

**Clearance Record
DOCUMENT COMMENT LOG**

Originating Office: AIR-110	Document Description: AC 21-XX Installation of TSOA Articles and LODA Appliances	Project Lead/Reviewer	Reviewer FAA Field Offices	Date of Review: Dec 2010
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Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
ACE-119We	Throughout AC	Reference to a product should be more specific		Change reference to “product” to read “ Type Certificated Product”.	Changed to “the type design of a product”	1
ACE-117C:WJ	General	There is no “reference” section		Add paragraph to identify related reference documents.	Non-concur, reference is provided in the paragraph when appropriate	2
ACE-116Wm	Page 1, Para 1	The stated purpose of this AC is to describe how an installer can achieve an installation approval (TC, STC, etc.) of TSO articles. However, this AC does not explain the full process for achieving an installation approval.	A reader could be misled into thinking that this AC stands alone, and could be used to install TSO articles without using the installation approval process.	One way to remedy this problem would be to change the purpose of the AC. The purpose could be <u>to describe the role of TSO approvals in the installation approval process</u> . Guidance and policy for the installation approval process should be referenced. For example, order 8110.4C, AC21-40A, etc.	Partially concur, revised Purpose of this AC for clarity	3
ACE-116Wm	Page 1, Para 3	This is a new section (it is no longer under Purpose and Applicability and therefore the numbering should re-start with 1.	Format error	Correct format error as suggested.	Format will be corrected to agree with DMO comments	4
ACE-116Wm	Page 1, Para 3.a	The approval could apply to any of the 3 methods listed, so 3.a should use “or”, not “and”.	See comment	Change “and” to “or”	Concur, revised accordingly	5
ACE-118Wa	Page 1, Para 1.a and Page 2, Para 3.c	The draft AC only includes DERs, does that mean ODAs and ODA UMs are	ODAs and ODA UMs are not mentioned in the draft AC.	Clarify whether or not ODAs and ODA UMs are included or excluded.	Partially concur. Reference to DER (and requested ODA) was	6

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		not included?			<p>removed because AIR-100 chose not to specify how the applicant would send their application to the FAA ...Paragraph revised as follows:</p> <p>"Describes the appropriate use of data approved by the FAA, through a technical standard order authorization (TSOA) or TSO letter of design approval (LODA), by applicants seeking a type certificate or approval of a change to type design under the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 21." Rather than say that the applicant would submit through a DER, we decided to remove the statement regarding the ACO and the DER.</p>	
Kenneth Mobley, ATL ACO	Page 1, Para. 3.b.	Should "changes" only be applicable to major changes?	Clarification; are only major changes applicability?	Change From "approval of changes" To "approval of major changes" if only major changes are applicable.	Non-concur with suggested change because AIR-100 does not want to specify major changes only.. Paragraph revised as	7

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					<p>follows:</p> <p>“Applicants incorporating a TSO article into the type design of a product must obtain FAA approval. The approval of a type design, or change in type design, of a product is separate from the TSOA or LODA. The procedures for obtaining this approval are defined in 14 CFR part 21 and include the following methods:</p> <p style="padding-left: 40px;">a. The issuance of a type certificate (TC), including a supplemental type certificate (STC) or an amended type certificate (ATC).</p> <p style="padding-left: 40px;">b. The approval of changes to the type design of a TC, STC or ATC.”</p>	
ACE-117C:KM	Page 1&2, Paragraph 1(a) and 3(c)	Why do these sections address DERs but not ODAs?		Update these sections to address both individual designees and delegated	Partially concur, but removed DER because AIR-100 does not want	8

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				organizations.	to specify how tje applicant sends their application to the FAA. Paragraph revised as follows: "Describes the appropriate use of data approved by the FAA, through a technical standard order authorization (TSOA) or TSO letter of design approval (LODA), by applicants seeking a type certificate or approval of a change to type design under the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 21." Rather than say that the applicant would submit through a DER, we decided to remove the statement regarding the ACO and the DER.	
ACE-119We	Page 2 Para 3.d	The text “The approval of any data in a manner acceptable to the FAA” is very open-ended.	This could lead to very inconsistent use of the AC	Remove this sentence.	Concur, text has been removed	9
ACE-116W	Page 2 Para 4 and 5	I found these sections to be very confusing. They describe certain steps, but	Purpose of these sections is not clear.	It would be helpful to explain the process for using data accepted during the TSO	Non-concur, these examples are appropriate for the ACO to use, but	10

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		<p>these steps may or may not be necessary show that the installation is compliant. Also, these steps may or may not be adequate to show that the installation is compliant.</p> <p>Is the purpose of these sections to describe the criteria for TSO articles to be accepted as compliant without further substantiation?</p>		<p>approval for showing compliance with airworthiness requirements.</p> <p>For example, if a TSO article was tested at high temperature during the TSO approval process, the installer would have to verify that the installed environment is not more severe than the TSO tested environment. If this can be shown, no further showing is necessary for performance at high temperature. The comparison between the TSO testing and the airplane requirements should be documented in a certification report.</p> <p>When a certification test is used to show compliance with installation requirements, the test article must conform to type design for all aspects being tested. Reference 8110.4C. If a TSO article is used for the test, the FAA conformity may only need to include determining if any Material Review Board actions would invalidate the test objectives.</p>	not necessary for the AC	

