

**AC 21-49
Comment Matrix**

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<p>Gregory L. Budinger Chief Engineer, Northwest Airlines</p>		<p>NWA interprets the intent of the draft AC as defined in paragraphs 7 – 10 as a means to provide a formal control of electronic components installed on passenger seats. Specifically, the concern being addressed relates to possible changes to electronic components that have been used for the required testing per TSO-C39 and –C127 and for changes to the seat electronics once the TSO approval has been granted that could impact the TSO.</p>	<p>one of the methods or alternative approval method that combines elements of the methods defined in 7.b and 7.c. <u>Alternate Approval Method:</u> Type certification using TSO-seat with electronic components included on TSO supporting documentation without TSO control of the electronic components. The alternate approval method should include the following.</p> <ul style="list-style-type: none"> o Manufacture by the Seat Manufacturer/TSO Holder o The seat is approved under TSO. o The TSO approval/holder controls the design and manufacturing quality of the seat including provisions for installation of electronic components, and wiring. o Electronic components may be included on the TSO drawings or supporting documents, such as the installation instructions and limitations, and installed by the seat 	<p>The “Alternate Approval Method” proposed by the commenter is essentially Option 7.b of the draft AC. After discussion with industry group it is clear that the definition of what constitutes “control” under the TSO process needs to be made more clear in this AC.</p>

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			<p>manufacturer.</p> <ul style="list-style-type: none"> o The TSO holder responsibility for the electronic components includes only items in Table 1 of this AC. This may be accomplished using the TSO holder's quality program as the means of controlling the attributes of the electronic components as defined in Table 1 that are relevant to the TSO. o A design approval to the applicable airworthiness standards (TC, ATC, or STC) for the seat with electronic components installed is still required for aircraft installation. See paragraph 9 of this AC for items that must be addressed under the installation approval, and not under the TSO approval. 	
<p>Gregory L. Budinger Chief Engineer, Northwest Airlines</p>		<p><u>Comments to Paragraph 10 "Manufacturing Seats with Design Changes to Include Electronic Components"</u> NWA is also concerned with the process defined in paragraph 10 that requires seat assembly up to the point of TSO labeling then disassembly for installation of the seat electronic components. Aside from the added cost and time required, the disassembly and reassembly may impact the integrity of the initial TSO</p>		<p>Although we acknowledge that this method to support option 7.c is not efficient from a business model, building the seat to the approved design is a regulatory requirement. We believe option 7.b of the AC is a solution that will work for</p>

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		build.		industry as it allows the TSOA holder to build a seat with integrated IFE in the same production process.
Gregory L. Budinger Chief Engineer, Northwest Airlines		It is also our recommendation that AC21-XXX be applicable only for new TSO or TC, ATC, or STC projects and not retroactive to modifications to existing approvals.		We disagree. However we recognize that current programs may require a transition time to either meet the AC or another compliant solution. We intend to work with industry to account for this transition period.
Gregory J. Bowles Director, Engineering & Manufacturing, GAMA		GAMA offers the following clarifying comments in reference to the draft guidance material: Paragraph 7, c: In the final sentence of this paragraph, GAMA suggests the FAA replace the term “someone” with “the installation design approval holder (TC, STC, etc.)” as the term someone is quite vague and could cause confusion.		Disagree. Although we recognize the commenter’s concern, paragraph 7.c.(2) immediately follows and explains that the someone is a person who needs a separate design approval to implement the change and explains that the TC process is typically the route used to gain that approval.
Gregory J. Bowles Director, Engineering & Manufacturing, GAMA		Paragraph 9, a: GAMA suggests the “Wire routing” component be expanded to “Wire routing and installation” as information such as how wires are secured and protected from moving parts of the seat to avoid any chance of power coming into contact with the seat frame is an important consideration that should be included in this concept.		Disagree. “Wire routing” was intended to include the issues the commenter makes. However, we do not want to suggest by use of the word “installation” that there is some degree of product installation approval versus installation of the wire routing into the seat. No change to text.
Scott Postle Honda Aircraft Company, Inc.	Para: 7.c. Page: 2	Allowing for a seat to receive a TSO without IFE included in the configuration presented for TSO presents a condition where: 1. The seat cannot be delivered as a TSO-approved article because it does not meet	Rather than requiring seat manufacturers to document configurations that will never be shipped or installed, IFE manufacturers should be held	A TSO for IFE would do little more than cover flammability and all the other issues that IFE present will still remain. Adequate supplier control by

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		<p>all the requirements of the underlying MPS unless the majority of IFE is installed. An open monitor cavity presents sharp edges, lethal projections, and other passenger safety issues. The TSO approval is rendered meaningless.</p> <p>2. Aircraft OEMs and STC Applicants become overly involved in seat certification and are forced to review aspects of seat installations that are fully under the purview of the TSO holder.</p>	<p>directly accountable to the FAA to develop and maintain flammability compliance data on all of their products so that ANY FAA-conformed or airworthy IFE component meets the basic flammability requirements of TSO-C39() and TSO-C127(). Industry has been requesting that FAA develop a TSO for IFE for several years now.</p>	<p>the TSOA holder will accomplish the goals the commenter suggests could be solved by an IFE TSO.</p>
<p>Scott Postle Honda Aircraft Company, Inc.</p>		<p>Requiring a seat manufacturer to obtain PMA or manufacture under an OEM's PC results in a duplicative approval process that is not value-added and contravenes Objective 2 under the Organizational Excellence section of the FAA Flight Plan by introducing additional costs related to multiple approvals on the same article.</p>	<p>See above.</p>	<p>The AC does not require a PMA or PC to build a seat with IFE under the TSO process. PMA and production under supplier to PC holder can be avoided if the TSOA holder follows option 7.b.</p>
<p>Scott Postle Honda Aircraft Company, Inc.</p>		<p>In instances where video monitors are installed on deployable arms (business class and front row tourist class seats), it is impossible to complete installation of the video monitor onto the seat without the seat manufacturer terminating the video harness and adding a connector supplied by the IFE manufacturer. It is not realistic to view the integration of IFE into a passenger seat assembly as an independent exercise that can be accomplished with a second approval.</p>	<p>See above.</p>	<p>This issue can be avoided if option 7.b of the AC is used by the TSOA holder.</p>
<p>Scott Postle Honda Aircraft Company, Inc.</p>		<p>This approach is inconsistent with incorporation of other articles where the design approval is held somewhere other than the TSO holder, such as flotation cushions made under TSO-C72c and occupant restraints made under TSO-C22g. Flotation cushions and occupant restraints directly affect performance of seating systems qualified for installations compliant with 14 CFR 25.562, but design and certification control to this degree is not required by the seat TSO holder. Restraint manufacturers typically do not release flammability data for their</p>	<p>Incorporate flammability data into a separate TSO for in-seat electronic equipment. Articles delivered under the TSO could then be incorporated into passenger seating without additional review. This would have the added benefit of simplifying conformity requirements for in-seat electronics.</p>	<p>The commenter is incorrect in his assertion that the TSOA seat holder does not have to control changes to a TSO approved seat cushion or safety belt approved under someone else's TSOA. As a TSO-C127a holder, you are responsible for compliance to that TSO and all its requirements including</p>

