



Explanatory Note to Decision 2016/013/R

CS-ETSO Amendment 11

RELATED NPA/CRD 2015-02 — RMT.0206 (ETSO.011) — 28.7.2016

EXECUTIVE SUMMARY

This Decision addresses an economic and harmonisation issue related to the regular update of European Technical Standard Orders (ETSOs) due to new or updated and improved standards for parts and appliances.

More specifically, the main objectives of this Decision are:

- (a) to modify of a number of ETSOs in order to harmonise them with the corresponding FAA TSOs;
- (b) to introduce new ETSOs (Index 1) which are technically similar to existing FAA TSOs; and
- (c) to introduce a new ETSO (Index 2), not existing in the FAA TSO series (i.e. ETSO-2C515 Aircraft halocarbon Clean Agent — Handheld fire extinguisher).

The changes are expected to reduce regulatory burden for validation of FAA TSO authorisations by EASA and vice versa, to increase cost-effectiveness, and to align CS-ETSO to the state of the art.

Applicability		Process map	
Affected regulations and decisions:	ED Decision 2003/10/RM (CS-ETSO)	Concept Paper:	No
Affected stakeholders:	— Certification authorities; — Equipment manufacturers	Terms of Reference (Issue 2):	26.06.2013
Driver/origin:	Efficiency/Proportionality	Rulemaking group:	No
Reference:	Article 5.6(b) of Regulation (EC) No 216/2008	RIA type:	Light
		Technical consultation during NPA drafting:	No
		Publication date of the NPA:	27.02.2015
		Duration of NPA consultation:	3 months
		Review group:	No
		Focused consultation:	No
		Publication date of the Opinion:	N/A
		Publication date of the Decision:	2016/Q3



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1. Procedural information

1.1. The rule development procedure

The European Aviation Safety Agency (hereinafter referred to as the 'Agency') developed ED Decision 2016/006/R in line with Regulation (EC) No 216/2008¹ (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure².

This rulemaking activity is included in the Agency's [Rulemaking Programme](#) under RMT.0206. The scope and timescale of the task were defined in the related Terms of Reference (ToR) (see process map on the title page).

The draft text of this Decision has been developed by the Agency based on the input of Rulemaking Group RMT.0206. All interested parties were consulted through NPA 2015-02³. 79 comments were received from interested parties, including industry and national aviation authorities (NAAs).

The Agency reviewed the comments received during the consultation process. Comments received and the Agency's responses thereto are presented in Comment-Response Document (CRD) 2015-02⁴.

The final text of this Decision with the certification specifications (CSs) has been developed by the Agency based on the outcome of several focused consultations.

The process map on the title page summarises the major milestones of this regulatory activity.

1.2. Structure of the related documents

Chapter 1 contains the procedural information related to this task. Chapter 2 explains the core technical content. The text of amended ETSO articles is annexed to the ED Decision.

¹ Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.3.2008, p. 1).

² The Agency is bound to follow a structured rulemaking process as required by Article 52(1) of the Basic Regulation. Such process has been adopted by the Agency's Management Board and is referred to as the 'Rulemaking Procedure'. See EASA Management Board (MB) Decision 01-2012 of 13 March 2012 amending and replacing MB Decision 08-2007 concerning the procedure to be applied by the Agency for the issuing of opinions, certification specifications and guidance material ('Rulemaking Procedure').

³ In accordance with Article 52 of the Basic Regulation and Articles 5(3) and 6 of the Rulemaking Procedure.

⁴ <http://easa.europa.eu/document-library/comment-response-documents>



2. Explanatory Note

2.1. Overview of the issues to be addressed

The purpose of this Decision is to amend Decision 2003/010/RM of the Executive Director of the Agency of 24 October 2003 on certification specifications, including airworthiness codes and acceptable means of compliance, for European Technical Standard Orders (CS-ETSO)⁵.

ETSOs are defined by Article 1.2(g) of Regulation (EC) No 748/2012 as detailed airworthiness specifications, issued by the Agency to ensure compliance with the requirements of the 'Part-21' as minimum performance standards for specified articles (i.e. parts and appliances as defined by Article 1(f) of the Regulation 748/2012).

