Approved Deviations for CS-ETSO

Introductory note

The hereby presented deviations have been accepted by the Agency on Industry request following a public consultation in accordance with EASA Management Board Decision n° 7-2004 as amended by EASA Management Board Decision No 12-2007[1] for products certification procedure dated 30 March 2004, Article 3 (2.). To ease tracking the deviations are presented in the order of the ETSO number without taking the CS-ETSO index into account.

The deviations are always linked to a specific revision of the respective ETSO as identified in the deviation number; e.g. ETSO-C2d#1 is linked to the revision "d" of ETSO-C2. If the ETSO - and in most cases as well the referenced Minimum Operational Performance Standard (MOPS) is revised - the applicability of the deviation needs to be re-assessed. For tracking purposes, the deviations superseded by new requirements are still present in this document, as they are still valid for the old ETSO authorisations granted and still may be needed to assess aircraft installations. Only in case of references to CS-ETSO Subpart A notes are added, indicating that the deviation is outdated. No notes will be added to deviations linked to already outdated ETSOs.

Deviations

CS-ETSO Subpart A 2.1#1

Use of EUROCAE ED-14E/RTCA DO-160E instead of ED-14D/DO-160D change 3.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

Note: Deviation is superseded through amendment CS-ETSO/6 effective 21/12/2010 modifying CS-ETSO Subpart A 2.1.

CS-ETSO Subpart A 2.1#2

Use of EUROCAE ED-14F/RTCA DO-160F instead of ED-14D/DO-160D change 3.

Published in ETSO.DevP.26 from 30.10.2008 to 21.11.2008.

No comment received.

Note: Deviation is superseded through amendment CS-ETSO/6 effective 21/12/2010 modifying CS-ETSO Subpart A 2.1.

ETSO-C2d#1 – Airspeed Instruments

Deviate from ETSO-C2d 3.1.1 to use SAE AS 8019A instead of SAE AS 8019 as the Minimum Performance Standard.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

[1] Cf. EASA Web: http://easa.europa.eu/management-board/meetings/2007/04/MB%20Decision%2012-2007%20amending%20the%20certification%20procedure.pdf

ETSO-C2d#2 – Airspeed Instruments

Deviate from ETSO-C2d to eliminate the requirement 3.2.3 in SAE AS 8019A that requires "the instrument face to be marked with 'Airspeed' or 'IAS' and also with the applicable units of measure."

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C2d#3 – Airspeed Instruments

Deviate from ETSO-C2d to modify the requirement 3.2.5 in SAE AS 8019A that requires "The indicating means to be visible from all points on a surface defined as making an angle of 30 degrees with the perpendicular." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) as 45 degrees in both horizontal directions, 45 degrees in the up vertical direction, and 10 degrees in the down vertical direction.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C2d#3a – Airspeed Instruments

Deviate from ETSO-C2d to modify the requirement 3.2.5 in SAE AS 8019A that requires "The indicating means to be visible from all points on a surface defined as making an angle of 30 degrees with the perpendicular." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) by the applicant.

In analogy to ETSO-C2d#3.

ETSO-C2d#4 – Airspeed Instruments

Deviate from SAE AS8019A § 3.2.1 and allow 10 knot graduations with speed labelling every 20 knots and no minor graduations. In addition, a digital display is provided. This proposal is in line with the recommended symbol 18 of SAE/ARP4102-7 App. A.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C2d#5 – Airspeed Instruments

The SAE AS 8019A 3.2.6 requirement for range marking on the nameplate shall not apply for EFIS displays.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C3d#1 – Turn and Slip Instruments

Deviate from ETSO-C3d to modify the requirement 3.7 in SAE AS 8004 that requires "The indicating means to be visible from all points on a surface defined as making an angle of 30 degrees with the perpendicular." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) as 45 degrees in both horizontal directions, 45 degrees in the up vertical direction, and 10 degrees in the down vertical direction.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C3d#1a – Turn and Slip Instruments

Deviate from ETSO-C3d to modify the requirement 3.7 in SAE AS 8004 that requires "The indicating means to be visible from all points on a surface defined as making an angle of

30 degrees with the perpendicular." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) by the applicant.

In analogy to ETSO-C3d#1 as SAE AS 8034 leaves it to the applicant defining the viewing angle.

ETSO-C4c#1 – Bank and Pitch Instruments

Deviate from ETSO-C4c 3.1.1 to use SAE AS 8001 instead of SAE AS 396B for Minimum Performance Standards and Environmental Standards.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C4c#2 – Bank and Pitch Instruments

Deviate from ETSO-C4c 3.1.2 and SAE Aerospace Standard AS 8001 to use RTCA DO-160D instead of RTCA DO-138 as the standard for Environmental Conditions and Test Procedures for Airborne Equipment.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C4c#2a – Bank and Pitch Instruments

Deviate from ETSO-C4c 3.1.2 and use RTCA DO-160D instead of SAE AS 396B as the standard for Environmental Conditions and Test Procedures for Airborne Equipment.

In analogy to ETSO-C4c#2 but without the use of deviation ETSO-C4c#1.

ETSO-C4c#2b – Bank and Pitch Instruments

Deviate from ETSO-C4c 3.1.2 and use RTCA DO-160F instead of SAE AS 396B as the standard for Environmental Conditions and Test Procedures for Airborne Equipment.

In analogy to ETSO-C4c#2 but without the use of deviation ETSO-C4c#1.

ETSO-C4c#3 – Bank and Pitch Instruments

Neither ETSO-C4c nor SAE Aerospace Standard AS 8001 specifies use of a standard for software development. EUROCAE ED-12B/RTCA DO-178B shall be used as the standard for Software Considerations in Airborne Systems and Equipment Certification. It is not necessary to file a deviation to use this standard in case software is used in the equipment.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C4c#4 – Bank and Pitch Instruments

Deviate from ETSO-C4c Section 4.1 to remove the marking requirement "*… the following information shall be legibly and permanently marked on the equipment: Nominal power input rating (electrical voltage and frequency, vacuum or air pressure)"*

Published in ETSO.DevP.26 from 31.10.2008 to 21.11.2008.

No comments received.

ETSO-C4c#5 – Bank and Pitch Instruments

Deviate from ETSO-C4c Section 3.1.1 for SAE AS 396B §6.1 for maximum "starting" time of 3 minutes. Adapt the starting time for TSO/ETSO C6d and C4d, introduce an

operational limitation in the installation manual, in the DDP and in the pilot's guide. Usage as secondary source of bank and pitch.

Published in ETSO.DevP.41 from 23.07.2009 to 17.08.2009.

CRD document: CRD DevP41.

ETSO-C6d#1 – Direction Instrument, Magnetic (Gyroscopically Stabilized)

Deviate from ETSO-C6d 3.1.1 to use SAE AS 8013A instead of SAE AS 8013 as the Minimum Performance Standard.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C6d#2 – Direction Instrument, Magnetic (Gyroscopically Stabilized)

Deviate from ETSO-C6d to modify the requirement 3.10.2 in SAE AS 8013A that requires "The indicating means to be visible from all points on a surface defined as making an angle of 30 degrees with the perpendicular." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) as 45 degrees in both horizontal directions, 45 degrees in the up vertical direction, and 10 degrees in the down vertical direction.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C6d#2a – Direction Instrument, Magnetic (Gyroscopically Stabilized)

Deviate from ETSO-C6d to modify the requirement 3.10.2 in SAE AS 8013A that requires "The indicating means to be visible from all points on a surface defined as making an angle of 30 degrees with the perpendicular." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) by the applicant.

In analogy to ETSO-C6d#2 as SAE AS 8034 leaves it to the applicant defining the viewing angle.

ETSO-C6d#3 – Direction Instrument, Magnetic (Gyroscopically Stabilized)

Deviate from ETSO-C6d to modify the requirement 3.6 in SAE AS 8013A and to provide an integral health monitoring with an associated health message. The detailed requirements are not adequate to AHRS not using the synchro or rotating gyro technology.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C6d#4 – Direction Instrument, Magnetic (Gyroscopically Stabilized)

Deviate from ETSO-C6d to modify the requirement 3.13 in SAE AS 8013A and use a sensor combination with a mathematical process to provide heading in line with magnetic heading. When no alignment is needed the indication of the alignment and /or failure of alignment status is not necessary.

Remark: It is EASA interpretation that a mathematical process bringing the heading in line with magnetic heading is an automatic function as described in the requirement and no deviation request is needed for such a function.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

CRD document CRD.DevP11.

ETSO-C6d#5 – Bank and Pitch Instruments

Deviate from ETSO-C6d §3.1.1 for SAE AS 8013 §4.1 for maximum “starting” time of 3 minutes. Adapt the starting time for TSO/ETSO C6d and C4d, introduce an operational limitation in the installation manual, in the DDP and in the pilot’s guide. Usage as secondary source of bank and pitch.

Published in ETSO.DevP.41 from 23.07.2009 to 17.08.2009.

CRD document: CRD DevP41.

ETSO-C6e#1 – Direction Instrument, Magnetic (Gyroscopically Stabilized)

Deviate from ETSO-C6e to modify the requirement 3.10.2 in SAE AS 8013A that requires "The indicating means to be visible from all points on a surface defined as making an angle of 30 degrees with the perpendicular." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) by the applicant.

Similar to ETSO-C6d#2 no republication.

ETSO-C7d#1 – Direction Instrument, Magnetic Non-Stabilized Type (Magnetic Compass)

Deviate from ETSO-C7d Section 3.1.2 to use of RTCA DO-160D change 3 in lieu of SAE AS398A for environmental testing except that the Extreme Temperature Tests must be performed in accordance with SAE AS398A.

Published in ETSO.DevP.28 from 7.11.2008 to 30.11.2008.

No Comments received.

ETSO-C8d#1 – Vertical Velocity Instrument (Rate-of-Climb)

Deviate from ETSO-C8d 3.1.1 to use SAE AS 8016A instead of SAE AS 8016 as the Minimum Performance Standard.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C8d#2 – Vertical Velocity Instrument (Rate-of-Climb)

Deviate from ETSO-C8d to modify the requirement 3.2.4 in SAE AS 8016A that requires "The indicating means to be visible from all points on a surface defined as making an angle of 30 degrees with the perpendicular." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) as 45 degrees in both horizontal directions, 45 degrees in the up vertical direction, and 10 degrees in the down vertical direction.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C8d#2a – Vertical Velocity Instrument (Rate-of-Climb)

Deviate from ETSO-C8d to modify the requirement 3.2.4 in SAE AS 8016A that requires "The indicating means to be visible from all points on a surface defined as making an angle of 30 degrees with the perpendicular." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) as 45 degrees in both horizontal directions, 45 degrees in the up vertical direction, and 10 degrees in the down vertical direction.

In analogy to ETSO-C8d#2 as SAE AS 8034 leaves it to the applicant defining the viewing angle.

ETSO-C9c#1 – Automatic Pilots

Deviate from ETSO-C9c 3.1.1 to use SAE AS-402B instead of AS-402A.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C9c#2 – Automatic Pilots

Deviate from AS-402B paragraph 4.4.1 to limit autopilot engagement to attitudes considered safe for the certified aircraft. Instead use Autopilot limitations that limit pitch and roll engagement to more conservative limits.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C9c#3 – Automatic Pilots

Deviate from AS402B paragraph 4.3.2 to not provide servo effort indications when the automatic pilot is not engaged in those cases that exclude servo effort by design in the non engaged state.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C9c#4 – Automatic Pilots

Deviate from ETSO-C9c 3.1.2 to use DO-160D instead SAE AS 402A for specified environmental tests.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C10b#1 – Aircraft Altimeter, Pressure Actuated, Sensitive Type

Deviate from ETSO-C10b 3.1.1 to use SAE AS 8009A instead of SAE AS 392C as the Minimum Performance Standard.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C10b#2 – Aircraft Altimeter, Pressure Actuated, Sensitive Type

Deviate from ETSO-C10b to modify the requirement 3.7 in SAE AS 8009A that requires "Pointers and dial markings shall be visible from any point within the frustrum of a cone; the side of which makes an angle of 30 degrees with the perpendicular to the dial and the small diameter of which is the aperture the instrument case." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) as 45 degrees in both horizontal directions, 45 degrees in the up vertical direction, and 10 degrees in the down vertical direction.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C10b#2a – Aircraft Altimeter, Pressure Actuated, Sensitive Type

Deviate from ETSO-C10b to modify the requirement 4.3 in SAE AS 392C (3.7 in SAE AS 8009A) that requires "Pointers and dial markings shall be visible from any point within the frustrum of a cone; the side of which makes an angle of 30 degrees with the perpendicular to the dial and the small diameter of which is the aperture the instrument case." The

viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) by the applicant.

In analogy to ETSO-C10b#2 as SAE AS 8034 leaves it to the applicant defining the viewing angle.

ETSO-C10b#3 – Aircraft Altimeter, Pressure Actuated, Sensitive Type

Deviate from SAE AS 8009A Section 3.11 to not display ALTITUDE or ALT next to the tape indicating altitude.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C10b#3a – Aircraft Altimeter, Pressure Actuated, Sensitive Type

Deviate from SAE AS 392C Section 4.2.4 to not display ALTITUDE or ALT next to the tape indicating altitude.

