TSO-C112d Public Comments Tracker

(cws-review)
This document tracks and records the publication of TSO-C112d.
All comments are due by COB 2011 May 06. Comments were taken until 13 May.

Version 0.80 - This is a copy of version 0.72. Posted on the internet for public comment.
Version 0.81 - All accepted comments added
Version 0.82 - All comments incorporated

SECTION 3 - PUBLIC REVIEW

Consolidated Field Comments for TSO-C112d						
#	**Name**	**Para Section**	**Comment Level C E or N**	**Comment**	**Suggested resolution**	**AIR-130 Disposition**
41	Boeing - Terry L. McVenes Director, Operational Regulatory Affairs	Section 3 Para 2 page 2		The proposed text states: *"Malfunction of the function defined in paragraph 3.a of this TSO is a major failure condition. Loss of the function defined in paragraph 3.a of this TSO is a major failure condition. Design the system to at least the major failure condition classification."*	We recommend changing the text as follows: *"Malfunction of the function defined in paragraph 3.a of this TSO is a major failure condition. Loss of the function defined in paragraph 3.a of this TSO is a* ***minor*** *failure condition.* ***Misleading altitude data reported by the transponder is a major failure condition.*** *Design the system to at least the major failure condition classification."* "Malfunction of the function" can be misinterpreted and is not consistent with terminology used in AC 25.1309-1A. Instead, we recommend using the terms "loss of the function" and "misleading data." Loss of the transponder function is deemed a minor functional hazard class using the guidelines and criteria of AC 25.1309-1A. Note: The functional hazard assessments (FHAs) for all of Boeing's previous and currently certified airplane models show loss of the transponder function as a minor functional hazard class. In addition, a minor functional hazard class for the loss of transponder function is consistent with the functional hazard class for the loss of ADS-B Out (TSO-C166b) function. Further, reference of the altitude data would clearly identify the type of misleading data that constitutes a major hazard class.	1) Template wording, will forward to template team, 2) proposal also does not cover risk from such things as misleading range from reply turnaround errors, or ID issues etc., 3) loss of function should be minor, and has been changed.
42	Boeing - Terry L. McVenes Director,	Section 3. REQUIREMENTS Paragraph		The proposed text states: *"We have provisions for using alternate or equivalent means of compliance to the criteria in the MPS of this TSO. If you*	We recommend changing the text as follows: *"We have provisions for using alternate or equivalent means of compliance to the*	Accepted, reference included.

	Operational Regulatory Affairs	g. Deviations Page 2		*invoke these provisions, you must show that your equipment maintains an equivalent level of safety. Apply for a deviation under the provision of 14 CFR 21 Subpart O dated April 14, 2010."*	*criteria in the MPS of this TSO. If you invoke these provisions, you must show that your equipment maintains an equivalent level of safety. Apply for a deviation under the provision of 14 CFR 21 Subpart O dated April 14, 2010* ***§21.618****."* We recommend referencing the precise regulation for TSO deviation submittal, per recently released Amendment 21-92 (effective 4/16/2011) as shown below. ***[14 CFR] §21.618 Approval for deviation*** *(a) Each manufacturer who requests approval to deviate from any performance standard of a TSO must show that factors or design features providing an equivalent level of safety compensate for the standards from which a deviation is requested.* *(b) The manufacturer must send requests for approval to deviate, together with all pertinent data, to the appropriate aircraft certification office. If the article is manufactured under the authority of a foreign country or jurisdiction, the manufacturer must send requests for approval to deviate, together with all pertinent data, through the civil aviation authority of that country or jurisdiction to the FAA.*	
43	Boeing - Terry L. McVenes Director, Operational Regulatory Affairs	Section 4. MARKING Paragraph a. Page 2		The proposed text states: *"Mark at least one major component permanently and legibly with all the information in 14 CFR 21 Subpart O. The marking must include the serial number…"*	We recommend changing the text as follows: *"Mark at least one major component permanently and legibly with all the information in 14 CFR 21 Subpart O* ***§45.15(b), except as modified within this paragraph****. The marking must include the serial number…"* We recommend referencing the precise regulation for marking, per recently released Amendment 21-92 (effective 4/16/2011). as shown below. Also, please note that the draft TSO requires that a	Template wording, will forward to template team, partly accepted, reference to §45.15(b) incorporated.