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ACE-118A	Page 2, Paragraph 4.b	Simplify the language	The language in this paragraph seems verbose.	<p><u>Change From:</u> “Identify the data accepted by the FAA under the TSOA (see section 5 for the types of data you may need to identify). The data, required to be supplied by the TSOA holder under their TSO, has been accepted under the TSOA.”</p> <p><u>Change to:</u> “Identify the data the TSOA holder supplied and the FAA accepted under the TSOA (see section 5 for the types of data you may need to identify).”</p>	Partially concur, revised as follows: “Identify the data approved by the FAA under the TSOA that is applicable to the airworthiness requirements (see section 5 for the types of data you may need to identify). The data, required to be supplied by the TSOA holder under their TSO, has been approved under the TSOA. To the extent that the FAA-approved TSOA data aligns with the applicable airworthiness requirements, the data needs no further substantiation or evaluation by the FAA.”	11
Kenneth Mobley, ATL ACO	Page 2, Para. 4.b.	What does “The data, required to be supplied by the TSOA holder under their TSO, has been accepted under the TSOA.” mean?	Is this text asking that acceptance be confirmed or is it stating that the TSOA holder is obligated to supply the data?	Clarify meaning of sentence.	Non-concur The data submitted with the TSOA application is approved. The intent of the paragraph is to identify that the TSOA holder's furnished data must be understood by the applicant.	12

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ACE-117C:KM	Page 2, Paragraph 4, Background	The sentence, "The amount of substantiation and descriptive data you need depends on several considerations," is misleading.	This first sentence leads me to believe that "several" considerations will be provided here as a background info. That is not the case.	Delete the sentence or identify the "considerations."	Non-concur. The considerations are in the following text in paragraph 4a: "A TSO defines the minimum performance standard (MPS) for an article. The data developed by a TSOA holder is required to address the MPS defined by the TSO, and might not address all of the applicable airworthiness requirements for its installation in the type design of a product."	13
ACE-117C:BO	Page 2, Paragraph 4(b) and 5(a)	TSOA holder needs to provide certain software/AEH data to the installer.	It is the installer's responsibility to insure that the TSO article performs its intended function and is safe when installed. In order to do that, they must have access to certain software life cycle data.	The TSOA holder should be required to provide the appropriate software/AEH data to enable the installer to determine that the TSOA article (or changes to a previously issued TSOA) are functional and safe for a particular installation. This should include data such as the software and AEH configuration index, accomplishment summary, and open problem reports/resolutions.	Out of scope for this AC	14
ACE-119We	Page 2, Para 4 Note	Although the TC/STC applicant might use the		Remove Note.	Concur, revised accordingly	15

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		TSO data to assist in showing compliance to airworthiness requirements, I don't think you want to set the precedence of saying the TSO alone shows compliance.				
ACE-119We	Page 2, Para 5.a	Sentence that refers to ETSO adds nothing to the discussion about TSO/LODA, and does not belong in this document. It only adds confusion.		Remove sentence.	Non-concur It is important to point out that a foreign authority may have different MPS.	16
ACE-116Wp	Page 2, Para 5.b	TSO approvals that deviate from standard could create additional installation certification issues	Section fails to address that additional qualification deviations can present additional installation challenges	Include note to emphasize that a TSO ELOS doesn't relieve the need for satisfying the installation requirements and thus, may require an aircraft level ELOS.	Non-concur, out of scope of this AC	17
Kenneth Mobley, ATL ACO	Page 3, Para. 5.b.	Change From: "You must identify any TSO deviations associated with the TSO article."	Clarify additional requirements.	Change To: "You must identify any TSO deviations associated with the TSO article <u>and substantiation that those deviations meet applicable airworthiness requirements</u>	Partially concur. Text has been revised as follows: "An applicant must consider any TSO deviations and related instructions when establishing compliance to the applicable airworthiness requirements."	18
ACE-117C:BO	Page 3, Paragraph 5(b)	Clarify that the installer must comply with any		Add "and/or limitations" to the sentence: "the	Partially concur, revised as follows:	19

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
		conditions and/or limitations resulting from a deviation.		<p>documentation provided with the TSO article may include conditions <u>and/or limitations</u> associated with the deviation.</p> <p>Clarify the last sentence by adding: “You must identify any TSO deviations associated with the TSO article, <u>and comply with the associated conditions and/or limitations.</u>”</p>	“The approval of a deviation may include installation or operational conditions that are necessary to ensure the equivalent level of safety. These conditions are reflected in installation or operational instructions.”	
ACE-119We	Page 3, Para 5.c	This paragraph should reflect the difference between incomplete & full TSOA installation differently.		<p>Change paragraph to the following:</p> <p>c. Incomplete TSO articles: Equipment may receive an incomplete TSOA as an incomplete system. In this case, the incomplete TSOA indicates compliance only to a subset of the MPS associated with a TSO, and should include instructions or limitations for its installation with the remainder of the equipment necessary to achieve the performance required by the entire MPS. You must address the missing aspects of the MPS as it relates to the airworthiness rules, and any conditions associated with the TSO</p>	Non-concur, this paragraph is intended to only address incomplete TSO articles.	20