Published in ETSO.DevP.05 from 8.5.2007 to 30.5.2007.

No Comments received.

ETSO-C10b#4 – Aircraft Altimeter, Pressure Actuated, Sensitive Type

Deviate from ETSO-C10b 3.1.1 to use RTCA DO-160D instead of SAE AS 8009A as the standard for Environmental Conditions and Test Procedures for Airborne Equipment.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C10b#4a – Aircraft Altimeter, Pressure Actuated, Sensitive Type

Deviate from ETSO-C10b 3.1.1 to use RTCA DO-160D instead of SAE AS 392C as the standard for Environmental Conditions and Test Procedures for Airborne Equipment.

In analogy to ETSO-C10b#4 but without the use of deviation ETSO-C10b#1.

ETSO-C10b#4b – Aircraft Altimeter, Pressure Actuated, Sensitive Type

Deviate from ETSO-C10b 3.1.1 to use RTCA DO-160F instead of SAE AS 392C as the standard for Environmental Conditions and Test Procedures for Airborne Equipment.

In analogy to ETSO-C10b#4 but without the use of deviation ETSO-C10b#1.

ETSO-C10b#5 – Aircraft Altimeter, Pressure Actuated, Sensitive Type

SAE AS392C § 4.2.1 states, “4.2.1 Increments: Markings shall be provided at intervals not exceeding 20 feet of altitude with major increment markings at 100 foot intervals.” Instead, a combination of a tape and a digital readout for indicating altitude shall be used. Following current PFD conventions, the proposed tape shall have graduations every 100 feet with markings every 500 feet. The proposed altitude display comports with recommended symbols 39 and 40 of SAE/ARP4102-7 App. A.

Published in ETSO.DevP.05 from 8.5.2007 to 30.5.2007 and in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C10b#5a

Deviate from SAE AS 392C section 4.2.1 and provide 25 feet marking interval instead of the required 20 feet interval when having an additional digital readout with 10 feet resolution.

Described in ETSO.DevP.88a has been accepted without new consultation based on similarity to the already accepted deviations.

ETSO-C10b#6 – Aircraft Altimeter, Pressure Actuated, Sensitive Type

ETSO-C10b §4.1 No maximum operating altitude shall be marked on the integrated instrument.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

CRD document CRD.DevP11.

ETSO-C10b#7 – Aircraft Altimeter, Pressure Actuated, Sensitive Type

SAE AS 392c 4.2.3: Use a blue/brown background instead of a black one to display the altitude.

Published in ETSO.DevP.05 from 8.5.2007 to 30.5.2007.

No Comments received.

ETSO-C10b#8 – Aircraft Altimeter, Pressure Actuated, Sensitive Type

Deviate from SAE AS 392C Section 4.1 and provide a vertical altitude scale/tape with digital readout instead of a pointer moving in a clockwise direction.

Published in ETSO.DevP.30 from 5.12.2008 to 16.1.2009.

No Comments received.

ETSO-C13f#1 – Life preservers

The International Standard ISO 12402-7 (issued November 2006) has been used to qualify the life preserver gas reservoir instead of MIL-C-601G (issued 1972).

Published in ETSO.DevP.36 from 12.5.2009 to 5.6.2009.

No Comments received.

ETSO-C30c#1 – -Aircraft Position Lights

Deviate from ETSO-C30c 3.1.1 and use SAE AS 8037A instead of AS 8037 as the Minimum Performance Standard for Aircraft Position Lights.

Published in ETSO.DevP.45 from 22.2.2010 to 12.3.2010.

No Comments received.

ETSO-2C35d#1 – Radar Marker Receiving Equipment

Deviate from ETSO-2C35d which calls out EUROCAE 1/WG7 Section 3.16 to allow the visual indication of the Standard Test Signal to not flash synchronized with the keying, but to flash at the following fixed rates while keyed: Outer 1.33 Hz, Middle 3 Hz, Inner 4 Hz.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-2C36f#1 – Airborne ILS localizer receiving equipment (108-112 MHz)

Deviate from CS-ETSO ETSO-2C36f 3.1.1 and use EUROCAE ED-46B including amendment 1 dated October 1995 and amendment 2 dated July 15, 1997 instead of referring to amendment 1 only.

Published in ETSO.DevP.51 from 28.7.2010 to 20.8.2010.

No Comments received.

ETSO-2C37e#1
Deviate from ETSO-2C37e 3.1.1 and use EUROCAE ED 23B including amendments 1 to 3 instead of the initial release of the document.

Published in ETSO.DevP.35 from 20.11.2009 to 11.12.2009.

No comment received.

ETSO-2C38e#1
Deviate from ETSO-2C38e 3.1.1 and use EUROCAE ED 23B including amendments 1 to 3 instead of the initial release of the document.

Published in ETSO.DevP.35 from 20.11.2009 to 11.12.2009.

No comment received.

ETSO-C39b#1 – Aircraft seats and berths

Deviate from ETSO-C39b paragraph 3.1.1 by meeting, instead of the requirements set forth in NAS 809 specification, the requirements contained in relevant paragraphs of SAE AS8049 Revision B which do correspond to the ones in SAE AS8049 Revision A as listed and modified by FAA TSO-C39c. This deviation was accepted on the basis that SAE standard AS8049 Rev. A is already used in a more recent issue of the equivalent FAA TSO and that that SAE standard AS8049 Rev. B is used as the basic technical standard for certification of seats and their installation on CS part 25 aircraft.

Published in ETSO.DevP.24 from 18.8.2008 to 29.8.2007.

No Comments received.

ETSO-2C40c#1 - VOR Receiving Equipment Operating Within the Radio Frequency Range 108-117.95 Megahertz

Deviate from ETSO-2C40c (EUROCAE ED-22B Section 5.2.9 - Measurement Procedure) to have a deflection response of 0.5 to 2.7 seconds instead of 0.5 to 2 seconds.

Published in ETSO.DevP.62a from 02.05.2011 to 23.05.2011.

No comment received.

ETSO-2C40c#2 VOR Receiving Equipment Operating Within the Radio Frequency Range 108-117.95 Megahertz

Deviate from ETSO-2C40c and EUROCAE ED-22B section 3.1.1 and reduce the course deviation indicator sensitivity by a factor of 2 for standby instruments.

Published in ETSO.DevP.86 from 04.02.2013 to 26.02.2013.

No comment received.

ETSO-2C41d#1 – Airborne Automatic Direction Finding (ADF) Equipment

Deviate from ED 51 § 3.10 Spurious Responses: For the case of spurious responses when the receiver is tuned anywhere in the frequency range 190-850 kHz, it is requested that the threshold for spurious responses be reduced from 80 dB down to 40 dB down for three discrete frequencies of 1/2, 1/3, and 1/4 of the tuned frequency.

Published in ETSO.DevP.21 from 01.8.2008 to 18.8.2008.

No comments were received.

ETSO-C43c#1 – Temperature Instruments

Deviate from ETSO-C43c 3.1.1 to use SAE AS 8005A instead of SAE AS 8005 as the Minimum Performance Standard.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C44b#1 – Fuel Flowmeters

Deviate from ETSO-C44b 3.1.1 to use SAE AS 407C instead of SAE AS 407B to demonstrate compliance for Fuel Flowmeters.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C44b#2 – Fuel Flowmeters

Deviate from ETSO-C44b 3.1.2 to use RTCA DO-160D instead of SAE AS 407B as the standard for Environmental Conditions and Test Procedures for Airborne Equipment.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C44b#3 – Fuel Flowmeters

Deviate from ETSO-C44b to modify the requirement 4.2.5 in SAE AS 407C that requires "The indicating means to be visible from all points on a surface defined as making an angle of 30 degrees with the perpendicular." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) as 45 degrees in both horizontal directions, 45 degrees in the up vertical direction, and 10 degrees in the down vertical direction.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C44b#4 – Fuel Flowmeters

Deviate from ETSO-C44b to modify the requirement 4.1.1 in SAE AS 407C that requires "Type I Instruments: Rotating pointer with fixed graduated dial or counter type indication. Clockwise pointer motion shall indicate increasing rate of flow." The gauge is defined as a horizontal or vertical bar with fixed graduations, with a pointer motion to the right or up indicating an increase rate of flow.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C44b#5 – Fuel Flowmeters

Deviate from SAE AS 407C 4.2.3 and allow the use of analog scales that have graduations that exceed 10% of full scale value when the analog scale is accompanied by a digital readout.

Published in ETSO.DevP.19 from 28.4.2008 to 20.5.2008.

No comment received.

ETSO-C45a#1 – Manifold Pressure Instruments

Deviate from ETSO-C45a 3.1.1 to use SAE AS 8042 instead of SAE AS 411 for Minimum Performance Standards.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C45a#2 – Manifold Pressure Instruments

Deviate from ETSO-C45a to use RTCA DO-160D instead of SAE AS 411 as the standard for Environmental Conditions and Test Procedures for Airborne Equipment.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C45a#3 – Manifold Pressure Instruments

Deviate from ETSO-C45a SAE 8042 3.10.5 to use MAN as abbreviation instead of MANIFOLD PRESSURE or MANIF PRESS.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C45a#3a – Manifold Pressure Instruments

Deviate from ETSO-C45a, SAE AS 8042, 3.10.5 and use MAP or MAN PRESS instead of MANIFOLD PRESSURE or MANIF PRESS.

SAE AS 8008

CRD CRD.DevP05

Remark: An assessment is necessary showing that no confusion is possible.

ETSO-C45a#4 – Manifold Pressure Instruments

Deviate from ETSO-C45a to modify the requirement 3.10.9 in SAE AS 8042 that requires "The indicating means to be visible from all points on a surface defined as making an angle of 30 degrees with the perpendicular." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) as 45 degrees in both horizontal directions, 45 degrees in the up vertical direction, and 10 degrees in the down vertical direction.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C46a#1 – Maximum Allowable Airspeed Indicator Systems

Deviate from ETSO-C46a § 3.1.2 and use RTCA DO-160D change 3 instead of the „Federal Aviation Administration Standard, Maximum Allowable Airspeed Indicator Systems“ as environmental standard.

Published in ETSO.DevP.05 from 8.5.2007 to 30.5.2007.

No comments received.

ETSO-C46a#1a – Maximum Allowable Airspeed Indicator Systems

Deviate from ETSO-C46a § 3.1.2 and use RTCA DO-160F instead of the „Federal Aviation Administration Standard, Maximum Allowable Airspeed Indicator Systems“ as environmental standard.

In analogy to ETSO-C46a#1 using in addition CS-ETSO Subpart A 2.1#2.

ETSO-C46a#2 – Maximum Allowable Airspeed Indicator Systems

Deviate from ETSO-C46a paragraph 3.1.1 to use SAE AS 437A in lieu of SAE AS 437 as the Minimum Performance Standard

Published in ETSO.DevP.26 from 30.10.2008 to 21.11.2008.

No comment received.

ETSO-C46a#3 – Maximum Allowable Airspeed Indicator Systems

Deviate from ETSO-C46a paragraph 4.1 to remove the requirement for "… the instrument must be marked to indicate its range in knots and, if applicable, to identify the calibration employed to control the movement of the maximum allowable airspeed pointer in the Vmo and Mmo ranges, or to identify the particular aircraft type design on which the instrument is intended to be used."

Published in ETSO.DevP.26 from 30.10.2008 to 21.11.2008.

No comment received.

ETSO-C47#1 – Pressure Instruments – Fuel, Oil and Hydraulic (Reciprocating Engine Powered Aircraft)

Deviate from ETSO-C47 3.1.1 to use SAE AS 408C instead of SAE AS 408A for Minimum Performance Standards and Environmental Standards.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C47#2 – Pressure Instruments – Fuel, Oil and Hydraulic (Reciprocating Engine Powered Aircraft)

Deviate from ETSO-C47 to modify the requirement 4.1.5 in SAE AS 408C that requires "The indicating means to be visible from all points on a surface defined as making an angle of 30 degrees with the perpendicular." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) as 45 degrees in both horizontal directions, 45 degrees in the up vertical direction, and 10 degrees in the down vertical direction.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C47#3 – Pressure Instruments – Fuel, Oil and Hydraulic (Reciprocating Engine Powered Aircraft)

Deviate from ETSO-C47 3.1.1 to use RTCA DO-160D instead of AS 408C as the standard for environmental testing.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C47#4 – Pressure Instruments – Fuel, Oil and Hydraulic

Deviate from ETSO-C47 Section 4.1 to remove the marking requirement for "*… in lieu of the weight, the range shall be shown*."

Published in ETSO.DevP.26 from 30.10.2008 to 21.11.2008.

No comment received.

ETSO-C47a#1 – Pressure Instruments – Fuel, Oil and Hydraulic

Deviate from ETSO-C47a 3.1.2 to use EUROCAE ED-14D (RTCA/DO-160D) change 3 or EUROCAE ED-14F (RTCA/DO-160F) instead of EUROCAE ED-14E as the standard for environmental testing.

In analogy to ETSO-C47#3 and the requirements as introduced with amendment 6 to CS-ETSO subpart A paragraph 2.1.