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		products. Seat TSO holders currently use a variety of approaches to demonstrate compliance to 25.853(c), including data generated by the cushion manufacturer.		changes to any subcomponents that might affect compliance to the TSO. The fact that some of the subcomponents have been previously approved to a TSO does not change that responsibility.
Scott E. Toner Principal Certification Engineer, Panasonic		<p>Summary Position: As an overview statement, Panasonic Avionics Corporation feels that the options presented in the in the Draft AC hold great merit, and agree in general with the certification concepts being expressed. That said, however, it is felt that there are a number of points that are not clearly expressed which will lead to future confusions. Further, certain FAA regulatory procedures and established industry practices which may not be correctly represented by the draft AC. It is Panasonic's position that while the global intent of the draft AC is fully supported, the document as written still requires a concerted effort by industry (beyond "simple" commentary) and FAA to be truly useful and to retain the gains achieved with the previously co-developed "Seat Streamlining" efforts of years past. For reasons detailed below, it is Panasonic's suggestion and request that the comment period to the Draft AC be further extended, and FAA implementation of the Draft AC be delayed pending completion of on-going industry consultations – with FAA participation.</p>		<p>The FAA did meet with this Panasonic representative in January 2009 to discuss comments at length.</p> <p>Also, the FAA met with the industry ad-hoc group in Seattle on October 21, 2009. Unfortunately, although invited, Panasonic did not attend.</p>
Scott E. Toner Principal Certification Engineer, Panasonic		Key among the overall concerns is the inconsistent referencing (or lack thereof) to the all-important "Table 1" addressing the options discussed in the Draft AC's paragraph 7(b). As currently drafted, the material may lead to both Regulatory compliance issues regarding FAR Part 21, as well as imposing business practices creating an exponential grown in equipment P/Ns, industry cost, and FAA workload. We feel that industry and the FAA would benefit by a more explicit		We disagree. Table 1 is explicitly referenced only when those attributes are controlled by the seat TSOA applicant/holder. When controlled by the TSOA applicant/holder, it is their responsibility alone to ensure those items meet the TSO.

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		<p>referencing of when/where Table 1 is intended to be the controlling guidance for the seat manufacturers, along with a more concise delineation between:</p> <p>(A) The TSO seat manufacturer, (B) IFE manufacturer, (C) Seat-to-aircraft integration (interior) STC Applicant, and (D) IFE STC Applicant roles.</p>		<p>None of the items listed in table 1 are the responsibility of the IFE manufacturer, interiors STC applicant or IFE STC applicant when done iaw method 7.b. We believe our meeting with Mr. Toner after these comments were submitted may have helped to clarify that role and responsibility.</p>
<p>Scott E. Toner Principal Certification Engineer, Panasonic</p>		<p>As presented, the Draft AC seems to make the incorrect assumption that (B, C, and D) are one and the same – which is most commonly NOT industry practice. This leads directly to complicating situations wherein increased potentials for non-compliance arise:</p> <p>1. Effectively “Pre-positioning” of non-PC, non-TSO, non-APIS prototype parts, based on (seemingly) contradictory FAA requirements;</p> <p>a) MIDO restrictions on shipset quantities of Prototype parts to be conformed under IFE STC vs. b) Unlimited quantities of IFE Supplier parts to seat TSO holder, and c) Seat TSO manufactures being held only to “Table 1” design criteria, vs. d) Unlimited TSO equipment delivery of Airworthy Product (Seats fitted with IFE compliant to Table 1), wherein LRUs have not undergone formal (detail) conformity inspections (see 1(a)).</p> <p>2. Significant configuration control issues with respect to IFE P/N evolutions and seat manufacturer type designs.</p> <p><input type="checkbox"/> Seat OEM vetting of Table 1 criterion is straight forward, but what of design evolution at detail electronic level, with the same LRU P/N requiring “approval” via each of the world’s seat OEMs? A simple chip change or board layout, when presented</p>		<p>The AC has been revised to reflect the more prevalent model of multiple STCs required to result in a seat-mounted IFE approved to function in an aircraft. In regards to item 1, this AC does not propose to change any requirements for pre-positioning of prototype parts because that is not an issue unique to IFE in seats. The requirements are not contradictory once the roles and responsibilities of each approval and production holder are understood. The AC makes clear the responsibilities of each party with the addition of Table 2 in section 12. In regards to item 2. the plain truth is that the scenario presented is the price of doing business. These issues can be limited by proper control established by business contract. Those agreements are outside the</p>

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		<p>to six seat OEMs (each responsible for complete type design), could be simultaneously accepted and rejected – becoming new LRU P/Ns, new seat P/Ns, new TSOs, new STCs, new PMAs.....</p> <p>The bases for the above concerns are best developed through an example typical in STC development, wherein industry workload may be split among various parties, with simultaneous certification efforts being coordinated across numerous FAA ACOs.</p>		<p>scope of this AC. This AC's concern is compliance to the regulations knowing the prevalent business model.</p>
<p>Scott E. Toner Principal Certification Engineer, Panasonic</p>		<p>The above issues can best be understood via recognition of the distinct sequential roles expressed above as (A, B, C, and D):</p> <ul style="list-style-type: none"> • IFE STC Applicant provides shipset of Conformed Prototype LRUs (with FAA Form 8130-3) to the seat manufacturer, • Seat OEM installs/conforms IFE LRUs into seat for delivery with FAA 8130-3/EASA Form 1 • Interior STC Applicant installs Seat with IFE build-up (IFE de-energized) <p>(Descriptively, the IFE STC Applicant considers the prototype STC aircraft to have been “provisioned” with Approved seats and inactive IFE via the Interior STC Applicant)</p> <ul style="list-style-type: none"> • IFE STC Applicant performs IFE system integration, activation, and demonstration of non-interference for IFE STC • IFE STC holder provides License for development of FAA-PMA to IFE manufacturer. <p>(Note that under this program structure, the seat installer (Interior STC Applicant) must receive/install seat per LOPA with seat OEM airworthiness tag, and that the installation conformity of the IFE LRU into seat and seat into a/c are NOT tasked to IFE applicant.)</p> <p>The FAA's Draft AC would be much clearer with a flowchart detailing the above sequence – however, this would only cover the Prototype Aircraft! The draft AC does not recognize or address the detail conformity, airworthiness tagging, or delivery (or</p>		<p>The AC has been revised to include a new section 12 with Table 2 to show roles and responsibilities in the common business model described in the comment.</p>