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
				article's approval, if it is an incomplete system. , After the incomplete equipment is combined with the remainder of the system required for complete compliance to the TSO MPS, compliance must be established to the applicable airworthiness rules for the installed system		
ACE-119We	Page 3, Para 5.d	Modify the last sentence to reflect the TC/STC applicant's responsibility to approve the Non-TSO function at installation		Change sentence to read: "You must identify any non-TSO functions and their associated level of performance accepted under the TSOA, and evaluate them for approval under the TC/STC.	Partially Concur. Text has been revised as follows: "All other data supporting the non-TSO functions included in the article, and accepted under the TSOA, must be evaluated and approved at installation, just as any other non-TSO part would be approved as part of a TC/STC.	21
Kenneth Mobley, ATL ACO	Page 3, Para. 5.d.	Change From: "You must identify any non-TSO functions and their associated level of performance accepted under the TSOA."	Clarify additional requirements.	Change To: "You must identify any non-TSO functions and their associated level of performance accepted under the TSOA <u>and substantiation that those functions meet applicable airworthiness requirements for installation.</u> "	Non-concur, there will be cases where there is no applicable airworthiness requirements.	22

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
ACE-119We	Page 3, Para 5.e	<p>This paragraph says the TSO holder is not required to maintain the functionality or performance not documented as part of the TSOA.</p> <p>There is also a statement that the installer will control the design of the TSO.</p>		<p>Why would the TSOA holder have functionality or performance that is not documented by the TSOA?</p> <p>Change wording to indicate that the TSOA holder, not the installer, is responsible for the TSOA article, all of the article.</p>	Text has been removed because it was out of scope of this AC	23
ACE-118A	Page 4, Paragraph 6.b.	Paragraph 6.b. indicates that a installation approval holder may make reference to TSOA's ICA, but there is no clear statement regarding the distribution requirements of those TSOA ICA.	As the installation approval holder, they are responsible for distribution of a complete set of ICA. As the AC discusses the revision level/version of the document, the approval holder (TC/ATC/STC) should distribute the data that is included by reference.	Add distribution requirement to the end of the paragraph after the reference to revision level/version.	Non-concur, out of scope of this AC	24
ACE-118A	Page 4, Paragraph 7.a	Simplify the language	Confusing	<p><u>Change from:</u> "...You are responsible for ensuring that minor changes to TSO articles are correctly identified with respect to the airworthiness requirements, and the correct information is used for the version of the article that is being installed." <u>Change to:</u> "...Regardless, you are responsible for verifying that the minor changes made by</p>	<p>Clarified text by revising as follows:</p> <p>"The airworthiness approval holder is responsible for evaluating minor changes to TSO articles to determine if the change affects compliance to the airworthiness requirements. The design approval holder should</p>	25

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
				TSO holders to TSO articles do not invalidate compliance to the airworthiness requirements.	maintain a list of all applicable TSO article versions, for which airworthiness compliance has been established, and provide this data in the installation data for the installer to ensure the correct TSO article version is being installed.”	
ACE-117C:JR	Page 4, paragraph 7.a.	<p>The first sentence references 14 CFR 21.611 for design of the article as a minor change under their TSOA.</p> <p>Under the new Part 21, which will take affect April 16, 2011, 21.611 is being renumbered to 14 CFR 21.619.</p>	Section is renumbered in new Part 21	Change reference to 14 CFR 21.619	Partially Concur. Paragraph reference has been removed	26
ACE-118Wa	Page 4, Para 7.a	It is unclear what is intended with this paragraph or if this paragraph is necessary since it is repeating information from other guidance material.	Paragraph seems to be restating guidance from other guidance material.	Perhaps reword or delete the paragraph, or refer to the other guidance material instead of restating to reduce confusion/conflicts between different guidance materials.	Concur. Text has been changed to improve its applicability	27
ACE-119We	Page 4, Para 7.a	The last sentence needs to address the data needed for evaluation.		Change the sentence: “You are responsible for ensuring that minor changes to TSO articles are correctly identified with respect to the	Partially concur, revised as follows: “The airworthiness approval holder is	28