ETSO-C47a#2 – Pressure Instruments – Fuel, Oil and Hydraulic

Deviate from ETSO-C47a Section 4.2 and SAE AS 408C 3.2.f and not require range marking for units not including the sensor.

In analogy to ETSO-C47#4.

ETSO-C49b#1 – Electric Tachometer: Magnetic Drag (Indicator and Generator)

Deviate from ETSO-C49b 3.1.1 to use SAE AS 404C instead of SAE AS 404B for Minimum Performance Standards and Environmental Standards.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C49b#2 – Electric Tachometer: Magnetic Drag (Indicator and Generator)

Deviate from ETSO-C49b to modify the requirement 4.1.2 in SAE AS 404C that requires "The indicating means to be visible from all points on a surface defined as making an angle of 30 degrees with the perpendicular." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) as 45 degrees in both horizontal directions, 45 degrees in the up vertical direction, and 10 degrees in the down vertical direction.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C49b#3 – Electric Tachometer: Magnetic Drag (Indicator and Generator)

Deviate from ETSO-C49b, SAE AS 404C requirement 4.1.3.2 second sentence which states, "The increment between graduations shall not exceed 2-1/2% of full scale, above 600 RPM." The tachometer gauge which incorporate a full time digital readout, multiple graduations on the dial are not needed in order for the correct reading to be obtained. The resolution of the digital readout will be 10 RPM which is less than 2-1/2% of full scale. A pointer with clockwise motion for increasing RPM, is provided.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C49b#4 – Electric Tachometer: Magnetic Drag (Indicator and Generator)

Deviate from ETSO-C49b 3.1.2 to use DO-160D instead of SAE AS 404B as the Environmental Standard.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C49b#5 – Electric Tachometer: Magnetic Drag (Indicator and Generator)

Deviate from ETSO-C49b Section 4.1 to remove the marking requirement for "… *in addition, range and rating shall be shown."*

Published in ETSO.DevP.26 from 30.10.2008 to 21.11.2008.

No comment received.

ETSO-C50c#1, - Audio Selector Panels and Amplifiers

Deviate from § 3.1.1 to use RTCA DO-214 instead of EUROCAE ED-18/RTCA DO-170 as the Minimum Performance Standard.

Published in ETSO.DevP.03 from 10.3.2007 to 2.4.2007.

CRD document: CRD DevP03.

ETSO-C50c#2 – Audio Selector Panels and Amplifiers

Deviate from § 3.1.2 to use EUROCAE ED-14E/RTCA DO-160E instead of ED-14D/ DO160D change 3 as environmental test standard.

Published in ETSO.DevP.03 from 10.3.2007 to 2.4.2007.

CRD document: CRD DevP03.

ETSO-C50c#3 – Audio Selector Panels and Amplifiers

Deviate from DO-214 2.8.2.7 Crosstalk

In sub-paragraph 2.8.7.2.1 Input-to-Output Crosstalk and Bleed-Through Levels: Vref will be defined as the rated output level of the monitored output in lieu of the rated input.

In sub-paragraph 2.8.2.7.2 Input-to-Input Crosstalk: Vref will be defined as the rated input level of the monitored input.

The use of rated input as the reference results in inconsistency in the permitted levels of crosstalk on different outputs.

Published in ETSO.DevP.03 from 10.3.2007 to 2.4.2007.

CRD document: CRD DevP03.

ETSO-C52b#1 – Flight Directors

Deviate from AS-8008 paragraph 3.6 to limit flight director operation to attitudes considered safe for the certified aircraft. The Autopilot limits pitch and roll engagement to more conservative limits.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C55#1 – Fuel and Oil Quantity Instruments (Reciprocating Engine Aircraft)

Deviate from ETSO-C55 3.1.1 to use SAE AS 405C instead of SAE AS 405B to demonstrate compliance for Fuel and Oil Quantity Instruments.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C55#2 – Fuel and Oil Quantity Instruments (Reciprocating Engine Aircraft)

Deviate from ETSO-C55 to modify the requirement 4.2.5 in SAE AS 405C that requires "The indicating means to be visible from all points on a surface defined as making an angle of 30 degrees with the perpendicular." The viewing envelope is defined (per ETSO-C113 and SAE AS8034 Section 4.2) as 45 degrees in both horizontal directions, 45 degrees in the up vertical direction, and 10 degrees in the down vertical direction.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C55#3 – Fuel and Oil Quantity Instruments (Reciprocating Engine Aircraft)

Deviate from ETSO-C55 to modify the requirement 4.2.4 in SAE AS 405C to allow "FUEL QTY" to be used to abbreviate "Fuel Quantity".

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C55#4 – Fuel and Oil Quantity Instruments (Reciprocating Engine Aircraft)

Deviate from ETSO-C55 3.1.2 to use DO-160D instead of SAE AS 405B as the Environmental Standard.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C57a#1 – Headsets and Speakers

Deviate from § 3.1.1 to use RTCA DO-214 instead of EUROCAE ED-18/RTCA DO-170 as the Minimum Performance Standard.

Published in ETSO.DevP.03 from 10.3.2007 to 2.4.2007.

CRD document: CRD DevP03.

ETSO-C57a#2 – Headsets and Speakers

Deviate from § 3.1.2 to use EUROCAE ED-14E/RTCA DO-160E instead of ED-14D/ DO160D change 3 as environmental test standard.

Published in ETSO.DevP.03 from 10.3.2007 to 2.4.2007.

CRD document: CRD DevP03.

ETSO-C57a#3 – Headsets and Speakers

Deviate from RTCA DO-214 2.3.8.4 and apply the Cord Connector Flexibility test only for the fixed panel mounted connectors and their counterpart and not for those acting as interconnections within the cable or at the headset.

Published in ETSO.DevP.03 from 10.3.2007 to 2.4.2007.

CRD document: CRD DevP03.

ETSO-C57a#4 – Headsets and Speakers

Deviate from EUROCAE ED-18 part II §4.4.1 for the limits of the rated impedance that shall be between the limits of 8 Ω and 32 Ω ± 20% instead of between 150 Ω and 600 Ω. This difference will be published in the DDP and in the user manual.

Published in ETSO.DevP.17 from 26.10.2007 to 26.11.2007.

No comments received.

No Deviation ETSO-C57a#5 – Headsets and Speakers

The RTCA DO 214 Section 2.3.8.4, 2.6.2.8 pull out test is not applicable the headset side of the cord.

Published in ETSO.DevP.27 from 19.12.2008 to 23.01.2009.

No comments received.

ETSO-C57a#6 – Headsets and Speakers

Deviate from RTCA DO-214 Section 2.3.1.1 and allow higher frequency response levels (up to +12 dB) at frequencies above 1.5 kHz. An additional speech quality test is performed to substantiate the equal level of safety.

Published in ETSO.DevP.27 from 19.12.2008 to 23.01.2009.

No comments received.

ETSO-C57a#7 – Headsets and Speakers

Deviate from RTCA DO-214 2.3.3.1 and provide a higher Sound Pressure Level (SPL) of 90 -5/+18 dB instead of 90 +/- 5 dB SPL (re: 20 µPa) out of 1 mW (RMS) input signal.

Published in ETSO.DevP.52 from 16.8.2010 to 6.9.2010.

CRD document: CRD DevP52.

ETSO-C58a#1 – Aircraft Microphones (Except Carbon)

Deviate from § 3.1.1 to use RTCA DO-214 instead of EUROCAE ED-18/RTCA DO-170 as the Minimum Performance Standard.

Published in ETSO.DevP.03 from 10.3.2007 to 2.4.2007.

CRD document: CRD DevP03.

ETSO-C58a#2 – Aircraft Microphones (Except Carbon)

Deviate from § 3.1.2 to use EUROCAE ED-14E/RTCA DO-160E instead of ED-14D/ DO160D change 3 as environmental test standard.

Published in ETSO.DevP.03 from 10.3.2007. to 2.4.2007.

CRD document: CRD DevP03.

ETSO-C58a#3 – Aircraft Microphones (Except Carbon)

Deviate from RTCA DO-214 Section 2.2.1 and replace/supplement the frequency response requirement by requirements provided in ISO/TR 4870, ANS/ S3.2-1989 for in-ear microphones using bone-conducting technology. In the frequency-range 3.2 – 6 kHz the limit may exceed the -10 dB up to a maximum of -20 dB at 6 kHz.

Published in ETSO.DevP.27 from 19.12.2008 to 23.01.2009.

No comments received.

ETSO-C58a#4 – Aircraft Microphones (Except Carbon)

Deviate from RTCA DO-214 Section 2.2.11 and allow acoustical cross-talk from the Headset to Microphone for frequencies above 4.5 kHz up to a maximum signal of 9 dB mV at 6 kHz for in-ear systems with one active microphone.

Published in ETSO.DevP.27 from 19.12.2008 to 23.01.2009.

No comments received.

ETSO-C58a#5 – Aircraft Microphones (Except Carbon)

Deviate from RTCA DO 214 Section 2 § 2.2.1.1 for the frequency response and use a frequency response tailored to the type of speaker/usage. A specific frequency response and a speech quality test to demonstrate an equivalent level of safety for this type of active switch microphone in the prescribed usage conditions were accepted. The usage conditions for the active switch microphone were specified on the ETSO authorisation as a usage limitation: Used in the cavity of the ETSO 2C78/TSO C78a Crew Oxygen masks as specified in the DDP.

Published in ETSO.DevP.44 from 16.12.2009 to 18.01.2010.

No comments received.

ETSO-C58a#6 – Aircraft Microphones (Except Carbon)

Deviate from RTCA DO-214 Test procedures as detailed in 2.6.2.1, 2.6.2.3, and 2.6.2.5 and use a supply voltage of 12 to 16 VDC instead of 8 to 16 VDC for handsets.

Published in ETSO.DevP.52 from 16.8.2010 to 6.9.2010.

CRD document: CRD DevP52.

ETSO-C58a#7 – Aircraft Microphones (Except Carbon)

Deviate from RTCA DO-214 2.2.9 and allow a lower Push to Talk switch current of 0.5 A instead of 1A and a higher switch contact resistance of 400 mOhm instead of 50 mOhm for Handsets.

Published in ETSO.DevP.52 from 16.8.2010 to 6.9.2010.

CRD document: CRD DevP52.

ETSO-C58a#8 – Aircraft Microphones (Except Carbon)

Deviate from RTCA DO-214 2.2.2 to allow 3.5 dB instead of the required 5 dB output increase when doing the 6 dB sound pressure increase test.

Published in ETSO.DevP.56 from 7.12.2010 to 5.1.2011.

No comments received.

ETSO-C62d#1 – Aircraft Tyres

Deviate from Appendix 1 §4.3 is requested for the requirement of 4 times rated pressure reduced to 3 times for retread tyres as per FAA AC145-4A paragraph 11d

Published in ETSO.DevP.37 from 11.6.2009 to 3.7.2009.

CRD document: CRD DevP37.

ETSO-2C63c#1 – Airborne Weather Radar

Deviate from EUROCAE/ED-38 paragraph 2.2.3, Pulse Duration, and use a pulse compression technique in lieu of limiting the pulse duration. Potential side-lobe effects need to be assessed.

Published in ETSO.DevP.71 from 12.7.2012 to 3.8.2012.

No comments received.

ETSO-2C63c#2 – Airborne Weather Radar

Deviate from EUROCAE ED-38 paragraph 2.2.8, Frequency of Antenna Scan, and allow a less frequent scanning of the volume for ranges grater than 25 nm.

Published in ETSO.DevP.71 from 12.7.2012 to 3.8.2012.

No comments received.

ETSO-2C63c#3 – Airborne Weather Radar

Deviate from EUROCAE/ED-38 paragraph 2.2.15, and allow a wider receiver bandwidth when using pulse compression technology.

Published in ETSO.DevP.89 from 04.03.2013 to 25.03.2013.

No comments received.

ETSO-C64a#1 - Oxygen Mask Assembly, Continuous Flow, Passenger

Deviate from paragraph 3.1 of ETSO-C64a by testing in accordance with SAE AS8025A versus SAE AS8025.

Published in ETSO.DevP.48r1 from 06.05.2010 to 28.5.2010.

CRD document: CRD DevP48.

ETSO-C64a#2 - Oxygen Mask Assembly, Continuous Flow, Passenger

Deviate from SAE AS8025A paragraph 6.1.7 and replace the breathing machine test to determine mask oxygen flows with testing performed on human subjects at altitude.

Published in ETSO.DevP.48r1 from 06.05.2010 to 28.5.2010.

CRD document: CRD DevP48.

ETSO-2C66b - Distance Measuring Equipment (DME) operating within the radio frequency range of 960-1215 Megahertz

Deviate the interpretation of EUROCAE ED-54 document §3.2.2 b) requirement for "DME/N Minimum Performance Specification standard conditions" "Multi-channel mode (scanning DME) "Search and Track" "Free Scanning". Substitute the 3 seconds requirement for the scanning of a single DME station by the 3 minutes requirement from ARINC 709-8 to completely scan all DME stations.

Published in ETSO.DevP.67 from 23.09.2011 to 17.10.2011.

No comments received.

ETSO-C73#1 – Static Electrical Power Inverter

Deviate from ETSO-C73 attached FAA Standard for Power Inverters paragraph 2.3 and provide 50 Hz +/- 1 % or 60 Hz +/- 1 % instead of the required 400 Hz.