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		Airworthiness tagging) of Pre-STC IFE LRUs to the seat OEM which were not conformed under the IFE Project:		
Scott E. Toner Principal Certification Engineer, Panasonic		<p>Q1): When working to Draft AC Paragraph 7(b), is IFE manufacturer considered a “Supplier” to seat OEM for LRU quantities in excess of those conformed by IFE STC Applicant?</p> <p>Q(1)(a) If “yes,” then does Seat OEM initiate IFE Part Conformities?</p> <ul style="list-style-type: none"> • To what level – Table 1 only, or detail electrical? <p>Q(1)(b) If “no,” then IFE STC applicant may be limited to one (1) shipset of Prototype Parts</p> <ul style="list-style-type: none"> • How can subsequent (Pre-STC) parts undergo Part Conformity inspections (beyond Table 1 criteria) without violating “pre-positioning” instructions? • Of what value are IFE components conformed only to Table 1(see Q(2))? 		Yes. Seat TSOA holder manages IFE supplier like any other supplier just to the things necessary to meet the TSO. Table 1 is an example of most of those concerns but there could be others as well. The approvals (TC, STC, TSOA) must be managed separately under the regulations that govern each. It may be impractical to not work both efforts concurrently or it may be advantageous to have a contractual arrangement between the STC/PMA holder and the seat OEM to act as supplier for those issues related to the installation. In this way the TSOA covers the Table 1 issues and as a supplier to the STC/PMA holder, they address the installation issues concurrently.
Scott E. Toner Principal Certification Engineer, Panasonic		<p>Q(2): The topics of (Q(1) notwithstanding, assume that multiple shipsets of conformed IFE <i>have been</i> delivered to Seat OEM for build-up, and further that multiple shipsets of built-up TSO-approved seats with IFE <i>have been</i> positioned at installer, complete with Airworthiness tags.</p> <p>Q(2)(a) If during IFE STC testing it is established that the IFE LRUs are a source of aircraft interference in a given position and are not approvable, what happens to the already-approved TSO seats?</p> <ul style="list-style-type: none"> • Does the Interior installer proceed with installation of 		Disposition of commenter’s item Q(2)(a): The “already-approved” TSO seats remain approved. EMI is not a TSO requirement. Assuming the “interior installer” is not responsible for compliance for EMI issues at the aircraft level, then yes, the interior installer can proceed. Its assumed that the

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		<p>“IFE-Provisioned” seats?</p> <ul style="list-style-type: none"> • If the answer to above bullet is “no,” is there a need for the FAA to prohibit the TSO-approved seat installation, and if so, on what basis is this to be accomplished? <p>Q(2)(b) If IFE STC is entirely successful, however IFE supplier is not PC, TSO, or APIS, on what basis are the non-Prototype parts in the positioned seats converted to “...deemed Airworthy without further ...”(the text nominally used in Form 8130-3’s Block 13)? (ie., pre-STC and Pre-PMA parts not conformed under the IFE Project)</p>		<p>interior installer is concerned with cabin safety issues like seat egress or HIC compliance but not power-up electrical issues handled under another STC/TC.</p> <p>Disposition of commenter’s item Q(2)(b): The IFE must be controlled by a design and production approval. They will likely be controlled under the aircraft TC or STC for “power-up” compliance and therefore will be managed as any other prototype parts under an STC. The IFE manufacturer cannot divorce himself of any relation to a design and production approval simply because all they want to do is sell IFE parts. There is a responsibility associated with the production and marketing of any part that ends up on an airplane. Ultimately the IFE will have to be controlled under one or more design and production approvals – like every other part that becomes part of a product’s type design.</p>
<p>Scott E. Toner Principal Certification Engineer, Panasonic</p>		<p>Q(3): Assume the single Prototype Aircraft (undergoing Interior and IFE STCs) has a given IFE P/N in each of three seat OEM TSOs, and the example in (Q(2)) applies to only one of the seat types (requiring “re-design” of LRU). What if technical “fix” is minor change inside of LRU (“mod dot” level), with no</p>		<p>The responsibility for configuration control (and therefore part numbering) lies with the design holder, it depends on the type of design issued. If its assumed</p>

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		effect on Table 1 criterion? Must all three seat OEMs approve change to retain P/N, or must there now two P/Ns for LRUs with identical exterior?		<p>in the example that all 3 seat OEMs hold TSOA and will take control of the IFE per option 7.b in the AC, then every change to the IFE must be evaluated to the TSO including Table 1. If it is determined that a change had no affect on meeting the TSO, then the TSOA holder would not have to change the part number of the “seat” – which is what the TSOA was issued for – not the IFE. Each TSOA holder must evaluate changes to their article even when using a common supplier. So, yes, each seat TSOA holder must determine there is no effect and no part number change required for their seat. Part number changes at the IFE level could also be dictated by each TSOA holder based on the supplier contract. Further, this only covers compliance to the TSO. There could be changes to the installation that would require a part number change to the IFE that are not an issue at the TSO level. So in reality the IFE manufacturer will have part configuration requirements to both the TSOA holder and the IFE installation holder.</p>