					serial number be used whereas §45.15(b)(2) states that a serial number **or** the date of manufacture can be used. ***[14 CFR] §21.616 Responsibility of holder*** … *(d) Mark the TSO article for which an approval has been issued. Marking must be in accordance with part 45 of this chapter, including any critical parts; …* ***[14 CFR] FAR §45.15 Marking requirements for PMA articles, TSO articles, and Critical parts.*** … *(b) TSO articles. The manufacturer of a TSO article must permanently and legibly mark –* *(1) Each TSO article with the TSO holder's name, trademark, symbol, or other FAA approved identification and part number; and* *(2) Each TSO article, unless otherwise specified in the applicable TSO, with the TSO number and letter of designation, all markings specifically required by the applicable TSO, and* ***the serial number or the date of manufacture*** *of the article or both.* [Highlighting added.]	
44	Boeing - Terry L. McVenes Director, Operational Regulatory Affairs	Section 5. APPLICATION DATA REQUIREMENTS Page 3		The proposed text states: *"You must give the FAA Aircraft Certification Office (ACO) manager responsible for your facility a statement of conformance, as specified in 14 CFR 21 Subpart O and one copy each of the following technical data to support your design and production approval…"*	We recommend changing the text as follows: *"You must give the FAA Aircraft Certification Office (ACO) manager responsible for your facility a statement of conformance, as specified in 14 CFR 21 Subpart O* ***§21.603(a)(1)*** *and one copy each of the following technical data to support your design and production approval…"* We recommend referencing the precise regulation for application data requirements per recently released Amendment 21-92 (effective 4/16/2011) as shown below.	Accepted, reference included.

					[14 CFR] §21.603 Application. *(a) An applicant for a TSO authorization must apply to the appropriate aircraft certification office in the form and manner prescribed by the FAA. The applicant must include the following documents in the application:* *(1) A statement of conformance certifying that the applicant has met the requirements of this subpart and that the article concerned meets the applicable TSO that is effective on the date of application for that article.*	
45	Rockwell Collins Robert Saffell	Section 3	E	Change "REQURIEMENTS" to " REQUIREMENTS"		Correction made.
46	Garmin	4.a		Marking the functional level, minimum peak output power and optional additional features is impractical and has little or no value. Garmin routinely requests and is granted deviations from such marking requirements to include them in the equipment installation manual as the equipment does not have sufficient space to include all required markings.	Remove the requirement to mark transponder functional level, minimum peak output power and optional additional features. Additionally, strongly urge the FAA to revise its Order 8150.1B CHG 1 TSO marking policy to eliminate the need to routinely request TSO deviations from these marking requirements.	1) Template wording, will forward to template team, 2) these marking requirements are necessary to identify the transponder capabilities in support of such things as installation and testing etc., and will remain.
47	Garmin	4.c		Paragraph 4.c states "If the article includes a deviation per paragraph 3.g of this TSO, the marking should include a means to indicate a deviation was granted." Recently effective rule § 45.15(b)(2) states: (b) TSO articles. The manufacturer of a TSO article must permanently and legibly mark – (2) Each TSO article, unless otherwise specified in the applicable TSO, with the TSO number and letter of designation, all markings specifically required by the applicable TSO, and the serial number or the date of manufacture of the article or both. While this new rule does not appear to	Recommend removing TSO-C112d paragraph 4.c and Order 8150.1B CHG 1 TSO template paragraph 4.c. Recommend adding the following statement in TSO-C112d paragraph 3.g and Order 8150.1B CHG 1 TSO template paragraph 3.g: "Any deviations to this TSO are required to be included in the Installation Manual."	Template wording, will forward to template team, partly accepted, paragraph 4.c deleted.