Published in ETSO.DevP.54 from 08.09.2010 to 29.09.2010.

CRD document: CRD DevP54.

ETSO-C74d#1 Airborne ATC Transponder Equipment

Deviate from ETSO-C74d to use RTCA/DO-144A instead of Appendix 1 of ETSO-C74d.

Published in ETSO.DevP.91 from 16.05.2013 to 06.06.2013.

No comments received.

ETSO-2C78#1 - Crewmember Oxygen Mask

Deviate from ETSO-2C78 Appendix 1 paragraph 3.3(a) and use the FAA TSO-C89a inward leakage requirement as called in the SAE standard AS8027 §3.2.2.2. for mask mounted regulators (type IV device).

Published in ETSO.DevP.55 from 8.11.2010 to 30.11.2010.

No comment received.

ETSO-2C78#2 - Crewmember Oxygen Mask

For masks with integrated regulators deviate from ETSO-2C78 Appendix 1 § 3.4.a and use FAA TSO-C89a § 3.2.3 (type 4) cumulative inspiratory resistance test.

Published in ETSO.DevP.55 from 8.11.2010 to 30.11.2010.

No comment received.

ETSO-2C87#1 – Low range radio altimeters

Deviate from EUROCAE ED-30 § 3.2.3.4 to implement an additional option for a greater time constant for height change filtering.

Published in ETSO.DevP.49 from 05.0.2010 to 02.08.2010.

No comment received.

ETSO-C89#7 - Oxygen Regulators, Demand

Deviate from ETSO-C89 Appendix 1 paragraph 4.4(a) and use the FAA TSO-C89a inward leakage requirement as called in the SAE standard AS8027 § 3.2.2.2 for mask mounted regulators (type IV device).

Published in ETSO.DevP.55 from 8.11.2010 to 30.11.2010.

No comment received.

ETSO-C89#8 - Oxygen Regulators, Demand

Deviate from ETSO-C89 Appendix 1 paragraph 4.5(b) and use the FAA TSO-C89a outlet proof pressure procedure as called in the SAE standard AS8027 § 3.2.1.2 and 3.2.1.3 for mask mounted regulators (type IV device).

Published in ETSO.DevP.55 from 8.11.2010 to 30.11.2010.

No comment received.

ETSO-C89#9 - Oxygen Regulators, Demand

For masks with integrated regulators deviate from C89 Appendix 1 § 4.1.a and use FAA TSO-C89a § 3.2.3 (type 4) cumulative inspiratory resistance test to demonstrate the air flow.

Published in ETSO.DevP.55 from 8.11.2010 to 30.11.2010.

No comment received.

ETSO-C89#10 - Oxygen Regulators, Demand

For masks with integrated regulators instead of the separate ETSO-C89 FAA standard § 4.4 (c) outlet leakage and ETSO-C89 FAA standard § 4.4 (d) overall leakage test one combined leakage test is performed using 0.02 L/min STPD as maximum leakage rate.

Published in ETSO.DevP.55 from 8.11.2010 to 30.11.2010.

No comment received.

ETSO-C90c#1 – Cargo Pallets, nets, and containers

Deviate from § 3.10.1 by reducing the ultimate static loads to be withstood by this specific Unit Load Device (ULD) for specific applications.

Published in ETSO.DevP.06 from 15.5.2007 to 8.6.2007.

CRD document: CRD DevP06.

ETSO-C95#1 - Mach Meters

Deviate from ETSO-C95 paragraph 3.1.1 to use SAE AS 8018A in lieu of SAE AS 8018 as the Minimum Performance Standard.

Published in ETSO.DevP.26 from 30.10.2008 to 21.11.2008.

No comment received.

ETSO-C96a#1 – Anticollision Light Systems

Deviate from ETSO-C96a 3.1.1 and use SAE document AS 8017B instead of AS 8017A as the minimum requirement standard.

Published in ETSO.DevP.18 from 5.11.2007 to 26.11.2007.

No Comments received.

ETSO-C106#1 – Air Data Computer

Deviate from ETSO-C106 3.1.1 and use SAE AS 8002 Rev. A instead of AS 8002 as the minimum requirement standard.

Published in ETSO.DevP.13 from 24.07.2007 to 14.8.2007.

No comments received.

ETSO-C106#2 – Air Data Computer

Deviate from AS8002 §9.2 f to indicate the input pressures range (static and total pressures) instead of altitude and airspeed range.

Published in ETSO.DevP.23 from 1.8.2008 to 22.8.2008.

No comments received (UK CAA stated they had no comment).

ETSO-C109#1 – Airborne Navigation Data Storage System

Deviate from „Minimum Performance Standard for the Airborne Navigation Data Storage Systems“, Global Systems Inc., dated March 31 1983 paragraph 1.2.3, and use a bi-directional data bus instead of two independent data buses one for data request and the other for data delivery.

Published in ETSO.DevP.12 from 25.07.2007 to 15.8.2007.

No comments received.

ETSO-C109#2 – Airborne Navigation Data Storage System

Deviate from „Minimum Performance Standard for the Airborne Navigation Data Storage Systems“, Global Systems Inc., dated March 31 1983 paragraph 2.5 and exclude the Disk Drive Unit and the embedded Disk Controller (Commercial of the Shelf subcomponents) from the 100% screening requirement applying if the specified equipment performance exceeds the component manufacturer’s specified performance if not used as permanent data storage.

Published in ETSO.DevP.12 from 25.7.2007 to 15.8.2007.

No comments received.

ETSO-C109#3 – Airborne Navigation Data Storage System

Deviate from „Minimum Performance Standard for the Airborne Navigation Data Storage Systems“, Global Systems Inc., dated March 31 1983 paragraph 1.2, and define the intended function to be a removable media navigation data storage device for loading current navigation data.

Published in ETSO.DevP.29 from 19.11.2008 to 11.12.2008.

No comments received.

ETSO-C109#4 – Airborne Navigation Data Storage System

Deviate from „Minimum Performance Standard for the Airborne Navigation Data Storage Systems“, Global Systems Inc., dated March 31 1983 paragraph 3.1, and allow the introduction of requests for a set of data.

Published in ETSO.DevP.29 from 19.11.2008 to 11.12.2008.

No comments received.

ETSO-C109#5 – Airborne Navigation Data Storage System

Deviate from „Minimum Performance Standard for the Airborne Navigation Data Storage Systems“, Global Systems Inc., dated March 31 1983 paragraph 3.2, and remove the

requirement to permanently store the navigation data in Non-volatile memory within the data base update system.

Published in ETSO.DevP.29 from 19.11.2008 to 11.12.2008.

No comments received.

ETSO-C109#6 – Airborne Navigation Data Storage System

Deviate from „Minimum Performance Standard for the Airborne Navigation Data Storage Systems“, Global Systems Inc., dated March 31 1983 paragraph 3.3, and modify the requirement to provide the data base identification and Expiration date on request in a way that the information is provided as part of the data base transfer but not on individual request for data base update systems.

Published in ETSO.DevP.29 from 19.11.2008 to 11.12.2008.

No comments received.

ETSO-C109#7 – Airborne Navigation Data Storage System

Deviate from „Minimum Performance Standard for the Airborne Navigation Data Storage Systems“, Global Systems Inc., dated March 31 1983 paragraph 3.4, and delete the requirement to use the error detection codes contained in the navigation data base file on each record during data transfer for data base update systems.

Published in ETSO.DevP.29 from 19.11.2008 to 11.12.2008.

No comments received.

ETSO-C109#8 – Airborne Navigation Data Storage System

Deviate from „Minimum Performance Standard for the Airborne Navigation Data Storage Systems“, Global Systems Inc., dated March 31 1983 paragraph 3.5, and delete the requirement to check for duplicate Identifiers for data base update systems.

Published in ETSO.DevP.29 from 19.11.2008 to 11.12.2008.

No comments received.

ETSO-C109#9 – Airborne Navigation Data Storage System

Deviate from „Minimum Performance Standard for the Airborne Navigation Data Storage Systems“, Global Systems Inc., dated March 31 1983 paragraph 3.6, and delete the requirement permanently store, update and automatically select navigation data based on expiration date for data base update systems.

Published in ETSO.DevP.29 from 19.11.2008 to 11.12.2008.

No comments received.

No Deviation **ETSO-2C112b#1 AIR TRAFFIC CONTROL RADAR BEACON SYSTEM/MODE SELECT (ATCRBS/MODE S) AIRBORNE EQUIPMENT**

ED-73B 1.4.2.2 reads: The label must be clearly visible when the transponder is mounted on the aircraft.

The requirement is ambiguous. The most common interpretation for “when mounted” is that the requirement has to be met after the installation has been finished. It is possible to read the sentence as well in a way that the requirement is valid during installation.

EASA will not require a deviation request if the label is not visible when the equipment is installed e.g. for panel mounted equipment but visible if holding the unit in hand e.g. during installation or on the bench.

Published in ETSO.DevP.04 from 04.04.2007 to 2.5.2007.

No comments received.

No Deviation ETSO-2C112b#4 AIR TRAFFIC CONTROL RADAR BEACON SYSTEM/MODE SELECT (ATCRBS/MODE S) AIRBORNE EQUIPMENT

EUROCAE ED-73B 3.21.2.6 c No means are provided to disable acquisition squitters when extended squitters are being emitted. The requirement is considered optional.

Published in ETSO.DevP.43 from 20.11.2009 to 11.12.2009.

No comments received.

ETSO-2C112b#5 – Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/MODE S) Airborne Equipment
Deviate from ETSO-2C112b 3.1.1 and use EUROCAE ED-73C instead of ED-73B.

Published in ETSO.DevP.53 from 28.8.2010 to 16.9.2010.

No comments received.

ETSO-2C112b#6 – Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/MODE S) Airborne Equipment
Deviate from EUROCAE ED-73C 2.5.e and provide no means to inhibit the transmission of altitude information.

Published in ETSO.DevP.53 from 28.8.2010 to 16.9.2010.

CRD document: CRD DevP53.

ETSO-C112c#1 – Air Traffic Control Radar Beacon System/Mode Select

(ATCRBS/MODE S) Airborne Equipment

Deviate from ETSO-C112c §3.1 to continue to use Eurocae ED-73B in lieu of Eurocae ED-73C in the following context:

- The unit combines several functions (ETSO-2C112b, ETSO-C119c and ETSO-C166a);
- The unit has been upgraded in order to comply with ETSO-C119c and there are no updates to the ETSO-2C112b function;
- The unit received the original FAA TSO Approval a few days after the date of applicability of EASA ETSO-C112c;
- ETSO-C112c is based on a Minimum Operational Performance Standards (MOPs) which is now completely harmonised between RTCA/DO-181D and Eurocae. ED-73C. However, RTCA/DO-181D and Eurocae ED-73C have been drastically changed in contents and organisation. Traceability between Eurocae ED-73C and ED-73B is not straightforward either;
- The achieved compliance of the unit versus with ETSO-2C112b and ETSO-C119c requirements has been assessed;
- Subsequent to the update of transponder's requirements, ADS-B MOPs were updated to RTCA/DO-260B and Eurocae ED-102A. Updates to the ADS-B MOPs forced a new update to the transponder MOPs with RTCA/DO-181E being harmonized with Eurocae ED-73E.

Published in ETSO.DevP.78 from 23.5.2012 to 14.6.2012.

No comments received.

ETSO-C112c#3 - Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/MODE S) Airborne Equipment

Deviate to use EUROCAE ED-73E instead of EUROCAE ED-73C.

Published in ETSO.DevP.81 from 29.08.2012 to 19.09.2012.

No comments received.

ETSO- C112c#4 - Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/MODE S) Airborne Equipment

Deviate to EUROCAE ED-73E 3.22.2.6.d / RTCA DO-181E 2.2.18.2.6.d Transmission of Acquisition Squitters Requirement.

Published in ETSO.DevP.81 from 29.08.2012 to 19.09.2012.

No comments received.

ETSO-C112c#5 - Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/MODE S) Airborne Equipment

Deviate from EUROCAE ED-73C / ED-73E paragraph 3.2.4 g (RTCA DO-181D, / DO-181E paragraph 2.2.2.4.g.) Sensitivity and Dynamic Range requirements.

Published in ETSO.DevP.81 from 29.08.2012 to 19.09.2012.

No comments received.

ETSO-C112c#6 - Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/MODE S) Airborne Equipment

Deviate from ED-73E, paragraph 3.27.2.1/RTCA DO-181E 2.2.22.2.1 and do not discard the incoming message in case no reply is sent.

Published in ETSO.DevP.81 from 29.08.2012 to 19.09.2012.

No comments received.

ETSO-C112c#7 – Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/Mode S) Airborne Equipment

Deviate from EUROCAE ED-73C section 3.28.3.4 and use the newer specification in EUROCAE ED-102A/RTCA DO-260B section 2.2.3.3.2.12 instead for the ADS-B message termination.

Published in ETSO.DevP.65 from 8.06.2011 to 30.6.2011.

No comments received.

ETSO-C113#1 – Airborne Multipurpose Electronic Displays

Deviate from ETSO-C113 3.1.1 and use SAE AS 8034 Rev. A instead of AS 8034 as the minimum requirement standard.