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
				<p>airworthiness requirements, and the correct information is used for the version of the article that is being installed.”, to read: “You are responsible for ensuring that minor changes, to TSO articles are correctly identified with respect to the airworthiness requirements, and that adequate and correct information is available for the installation evaluation of the TSOA article.”</p>	<p>responsible for evaluating minor changes to TSO articles to determine if the change affects compliance to the airworthiness requirements. The design approval holder should maintain a list of all applicable TSO article versions, for which airworthiness compliance has been established, and provide this data in the installation data for the installer to ensure the correct TSO article version is being installed”</p>	
ACE-119We	Page 4, Para 7.b	This section does not adequately address the possible loss of configuration management by installer modification of the TSOA article.		<p>If the installer modifies the TSOA article in any way, there is a possible loss of configuration control of the article for the TSOA holder. If the TSOA article is modified, the installer should obtain the concurrence of the TSOA holder that the original TSO is still met.</p>	<p>Non-concur, configuration management is out of scope for this AC.</p>	29
ACE-118Wa	Page 4, Para 7.b	The sentence can be misinterpreted to mean if the installation does not include any modification to the article, then the	Wording of the sentence “If the installation of the article includes any modification to the article, you are responsible for all aspects of compliance with the airworthiness	Reword/clarify the sentence so that it is clear the installer is responsible for compliance to airworthiness requirements even if there are no	<p>Text was revised for clarity as follows: “When you make changes to the design of</p>	30

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
		installer is not responsible for compliance with the airworthiness requirements.	requirements.” could be misinterpreted.	modifications to the article.	a TSO’d article, and you are not the holder of the TSOA for the article, you must follow 14 CFR Part 21 Subpart O paragraph titled “Design Changes - Changes by person other than manufacturer”. In addition, if you cannot demonstrate that the TSO article still meets the TSO MPS with your design changes, the data approved or accepted under the TSOA may not be valid. Additional FAA review of any TSO data affected by your changes is required to insure that the article complies with any applicable airworthiness requirements at installation.”	
ACE-118Wa	Page 4, Para 7.b	The sentence “Regardless, the article must be marked to show that it has been modified by you, with a reference to the approval given to the modified article (eg, reference to an STC).” does not provide instructions on how to	The sentence lacks instructions on how to mark modified articles.	Provide instructions on how and what information needs to be marked on the modified article, or if the marking requirements of 14 CFR § 45.15 are applicable.	Out of scope of this AC	31

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
		mark the article and what information needs to be marked.				
ANM-130S (J. Collier)	Page 2, para 4.	Don't understand why data is "accepted" under a TSO "approval." How does "accepted" relate to 14 CFR 21.601?	This distinction will generate many questions and many "interpretations."	Explain why data is "accepted" and TSOA is "approved."	Text has been changed to say that the data is approved	32
ANM-100L (Phan-Tran)	Page 2, para 5a.	Statement:" The TSOA holder is required to provide you with certain data (typically specified in paragraph 7 of a TSO standard)	There is no paragraph 7 in any TSO standards	Change to paragraph 5 of a TSO standard for Data Requirements	Partially concur, changed text as follows to remove paragraph reference: "The TSOA holder is required to provide the applicant with certain data, typically called FURNISHED DATA in a TSO."	33
ANM-130S (J. Collier)	Page 2, para 5b.	Recently, AIR 130 has stated that a deviation may only be granted prior to TSOA. Deviation may not be granted for non-	Some applicants have attempted to seek deviation for non-compliance discovered after TSOA.	Identify conditions for and where in the sequence of events that a deviation may be requested.	Out of scope for this AC	34

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
		compliance after TSOA. This mandatory sequence was not identified.				
ANM-113 (M.Thompson)	Page 1, para 3.a. and 3.b.	Add amended STCs to the list since amended TCs are in the list	There are TCs and STCs and amendments to both of these certificates. It's inconsistent to list amended TCs and not amended STCs.	Add amended STCs to the list	Concur, revised accordingly	35
ANM-113 (M.Thompson)	Page 2, para 3.c.	Consider changing "DER" to "designee (e.g., DER)"	I believe it's possible that other designees (such as a delegated organization) could also provide data approval which could be used to support a major repair or major alteration.	Review and add other designees as applicable.	Partially concur. Reference to DER (and requested ODA) was removed because AIR-100 chose not to specify how the applicant would send their application to the FAA ...Paragraph revised as follows: "Describes the appropriate use of data approved by the FAA, through a technical standard order authorization (TSOA) or TSO letter of design approval (LODA), by applicants seeking a type certificate or approval of a change to type design under the provisions of Title 14 of the Code of	36

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					Federal Regulations (14 CFR) part 21." Rather than say that the applicant would submit through a DER, we decided to remove the statement regarding the ACO and the DER.	
ANM-113 (M.Thompson)	Page 2, para 3.d.	It is not clear how this provides an installation approval by a means which is not already covered in para. 3.a., 3.b. and 3.c. Para. 3.a., 3.b. and 3c. already cover the means for obtaining installation approvals through type certificates and means available by AFS. Data may be approved to support each of these means for installation approval. What type of installation approval is covered in 3.d.?	Clarification is needed.	Revise paragraph to add clarity.	Paragraph 3d was deleted because it's not an option for installation of a TSOA article.	37
ANM-130S (J. Collier)	Page 3, para 5d.	Non-TSO functions are accepted based on	The "non-interference" aspect was not mentioned.	Identify the non-interference basis for	Non-concur, out of scope for this AC	38

