153\(\)](#) and [ETSO-C214](#).

## 2.6 Information security protection

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.

## 2.7 Open problem reports (OPRs)

Problem reports that are related to ETSO articles that contain software or airborne electronic hardware shall be identified and managed. The accepted means of compliance for the management of OPRs is contained in the revision of AMC 20-189<sup>1</sup> 'Management of Open Problem Reports' that is current at the time of application, or in any later

<sup>1</sup> Refer to ED Decision 2020/010/R (<https://www.easa.europa.eu/document-library/agency-decisions>).

revision. The use of any other means of compliance shall be subject to a deviation request.

## 2.8 Embedded batteries

If an ETSO article embeds a lithium battery whose energy is equal to or greater than 2 Wh, the battery shall be approved in accordance with the applicable battery ETSO. Additionally, when the battery ETSO covers the article embedding the battery, the article shall also be approved in accordance with the applicable battery ETSO.

For rechargeable lithium batteries whose energy is less than 2 Wh, the battery shall comply with the UN Recommendations on the Transport of Dangerous Goods - Model Regulations and shall be certified to UL 1642, UL 2054 or IEC 62133, unless it is shown to meet the requirements of RTCA document DO-311A Energy Category 2.

For non-rechargeable lithium batteries whose energy is less than 2 Wh, the battery shall be certified to UL 1642 and shall comply with the UN Recommendations on the Transport of Dangerous Goods - Model Regulations.

If there is no ETSO that is applicable to a particular battery that an applicant intends to use in an ETSO article, the applicant should contact EASA.

## 3. ADDITIONAL INFORMATION

3.1 In some ETSOs, reference is made to an associated FAA standard. In these cases, the corresponding FAA technical standard order (TSO) can be consulted on [http://rgl.faa.gov/Regulatory\\_and\\_Guidance\\_Library/rgTSO.nsf/Frameset?OpenPage](http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgTSO.nsf/Frameset?OpenPage).

3.2 The standards documents referred to in this CS-ETSO may be purchased or obtained from the following organisations:

— ASD-STAN documents:

AeroSpace and Defence Industries Association of Europe – Standardization  
Rue Montoyer 10 - 1000 Brussels

(Email: [sales@asd-stan.org](mailto:sales@asd-stan.org), website: [www.asd-stan.org](http://www.asd-stan.org))

— ASTM documents:

American Society for Testing and Materials, ASTM International,  
100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania  
19428-2959, USA

(Website: [www.astm.org](http://www.astm.org))

— ETSI European Telecommunications Standards Institute

650, Route des Lucioles  
06560 Valbonne - Sophia Antipolis  
FRANCE

Telephone: +33 4 92 94 42 00

([https://www.etsi.org/standards#Pre-defined Collections](https://www.etsi.org/standards#Pre-defined%20Collections))

— EUROCAE documents:

European Organisation for Civil Aviation Equipment

9-23 rue Paul Lafargue, “Le Triangle” building, 93200 Saint-Denis, France

Telephone: +33 1 49 46 19 65

(Email: [eurocae@eurocae.net](mailto:eurocae@eurocae.net), website: [www.eurocae.net](http://www.eurocae.net))

— EUROCONTROL Surveillance Document Library:

<https://www.eurocontrol.int/articles/surveillance-library>

— FAA standards:

Superintendent of Documents, Government Printing Office

732N Capitol Street NW, Washington DC 20401, USA

(Website: [www.gpoaccess.gov](http://www.gpoaccess.gov))

— FCC Documents:

<http://www.fcc.gov>

— Global System, Inc., documents:

Global Systems, Inc., 2144 Michelson Drive, Irvine, California 92715, USA

Telephone: (714) 851-0119

— International Electrotechnical Commission

<https://webstore.iec.ch>

— MIL specifications:

DODSSP, Standardization Documents Order Desk

Building 4D, 700 Robbins Avenue, PHILADELPHIA, PA 19111-5094, USA

or from the ASSIST Customer Service Desk, telephone (215) 697-6396

(Website: <http://quicksearch.dla.mil/>)

— NAS specifications:

Aerospace Industries Association (AIA)

1327 Jones Drive, Ann Arbor, MI 48105, USA

(Website: [www.techstreet.com](http://www.techstreet.com))

— RTCA documents:

Radio Technical Commission for Aeronautics, Inc.

1828 L Street NW, Suite 805, Washington DC 20036, USA

(Website: [www.rtca.org](http://www.rtca.org))

— RTCM documents:

Radio Technical Commission for Maritime Services

1621 N. Kent St., Suite 705

Arlington, Virginia 22209 USA

(Website: <https://www.rtcmm.org/>)

— SAE documents:

Society of Automotive Engineers, Inc.

400 Commonwealth Drive, WARRENDALE, PA 15096-001, USA

(Website: [www.sae.org](http://www.sae.org))

— UN United Nations Economic Commission for Europe transport regulations:

United Nations Bookshop

GA-1B-103

New York, NY 10017

USA

Tel: +1-212-963-7680

Email: [bookshop@un.org](mailto:bookshop@un.org)

(Website:

[https://www.unece.org/trans/danger/publi/unrec/rev13/13nature\\_e.html](https://www.unece.org/trans/danger/publi/unrec/rev13/13nature_e.html))

— UL Underwriters Laboratory standards:

(website: <https://standardscatalog.ul.com>)

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