Published in ETSO.DevP.13 from 24.07.2007 to 14.8.2007.

No comments received.

ETSO-C113#2 – Airborne Multipurpose Electronic Displays

Deviate from ETSO-C113 §3.1.1 which references SAE AS8034 (Airborne Multipurpose Electronic Displays) to adapt some further referenced requirements of SAE ARP4256A for Liquid Crystal Displays for Part 25 (Transport) Aircraft to meet human factors' analysis of a specific installation: assess High Ambient Contrast Ratio on the installation instead of using generic criteria as defined in SAE ARP4256A §4.2.3.2. Indicate the corresponding limitation in the Declaration of Design and Performance.

Published in ETSO.DevP.61 from 22.3.2011 to 20.4.2011.

No comments received.

ETSO-C113#3 – Airborne Multipurpose Electronic Displays

Deviate from SAE ARP4256A §4.2.3.2 for the assessment of specific requirements for the installation. Use tailored human factors tests in the flight simulator instead of SAE ARP4256A §4.2.3.2 criteria. Indicate the corresponding limitation "for installation on <specific installation>" in the Declaration of Design and Performance.

Published in ETSO.DevP.63 from 12.5.2011 to 6.6.2011.

ETSO-C113#4 – Airborne Multipurpose Electronic Displays

Deviate from ETSO-C113 §3.1 to use SAE AS8034A in lieu of AS8034 as in deviation ETSO-C113#1 and substitute reference tests for CRT and LCD direct-view displays from SAE ARP4260 and SAE ARP1782 with corresponding standards from SAE AS8055 for a reflective head-up display (HUD) in the case of a monochrome Display Unit (DU) only. The additional acceptable display colours as stated in ETSO-C113 3.1.1 (a), (b) and (c) are not applicable to the (monochrome) unit which does not include a symbol generator.

Published in ETSO.DevP.76 from 20.3.2012 to 20.4.2012.

ETSO-C113#5 Airborne Multipurpose Electronic Displays

Deviate from ETSO-C113 3.1.1 and use SAE AS 8034B instead of SAE AS 8034.

Published in ETSO.DevP.84 from 24.08.2012 to 14.09.2012.

No comments received.

ETSO-C114#1 – Torso Restraint Systems

Deviate from ETSO-C114 paragraph 3.1.1 by meeting the requirements set forth in SAE AS 8043 Revision A specification, instead of SAE AS 8043 original issue.

Published in ETSO.DevP.38 from 19.6.2009 to 10.7.2009.

No comments received.

ETSO-C115b#1: Airborne Area Navigation Equipment Using Multi-Sensor Inputs

Deviate from EUROCAE ED-58 Appendix G 2.2.7 and only provide position consistency monitoring combined with sensor validity monitoring instead of the additionally requested velocity consistency monitoring.

Published in ETSO.DevP.69 from 15.12.2011 to 15.1.2012.

No comments received.

ETSO-C118#1 – Traffic Alert and Collision Avoidance System (TCAS) Airborne Equipment, TCAS I

Deviate from ETSO-C118 3.1.1 to use RTCA DO-197A instead of RTCA DO-197 as the Minimum Performance Standard.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

Superseded by ETSO-C118#2

Note: For accepted deviations to RTCA DO-197A see ETSO-C147

ETSO-C118#2 – Traffic Alert and Collision Avoidance System (TCAS) Airborne Equipment, TCAS I

Deviate from ETSO-C118 3.1.1 to use RTCA DO-197A section 2 amended by appendix 1 of ETSO-C147 instead of RTCA DO-197 section 2 as the Minimum Performance Standard.

Published in ETSO.DevP.58 from 05.09.2011 to 30.09.2011.

No comment received.

ETSO-C119b#2 – Traffic alert and collision avoidance system (TCAS) airborne equipment, TCAS II

Deviate from RTCA DO-185A and consider the RWG Recommended Modification 2.0 to TSO-C119B and the modifications as introduced by appendix 1 to TSO-C119b.

Published in ETSO.DevP.35 from 20.11.2009 to 11.12.2009.

No comment received.

ETSO-C119b#3 – Traffic alert and collision avoidance system (TCAS) airborne equipment, TCAS II

Deviate from RTCA DO-185A section 2.2.4.4.2.2.b to use the Enhanced Preamble Detection method of RTCA DO-260A Appendix I section I.4.1.

Published in ETSO.DevP.35 from 20.11.2009 to 11.12.2009.

No comment received.

ETSO-C119b#4 – Traffic alert and collision avoidance system (TCAS) airborne equipment, TCAS II

Deviate from RTCA DO-185A section 2.2.4.4.2.2.c to use the baseline multi-sample bit and confidence declaration technique of RTCA DO-260A Appendix I section I.4.2.3.1.

Published in ETSO.DevP.35 from 20.11.2009 to 11.12.2009.

No comment received.

ETSO-C119c#1 – TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM (TCAS) AIRBORNE EQUIPMENT, TCAS II

Deviate from EUROCAE ED-143/ RTCA DO-185B subparagraph 2.2.6.1.2.1.1 to use an off-white own aircraft symbol and white proximate and other traffic symbols as shown below:

Published in ETSO.DevP.46 from 15.07.2010 to 06.08.2010.

No comment received.

ETSO-C119c#2 - TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM (TCAS) AIRBORNE EQUIPMENT, TCAS II

Deviate from EUROCAE ED-143/ RTCA DO-185B subparagraph 2.2.6.6.2.(a) and 2.2.6.6.3.(a) to display “TCAS STBY” as an advisory (level 1) annunciation in amber instead of as an information (level 0) annunciation in white, when the own aircraft is airborne and the TCAS is in Standby.

Published in ETSO.DevP.46 from 15.07.2010 to 06.08.2010.

No comment received.

ETSO-C119c#3 - TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM (TCAS) AIRBORNE EQUIPMENT, TCAS II

Deviate from ETSO-C119c paragraph 3.1.2 for the environmental standard to be unchanged from the original basis of an existing TCAS II product for a software upgrade limited to the changes introduced by EUROCAE ED-143/RTCA DO-185B (also known as "TCAS II version 7.1").

Published in ETSO.DevP.57 from 17.01.2011 to 08.02.2011.

No comment received.

ETSO-C119c#4 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.3.13.2.1.1 to not interface with ETSO-C119a compatible transponder units.

Published in ETSO.DevP.58 from 05.09.2011 to 30.09.2011.

No comment received.

ETSO-C119c#5 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.4.2.2 b. to use the Enhanced Preamble Detection method of RTCA DO-260B appendix I section I.4.1 for preamble acceptance.

Published in ETSO.DevP.58 from 05.09.2011 to 30.09.2011.

No comment received.

ETSO-C119c#6 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.4.2.2.c to use the Baseline Multi-Sample bit and confidence declaration technique of RTCA DO-260B appendix I section I.4.2.3.1.

Published in ETSO.DevP.58 from 05.09.2011 to 30.09.2011.

No comment received.

ETSO-C119c#7 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.6.7.2 (Table 2-22 item 'Intruder Bearing') to utilize tracked correlated ADS-B data for TCAS display instead of tracked bearing from Collision Avoidance System.

Published in ETSO.DevP.58 from 05.09.2011 to 30.09.2011.

No comment received.

ETSO-C119c#8 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.7.2.5.2.3, specifically the requirement that the system receive valid radio altitude for 5 consecutive TCAS processing cycles before issuing TA/RAs at power off/on system reset. The deviation allows for a shorter validation time be permitted as long as the monitoring adequately

provides for at least 5 valid radio altitude samples before issuing an RA or Traffic Advisory.

Published in ETSO.DevP.64 from 01.08.2011 to 22.08.2011.

No comment received.

ETSO-C119c#9 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.7.2.5.1 and set the system into TCAS standby after 6 consecutive processing cycles of non-credible pressure altitude instead of failing the system after 5 consecutive TCAS processing cycles.

Published in ETSO.DevP.64 from 01.08.2011 to 22.08.2011.

No comment received.

ETSO-C119c#10 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.3.12 and use power dependent suppression times.

Published in ETSO.DevP.64 from 01.08.2011 to 22.08.2011.

No comment received.

ETSO-C119c#10 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.3.12 and use power dependent suppression times.

Published in ETSO.DevP.64 from 01.08.2011 to 22.08.2011.

No comment received.

ETSO-C119c#11 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.5.4.1.1, 2.2.4.5.4.1.2 and suppress the S1 pulse on the two lowest power interrogations in a whisper-shout sequence.

Published in ETSO.DevP.64 from 01.08.2011 to 22.08.2011.

No comment received.

ETSO-C119c#11 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.5.4.1.1, 2.2.4.5.4.1.2 and suppress the S1 pulse on the two lowest power interrogations in a whisper-shout sequence.

Published in ETSO.DevP.64 from 01.08.2011 to 22.08.2011.

No comment received.

ETSO-C119c#12 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.5.4.1.1, 2.2.4.5.4.1.2 and use a whisper-shout interrogation sequence for a bottom directional antenna with ten total interrogation steps.

Published in ETSO.DevP.64 from 01.08.2011 to 22.08.2011.

No comment received.

ETSO-C119c#13 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.5.4.1.2 and use a 14 step instead of a 4 step whisper-shout interrogation sequence for a bottom omni-directional antenna.

Published in ETSO.DevP.64 from 01.08.2011 to 22.08.2011.

No comment received.

ETSO-C119c#14 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.6.2.2.2 and establish a track after three consecutive and consistent replies instead of only two consecutive replies.

Published in ETSO.DevP.64 from 01.08.2011 to 22.08.2011.

No comment received.

ETSO-C119c#15 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.6.2.2.1 and interrogate a Mode-S transponder after receipt of only one valid, error free squitter.

Published in ETSO.DevP.64 from 01.08.2011 to 22.08.2011.

No comment received.

ETSO-C119c#16 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.4.1.1 and allow a Minimum Trigger Level (MTL) of -77dBm instead of -74dBm but raises the MTL to -73dBm when the interference limiting inequalities are initially violated.

Published in ETSO.DevP.64 from 01.08.2011 to 22.08.2011.

No comment received.

ETSO-C119c#17 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B section 2.2.4.4.1.1 and allow reduction of the minimum trigger level (MTL) in the forward quadrant to -82 dBm for squitter listening and -84 dBm for tracking interrogations instead of -74 dBm.

Published in ETSO.DevP.64 from 01.08.2011 to 22.08.2011.

No comment received.

ETSO-C119c#18 – Traffic Alert and Collision Avoidance System (TCAS) airborne equipment, TCAS II

Deviate from EUROCAE ED-143/RTCA DO-185B Volume I Section 2.2.4.5.4.1.3 and Volume II Sections 2.1.17, 2.1.18, 3.57, 3.104, Appendix A and allow the altitude tracker to limit the credibility checks to 0.5 g (16 feet/sec²) instead of 1.25 g (40 feet/sec²) vertical accelerations under certain conditions.

Published in ETSO.DevP.64 from 01.08.2011 to 22.08.2011.

No comment received.

ETSO-2C126#1 – 406 MHz Emergency Locator Transmitter (ELT), ED-62 3.2.1.1

Use of 406.028 MHz instead of 406.025 MHz as operating frequency.

Published in ETSO.DevP.05 from 08.05.2007 to 30.05.2007.

No comments received.

ETSO-2C126#2 – 406 MHz Emergency Locator Transmitter (ELT), ED-62 3.1

ELT without 243.0 MHz transmitter capability:

Published in ETSO.DevP.05 from 08.05.2007 to 30.05.2007.

No comments received.

ETSO-2C126#3 – 406 MHz Emergency Locator Transmitter (ELT), 3.1.1

Deviate from ETSO-2C126 §3.1.1 and use EUROCAE ED-62A or RTCA DO-204A instead of EUROCAE ED-62 as MOPS (Minimum Operational Performance Standard)

Published in ETSO.DevP.42 from 23.10.2009 to 13.11.2009.

No comments received.

ETSO-C127a#32 – Rotorcraft, Transport aeroplane, and normal and utility aeroplane seating systems, SAE AS No AS 8049A

Use of SAE AS8049 Revision B instead of SAE AS8049 Revision A. The amended paragraphs of AS8049 Revision A listed in Appendix 1 of TSO-C127a are included in AS8049 Revision B. Moreover, current SAE standard AS8049 Rev. B is used as the basic technical standard for certification of seats and their installation on CS part 25 aircraft.

Published in ETSO.DevP.32 from 16.01.2009 to 06.02.2009.

No comments received.

ETSO-C127a#59 – Rotorcraft, Transport aeroplane, and normal and utility aeroplane seating systems

Deviating from ETSO-C127a, Appendix 1, paragraph 2.2.3 by meeting, instead of the acceptance criteria set forth Appendix F, Part II of CS25, the alternative acceptance criteria contained in FAA memorandum ANM-115-07-002 *"Policy Statement on certification for flammability of lightweight seat Cushions*" (dated 16th April 2009).

Published in ETSO.DevP.59 from 28.1.2011 to 18.02.2011.

CRD document: CRD DevP59.