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
		“non interference” with the TSO MOPS.		accepting non-TSO functions in a TSO article.		
ANM-113 (M.Thompson)	Page 3, para 5.d.	Clarify what is meant by “the TSOA manufacturer <u>is required to control the performance</u> of their article relative to the non-TSO functions...”	The required action of the TSOA manufacturer is not clear.	Revise paragraph to add clarity.	Concur, the requirement to control the performance was incorrect and removed from paragraph.	39
ANM-130S (T. Nguyen)	Page 3, para 5d.	The distinction is not clear between “declared” and “accepted.” What is the difference between “declared” and “accepted” non-TSO functions?	This distinction will generate many questions and many “interpretations.”	Provide an example of which non-TSO functions are “declared” and which non-TSO functions are “accepted.”	Partially Concur, the previous wording was incorrect but providing examples is out of scope for this AC	40
ANM-130S (T. Nguyen)	Page 3, para 5e.	Don’t understand why the TSOA article provides functionality or performance that is not documented. How does it relate to the CFR 21.305(b)?	Some TSOA holders could attempt to perform minor changes to a TSO article without documenting or controlling them?	Explain why it is accepted?? Provide an example of functionality or performance that is acceptable without documentation as part of the TSOA or not	Concur. Text was removed because it was incorrect.	41

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
		How does it relate to order 8110.4c?		consider as non-TSO functions.		
ANM-100L (Phan-Tran)	Page 3, para 5e.	5e. Functions of performance not covered under TSOA	Technical Standard Order Program, Order 8150.1b and AC 21-46, allows an article to be identified as an incomplete TSO system, multiple-use systems, or non TSO functions within an article. There is no category identified as <u>functions or performance not covered under TSOA in Order 8150.1b or AC 21-46</u>	Remove section 5e to comply with Order 8150.1 or revise the Order to include this function.	Concur. Text was removed.	42
ANM-100L (Phan-Tran)	Page 4, para 7a.	Statement” minor change under their TSOA (14CFR 21.611)	14CFR611 for design change has been renumbered as 14CFR21.619 since 1/1/10	Reference 14CFR21.619a for minor changes	Paragraph reference has been removed	43
ANM-130S (T. Nguyen)	Page 4, para 7a.	Some TSO Minor Changes are related to changes to Airborne Electronic Hardware.	Some TSO articles have separate AEH part numbers.	Add a change to AEH part number.	Non-concur, out of scope of this AC	44
ANM-130S (T. Nguyen)	Page 4, para 7b.	This section uses the “data approved” term while the other section use the “data accepted” term.	Inconsistent within AC.	Change from “data approved” to “data accepted”	Revised as follows for clarity: “... the data approved or accepted under the TSOA may not be	45

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ANM-130S (D.Thomson)	Page 2, para 4 Note:	The note is not clear, it appears to conflict with the last sentence of the 1 st paragraph <i>Background</i> The note... “TSOA is sufficient evidence of compliance”	The FAA only accepts the data without evaluation. This leaves the task to the applicant to assure the data supports demonstration of compliance.	If after evaluation of TSOA data for airworthiness requirements, the FAA-accepted TSOA data is found sufficient, it may be used to demonstrate compliance.	valid.” Note was deleted. Paragraph 4a was revised as follows for clarity: “... The data developed by a TSOA holder is required to address the MPS defined by the TSO, and might not address all of the applicable airworthiness requirements for its installation in the type design of a product. Therefore, the TSO marking on a TSO article does not indicate that the applicable airworthiness requirements of the product on which it is being installed have been	46

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
					addressed.”	
ANM-130S (D.Thomson)	Page 4, para 7b.	Why limit this to “modifications” to the article?	The installer is responsible regardless of initial installation, or installation after a modification Major or Minor	If the installation of the article includes any modification to the article, You are responsible for all aspects of compliance with the airworthiness requirements <i>for the article new or modified.</i>	Text was revised as follows for clarity: “When you make changes to the design of a TSO'd article, and you are not the holder of the TSOA for the article, you must follow 14 CFR part 21 Subpart 0 paragraph 21.6 19(c), titled "Design Changes - Changes by person other than manufacturer".”	47
George Schwab ASW-112	Page 1 Paragraph 1a.	Why is there no mention of a FSDO Field Approval or Repair Station Return to Service?	TSO articles are currently being installed and approved under the FSDO Field Approval or Repair Station Return to Service on a regular basis.	Include the FSDO Field Approval or Repair Station Return to Service as a method available to the installer.	Text has been changed to say that these two options are not covered in this AC	48
George Schwab ASW-112	Page 3 Paragraph 6	There are a lot of “ifs” in this section and it seems to confuse the topic particularly the last part.	To improve the readability of the document and minimize potential confusion.	Revise this paragraph to reduce the number of “if” conditions if possible.	Concur, paragraph rewritten for clarity to minimize the phrase “if ...”	49
Andy Shaw ASW-112	Page 3 Paragraph 5e.	The intent of the first sentence is not clear. If a TSO article provides functionality or performance that is not documented as part of	It would very difficult to put all the responsibility on the installer to control the design and subsequent changes to a unit that was designed and is being manufactured by another	Clarify what a “declared” non-TSO function/performance is by providing examples. Clarify reference statement to ensure that no conflicts	Paragraph was deleted because the text was incorrect.	50