2.2. Objectives

The overall objectives of the EASA system are defined in Article 2 of the Basic Regulation. This Decision will contribute to the achievement of the overall objectives by addressing the issues outlined in Chapter 2 of the NPA 2015-02.

This Decision:

- (a) modifies a number of ETSOs in order to harmonise them with the corresponding FAA TSOs;
- (b) introduces new ETSOs (Index 1) which are, where possible, technically similar to existing FAA TSOs⁶; and
- (c) introduces new ETSO (Index 2) not existing in the FAA TSO series.

2.3. Outcome of the consultation

79 comments from 24 commentators were received on NPA 2015-02, and the individual responses to each one of them were published in CRD 2015-02. The nature of the comments received ranges from specific technical comments, to comments aiming to improve the wording as well as others on the NPA text.

The majority of the comments submitted were either accepted or partially accepted.

2.4. Summary of the regulatory impact assessment (RIA)

Two possible policy options were identified for this task:

Option No	Short title	Description
0	Do nothing	Do not update/publish new versions of EASA ETSOs aligned with the latest FAA TSOs versions.
1	Amend CS-ETSO	Introduction of new ETSO(s) and transposition of selected FAA TSO specifications into technically similar ETSO(s).

⁵ Decision as last amended by Decision 2016/006/R of 25 April 2016.

⁶ FAA TSOs are available at <http://www.airweb.faa.gov>.



All the options were analysed in NPA 2015-02.

Option 1 (amend CS-ETSO) will contribute to the maximum possible harmonisation of CS-ETSO and FAA TSO and will save costs by minimising any duplication of certification and maintenance activities, including validation of (E)TSO authorisations across the two sides of the Atlantic. The adoption of these ETSO(s) will have a positive impact on safety through the introduction of new or improved technology. The systematic introduction of new standards will enable the Agency to match the new technology with adequate safety objectives.

Based on the foregoing, the preferred option was Option 1.

2.5. Overview of the amendments

Annex I (Preamble) lists the CS-ETSO Subparts and Indexes affected by this amendment.

Annex II contains the updated and complete CS-ETSO Indexes as well as the amended and newly introduced ETSO articles as listed hereinafter.

CS-ETSO

Subpart B

Index 1

ETSO-C3e: Turn and Slip Instruments

This update of ETSO-C3d is based on FAA TSO-C3e, issued on 15.10.2007.

Minimum Performance Standards (MPSs) are defined in SAE AS 8004, Minimum Performance Standard for Turn and Slip Instruments, dated 1 September, 1975.

This revision harmonises this ETSO with the corresponding FAA TSO regarding revision letter, complex hardware requirements, and failure classifications.

ETSO-C5f: Direction Instrument, Non-Magnetic (Gyroscopically Stabilized)

This update of ETSO-C5e is based on FAA TSO-C5f, issued on 2.2.2007.

Minimum Performance Standards (MPS) are defined in SAE AS 8021, Minimum Performance Standard for Direction Instrument, Non-Magnetic (Gyroscopically Stabilized), dated 16 March 1981.

This revision harmonises this ETSO with the corresponding FAA TSO regarding revision letter, complex hardware requirements and failure classifications.

ETSO-C70b: Life Rafts

This new Index 1 ETSO article is actually an updating of the previous ETSO-2C70b. It is based on FAA TSO-C70b, issued on 4.8.2014.

Newly designed Life Rafts must meet the Minimum Performance Specifications (MPS) of SAE AS1356, dated July 2012, as modified by Appendix 1 to the ETSO.

The content and Minimum Performance Standards (MPS) of this ETSO were harmonised with the corresponding FAA TSO, therefore, the ETSO-2C70b has been removed from Index 2 and moved to Index 1 of CS-ETSO.



ETSO-C76b: Fuel Drain Valves

This update of ETSO-C76a is based on FAA TSO-C76b, issued on 18.4.2012.