				contradict the paragraph 4.c requirement to mark the TSO article "to indicate a deviation was granted", the fact remains that most TSO articles have at least one deviation and FAA requires these deviations to be included in the article's installation manual which an installer must use to determine whether the article with deviations can be used in a particular aircraft installation. Furthermore, FAA has routinely granted deviations from other TSOs that have required marking the equipment "to indicate a deviation was granted" since equipment typically does not have sufficient space to include the "deviation granted" marking as well as all other required markings. Consequently, there is no benefit to marking the article "to indicate a deviation was granted" since the currently accepted method is to provide the deviation information in the Installation Manual.		
48	Garmin	5.d		Paragraph 5.d states "If the article includes a simple or complex custom micro-coded component, a plan for hardware aspects of certification (PHAC), hardware verification plan, top-level drawing, and hardware accomplishment summary (or similar document, as applicable)." This is inconsistent with AC 20-152 which applies to complex custom micro-coded components only.	Recommend changing Paragraph 5.d to: If the article includes a complex custom micro-coded component, a plan for hardware aspects of certification (PHAC), hardware verification plan, top-level drawing, and hardware accomplishment summary (or similar document, as applicable).	Template wording change, accepted with small change.
49	Garmin	5.f		TSO-C112d paragraph 5.f and its subparagraphs (which are based on FAA Order 8150.1B CHG 1 TSO template paragraph 5.f and its subparagraphs) include guidance about the definition of non-TSO functions and the data to be submitted to the ACO for non-TSO functions. This guidance is inconsistent with the FAA-industry agreed guidance that was originally published in FAA Notice 8150.6 and recently reaffirmed in Order 8110.4C CHG 4. Specific areas of issue with TSO-C112d paragraph 5.f and its subparagraphs (and FAA Order 8150.1B CHG 1 TSO template paragraph 5.f and its subparagraphs) include: Paragraph 5.f states "Identify functionality, features or performance contained in the article not evaluated under paragraph 3 of this TSO (that is non-TSO functions)." Use of the terms "features or	Rather than trying to re-invent the wording associated with defining and managing Non-TSO functionality recommend revising TSO-C112d paragraph 5.f and Order 8150.1B CHG 1 TSO template paragraph 5.f to reference Order 8110.4C CHG 4.	Template wording, will forward to template team.

				performance" in the definition of a non-TSO function is inconsistent with the Order 8110.4C CHG 4 paragraph 6-9.b.(1) and 6-9.b.(3)(a) guidance regarding how to define a non-TSO function and contradicts the following N8150.6 Appendix 2 FAQ, which uses the terms "characteristics", "features", and "performance" and disassociates such aspects from functions that should be declared as non-TSO functions: **7. Q: Are all functions in a TSO article, not specifically covered by a TSO-approved minimum performance standard (MPS), considered non-TSO functions?** **A:** No. Manufacturers often incorporate functions that do not have a direct MPS reference, but that are derived from existing requirements within the MPS. Unlike the non-TSO function, these functions have a direct bearing on the basic TSO operation and are often referred to as "characteristics" or "features" since they are added to enhance performance, usability or integrity of the TSO article. Examples of TSO features might include: the capability to flip-flop the "active" and "standby" frequencies of a communication or navigation radio, facility information (e.g., airport frequencies, runways, airport services available, etc.), built in test (BIT) capability on start-up, and health monitoring to name just a few. Paragraph 5.f indicates that "you must declare these functions and include the following information with your TSO application" but the 5.f subparagraphs which specify the required information to be supplied to the ACO for a non-TSO function are inconsistent with the Order 8110.4C CHG 4 paragraph 6-9.b.(3) "**Manufacturer Data Submittal**" requirements. For example, paragraphs 5.f.(5) and 5.f.(6) require submittal of "Results of test/analysis" while Order 8110.4C CHG 4 paragraph 6-9.b.(3) requires submittal of "proposed test procedures"; while both sets of guidance use the word "test", otherwise there is no similarity.		
50	Garmin	7.a		Items 5.c and 5.d do not need to be provided to each installer. Software and hardware planning documents and accomplishment summaries may contain company proprietary data and do not provide any information of value to the installer.	Recommend that 7.a specify items 5.a, 5.b, 5.e and 5.f.	Template wording change, accepted with small change.

51	Gary Furr			in an e-mail to Bob Saffell, John Fisher CC'd "I am surprised to have seen that you did not comment on the possibility of mentioning the need to put some sort of "ERRATA" in an Appendix to TSO C112d based on the analysis of the problem raised by Kevin Wilson and commented on by yourself with regard to Test Procedure #1 in paragraph 2.5.4.1.2. Since this errata has to be the "only" screw-up in the entire DO-181E, and it also exists in ED-73E, we should consider posting the 1.5 page proposed revision that you have already prepared in some manor in the TSO, so that EASA could follow the same route with their ETSO."		This comment will be incorporated in a change to DO-181E and will be processed at that time.
52	Gary Furr			You seem to have several references to different versions of DO-160 in TSO C112d, and none of them are to the current revision "G" version.	I doubt that the lawyers will allow you to change all of those references to "the latest version of DO-160()" but you should either try that, or change all of the references to DO-160G	Template wording, will forward to template team.
53	Gary Furr			We should also give serious consideration to what to do with the issue of the problem identified in test procedure #1 at paragraph 2.5.4.1.2 and the proposed resolution from Bob Saffell. Upon discussion of this needed correction with Eric Potier during the Toulouse ASP Meeting, we agreed to further discuss this and do the same thing in both documents/TSOs even though we probably could have made the correction in ED-73E before EUROCAE published it.		This comment will be incorporated in a change to DO-181E and will be processed at that time.