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		<p>the TSOA or as part of the required data under the TSOA, is this considered to be a non-declared function/performance? If yes, then this seems to be in conflict with the new proposed FAA Order 8110.4C Change 4 with respect to non-TSO functions or performance. Per the proposed Order, non-TSO functions must be "declared". Also, the intent of the phrase "then the TSOA holder is not required to maintain that functionality or performance when making minor changes to the TSO article" is also not clear. Why restrict this to "minor" changes?</p>	<p>party. The installer will have little to no data oversight to control changes made by the TSO holder to non-TSO functions that the installer relied to meet the airworthiness requirements.</p>	<p>exist between this draft AC and the draft FAA Order 8110.4C, Change 4 with respect to non-TSO functions and declared functions (i.e. can there be a non-TSO function that is not declared?).</p>		
<p>AIR-40 Hal Jensen</p>	<p>Page 1, Subject</p>	<p>May want to change "LODA Appliances to LODA Articles"</p>	<p>Effective April 16, 2011, Subpart O is being revised to standardize the use of articles between TSOAs and LODAs.</p>	<p>Consider the release date of the AC and whether or not it's prudent to switch "Articles" for "Appliances". If suggestion is adopted, revise throughout AC.</p>	<p>Non-concur, we want to show validity to past regulations with the term appliances</p>	<p>51</p>
<p>AIR-40 Hal Jensen</p>	<p>Page 1, Para 1.c.</p>	<p>"This AC" is not necessary.</p>	<p>The statement following "c." is a continuance of 1. and the literal</p>	<p>Revise to: "c. Is not mandatory and..."</p>	<p>Partially concur, paragraph was</p>	<p>52</p>

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
			reading results in a redundancy.		<p>reformatted to paragraph 1b and revised as follows:</p> <p>“This AC is not mandatory and is not a regulation. This AC describes an acceptable means, but not the only means, to comply with the applicable requirements. However, if you use the means described in this AC, you must follow it entirely.”</p>	
AIR-40 Hal Jensen	Page 2, Para 3.c. and d.	C. and d. are inconsistent with the title of section 3.	Section 3. is titled how to obtain an “installation approval”. 3.a and 3.b list types of installation approvals. However, 3.c and 3.d list types of data approval which by themselves are not installation approvals for the article in the product.	Clarify the difference between an installation approval and data approval to support an installation approval. Perhaps create a new section for the data to support an installation approval to make it clear it’s different and does not constitute an approval to install.	Partially concur, paragraphs 3c and 3d were deleted and paragraph 3 title was revised as follows : “ Requirement to obtain approval when installing a TSO article ”	53
AIR-40 Hal Jensen	Page 2, Para 4.	LODA holders must be considered as well.	Paragraph 4 addresses only TSOA holders but should also include LODA holders.	“The data developed by a TSOA or LODA holder is required to...”	Non-concur, We say TSOA holder includes LODA holder, but this wording could be made clearer in a	54

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
					future revision.	
AIR-40 Hal Jensen	General	LODA holders must be considered as well.	Many paragraphs address only TSOA holders but should also include LODA holders.	Review AC to determine if LODA is needed in every instance where TSOA is used; revise as necessary.	Non-concur, We say TSOA holder includes LODA holder, but this wording could be made clearer in a future revision.	55
AIR-40 Hal Jensen	Page 2, Para 4. Note	The Note needs to be clarified for intent and revised to include data associated with a LODA.	Data associated with a TSO approval would not align with the applicable airworthiness regs but it could align with the methods of compliance that are acceptable for demonstrating compliance with the applicable airworthiness regs.	Revise to: " Note: To the extent that the FAA-accepted TSOA or LODA data aligns with methods adequate to show compliance to the applicable airworthiness requirements, the TSOA or LODA is sufficient evidence of compliance."	Note was deleted for clarity	56
AFS-360 GS	Title	Title Should be TSO Articles			Non-concur, we want to show validity to past regulations with the term appliances	57
AFS-360 GS	Pg 2, Paragraph 4.c. and 4.d.	I don't understand what differences are being referred to. Does this intend to mean "the airworthiness requirements for the installation that are not addressed by the TSOA data"?			Paragraph 4c and 4d were removed for clarity.	58
AFS-360 GS	Pg 3, Paragraph 5.c.	This section is very confusing. Could be stated			Partially concur, revised as follows:	59

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
		<p>clearer that any required elements of the MPS that are not provided by the TSO article will have to be addressed in the installation and in compliance with the applicable airworthiness requirements. Give an example as is done in Order 8150.1b</p>			<p>“TSO articles may be approved as incomplete systems. In this case, the TSOA shows compliance only to a subset of the MPS associated with a TSO, and may include instructions or limitations for its installation necessary to achieve the performance required by the MPS. The applicant must address the missing aspects of the MPS as it relates to the airworthiness rules, and any conditions associated with the TSO article’s approval. Compliance is established to the applicable airworthiness rules. It is not necessary to establish that a complete system is achieved through the installation of the incomplete TSO into type design, or that the type design complies</p>	