Minimum Performance Standards (MPS) are defined in Appendix 1 to the ETSO, MINIMUM PERFORMANCE STANDARD (MPS) FOR FUEL DRAIN VALVES.

For harmonisation reasons with FAA TSO-C76b, and to avoid confusion with different revision levels, EASA directly publishes revision b of ETSO-C76.

ETSO-C88b: Automatic Pressure Altitude Reporting Code Generating Equipment

This update of ETSO-C88a is based on FAA TSO-C88b, issued on 6.2.2007.

Minimum Performance Standards (MPS) are defined in SAE AS 8003, Minimum Performance Standard for Automatic Pressure Altitude Reporting Code Generating Equipment, issued in July 1974 and reaffirmed in May 1991.

This revision harmonises this ETSO with the corresponding FAA TSO regarding revision letter, complex hardware requirements and failure classifications.

ETSO-C89a: Crew Member Oxygen Regulator, Demand

This update of ETSO-C89 is based on FAA TSO-C89a, issued on 8.4.2008.

Newly designed Crew Member Oxygen Regulators must meet the Minimum Performance Specifications (MPS) of SAE AS 8027 'Crew Member Oxygen Regulator, Demand', dated June 2004, as modified by Appendix 1 to the ETSO.

ETSO-C90d A1: Cargo Pallets, Nets and Containers

The aim of this editorial update of ETSO-C90d is to correct a typo in paragraph 3.1.1 of ETSO-C90d.

ETSO-C99a: Flight Deck (Sedentary) Crew Member Protective Breathing Equipment

This update of ETSO-C99 is based on FAA TSO-C99a, issued on 5.6.2008.

Minimum Performance Standards (MPS) are defined in SAE AS 8031A, Personal Protective Devices for Toxic and Irritating Atmospheres Air Transport Flight Deck (Sedentary) Crewmembers, dated March 1999, as amended by Appendix 1 to the ETSO.

ETSO-C100c: Aviation Child Safety Device (ACSD)

This update of ETSO-C100b is based on FAA TSO-C100c, issued on 6.4.2012.

Newly designed Aviation Child Safety Device (ACSD) must meet the Minimum Performance Standards set forth in SAE AS 5276/1, Performance Standard for Child Restraint Systems in Transport Category Airplanes, dated November 2000, as amended by Appendix 1 to the ETSO.

ETSO-C112e: Secondary Surveillance Radar Mode S Transponder

This update of ETSO-C112d is based on FAA TSO-C112e, issued on 16.9.2013.



Minimum Performance Standards (MPS) are defined in EUROCAE ED-73E, Minimum Operational Performance Standards for Secondary Surveillance Radar Mode S Transponders, dated May 2011, as amended by Appendix 1 to the ETSO.

ETSO-C113a: Airborne Multipurpose Electronic Displays

This update of ETSO-C113 is based on FAA TSO-C113a, issued on 30.4.2012.

Minimum Performance Standards (MPSs) are defined in SAE AS 8034B, Minimum Performance Standards for Airborne Multipurpose Electronic Displays, dated June 2011. Additional requirements on colour can be found in Appendix 1 to the ETSO.

ETSO-C116a: Crewmember Portable Protective Breathing Equipment

This update of ETSO-C116 is based on FAA TSO-C116a, issued on 30.7.2009.

Minimum Performance Standards (MPS) are defined in SAE AS 8047, Performance Standard for Cabin Crew Portable Protective Breathing Equipment for Use During Aircraft Emergencies, dated June 2002, as modified by Appendix 1 to the ETSO.

ETSO-C119d: Airborne Collision Avoidance System II (ACAS II, Version 7.1)

This update of ETSO-C119c is based on FAA TSO-C119d, issued on 5.9.2013.

Minimum Performance Standards (MPS) are defined in EUROCAE Document ED-143, Minimum Operational Performance Standards for Traffic Alert and Collision Avoidance System II (TCAS II), dated September 2008, as modified by Change 1 dated April 2009, Change 2 (Version 7.1) dated April 2013, and by Appendix 1 to this ETSO.