ETSO-C129a#1 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from ED-72A 3.2.2.1f(3) and 3.2.2.4j(4) to eliminate the annunciation for pending CDI scale change 3.0 NM from the FAF.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C129a#2 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from ED-72A 3.2.2.1f(4), 3.2.2.3e(4), and 3.2.2.4j(2) to eliminate the requirement to "alert the pilot of the need to manually insert the barometric pressure in case the unit calibrates pressure altitude whenever RAIM is available en route.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C129a#3 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from ED-72A 3.2.2.4j(8) to modify the requirement to allow the approach mode to be deselected by performing a direct-to action on the unit. Instead, a two step operation that is consistent with the operational philosophies applied to the box in other areas is proposed. Consistent operation throughout the operation minimizes pilot error.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C129a#4 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from ED-72A 3.2.2.3d(2) to eliminate the requirement to provide a "means to manually identify a satellite that is expected to be unavailable at the destination" for the RAIM prediction process.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C129a#5 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from ETSO-C129a to change the requirement in ED-72A paragraph 4.16.2 to match the WAAS TSO-C145a and DO-229 requirements for Power input testing. ETSO C145 and DO-229a allow a system reset followed by satellite acquisition time of 5 minutes for abnormal operating conditions power input tests.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C129a#6 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from EUROCAE ED-72A Section 3.2.2.4.j.(4), -(5) and provide a smooth ILS look alike cross track deviation instead the requested transition to 0.3 NM full scale deviation.

Published in ETSO.DevP.08 from 29.5.2007 to 19.6.2007.

CRD document: CRD DevP08

ETSO-C129a#7 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

a) Deviate from EUROCAE ED-72A Section 3.2.2.4.j(4) and enable the approach 3 NM prior to the FAF or the FACF, if a CF leg is coded as start of the sequence.

b) Provide the scale change alert 15 seconds instead of 3 NM prior to the FAF or FACF

Published in ETSO.DevP.08 from 29.5.2007 to 19.6.2007.

CRD document: CRD DevP08

ETSO-C129a#8 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from EUROCAE ED-72A Section 3.2.2.4.f(3) and allow automatic leg sequencing for procedure turns vs. the ETSO requirement of manual leg sequencing.

Published in ETSO.DevP.08 from 29.5.2007 to 19.6.2007.

CRD document: CRD DevP08

ETSO-C129a#9 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from EUROCAE ED-72A Section 3.2.2.4.j(2) and enable the approach alert at 50 NM from the destination airport vs. the requirement of alerting at 30 NM.

Use a two step operation to select the approach mode after the alert message has been received if not displaying the typically selected NAV page.

Published in ETSO.DevP.08 from 29.5.2007 to 19.6.2007.

CRD document: CRD DevP08

ETSO-C129a#10 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from EUROCAE ED-72A Section 3.1.2.1 table 3-2 and use the interference levels as specified by RTCA DO-229C Appendix C.

Published in ETSO.DevP.08 from 29.5.2007 to 19.6.2007.

CRD document: CRD DevP08

ETSO-C129a#12 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from EUROCAE ED-72A §3.1.1.1 “Sensitivity” within condition #1 while providing an equivalent level of safety: no operational conditions that lead to a search the sky acquisition failure and compliance with RTCA DO-208 (basis for TSO C129a.that is considered “technically similar” to ETSO C129a). FAA TSO C129a/RTCA DO-208 and EASA CS-ETSO C129a/EUROCAE ED-72A have been declared as providing an equal level of safety.

Published in ETSO.DevP.39 from 22.6.2009 to 13.7.2009.

No comments received.

ETSO-C129a#13 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from EUROCAE ED-72A 3.2.2.3.e, (3.2.3.2.e), and 5.6.11 and use RTCA DO-229C appendix G as barometric altitude input requirements.

Published in ETSO.DevP.50 from 26.7.2010 to 16.8.2010.

No comments received.

ETSO-C129a#14 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from EUROCAE ED-72A 5.6.8.1 and use RTCA DO-229C section 2.5.9.3.2 as modified by appendix R.5.6 for the GPS simulation satellite geometry scenario for tightly integrated GPS/inertial systems.

Published in ETSO.DevP.50 from 26.7.2010 to 16.8.2010.

No comments received.

ETSO-C129a#15 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from EUROCAE ED-72A 5.6.8.3 and use RTCA DO-229C section 2.5.9.3.3 for Class Beta equipment as modified by appendix R.5.6 for the GPS simulation to verify the Missed Detection Probability scenario for tightly integrated GPS/inertial systems.

Published in ETSO.DevP.50 from 26.7.2010 to 16.8.2010.

No comments received.

ETSO-C129a#16 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from EUROCAE ED-72A 5.6.8.4 and use RTCA DO-229C section 2.5.9.4.2 as modified by appendix R.5.3 for the GPS simulation to verify the false alarm rate scenario for tightly integrated GPS/inertial systems.

Published in ETSO.DevP.50 from 26.7.2010 to 16.8.2010.

No comments received.

ETSO-C129a#17 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from EUROCAE ED-72A 5.6.9 and use RTCA DO-229C section 2.5.9.5 as modified by appendix R.5.7 for the on-line bench tests scenario for tightly integrated GPS/inertial systems.

Published in ETSO.DevP.50 from 26.7.2010 to 16.8.2010.

No comments received.

ETSO-C129a#18 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from EUROCAE ED-72A 5.6.8.2 and use RTCA DO-229C appendix R R.4.1 for the pseudo range error model scenario (SA-on case) in conjunction with a different model for the SA-off case for tightly integrated GPS/inertial systems.

Published in ETSO.DevP.50 from 26.7.2010 to 16.8.2010.

No comments received.

ETSO-C129a#19 – Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)

Deviate from EUROCAE ED-72A 3.2.3.1 and 5.6.6 and use RTCA DO-229C appendix R section R.2.1.1, R.5.4, and R.5.5 to define 2D position accuracy criteria scenario for Class B or C tightly integrated GPS/inertial systems.

Published in ETSO.DevP.50 from 26.7.2010 to 16.8.2010.

No comments received.

ETSO-C135#1 – Deviation Request for CS-ETSO ETSO-C135 applicable to Transport Aeroplane Wheels and Brake Assemblies

Deviate from ETSO-C135 § 3.2.2.2 for interference occurring between brake and tyre before the combined limit loads were reached. The deviation is granted with limitations stated on the ETSO Authorisation. Moreover, this deviation would then be usable by other applicants, if they could substantiate their specific case with relevant data and when supported by the applicable aircraft manufacturer.

Published in ETSO.DevP.07 from 23.04.2007 to 11.05.2007.

CRD document: CRD DevP07.

ETSO-C135#2 – Deviation Request for CS-ETSO ETSO-C135 applicable to Transport Aeroplane Wheels and Brake Assemblies

Deviate from ETSO-C135 § 3.3.3.3 for starting the accelerate--stop test with a starting heat sink temperature of 340°F. This initial stator temperature corresponds to 9.7% RTO K.E. only instead of 10 percent KERT when no analysis is used to substantiate the starting value. Even though the initial stator temperature was lower than required, the total kinetic energy that was absorbed during the test was higher than required and performance margins were demonstrated both during the new brake and the worn brake accelerate - stop test. This deviation is an initial condition deviation which does not impact the design compliance with ETSO-C135 requirements.

Published in ETSO.DevP.22 from 27.8.2008 to 18.9.2008.

No comments were received.

ETSO-C139#1 – Headsets and Speakers

Deviate from RTCA DO-214 2.3.8.4 and apply the Cord Connector Flexibility test only for the fixed panel mounted connectors and their counterpart and not for those acting as interconnections within the cable or at the headset.

In analogy to ETSO-C57a#3, published in ETSO.DevP.03 from 10.3.2007 to 2.4.2007.

CRD document: CRD DevP03.

ETSO-C139#2 – Headsets and Speakers

Deviate from RTCA DO-214 2.3.3.1 and provide a higher Sound Pressure Level (SPL) of 90 -5/+18 dB instead of 90 +/- 5 dB SPL (re: 20 µPa) out of 1 mW (RMS) input signal.

In analogy to ETSO-C57a#7 published in ETSO.DevP.52 from 16.8.2010 to 6.9.2010.

CRD document: CRD DevP52.

ETSO-C144#1 – Airborne Global Positioning System Antenna

Deviate from RTCA/DO-228 §2.2.2.1 "*Preamplifier Gain and Noise Figure"* and use a different preamplifier gain. This deviation was accepted for a dedicated antenna in conjunction with a limitation to use the antenna only in combination with compatible GPS receivers.

Published in ETSO.DevP.09 from 22.06.2007 to 18.07.2007.

No comments were received.

ETSO-C145#1 – Airborne Navigation Sensors using the GPS augmented by WAAS

Deviate from ETSO-C145 to use RTCA DO-229**C** (as required in FAA TSO-C145a) instead of RTCA DO-229**A**.

Published in ETSO.DevP.10 from 22.6.2007 to 20.7.2007.

CRD document: CRD DevP10

ETSO-C145#2 Airborne Navigation Sensors using the GPS augmented by WAAS

Deviate from RTCA DO-229C, Paragraph "2.5.9: Integrity Monitoring Test Procedures" by using an alternate method.

Published in ETSO.DevP.10 from 22.6.2007 to 20.7.2007.

CRD document: CRD DevP10

ETSO-C145#3 – Airborne Navigation Sensors using the GPS augmented by WAAS

Deviate from RTCA DO-229C, Paragraph 2.5.4, Initial Acquisition Time, and use the test procedures defined in the draft of DO-229D RTCA Paper 093-06/SC-159-939.

Published in ETSO.DevP.10 from 22.6.2007 to 20.7.2007.

CRD document: CRD DevP10

ETSO-C145#4 – Airborne Navigation Sensors using the GPS augmented by WAAS

Deviate from RTCA DO-229C, Paragraph 2.5.6, Satellite Reacquisition Test, and use the test procedures defined in draft of DO-229D RTCA Paper 093-06/SC-159-939.

Published in ETSO.DevP.10 from 22.6.2007 to 20.7.2007.

CRD document: CRD DevP10

ETSO-C145#5 – Airborne Navigation Sensors using the GPS augmented by WAAS

Deviate from RTCA DO-229C, Paragraph 2.1.4.2.2.4: Wide Area Augmentation System (WAAS) Precision Approach (PA) RAIM Availability for Vertical Alert Limit (VAL) of 15m and use 25 m instead.

Published in ETSO.DevP.10 from 22.6.2007 to 20.7.2007.

CRD document: CRD DevP10

ETSO-C145#6 – Airborne Navigation Sensors using the GPS augmented by WAAS

Deviate from RTCA DO-229C, paragraph 2.5.9: RAIM Test Procedures with Selective Availability (SA) Off and use the test procedures of draft version of DO-229D (RTCA Paper 093-06lSC-159-939) instead.

Published in ETSO.DevP.10 from 22.6.2007 to 20.7.2007.

CRD document: CRD DevP10

ETSO-C145#7 – Airborne Navigation Sensors using the GPS augmented by WAAS

Deviate from RTCA DO-229C paragraph 2.5.8, Accuracy Test, and use the test procedures defined in draft of DO-229D, RTCA Paper 093-06/SC-159-939 instead.

Published in ETSO.DevP.10 from 22.6.2007 to 20.7.2007.

CRD document: CRD DevP10

ETSO-C145#8 Airborne Navigation Sensors using the GPS augmented by WAAS

Deviate from ETSO-C145 to use RTCA DO-229D (as required in FAA TSO-C145b) instead of RTCA DO-229A.

Published in ETSO.DevP.31 from 12.12.2008 to 06.01.2009.

No Comments received.

ETSO-C146#1 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

Deviate from ETSO-C146 3.1.1 to use RTCA DO-229C instead of RTCA DO-229B.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C146#2 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

Deviate from ETSO-C146 to modify the requirement 2.2.1.1.4.3 in RTCA/DO-229C which states, "They [all displays] shall be fully readable up to a vertical viewing angle of 20 degrees from normal to the face of the display screen." This deviation uses a 10 degree vertical viewing angle below the lower display edge. DO-229C makes no distinction between upper and lower display edges for the requirement of a 20 degree vertical viewing angle.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C146#3 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

Deviate from ETSO-C146 to modify the requirement 2.2.1.4.9.c in RTCA/DO-229C which states, "BRG to or from a VOR: The bearing is based on the true-to-magnetic conversion at the waypoint location, using the same magnetic conversion as used to define the path." This conversion is based upon the present aircraft location instead, which is how other waypoint's magnetic variation is computed.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C146#4 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

Deviate from ETSO-C146 to eliminate the requirement 2.2.4.2.3 in RTCA/DO-229C which states, "If the aircraft is past the FPAP - (length offset), and the pilot has not already activated the missed approach, the receiver shall automatically transition to missed approach guidance." This requirement is being eliminated in DO-229D.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C146#5 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

Deviate from ETSO-C146 to modify the requirements 2.2.4.6.4 and 2.2.5.6.4 in RTCA/DO-229C, pertaining to the low altitude alerting function. The TAWS capabilities of the aircraft shall be used if available.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C146#6 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

Deviate from ETSO-C146 to modify the requirement 2.2.1.1.6 in RTCA/DO-229C states: "If a function is implemented as a discrete action, the equipment shall use the labels or messages in the Table". The table (TABLE 2-5 LABELS AND MESSAGES), states that the function “Indication that there is a message” shall be labeled as “MSG” or “M”. Instead the terms “ADVISORY” and “ALERTS” in addition to “MSG” may be used depending upon the aircraft message convention.