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
					with the TSO MPS." Examples were not included in revised text because AIR-100 decide that examples were not necessary	
AFS-360 GS	Pg 3, Paragraph 5.e.	Functions or performance not covered... States that non-TSO functions may not be documented in the documents required to be supplied under the TSOA. Whether declared in the TSOA or not, the functions should be			Paragraph 5e was removed because it was incorrect.	60
AFS-360 GS	Pg 3, Paragraph 5.e.	Functions or performance not covered... If the article has non-TSO functions, they must be shown to comply with the airworthiness requirements for installation. How would a function be necessary to meet airworthiness requirements? If an article has non-TSO functions, how is the installer now responsible for control of the design? In the case of Field Approval?			Paragraph 5e was removed for clarity	61

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
AFS-360 GS	Pg 3, Paragraph 5	<p>General Comment</p> <p>The wording of Order 8150.1b is clearer for Incomplete TSO articles and non-TSO functions.</p>			<p>Non-concur. Order 8150.1b does not cover installation of non-TSO function.</p> <p>Revised paragraph 5c (Incomplete TSO Articles) and paragraph 5d (Non-TSO functions or performance) for clarity.</p>	62
AFS-360 GS	Pg 4, Paragraph 7.b.	<p>Changes to TSO article, by the installer</p> <p>Installing the article in a manner different...</p> <p>However you are responsible...</p> <p>If an article is not installed in a manner prescribed by the TSOA documentation, the concern would be that the MPS will no longer be achieved and that would be the responsibility of the installer to show the MPS is met. Of course that part of the installation requirements of the TSOA would no longer be applicable and could not be referenced to show compliance with</p>			Paragraph 7b was revised for clarity.	63

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
		airworthiness requirements.				
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Global Change	Incorrect spacing.		Remove auto tab. There should only be two spaces between the labeling/numbering of the paragraph and title.	Concur, revised accordingly	64
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Global Change	The term “Advisory Circular” has already been defined.		Use the acronym “AC” after the first usage.	Concur, revised accordingly	65
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Global Change	Missing heading.		Place the AC number in the top left-hand corner and date in the top right-hand corner of the document within the header on each page.	Concur, revised accordingly	66
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Global Change	Incorrect format.		Place text immediately after the paragraph title when there is one paragraph in a section or when the text following the first paragraph is not labeled separately. For examples refer to paragraphs 3, 4, 5, and 6.	Concur, revised accordingly	67
<i>Angeline Garrett AIR-DMO and</i>	Global Change	Missing space.		Place a space between each subparagraph. For examples refer to paragraphs 4a thru d and	Concur, revised accordingly	68

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
<i>RMT-Team Lead Branch, AIR-510</i>				6a & b.		
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Header Section, Page	Incorrect format.		Delete the date place holder "XX/XX/XXXX".	Concur, revised accordingly	69
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Subject Area, Page	Define the term for acronyms "TSOA" and "LODA" first.		Use the acronym acronyms "TSOA" and "LODA" after the first usage.	Concur, revised accordingly	70
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Above Paragraph 1, Page 1	Incorrect format. Redundant information.		Delete the title "Purpose and Applicability" from above paragraph 1.	Concur, revised accordingly	71
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Paragraph 1a, 1 st sentence, Page 1	Change wording and delete comma after the acronym "FAA".		Rewrite to read: Describes what you, as an installer, must show in a data package that is presented to the Federal Aviation Administration (FAA) through either an...	Concur, revised accordingly	72
<i>Angeline Garrett</i>	Paragraph 1a, last sentence, Page 1	Missing comma.		Place a comma after the term "document".	Concur, revised accordingly	73

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
<i>AIR-DMO and RMT-Team Lead Branch, AIR-510</i>						
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Paragraph 1b, Page 1	Change wording.		Rewrite to read: Describes the appropriate use of FAA-approved installation data.	Concur, revised accordingly	74
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Paragraph 1c, 1 st sentence, Page 1	Change wording.		Rewrite to read: Is not mandatory and is not a regulation.	Concur, revised accordingly	75
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Paragraph 2, Page 1	Delete the term "Audience" in the title.		Replace with the title "Applicability".	Concur, revised accordingly	76
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Above Paragraph 3, Page 1	Incorrect format. Redundant information.		Remove the text/title "Applicant Responsibilities" found above paragraph 3.	Concur, revised accordingly	77
<i>Angeline</i>	Paragraph 3b, Page	Missing comma.		Place a comma after the acronym	Concur, revised accordingly	78