The optional functionality set forth in EUROCAE Document ED-221, Minimum Operational Performance Standards for Traffic Alert and Collision Avoidance System II (TCAS II) Hybrid Surveillance, dated April 2013, Sections 2 and 3 (as modified by Appendix 2 to the ETSO) are included.

ETSO-C126b: 406 and 121.5 MHz Emergency Locator Transmitter

This update of ETSO-C126a is based on FAA TSO-C126b, issued on 26.11.2012.

Minimum Performance Standards (MPS) are defined in EUROCAE ED-62A, Minimum Operational Performance Standards (MOPS) for 406 MHz Emergency Locator Transmitters (ELTs), dated February 2009.

ETSO-C127b: Rotorcraft, Transport Aeroplane, and Small Aeroplane Seating Systems

This update of ETSO-C127a is based on FAA TSO-C127b, issued on 6.6.2014.

New models of rotorcraft, transport aeroplane, and small aeroplane seating systems must meet the Minimum Performance Standards (MPS) defined in SAE AS8049B, Performance Standard for Seats in Civil Rotorcraft, Transport Aircraft, and General Aviation Aircraft, dated January 2005, as modified by Appendix 1 to the ETSO, as well as SAE ARP5526C, Aircraft Seat Design Guidance and Clarifications, dated May 2011, as modified by Appendix 1 to the ETSO and Appendix 2 to the ETSO (for specific elective requirements).



ETSO-C139a: Audio Systems and Equipment

This update of ETSO-C139 is based on FAA TSO-C139a, issued on 25.2.2014.

Minimum Performance Standards (MPS) are defined in RTCA DO-214A, Audio Systems Characteristics and Minimum Performance Standards for Aircraft Audio Systems and Equipment, dated 18 December 2013.

ETSO-C151c: Terrain Awareness and Warning System (TAWS)

This update of ETSO-C151b is based on FAA TSO-C151c, issued on 27.6.2012.

Minimum Performance Standards (MPS) are defined in Appendix 1 to the ETSO 'Federal Aviation Administration Minimum Performance Standard For A Terrain Awareness And Warning System For Classes A And B' and in Appendix 3 'Federal Aviation Administration Minimum Performance Standard For A Terrain Awareness And Warning System For Class C', dated 27 June 2012.

ETSO-C159b: Next Generation Satellite Systems (NGSS) equipment

This update of ETSO-C159a is based on FAA TSO-C159b, issued on 29.9.2014.

Minimum Performance Standards (MPS) are defined in RTCA DO-262B, Minimum Operational Performance Standards for Avionics Supporting Next Generation Satellite Systems (NGSS), dated 17 June 2014, except that any requirement of RTCA DO-326, 'Airworthiness Security Process Specification', which are referenced in the applicable Normative Appendix D or E of RTCA DO262B .

ETSO-C166a A2: Extended Squitter Automatic Dependent Surveillance-Broadcast (ADS-B) And Traffic Information Services-Broadcast (TIS-B) Equipment Operating On The Radio Frequency Of 1090 Megahertz (MHz)

This update of ETSO-C166b A1 is only correcting a remaining reference to RTCA DO-260B into a reference to EUROCAE ED-102A. The technical content is unchanged.

Minimum Performance Standards (MPS) are defined in EUROCAE ED-102A, Minimum Operational Performance Standards for 1090 MHz Extended Squitter Automatic Dependent Surveillance-Broadcast (ADS-B) and Traffic Information Services-Broadcast (TIS-B), dated December 2009, Section 2.

ETSO-C173a: Nickel-Cadmium and Lead-Acid Batteries

This update of ETSO-C173 is based on FAA TSO-C173a, issued on 15.3.2013.

Newly designed Nickel-Cadmium and Lead-Acid Batteries must meet the requirements of RTCA DO-293A, Minimum Operational Performance Standards (MPS) for Nickel-Cadmium, Nickel Metal-Hydrate, and Lead-Acid Batteries, dated 2 December 2009, as amended by Appendix 1 to the ETSO.