Published in ETSO.DevP.02 from 26.2.2007 to 16.3.2007.

CRD document: CRD DevP02.

ETSO-C146#7 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

Deviate from RTCA DO-229C § 2.2.1.2.3 and stop operation if a data base error has been determined. The consequences of data base failures are not transparent and for safety reasons the system operation is stopped.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C146#8 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

RTCA DO-229C § 2.2.1.4.4 requires displaying the bearing in true or magnetic bearing as selected. Only magnetic bearing is provided.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C146#9 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

RTCA DO-229C § 2.2.1.4.5.3 requires the track angle error to be displayed with 1° resolution. No numerical display will be provided. Instead, the aircraft track is displayed on the primary flight display with a track marker (green diamond) and by the position of the flight path marker. Desired track is shown on the primary flight display with a waypoint bearing marker (magenta waypoint star) and a perspective, highway-in-the-sky path depiction.

Aircraft track is displayed on the navigation display with a track marker (green diamond) and lubber line (segmented green line). Desired track is shown on the navigation display with a waypoint bearing marker (magenta waypoint star) and a depiction of the flight plan route with active leg shown in magenta and other legs shown in white.

The displays provide a superior method for the pilot to understand the relationship between aircraft track and desired track and offer an equivalent level of safety to a numerical display of track angle error.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C146#10 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

DO-229C § 2.2.2.4.3 requires in oceanic/remote, en route, or terminal mode to provide either a display or electrical output of cross-track deviation with a range of at least ± 20 nm (left and right). DO-229C § 2.2.3.4.3 requires in non-precision approach mode to provide either a display or electrical output of cross-track deviation with a range of at least ± 9.99 nm (left and right).

No numeric cross-track deviation display shall be provided. Instead, the aircraft relationship to the desired track is graphically shown on the navigation display.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C146#11 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

DO-229C § 2.2.3.4.3 requires in non-precision approach mode either a display or electrical output of cross-track deviation with a range of at least ± 9.99 nm (left and right). Instead a "skyway" and other perspective symbols in lieu of a vertical deviation indicator are used.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C146#12 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

DO-229C § 2.2.3.3.4(c), 2.2.4.4.4 non-numeric vertical deviation display: Instead of a vertical deviation indicator a "skyway" and other perspective symbols are used.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C146#13 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

DO-229C § 2.2.3.4.4, 2.2.3.4.5 Instead displaying the distance to the Missed Approach Waypoint (MAWP) and the bearing to the MAWP, the aircraft relationship to the MAWP is graphically shown on the navigation display. For the use of a moving map, no deviation request is necessary.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C146#14 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

Deviate from RTCA/DO-229C 2.2.1.4.1 Table 2-5 requiring access to primary navigation display with a label "NAV" and do not provide such button.

Published in ETSO.DevP.18 from 5.11.2007 to 26.11.2007.

No Comments received.

ETSO-C146#15 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

Delete the requirement 2.2.3.2.2 in RTCA/DO-229C which states, "The equipment shall allow the pilot to initiate the missed approach with manual action. It shall be possible to take this action before crossing the MAWP (Missed Approach Waypoint), in which case the equipment shall automatically initiate the missed approach procedure at the MAWP"

Published in ETSO.DevP.18 from 5.11.2007 to 26.11.2007.

One comment received. See CRD Dev.P18.

ETSO-C146#16 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

Deviate from RTCA DO-229C to modify the requirements 2.1.1.9 to allow the unit up to 20 seconds (instead of 10 seconds) to reacquire a dropped satellite under the conditions described in the paragraph.

Published in ETSO.DevP.18 from 5.11.2007 to 26.11.2007.

No Comments received.

ETSO-C146#17 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

Deviate from DO-229C paragraphs 2.1.1.10, 2.1.1.7, 2.1.1.8.1, 2.1.1.8.2, 2.1.1.9, 2.1.2.1, 2.1.3.1, 2.1.4.1.4, 2.1.4.1.5 and 2.1.5.1 to allow:

1. The ability to use antennas that may not meet the minimum gain performance requirements of DO-228.
2. The ability to mitigate the effects of the different gain characteristics of those antennas by increasing the effective mask angle through operational limitations.
3. The ability to further increase the effective mask angle, through operational limitations, to a level commensurate with test conditions used in the original TSO qualification tests.
4. The ability to use -128 dBmic as the minimum GPS satellite signal-in-space for the purpose of assessing the operational limitation.
5. The ability to use -128 dBmic as the minimum SBAS satellite signal-in-space for the purpose of assessing the operational limitation.

Depending on the system configuration selected, an operational limitation may be necessary to reach an Equivalent Level of Safety during the installation.

Published in ETSO.DevP.19 from 28.4.2008 to 20.5.2008.

One comment received. See CRD Dev.P19

Remark: This deviation should not be used for new designs.

ETSO-C146#18 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

Deviate from ETSO-C146 3.1.1 and use RTCA DO-229D instead of DO-229B as Minimum Performance Standard.

Published in ETSO.DevP.25 from 16.9.2008 to 10.10.2008.

No Comments received.

ETSO-C146#21 – Stand-Alone Airborne Navigation Equipment using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)

Deviate from RTCA DO-229D 2.2.1.1.4.3 and allow the use of other viewing angles e.g. 10 degree maximum vertical viewing angle above the upper display edge, identified as limitation in the installation manual.

Published in ETSO.DevP.33 from 26.02.2009 to 19.03.2009.

No Comments received.

ETSO-C147#1–Traffic Advisory System (TAS) Airborne Equipment

Deviate from RTCA DO-197A section 2.2.9.1 to realize the bearing estimation function using a direction finding antenna augmented by tracked correlated ADS-B data (hybrid surveillance).

Published in ETSO.DevP.35 from 20.11.2009 to 11.12.2009.

No comment received.

ETSO-C147#2–Traffic Advisory System (TAS) Airborne Equipment

Deviate from RTCA DO-197A section 2.2.11 to use the suppression pulse on the aircraft suppression bus specified by RTCA DO-185A section 2.2.3.12 (70 +/-1 µs from top antenna and 90 +/-1 µs from bottom antenna) instead of 100 +/-5 µs.

Published in ETSO.DevP.35 from 20.11.2009 to 11.12.2009.

No comment received.

ETSO-C147#3 –Traffic Advisory System (TAS) Airborne Equipment

Deviate from ETSO-C147 Appendix 1 section 1.6 and use selective Mode S interrogations to limit the interference.

Published in ETSO.DevP.35 from 20.11.2009 to 11.12.2009.

No comment received.

ETSO-C147#4–Traffic Advisory System (TAS) Airborne Equipment

Deviate from RTCA DO-197A section 2.2.3.2.1 to use the Interrogations Spectrum requirement of RTCA DO-185A section 2.2.3.3 for Mode S interrogations.

Published in ETSO.DevP.35 from 20.11.2009 to 11.12.2009.

No comment received.

ETSO-C147#5–Traffic Advisory System (TAS) Airborne Equipment

Deviate from RTCA DO-197A section 2.2.3.5 to use the “Mode C Only All-Call” format specified by RTCA DO-185A section 2.2.3.8.1 instead of the “Mode C” format for interrogations.

Published in ETSO.DevP.35 from 20.11.2009 to 11.12.2009.

No comment received.

ETSO-C147#6 – Traffic Advisory System (TAS) Airborne Equipment

Deviate from ETSO-C147 Appendix 1 paragraph 3.1.1 and show only the warning with the higher priority in case of multiple warnings are applicable simultaneously.

Published in ETSO.DevP.62a from 02.05.2011 to 23.05.2011.

No comment received.

ETSO-C151a#1 – Terrain Awareness and Warning System (TAWS)

ETSO-C151a App. 1 § 3.3.e states, "If a two tone sweep is used to comply with RTCA Document No. DO-161A, paragraph 2.3, the complete cycle of two tone sweeps plus annunciations may be extended from "1.4" to "2" seconds.

No "Whoop-Whoop" tone is provided.

The provision of a "Whoop-Whoop" tone is not required by Appendix 1 of ETSO-C151a, per the "if…used to comply" statement. In addition, the voice alerts specified in DO-161A conflict with those specified in ETSO-C151a. Applicant proposes the aural and visual alerts in the following table to comply with the requirements of the ETSO. These alerts are based upon the alerts in the ETSO and offer an equivalent level of safety to the alerts specified in DO-161A.

Alert Type	Caution		Warning	
	Visual	Aural	Visual	Aural
FLTA	"TERRAIN"	"Caution, Terrain; Caution, Terrain"	"PULL UP"	"Terrain, Terrain; Pull Up, Pull Up"
PDA	"TOO LOW"	"Too Low Terrain"		
GPWS Mode 1	"SINK RATE"	"Sink Rate"	"PULL UP"	"Pull Up, Pull Up"
GPWS Mode 2	"TERRAIN"	"Caution, Terrain; Caution, Terrain"	"PULL UP"	"Terrain, Terrain; Pull Up, Pull Up"
GPWS Mode 3	"TOO LOW"	"Too Low Terrain"		
GPWS Mode 4	"TOO LOW"	"Too Low Terrain," "Too Low Gear," or "Too Low Flaps" depending upon aircraft speed and configuration		
GPWS Mode 5	"GLIDE SLOPE"	"Glide Slope"	"GLIDE SLOPE"	"Glide Slope"
500 Foot Wake-Up		"Five Hundred"		

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C151a#2 – Terrain Awareness and Warning System (TAWS)

ETSO-C151a App. 1 § 4.7, § 4.9 Instead of providing multiple, selectable messages for certain alert conditions, a fixed set of alert messages is provided.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C151a#3 – Terrain Awareness and Warning System (TAWS)

ETSO-C151a App. 1 § 10.2 and § 10.3 In the conditions for defining the Terminal or Approach Phase the decreasing range to nearest runway threshold is not used.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C151a#4 – Terrain Awareness and Warning System (TAWS)

DO-161A § 2.1.2: Instead using purely the flaps to determine landing configuration the following criteria are used depending on aircraft type.

Logic for Mode 2 envelope selections:

Aircraft Type	Mode 2A	Mode 2B
Airplane RG	Flaps NOT in landing	Flaps in landing configuration.

+ F	configuration.	
Airplane RG	Landing Gear UP	Landing Gear DOWN
Airplane FG + F	Flaps NOT in landing configuration	Flaps in landing configuration
Airplane FG	AGL Altitude > 500' OR IAS > Note 1	AGL Altitude < 500' AND IAS < Note 1
Rotorcraft RG	Landing Gear UP	Landing Gear DOWN
Rotorcraft FG	AGL Altitude > 200' OR IAS > 80KIAS	AGL Altitude < 200' AND IAS < 80KIAS

Notes:

RG + F = Retractable Gear with Defined Landing Flaps Position
RG = Retractable Gear
FG + F = Fixed Gear with Defined Landing Flaps Position
FG = Fixed Gear
1. Normal Landing Pattern Speed + 15KIAS

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C151a#5 – Terrain Awareness and Warning System (TAWS)

DO-161A § 2.1.3: Instead basing the arming logic of Mode 3 upon flap configuration the logic is based upon mode-of-flight states.

GPWS Mode 3 is armed by either being in ground mode (defined as indicated airspeed less than V_s (airplanes) / 40KIAS (rotorcraft) AND AGL altitude less than 75 feet) or by being on the first leg of a missed approach procedure (as determined by the FMS function) with distance to the active runway threshold increasing. As proposed, GPWS Mode 3 is disarmed upon climbing through 700 feet AGL, travelling more than 6NM from the last point at which the ground mode existed (this will be near the lift-off point), or transitioning to the second leg of a missed approach procedure.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C151a#6 – Terrain Awareness and Warning System (TAWS)

DO-161A § 2.1.4: For Mode 4 alerts the specific conditions are used:

Aircraft Type	Mode 4A	Mode 4B
Airplane RG + F	Landing Gear UP	Landing Gear UP OR Flaps not in landing configuration.
Airplane RG	Landing Gear UP	Landing Gear UP
Airplane FG + F	Not Applicable	Flaps not in landing configuration
Airplane FG	Not Applicable	Not Applicable
Rotorcraft RG	Landing Gear UP	Not Applicable
Rotorcraft FG	Not Applicable	Not Applicable

Notes: RG + F = Retractable Gear with Defined Landing Flaps Position
RG = Retractable Gear
FG + F = Fixed Gear with Defined Landing Flaps Position

FG = Fixed Gear

Due to the aircraft type some modes are not applicable.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

CRD document CRD.DevP11.

ETSO-C151a#7 – Terrain Awareness and Warning System (TAWS)

DO-161A § 2.3.2 states, "The visual warning for Modes 1 through 4 shall be red and include, in distinctive letters, the letter GPWS (or other acceptable legend)."

No red "GPWS" visual warning for Modes 1 through 4 will be provided.

The visual alert specified in DO-161A conflicts with those specified in ETSO-C151a. Applicant proposes the aural and visual alerts in the following table to comply with the requirements of the TSO. These alerts are based upon the alerts in the TSO.