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Scott E. Toner Principal Certification Engineer, Panasonic		<p>Conclusion: Based upon review of the Draft AC, FAA Order and regulation, and “real world” industry practices and needs, it seems that the following points need to be fully considered prior to implementation of the AC.</p> <ol style="list-style-type: none"> 1) Clarification of the AC text with respect to application of Table 1 2) A means (short of PC, TSO, APIS) to develop multi-shipset Part Conformities for delivery to seat OEMs. (i.e., not to field), and creation/retention of part’s Airworthiness Approval once fielded. 3) A means for set OEMs to recognize “families” of IFE P/Ns which are found compliant with Table 1 for given seats, wherein internal electronic changes need not be accounted for within seat TSO. 4) Extending item 3, immediately above, a means by which various seat OEMs can be provided with envelope information (the “Attributes” of 1998 and Table 1) to assure non-violation of seat assembly-level TSO, such that creation of IFE LRU P/Ns (and follow-on effects) do not grow exponentially with evolutionary electronic design changes. 5) The Draft AC paragraph 7(c) should be expanded to address TSO-approved modifications to existing TSO seats, for example via seat OEM Service Bulletin 		<p>Item 1. The AC has been revised in several areas to make more clear the application of Table 1.</p> <p>Item 2. This issue is beyond the scope of this AC and is not unique to IFE in seats.</p> <p>Item 3. This can already be accomplished under a properly managed design and quality control system and is not unique to IFE.</p> <p>Item 4. This is purely a business issue that is beyond the scope of this AC or the FAA to resolve. The FAA can provide feedback on regulatory issues to any industry consensus plan if offered.</p> <p>Item 5. This issue is beyond the scope of this AC as it addresses alterations and repairs handled under part 43 and related policy.</p>
Benoît DAVID EADS SOGERMA	Para: 5 Page: 1	All the electrical equipments are grouped whereas some of them are from seat supplier responsibility (seat actuation system, reading light, SFCU) and other are not under seat vendor responsibility (IFE and ISPS). For seat actuation, reading light, SFCU... we control the design and manufacturing quality but not for the IFE, ISPS.	Split the electrical equipments in two categories.	Partly agree. We do not believe there needs to be two explicitly defined electrical component groups but recognition that the difference the commenter has made between the two groups of electrical items represents those things they have adequate control of versus those that they do not control under the TSO system. FAQ 9 revised to help clarify this issue.

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Benoît DAVID EADS SOGERMA	Para: 7 b) Page: 2	How should be organized our TSO drawings and Part List? Today, all the electronic components under seat vendor responsibility are declared in the seat TSO Part Number but not the IFE, ISPS equipment.	Make a difference between these two categories of equipments and continue to keep out of the TSO Part Number the equipments like IFE, ISPS.	Partly agree. The AC stresses that the configuration a TSOA holder controls must be defined via drawing and therefore part number. There may be a greater need to make this connection in the AC – will review and revise as needed. FAQ 9 revised to help clarify this issue.
Benoît DAVID EADS SOGERMA	Para: 7 b) Page: 2	If the criteria in Table 1 are checked during qualification. Then, we are ok to be in the configuration where electronic components are in the TSO design but as we not control the design and manufacturing quality of these equipments (ex: no information concerning Flammability aspects), we can not really integrate those PN under our TSO		The TSOA holder must control all aspects necessary to meet the TSO in order to include a component in their seat configuration and list it on their drawings. So all the aspects of Table 1 must be “controlled” in order to define it as part of your TSO configuration. FAQ 9 revised to help clarify this issue.
Raki Islam, Rep Ad-Hoc Group		<p>Industry Request for FAA Meeting</p> <p>While working on this subject, it was very evident to the Industry ad hoc committee that a joint forum with FAA is required to ensure there is a viable plan for and format of implementation for all the applicants and the implementation of this AC by different ACO's are uniform. Additionally, the Industry ad hoc committee feels strongly that such a forum is imperative to ensure the AC supports current compliant processes and that future compliant processes fully meet the FAA's expectations and address the FAA's concerns in the most expeditious, efficient manner with the least upset to the air transport industry.</p> <p>Industry points to the FAA and Industry activities in support of Public Law 106-181, Section 757, Streamlining Seat and Restraint System Certification Process and the Passenger Seat and Associated</p>		The FAA met with the industry ad-hoc group, including Weber in Seattle on October 21, 2009.

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		Electronics TSO Workshop held April 27-30, 1998 in Atlanta, Georgia as examples of similar joint forums. Therefore, we are also requesting a 2 day forum with FAA as requested through our letter dated June 9, 2008.		
		<p>Industry Request for Public Comment Period Extension</p> <p>The participants of this ad hoc committee have been working for the past few months on developing a proposal that is compliant with the FAA requirements and is useful for all stakeholders including FAA without adversely impacting our business. However, we will require additional time to complete that proposal. We believe that the importance of this proposed AC and the potential to cause disarray within the Industry if poorly implemented or understood is of such a magnitude that it is in the FAA's and Industry's best interest to grant this request. Therefore, we would like to respectfully request a 90 day extension of the comment period (from July 23, 2008) to complete our proposals for FAA.</p>		The FAA did see a preliminary paper presented by this ad-hoc group at the October meeting. Although the methodology could work if better refined, it is currently too broad to ensure a compliant solution is achieved. It allows for many solutions, some of which could result in non-compliant methods. The FAA intends to move forward with the AC. We have sent a response letter to the ad-hoc group explaining this but requesting any minor comments to the AC be sent in by Jan 31, 2010. We also explained that we will always consider new proposals for compliance even after the AC is issued.
1	General	When AC is finalized/released, can FAA clarify effectivity. Can we assume that the new advisory not be applicable for currently certified programs?		As stated in our response letter to the ad-hoc group, the AC will be effective upon issuance and applies to all new programs. We will also ask our offices to review existing approvals to ensure compliance to the AC or an alternative compliant solution. However we recognize that current programs may require a transition time to either

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				meet the AC or another compliant solution. We intend to work with industry to account for this transition period.
	General	Currently, seats are being manufactured, including installation of electronics equipment, by the holder of the seat TSO authorizations. Some seat OEMs have developed a system of part numbers and drawings to differentiate the TSO article (some electronic components not installed) from the “integrated” seat (with all electronic components installed). Will the AC still allow this for already certified programs? Will the AC be retroactive?		As stated in our response letter to the ad-hoc group, the AC will be effective upon issuance and applies to all new programs. We will also ask our offices to review existing approvals to ensure compliance to the AC or an alternative compliant solution. However we recognize that current programs may require a transition time to either meet the AC or another compliant solution. We intend to work with industry to account for this transition period.
	General	involved stakeholders are aware of available time to prepare for the change. FAA should allow at least one year to make this AC effective. The effectivity should be only for new TSO authorization and on. Will not be applicable to previously approved TSO authorizations.	This will reduce the burden on industry and will allow some time to get prepared for the new way of doing business.	We disagree. As stated in our response letter to the ad-hoc group, the AC will be effective upon issuance and applies to all new programs. We will also ask our offices to review existing approvals to ensure compliance to the AC or an alternative compliant solution. However we recognize that current programs may require a transition time to either meet the AC or another compliant solution. We intend to work with industry to account for this transition period.