ETSO-C201: Attitude and Heading Reference Systems (AHRS)

This new ETSO is based on FAA TSO-C201, issued on 26.7.2012.

Newly designed Attitude and Heading Reference Systems must meet the requirements of Sections 2.1, 2.2.1, and 2.2.2 of RTCA Document No RTCA/DO-334, Minimum Operational Performance Standards (MOPS) for Solid-State Strap-Down Attitude and Heading Reference Systems (AHRS), dated 21 March 2012.



ETSO-C202: Cargo Stopper Devices

This new ETSO is based on FAA TSO-C202.

Newly designed Cargo Stopper Devices must meet the Minimum Performance Standards (MPS) defined in SAE AS6554, Cargo Stopper Devices, issued in July 2011.

Index 2**ETSO-2C515: Aircraft Halocarbon Clean Agent — Hand Held fire extinguishers**

This new ETSO is created in accordance with Commission Regulation (EU) No 744/2010⁷ on phasing out halon as a fire extinguishing agent.

Newly designed aircraft handheld fire extinguishers have to meet the Minimum Performance Standards (MPS) set forth in SAE AS6271, Halocarbon Clean Agent — Hand-Held Fire Extinguisher, issued in January 2013, as modified by Appendix 1 to the ETSO.

With publication of ETSO-2C515 the first step is done to achieve the replacement of the Ozone depleting Halon gas from the aircraft and to comply with Regulation (EC) No 1005/2009⁸ and subsequent amendments thereto.

2.5.1 Changes since the publication of the NPA

The changes highlighted below do not represent the complete list of the changes made compared to the text proposed by the NPA, but lists only the high level changes.

They are the result of the comments received during the public consultation of the NPA.

Deletion of C167

After consideration of substantial comments from industry, followed by an internal review with the related experts of the Agency, it was decided not to publish ETSO-C167.

The well-established certification practise in Europe, based on STC process, has been considered to be an adequate and safe process producing equal or better results than it would have been achieved by transposition of FAA TSO-C167.

The Certification Memorandum (ref. CM-CS-005 Issue 01, dated 08/12/2014) clarifies the European Aviation Safety Agency's general course of action on this specific certification item.

Definition of failure conditions

Where necessary, the proposed CS-ETSO articles have been modified in order to make a clear distinction between loss and erroneous aspects of the failure conditions.

⁷ Commission Regulation (EU) No 744/2010 of 18 August 2010 amending Regulation (EC) No 1005/2009 of the European Parliament and of the Council on substances that deplete the ozone layer, with regard to the critical uses of halons (OJ L 218, 19.8.2010, p. 2).

⁸ Regulation (EC) No 1005/2009 of the European Parliament and of the Council of 16 September 2009 on substances that deplete the ozone layer (OJ L 286, 31.10.2009, p. 1).



The Agency's position is that ETSO an article manufacturer has to define assumptions regarding the installation on the aircraft and come up with failure condition classifications while specifying the equipment.

The affected articles are ETSO-C3e, ETSO-C5f, ETSO-C88b, ETSO-C112e, ETSO-C159b, ETSO-C166b, and ETSO-C119d.

References to DO-160/ED-14

References to dedicated revisions of DO-160/ED-14 have been replaced by a reference to CS-ETSO, Subpart A, paragraph 2.1

Appendix 1 of ETSO-C70b 'Life Rafts'

Based on a post NPA comment received from industry, the Agency decided to amend the Appendix 1 of ETSO-C70b in order to accommodate partial ETSO authorisations for liferaft to be integrated in rotorcraft installations.

In these specific cases, certain ETSO functions are provided by the TC/STC holder through the aircraft installation process.



3. References

3.1. Related regulations

None.

3.2. Affected decisions

Decision No. 2003/10/RM of the Executive Director of the Agency of 24 October 2003 on certification specifications, including airworthiness codes and acceptable means of compliance, for European Technical Standard Orders ([‘CS-ETSO’](#))

3.3. Reference documents

Not applicable.