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
<i>Garrett AIR-DMO and RMT-Team Lead Branch, AIR- 510</i>	1			“STC”.		
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR- 510</i>	Footer Section, Page 1	Incorrect format.		Delete the page number “1” from the footer. The first page of the document should never have the page number listed/indicated.	Concur, revised accordingly	79
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR- 510</i>	Paragraph 4, 2 nd unidentified paragraph, Page 2	Change wording in title.		Rewrite to read: What Installers must do:	Concur, revised accordingly	80
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR- 510</i>	Paragraph 4, 2 nd unidentified paragraph, 1 st sentence, Page 2	Add wording.		Rewrite to read: You must have the descriptive and substantiation data necessary to show for daily that your information meets...	Concur, revised accordingly	81
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR- 510</i>	Paragraph 4c, Page 2	Missing word possession.		Rewrite to read: ...airworthiness requirements for your product’s design and installation.	Concur, revised accordingly	82

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Paragraph 4, Page 2	Clarity.		Paragraphs 4 end – do references to “TSOA holders” also include LODA TSOA data holders and data? Need clarification.	Concur, revised accordingly	83
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Paragraph 5, Page 2	Improper capitalization.		Remove the capitalization from the terms “data accepted” in the title.	Concur, revised accordingly	84
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Paragraph 5a, 3 rd sentence, Page 2	Define the term for the acronym “ESTO” first.		Use the acronym “ETSO” after the first usage.	Concur, revised accordingly	85
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Between Paragraphs 5a & b, Page 2	Incorrect spacing.		Remove the extra space between paragraphs 5a & b.	Concur, revised accordingly	86
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Paragraph 4, Page 2	Missing paragraph identifier or labeling.		Label the two unidentified paragraphs with a letter and re-label the other subparagraphs or include the two unidentified paragraphs after the title of paragraph 4.	Concur, revised accordingly	87

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
<i>510</i>						
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR- 510</i>	Paragraph 5c, last sentence, Page 3	Clarity.		Should it be applicable airworthiness “rules” or standards”? Be consistent with word usage.	Concur, revised accordingly	88
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR- 510</i>	Between paragraphs 5e & 6, Page 3	Incorrect spacing.		Remove the extra space from between paragraphs 5e and 6.	Concur, revised accordingly	89
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR- 510</i>	Paragraph 6, Page 3	Missing period.	Inconsistent with the rest of the text.	Place a period after the term “airworthiness” in the title.	Concur, revised accordingly	90
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR- 510</i>	Below Paragraph 6b, Page 3	Missing paragraph identifier or labeling.	Each paragraph must have a unique identifier.	For example, re-label paragraphs as: 6. Responsibilities for Instructions... a. If you choose not to fully... (1) That your ICA are adequate... (2) That your ICA is sufficient... b. If you choose to fully utilize...	Concur, revised accordingly	91
<i>Angeline Garrett</i>	Paragraph 6b, unidentified	Missing comma.		Place a comma after the term “instructions”.	Concur, revised accordingly	92

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
<i>AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	paragraph, 1 st sentence, Page 3					
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Paragraph 6b, unidentified paragraph, 2 nd sentence, Page 3	Missing comma.		Place a comma after the term "instructions".	Concur, revised accordingly	93
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Paragraph 6b, unidentified paragraph, last sentence, Page 3	Missing comma.		Place a comma after the term "manner".	Concur, revised accordingly	94
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Between Paragraphs 6 & 7, Page 4	Incorrect spacing.		Remove the extra space from between last paragraphs 6 and 7.	Concur, revised accordingly	95
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Paragraph 7, Page 4	Incorrect formatting/alignment.		Move the title of paragraph 7 over to be placed directly above the labeling of subparagraph a.	Concur, revised accordingly	96
<i>Angeline</i>	Paragraph 7a, 1 st	Missing section symbol (§).		Rewrite reference to read: ...14	Concur, revised accordingly	97

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
<i>Garrett AIR-DMO and RMT-Team Lead Branch, AIR- 510</i>	sentence, Page 4			CFR § 21.611.		
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR- 510</i>	Paragraph 7b, Page 4	Change wording of title.		Rewrite to read: By the installer:	Concur, revised accordingly	98
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR- 510</i>	Paragraph 7b, 3 rd sentence, Page 4	Incorrect abbreviation.		Rewrite to read: e.g.,	Concur, revised accordingly	99
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR- 510</i>	Paragraphs 8 & 8a, Page 4	Incorrect spacing.		Remove the extra space from between the title of paragraph 8 and subparagraph 8a.	Concur, revised accordingly	100
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR- 510</i>	Paragraph 8a, 1 st sentence, Page 4	Improper usage of comma.		Delete the comma after the acronym "CFR".	Concur, revised accordingly	101

Commenter	Page & Paragraph	Comment	Reason for Comment	Suggested Change	Comment Resolution	#
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Paragraph 8a, 2 nd sentence, Page 4	Missing comma.		Place a comma after the term "information".	Concur, revised accordingly	102
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Paragraph 8b, last sentence, Page 4	Change wording.		Rewrite to read: You can also get copies from the FAA website at http://www.faa.gov/regulations_policies/advisory_circulars/ .	Concur, revised accordingly	103
<i>Angeline Garrett AIR-DMO and RMT-Team Lead Branch, AIR-510</i>	Below Paragraph 8, Page 4	Missing signature block.		Place the signature block five spaces below the last paragraph.	Concur, revised accordingly	104