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	General	What would be the process of implementation for existing TSO's? Would minor changes to currently certified programs be allowed to be qualified by the system under which they were qualified? Would currently certified programs (with no design changes) be required to change qualification methods for additional shipments?		We will ask our offices to review existing approvals to ensure compliance to the AC or an alternative compliant solution. However we recognize that current programs may require a transition time to either meet the AC or another compliant solution. We intend to work with industry to account for this transition period. Any TSO program that still produces and ships seats will need to be reviewed. We do not envision taking any action on previously shipped seats unless a safety issue were to become evident.
	Pars: 2 Page: appendix 2, A2-1	Once a modifier changes a TSO-approved design (to create their own new seat p/n), is the modifier required to create a document identifying its installation limitation?	Additional clarification required	Yes, or a statement that existing limitations were not violated based on a valid evaluation. FAQ #8 was revised to address this issue.
	Par: section 7(c) Page: 2	In Paragraph 7.c. (1), it is stated that after the FAA issues the TSO approval to the seat manufacturer (not including electronic components), "someone other than the seat manufacturer changes the seat design to include electronic components". Is this statement intended to be restrictive? In other words, is it intended to mean that the "someone" CANNOT be the seat manufacturer? Paragraph 10. a. seems to imply that the seat modifier (installer of the electronic components) can (and often is) the TSO holder/seat manufacturer. See also Appendix 2, Paragraph 2. a. which states that "the TSO approval holder can change the seat design to include electronic components."	Clarification required	The intent of "someone" was to mean that its being done under another approval method outside the TSO process. If the seat manufacturer were going to include electronic components they could do that under their own TSOA as long as they fully control those components to meeting the TSO. Paragraph 7.c. assumes the components are not being added under the TSO process but rather under

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				<p>a different approval process like a PMA. Its possible that the TSOA holder for the seat could get a PMA for the seat with IFE but not sure why they'd want to do this.</p> <p>AC revised as follows: "After we issue the TSO approval to the seat manufacturer, typically someone other than the seat manufacturer changes the seat design to include electronic components."</p>
	<p>Par: Section 10 Page: 4</p>	<p>This section explains how seats with design changes (installation of electronic components when these components are not under the seat TSO) must be "finished" (meaning have the electronic components installed) under a PMA or Production Certificate. Would such a modification of the TSO article require a Service Bulletin from the holder of the TSO authorization?</p>	<p>Clarification required</p>	<p>No, a service bulletin would not be required however one could be utilized. A service bulletin from the TSOA holder would be very helpful in determining that the changes did not affect compliance to the TSO. But it is not a requirement.</p>
	<p>Para: 2(a) Appendix 2 Page: A2-1</p>	<p>It is stated that "the TSO approval holder can change the seat design to include electronic components, if they control the design and manufacturing quality of the entire article". Is this intended to mean complete control of the design of the electronic components, or only control of the design of the electronic components limited to the attributes which impact the items listed in Table 1 of the AC?</p>	<p>Clarification required Action: Define or develop an MPS for design and quality control of electronic components.</p>	<p>FAQ 2.a. was revised to make this more clear.</p>
	<p>General</p>	<p>Under the situation where the seat supplier (TSO authorization holder) decides to include the electronic components in the TSO article, must the seat supplier then purchase the electronic components (IFE) from the IFE supplier? Or can these components be provided to the seat supplier by a third party (usually the end user of the seat, the airline)?</p>	<p>Clarification required Action: Define or develop an MPS for design and quality control of electronic components.</p>	<p>We will review AC and clarify as needed. Components cannot simply be bought to install. There must be a chain of control for both design and production. As long as the intermediate party</p>

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				helps you establish that control over IFE supplier, they can be utilized. But it's the TSOA holder's responsibility to maintain control – not the intermediary.
	Para: 7 Appendix 2 Page: A2-3	The example supposes that there is a contract between the IFE supplier and the seat manufacturer. In fact this is rarely the case because the end user or the airframe manufacturer selects and procures the IFE components. It is problematic for the seat supplier to impose design and quality requirements on an IFE supplier if there is no contract between the two companies. Action: Define or develop an MPS for design and quality control of electronic components.	Allow the TSO holder to rely on the quality and design oversight provided by the installer. As mentioned in paragraph 9 (a) of the draft AC, the installer must take responsibility for these aspects already in order to cover the aircraft type certification requirements. This would reduce the duplication of effort required to have multiple companies manage the design and quality of the same product.	The TSOA holder must have complete control per 21.601b5. If the TSOA holder established the installer as a supplier to the TSOA holder for the IFE, then this could work. But currently that relationship is rarely the case.
	General	Industry and FAA should develop a minimum standard for design and quality control of electrical equipment under TSO, especially for option 7.b. Action: Define or develop an MPS for design and quality control of electronic components.	This will allow all the applicants and local ACO's to implement the FAA policy uniformly.	We are willing to look at any proposal to help us and industry establish a standardized approach to meeting table 1 and other items necessary to control electrical equipment. No action at this time.
	General	Is there any coordination ongoing between the FAA and EASA concerning the subject matter of this proposed AC?	Information	As expressed at the ad-hoc meeting in October 2009, we took an action to coordinate our AC further with EASA before releasing it.
	Section 1.b. Section 4. Page 1	Is this document properly classified as an Advisory Circular? It appears to be a Policy Letter, because it does not appear that the FAA will accept any means of compliance other than what is listed in this document. Additionally, it cancels previously approved means of compliance.	Release as Policy Letter	Disagree. It is clearly stated in the AC that this is one means, not the only, and we will always accept alternate compliant solutions.