Alert Type	Caution		Warning	
	Visual	Aural	Visual	Aural
FLTA	"TERRAIN"	"Caution, Terrain; Caution, Terrain"	"PULL UP"	"Terrain, Terrain; Pull Up, Pull Up"
PDA	"TOO LOW"	"Too Low Terrain"		
GPWS Mode 1	"SINK RATE"	"Sink Rate"	"PULL UP"	"Pull Up, Pull Up"
GPWS Mode 2	"TERRAIN"	"Caution, Terrain; Caution, Terrain"	"PULL UP"	"Terrain, Terrain; Pull Up, Pull Up"
GPWS Mode 3	"TOO LOW"	"Too Low Terrain"		
GPWS Mode 4	"TOO LOW"	"Too Low Terrain," "Too Low Gear," or "Too Low Flaps" depending upon aircraft speed and configuration		
GPWS Mode 5	"GLIDE SLOPE"	"Glide Slope"	"GLIDE SLOPE"	"Glide Slope"
500 Foot Wake-Up		"Five Hundred"		

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C151a#8 – Terrain Awareness and Warning System (TAWS)

DO-161A § 2.6.4: Mode 5 shall be armed and disarmed based upon landing gear and flap position and various other detectable flight conditions. Mode 5 is armed when a valid glideslope signal is being received AND the aircraft's 5 second filtered descending glidepath is greater than 1° AND the aircraft is below 1000 ft AGL.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C151a#9 – Terrain Awareness and Warning System (TAWS)

DO-161A Appendix A envelope drawings for Modes 1, 2A, 3, 4 and 5: Use of terrain database derived AGL altitude when radar altitude is not available with a descent inhibit height of 100 feet instead of "Descent Inhibit Height" of 50 feet ± 10 feet.

Published in ETSO.DevP.11 from 29.6.2007 to 20.7.2007.

No Comments received.

ETSO-C151b#1 - Terrain Awareness and Warning System (TAWS)

Deviate from ETSO-C151b Section 4.2.a to remove the marking requirement "… in Part 21 Section A Subpart Q § 21A.807(a)(3), the date of manufacture must be used in lieu of the serial number."

Published in ETSO.DevP.26 from 30.10.2008 to 21.11.2008.

No comment received.

ETSO-C155#1 – Recorder Independent Power Supply

Deviate from ETSO-C155 Appendix 1, Section 2 and provide less than the minimum 12 watts of output power for the supply duration.

Published in ETSO.DevP.60 from 23.2.2011 to 18.3.2011.

One comment received. See CRD DevP60.

ETSO-C155#2– Recorder Independent Power Supply

Deviate from ETSO-C155 Appendix 2 and use different categories for environmental testing than those specified in the appendix.

Published in ETSO.DevP.60 from 23.2.2011 to 18.3.2011.

One comment received. See CRD DevP60.

ETSO-C166a#1- Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services (TIS-B) Equipment Operating on the Radio Frequency of 1090 MHz

Deviate from ETSO-C166a, 4.2 and allow not marking the unit with the class information, which is instead provided in the installation and operation manual.

Published in ETSO.DevP.35 from 20.11.2009 to 11.12.2009.

One comment received. See CRD DevP35.

ETSO-C166a#2 - Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services (TIS-B) Equipment Operating on the Radio Frequency of 1090 MHz

Deviate from RTCA DO-260A section 2.2.4.3.4.7.3.b and use alternate correction techniques as specified in DO-260A section 2.2.4.4.3.1.

Published in ETSO.DevP.35 from 20.11.2009 to 11.12.2009.

No comment received.

ETSO-C166a#3 - Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services (TIS-B) Equipment Operating on the Radio Frequency of 1090 MHz

Deviate from RTCA DO-260A section 2.2.4.5.b and use alternate correction techniques as specified in DO-260A section 2.2.4.4.3.1.

Published in ETSO.DevP.35 from 20.11.2009 to 11.12.2009.

No comment received.

ETSO-C166a#4 Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services (TIS-B) Equipment Operating on the Radio Frequency of 1090 MHz

RTCA DO-260A, 2.2.3.2.3.7.3.1, 2.2.3.2.3.8.3.1, 2.2.3.2.4.7.3.1, 2.2.3.2.4.8.3.1 - When the latitude of the GPS position exceeds 87 degrees latitude North or South at any longitude (Polar Region), the ADS-B Transmitter shall encode the position as received from the GPS without extrapolating for latency or the required 200 ms updates. Instead the NACp is increased to 6 indicating a higher position uncertainty. A potential resulting ground speed limitation will be recorded in the DDP and on the ETSO certificate.

Published in ETSO.DevP.43 from 20.11.2009 to 11.12.2009.

CRD document CRD.DevP43.

ETSO-C166a#5 Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services (TIS-B) Equipment Operating on the Radio Frequency of 1090 MHz

RTCA DO-260A 2.2.3.2.7.3.2.1: Implement the "TEST' Message with SUBTYPE=7, without a geographic filter for Mode A code transmission. See FAA letter published as amendment to TSO-C166a.

Published in ETSO.DevP.43 from 20.11.2009 to 11.12.2009.

No comment received.

ETSO-C166a#6 Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services (TIS-B) Equipment Operating on the Radio Frequency of 1090 MHz

Deviate from ETSOC166a 3.1.1 and use EUROCAE ED-102A/RTCA DO-260B instead of DO-206A change 2 as the Minimum Performance Standard.

Published in ETSO.DevP.47r1 from 16.04.2010 to 07.05.2010.

No comment received.

ETSO-C166a#7 - Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services (TIS-B) Equipment Operating on the Radio Frequency of 1090 MHz

Deviate ETSO-C166a 3.1.1 to use of RTCA DO-260B with Corrigendum 1 / EUROCAE ED-102A with Corrigendum 1 in lieu of RTCA DO-260A.

Published in ETSO.DevP.81 from 29.08.2012 to 19.09.2012.

No comments received.

ETSO-C166a#8 - Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services (TIS-B) Equipment Operating on the Radio Frequency of 1090 MHz

Deviate from ETSO-C166a 3.1.2 to use EUROCAE ED-14D / RTCA DO-160D change 3 for environmental test procedures.

Published in ETSO.DevP.81 from 29.08.2012 to 19.09.2012.

No comments received.

ETSO-C166a#9/ETSO-C166b#2 - Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services (TIS-B) Equipment Operating on the Radio Frequency of 1090 Megahertz (MHz)

When the latitude of the GPS position exceeds 87 degrees latitude North or South at any longitude (Polar Region), the ADS-B Transmitter shall encode the position as received from the GPS without extrapolating for latency or the required 200 ms updates.

Published in ETSO.DevP.81 from 29.08.2012 to 19.09.2012.

No comments received.

ETSO-C166b#1 - Extended Squitter Automatic Dependent Surveillance - Broadcast (ADS-B) and Traffic Information Services (TIS-B) Equipment Operating on the Radio Frequency of 1090 Megahertz (MHz)

Deviate ETSO-C166b 3.1.1 to use of RTCA DO-260B with Corrigendum 1 / EUROCAE ED-102A with Corrigendum 1 in lieu of only RTCA DO-260B.

Published in ETSO.DevP.81 from 29.08.2012 to 19.09.2012.

No comments received.

ETSO-C166b#3- Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services (TIS-B) Equipment Operating on the Radio Frequency of 1090 MHz

Deviate from ETSO-C166b, 4.2 and allow not marking the unit with the class information, which is instead provided in the installation and operation manual.

In analogy to ETSO-C166a#1.

ETSO-C166b#4 - Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services (TIS-B) Equipment Operating on the Radio Frequency of 1090 MHz

Deviate from RTCA DO-260B section 2.2.4.3.4.7.3.b and use alternate correction techniques as specified in DO-260B section 2.2.4.4.3.1.

In analogy to ETSO-C166a#2.

ETSO-C166b#5 - Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services (TIS-B) Equipment Operating on the Radio Frequency of 1090 MHz

Deviate from RTCA DO-260B section 2.2.4.5.b and use alternate correction techniques as specified in DO-260B section 2.2.4.4.3.1.

In analogy to ETSO-C166a#3.

ETSO-2C169a#1 VHF Radio Communications Transceiver Equipment Operating Within The Radio Frequency Range 117.975 To 137.000 Megahertz

Deviate from EUROCAE ED-23C paragraph 3.1.3.2 to have up to 11.2 db reduction in audio output instead of 10 db.

Published in ETSO.DevP.91 from 16.05.2013 to 06.06.2013.

No comments received.

ETSO-2C514#1 Airborne Systems for Non Required Telecommunication Services (In Non Aeronautical Frequency Bands) (ASNRT)

Deviate from ETSO-2C514, 3.1.2 and use EUROCAE ED-14D change 3/RTCA DO-160D change 3 instead of ED-14E/DO-160E as environmental test procedure.

Published in ETSO.DevP.40 from 30.07.2009 to 21.08.2009.

CRD document CRD.DevP40.

Comments Summary

Comments received to ETSO.DevP.02, ETSO.DevP.03 have been of general nature and handed over to rulemaking for further consideration.

Revision History

Rev. 0: issued 4.4.2007 covers the deviation publication ETSO.DevP.02 and ETSO.DevP.03

Rev. 1 issued 11.5.2007 covers the deviation publication ETSO.DevP.04

Rev. 2 issued 22.5.2007 covers the deviation publication ETSO.DevP.07

Rev. 3 issued 30.5.2007 corrected date for publication of ETSO.DevP.02 and inserted links to PDF files for ETSO.CRD in order to further generate PDF self-contained file for Web publication.

Rev. 4 issued 22.6.2007 covers the deviation publication ETSO.DevP.05 (2C126 only) ETSO.DevP.06 and ETSO.Dev.P.08.

Rev. 5 issued 06.09.2007 covers the deviation publications ETSO.DevP.09, ETSO.DevP.10, ETSO.DevP.11.

Rev. 6 issued 29/10/2007 covers ETSO.DevP.05 second part, ETSO.DevP.13

Rev. 7 issued 18/12/2007 covers ETSO.DevP.12 and ETSO.DevP.17

Rev. 8 issued 29/04/2008 covers ETSO.DevP.18 including CRD DevP18.

Rev. 9 issued 24/09/2008 covers ETSO.DevP.19 (partly) including CRD DevP19, ETSO.DevP.21 and ETSO.DevP.22.

Rev. 10 issued 01/12/2008 covers ETSO.Dev.P.23, ETSO.Dev.P.24 and the integration of the missing text for ETSO.DevP.22 (ETSO-C135a#2).

Rev. 11 issued 23/03/2009 covers ETSO.DevP.10 second part, ETSO.DevP.27, ETSO.DevP.28, ETSO.DevP.29, ETSO.DevP.30 and ETSO.DevP.32.

Rev. 12 issued 16/07/2009 covers ETSO.DevP.36, ETSO.DevP.38.

Rev. 13 issued 17/12/2009 covers ETSO.DevP.26, ETSO.DevP.39, ETSO.DevP.40, ETSO.DevP.43

Rev. 14 issued 20/04/2010 covers ETSO.DevP.35 section 2,3 including CRD DevP35, ETSO.DevP.37 including CRD DevP37, ETSO.DevP.41, ETSO.DevP.42, ETSO.DevP.44 and ETSO.DevP.45

Rev. 15 issued 03/02/2011 covers partially ETSO.DevP.25, ETSO.DevP.31, ETSO.DevP.47, ETSO.DevP.48 including CRD.DevP48, ETSO.DevP.49, ETSO.DevP.50, ETSO.DevP.52 including CRD.DevP52, ETSO.DevP.53 including CRD.DevP53, ETSO.DevP.54 including CRD.DevP54, ETSO.DevP.55, ETSO.DevP.56

Rev. 16 issued 30.3.2011 covers ETSO.DevP.19 (partly), ETSO.DevP.46, ETSO.DevP.57

Rev. 17 issued 1.9.2011 covers ETSO.DevP.33 (partly), ETSO.DevP.59 including CRD.DevP59, ETSO.DevP.62, ETSO.DevP.64, Introduction modified

Rev. 18 issued 21.10.2011 covers ETSO.DevP.67 and includes the amendment of EASA Management Board decision n° 7-2004

Rev. 19 issued 21.11.2011 covers ETSO.DevP.35 section 4, ETSO.DevP.51, ETSO.DevP.61 and ETSO.DevP.63

Rev. 20 issued 20.06.2012 covers ETSO-C47a#1, #2; ETSO-C112c#1; ETSO-C113#4

Rev. 21 issued 21.09.2012 covers ETSO.DevP.58, ETSO.DevP.60

Rev. 22 issued 19.11.2012 covers ETSO-C166b#1, ETSO-C166b#2, ETSO-C166b#3, ETSO.DevP.65, ETSO.Dev.P.69, ETSO.DevP.71, ETSO.DevP.81

Rev. 23 issued 01.07.2013 covers ETSO-C3d#1a, ETSO-C6d#2a, ETSO-C10b#2a, ETSO-C139#1, ETSO-C139#2, ETSO.DevP.84, ETSO.DevP.86, ETSO.DevP.88a, ETSO.DevP.89, ETSO.DevP.91