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	Section 4	The 1998 white paper was developed by industry and FAA together as an agreement. How FAA could change that agreement via an AC without discussing this subject with the industry?	A conference should be arranged to hold a discussion between FAA and industry. If FAA concurs, industry can arrange the conference.	The 1998 policy memo was a method for industry to demonstrate compliance to the regulations – it is not a contract or agreement. It is within our authority to revise that as needed. In addition we met with the ad-hoc group in October of 2009 to discuss industry concerns.
	Section 7	<p>When working to Draft AC Paragraph 7(b), is IFE manufacturer considered a “Supplier” to seat OEM?</p> <ul style="list-style-type: none"> • If “yes,” then does Seat OEM initiate IFE Part Conformities? <ul style="list-style-type: none"> <input type="checkbox"/> To what level – Table 1 only, or detail electrical? • If “no,” then IFE STC applicant may be limited to one (1) shipset of Prototype Parts <ul style="list-style-type: none"> <input type="checkbox"/> How can subsequent (Pre-STC) parts undergo Part Conformity inspections (beyond Table 1 criteria) without violating “prepositioning” instructions? <input type="checkbox"/> Of what value are IFE components conformed only to Table 1(see question #16)? 		Yes. Seat TSOA holder manages IFE supplier like any other supplier just to the things necessary to meet the TSO. Table 1 is an example of most of those concerns but there could be others as well. The approvals (TC, STC, TSOA) must be managed separately under the regulations that govern each. It may be impractical to not work both efforts concurrently or it may be advantageous to have a contractual arrangement between the STC/PMA holder and the seat OEM to act as supplier for those issues related to the installation. In this way the TSOA covers the Table 1 issues and as a supplier to the STC/PMA holder, they address the installation issues concurrently.
	Section 7	The topics of previous question #15 notwithstanding, assume that multiple shipsets of conformed IFE <i>have been</i> delivered to the Seat OEM for build-up, and further that multiple shipsets of built-up TSO-approved		Disposition of commenter’s item (a): The “already-approved” TSO seats remain approved. EMI

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		<p>seats with IFE <i>have been</i> positioned at installer, complete with Airworthiness tags.</p> <p>(a) If during IFE STC testing it is established that the IFE LRUs are a source of aircraft interference in a given position and are not approvable, what happens to the already-approved TSO seats?</p> <ul style="list-style-type: none"> • Does the Interior installer proceed with installation of “IFE-Provisioned” seats? • If the answer to above bullet is “no,” is there a need for the FAA to prohibit the TSO-approved seat installation, and if so, on what basis is this to be accomplished? <p>(b) If IFE STC is entirely successful, however IFE supplier is not PC, TSO, or APIS, on what basis are the non-Prototype parts in the positioned seats converted to “...deemed Airworthy without further...”(the text nominally used in Form 8130-3’s Block 13)? (ie., pre-STC and Pre-PMA parts not conformed under the IFE Project)</p>		<p>is not a TSO requirement. Assuming the “interior installer” is not responsible for compliance for EMI issues at the aircraft level, then yes, the interior installer can proceed. Its assumed that the interior installer is concerned with cabin safety issues like seat egress or HIC compliance but not power-up electrical issues handled under another STC/TC.</p> <p>Disposition of commenter’s item (b): The IFE must be controlled by a design and production approval. They will likely be controlled under the aircraft TC or STC for “power-up” compliance and therefore will be managed as any other prototype parts under an STC. The IFE manufacturer cannot disassociate itself of any relation to a design and production approval simply because all they want to do is sell IFE parts. There is a responsibility associated with the production and marketing of any part that ends up on an airplane. Ultimately the IFE will have to be controlled under one or more design and production approvals – like every other part that becomes part of a product’s</p>

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				type design.
	Section 7	Assume the single Prototype Aircraft (undergoing Interior and IFE STCs) has a given IFE P/N in each of three seat OEM TSOs, and the example in previous question #16 applies to only one of the seat types (requiring “re-design” of LRU). What if technical “fix” is a minor change inside of the LRU (“mod dot” level), with no effect on Table 1 criterion? Must all three seat OEMs approve change to retain P/N, or must there now be two P/Ns for LRUs with identical exterior?		The responsibility for configuration control (and therefore part numbering) lies with the design holder, it depends on the type of design issued. If its assumed in the example that all 3 seat OEMs hold TSOA and will take control of the IFE per option 7.b in the AC, then every change to the IFE must be evaluated to the TSO including Table 1. If it is determined that a change had no affect on meeting the TSO, then the TSOA holder would not have to change the part number of the “seat” – which is what the TSOA was issued for – not the IFE. Each TSOA holder must evaluate changes to their article even when using a common supplier. So, yes, each seat TSOA holder must determine there is no effect and no part number change required for their seat. Part number changes at the IFE level could also be dictated by each TSOA holder based on the supplier contract. Further, this only covers compliance to the TSO. There could be changes to the installation that would

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				require a part number change to the IFE that are not an issue at the TSO level. So in reality the IFE manufacturer will have part configuration requirements to both the TSOA holder and the IFE installation holder.
	Section 7. Pages 2-3	A Table would be very useful to clarify the three proposed methods.	A recommendation is to list roles/responsibilities in the left column (TSO application, TC application, Design & Quality Control of electronic components, Flammability Qualification of electronics, etc.), list the three methods across the top row (7.a., 7.b., 7.c.), and list the responsible party in each cell (Seat Manufacturer, Seat Modifier, Electronics Components Assembler, etc.). Some cells, of course would be marked N/A for that method.	Partially agree. We revised the AC to include a table to explain the roles and responsibilities for each of the stakeholders when method 7.b is used. Our meeting with the ad-hoc group reinforced that this method is the preferred method of compliance. Table 2 was added to new section 12.
	Section 7 Pages 2-3	New option 7.d could be added where separate TSO will be established for electrical equipment and then seat TSO will include the electrical equipment already approved under electrical equipment TSO (similar to TSO-C22 for restraints).	This will reduce negative impact on seat industry (compared to current practice based on 1998 white paper) and will ensure proper compliance that FAA is looking for.	A TSO for IFE would do little more than cover flammability and all the other issues that IFE present will still remain. Adequate supplier control by the TSOA holder will accomplish the goals the commenter suggests could be solved by an IFE TSO.
	Par: section 7 Page:2	1. General Comment: Section 7 defines the 3 ways the FAA could approve seats with electronic components under the AC. If we exclude the “no-TSO” option (7. a.), the seat supplier would be left with the following choice: a. either include the electronic components in the TSO, and take responsibility for the design and quality	Request the FAA provide another way to approve seats with electronics. In particular, could the seat supplier obtain a TSO authorization which does not include the electronic components, but which include	No. In order to manufacture under a TSOA, the design and quality of the article including all parts, processes, and services including those procured from an outside source must be controlled. So

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		<p>of the electronic components, b. or leave the electronic equipment out of the TSO, and take on the additional burden of having to disassemble the seat to integrate the electronic components, and get further authorizations, outside of the TSO, to complete this work. Clearly, both a. and b. above are putting substantial additional burden on the seat supplier.</p>	<p>design data (i.e. electronic components installation drawings) which define the installation of the electronic components?</p>	<p>you must define the configuration you design and build only to the approved design.</p>
	<p>Par: section 10(b) Page: 5</p>	<p>From a practical point of view, if the seat manufacturer is also the seat IFE installer it may not be efficient for the manufacturer to build the seat, conform it, then disassemble to install the electronic components. Method 7c is not practical.</p>	<p>Request FAA add a sentence to allow some type of agreed-upon coordination between the seat manufacturer and local ACO/MIDO for establishing conformity of seats.</p>	<p>Disagree. The purpose of the AC is to ensure compliance to subpart O and preclude any agreements that circumvent the regulations. While option 7.c. may not be practical, it is a compliant solution as is option 7.b which is a practical solution.</p>
	<p>Page 5, Part b</p>	<p>This section indicates that the seat supplier can't include electrical components prior to TSO conformity, but will actually need to disassemble the seats after TSO. This isn't practical for the seat suppliers to perform - since it is inefficient with the manufacturing process. This is a departure from the current method of installing electrical components.</p>	<p>Suggested Change: Add another option that allows the ability to use multiple options (b & c) Or Revise b or c Method 7c is not practical.</p>	<p>Disagree. The purpose of the AC is to ensure compliance to subpart O and preclude non-compliant hybrid option approaches that circumvent the regulations. While option 7.c. may not be practical, it is a compliant solution as is option 7.b which is a practical solution.</p>
	<p>Para: 10 (b) Page: 5</p>	<p>The idea of building a complete seat which complies with the TSO requirements and conforms to the TSO approved design definition only to disassemble it to add IFE components is not practical. If a seat is designed to have an IFE system installed, with these components not installed in the seat, the seat may not meet the requirements of the TSO (e.g. exposed edges where the equipment would be installed). In order to address this issue some sort of design solution would have to be created (e.g. a close out panel or shroud) which will never be used. This is a waste of design, manufacturing, assembly and</p>	<p>Method 7c is not practical.</p>	<p>Agree. Method 7.c. is not practical but it is compliant. Option 7.b. is also compliant and is practical. It must be reiterated that a TSOA holder must only build to the approved design. Taking control of the IFE to meeting the TSO and therefore making it part of the approved design would allow the TSOA holder to build the IFE into</p>

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		inspection resources that does not improve the safety of the final product. In addition the FAA's effort is increased in that they will have to review the design of products that will never be installed.		the seat under the TSOA production line and preclude the need to build and tear apart the seat to install the IFE.
	10 b&c	This process is non value added for industry as well as FAA. Method 7c is not practical.	Conformity and First Article inspections should be done at the same time if the seat manufacturer and the IFE integrator is one and the same. Applicant's approved quality control system should be able to conform products.	Method 7.c. is not practical but it is compliant. Option 7.b. is also compliant and is practical. It must be reiterated that a TSOA holder must only build to the approved design. Taking control of the IFE to meeting the TSO and therefore making it part of the approved design would allow the TSOA holder to build the IFE into the seat under the TSOA production line.
	General	If a third party modifies the seat, are AC21-25A and Order 8150.C still applicable?	FAA to verify that this AC is in agreement with existing AC's and Orders.	Yes, AC 21-25A remains valid and is referenced in the draft AC as being so.
	General	While this AC strives to control certain production related aspects of TSO, there are other concerns affecting the qualification of the design and implementation of these items on the seats that are largely ignored. Example, there are several tests required on IFE, when installed on the TSO articles; therefore, TSO holders commonly use policy like ARP-5475 for this aspect of the certification process. What is the certification path for qualifying Non-TSO items at the component level when removed from under the TSO system?	Rewrite guidance like ARP 5475 along with several policy letters issued when FAA expected that this type of review was to be done at the TSO level and not at the integrated level for this "Non-TSO" or "Optional" equipment. FAA to verify that this AC is in agreement with existing AC's and Orders.	The AC explains the methods acceptable for approving seats with additional items not covered by the seat TSOs and options include not using the TSO process. This AC was not intended to address approving components separate from the seat.
	Appendix 2 Question 17. Page A2-6	Is FAA going to revise the IIL standards document published in September 2003 based on this AC? The opening comments within this policy state that the IIL entries for the Non-TSO items is sufficient for showing compliance to TSO-C127a. FAA to verify that this AC is in agreement with existing AC's and Orders.	The IIL format and other applicable FAA policy memos that impact seat certification must be reviewed and revised accordingly by FAA.	The FAA intends to revise the IIL document to make it consistent with this AC.

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	Par: 2 Page: appendix 2, A2-1	If a “modifier” (i.e. not the original TSO holder) takes a TSO-approved seat and makes a change, there should be some MINIMUM communication (i.e. “No Technical Objection” letter) with the original TSO holder in order to correctly identify if any of the proposed changes could be deemed potentially critical to the original certification. For example, if a modifier is installing a wire harness clamp and requires drilling of holes through portions of the seat spreader or seat legs, the modifier may not necessarily be able to identify if the changes they are making compromise the structure of the seat. At worst case scenario, what the modifier sees as a minor change may not necessarily be true. Paragraph 7)c)2) and FAQ 8 relates to this (i.e. “...must show that the seat continues to meet TSO...”). But as the original seat manufacturer/certifier, we are best qualified to identify what would and would not be considered a critical change to the seat.	Add requirement that “modifier” obtain concurrence from TSO holder that change is not critical.	Regulation 21.611 allows persons other than the manufacturer (i.e. TSOA holder) to make design changes to a TSO-approved article. While the commenter makes a good point and we encourage a modifier to follow this practice, we cannot require or enforce it under an AC.
	Par: 11(b); Appendix 2, section 4 page: 5; A2-2	We recommend that FAA clarify that a modifier's placard includes a new seat p/n (not the original TSO-approved seat p/n) with the modifier's name. Also, if the seat modification takes the seat out of TSO qualification, then TSO placard should be removed/destroyed.	Additional clarification requested	We require that the modifier put on a placard that identifies the means of design approval. Although this may not require a new part number addition, generally it will result in that occurring.
	Page 3, Paragraph 2	"You must show that the seat (with design changes to include the electronic components) continues to meet the TSO, so that the original TSO approval remains valid (see FAQ 8)." Our comment is that we don't know how "we" (Boeing) would show that the seat continues to meet the TSO. Boeing has never been involved in making a finding of compliance to the TSO.	Suggested Change: Allow the agent (e.g. seat manufacturer) acting on the behalf of the TC or STC holder to provide a statement declaring that the modification do not alter the TSO. Rationale: It is unknown how “you” would make this finding or demonstrate this. Suggested Change: Specify who “you” is. Rationale: Make it clear who is responsible – is this the person	Agree. AC revised to include: “It is acceptable for the person seeking to change the TSO article to employ the original TSOA holder to help make this determination.”

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			responsible for the modification.	
	Para: 10 (b) Page: 5	For some airframes the supplier ships the seats without SEBs installed. The SEBs are installed as a preparation phase (as well as life vests) prior to installing the seats in the aircraft. This phase creates an assembly of separately approved components but does not require the seat to be re-identified as a modified part.	Suggest that the seat suppliers be allowed to perform a portion of this preparation phase prior to shipping the seats to the installer.	The SEBs can only be attached to the seat under the appropriate production approval (which implies the SEB as a design approval as well). If the SEBs are controlled under the TSO process per Option 7.b. then the seat OEM can attach the SEBs prior to marking with TSO. If however, the SEBs are not part of the TSOA, then it is a modification to a TSOA article and must be appropriately approved, produced, and marked as modified. The seat OEMs can serve as a supplier for this service under another approval, but it must be clear under which approval the SEBs are added.
	Section 7.a and 7.b Page 2	Currently most of the seat suppliers segregate their drawing system to show different seat P/N for seats with IFE and seats without IFE.	According to option 7.a and 7.b, the drawing/set part number segregation is not required. This should be explained and clarified.	We believe we have explained this in FAQ 9 and in section 7 of the AC.
	General	The AC does not address the situation where seats are modified by service bulletin after installation.	The AC should address roles and responsibilities in the case where seats in service are modified by manufacturer service bulletin.	This AC was not intended to address modification of in-service seats as that is a larger issue of modification of any in-service TSO-approved article. This AC focuses on original certification and is not intended to address repairs or alterations made under Part 43 regulations.

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	General	<p>The AC does not make clear the distinctions between the following entities:</p> <ul style="list-style-type: none"> • Seat Manufacturer • Installer of seat with electronics • IFE installer/activator <p>For example: The STC Applicant installing a seat <i>provisioned</i> with IFE is NOT necessarily (or even typically) the STC Applicant charged with IFE Type Design or activation</p>	Provide comprehensive distinction between roles & responsibilities	The AC has been revised to include a new section 12 with Table 2 to show roles and responsibilities in the common business model described in the comment.
	General	<p>Industry proposes that an additional method be added to section 7 of the proposed AC 21-XXX detailing an existing and compliant methodology most commonly utilized within Industry. Industry is in the process of developing such an option that includes suggestions to improve this process by documenting the contractual or appropriate relationships between seat supplier (TSO holder), IFE supplier, & Installer (TC/STC holder) that control the division of responsibilities. The proposal being developed is hoped to achieve:</p> <ul style="list-style-type: none"> • Timely and efficient product type design, production, and installation approval of seating and electrical systems designed and manufactured by these companies. • Clearly defined and understood roles, responsibilities, and accountability of all stakeholders. <p>Although the briefest description is available here, Industry is continuing to work on the details of this proposal and requires extra time to finalize and would greatly appreciate working together with the FAA to achieve the aforementioned objectives.</p>		<p>The FAA did see a preliminary paper presented by the ad-hoc group at the October 2009 meeting. Although the methodology could work if better refined, it is currently too broad to ensure a compliant solution is achieved. It allows for many solutions, some of which could result in non-compliant methods. The FAA intends to move forward with the AC. We will always consider new proposals for compliance even after the AC is issued.</p>
John A. Moritz Delta Engineering	Para: 5. Page 1	Powered footrests should not be included in this paragraph, as an integrated systems.	As provided in SAE AS8049 section 3. (seat swivel, back recline, stowage of movable tables, armrests, footrests, etc) should all be part of the seat. Therefore, if the seat is TSO'd those items should be included	We disagree. While a seat TSOA holder can define an electric, pneumatic, or hydraulic feature in their design, TSO-C127 is not adequate to evaluate those characteristics. So a

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			into the TSO'd seat. Meaning, the seat manufacturer would also be responsible for operational aspects of those parts, including power emissions, etc. and the items listed in Paragraph 9 of this AC	powered footrest cannot be evaluated for electrical issues under the TSO. Those characteristics would be evaluated under the TC or STC for integration into the aircraft and would be the responsibility of the TC/STC applicant. The TC/STC applicant could, through a business contract, specify to the seat OEM what electrical performance must be for the powered footrest and the seat OEM would be bound by contract as a supplier to the TC/STC applicant to meet it. However, from a regulatory standpoint, it is not a requirement to gain the TSOA, it's a requirement to gain the TC/STC and we hold the TC/STC responsible for those issues.
John A. Moritz Delta Engineering	Para: 7.c. Page: 2	The second sentence should be changed so that it is consistent with 7.b. "The TSO approval applicant/holder doesn't define the electronic components as part of the TSO article design because they don't control the design and manufacturing quality of the electronic components" Add the same text as provided in 7b.	For example, "The TSO approval applicant/holder doesn't define the electronic components as part of the TSO article design because they don't control the design and manufacturing quality of the electronic components as related to the attributes provided in Table 1".	Concur. Revised AC accordingly.
John A. Moritz Delta Engineering	Para: FAQ 1.b. Page A2-1	Third sentence, "The use of production approval holder (PAH) in this document applies to non-US manufacturers..." Change the wording to mean that PAH includes non-US manufacturers. The wording implies that PAH is limited to non-US manufacturers.	"The use of production approval holder (PAH) in this document includes non-US manufacturers...."	Concur. Revised AC accordingly.

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John A. Moritz Delta Engineering		A TSO holder that includes the electronic components are part of the TSO'd seat can ship replacement electronic components to support in service repair of the seat. Text should be added to address the electronic components being supplied as replacement units, so that it is clear the electronic components are not approved as operational units and cannot be used to replace an electronic component that are approved as an operational unit.	The electronic production quality requirements to meet the criteria in Table 1 may not be the same as the production quality requirements for the electronic component having operational approval.	Concur. Revised FAQ 14.b to make this point clear.