

FAA TSO APPROVAL PROCESS & RELATED POLICY

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By: Hal Jensen

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Overview

- FAA TSO Approval Process
- Highlights of new FAA TSO Policy
- Accessing FAA TSO Information

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FAA TSO Approval is a finding that:

- Article design meets a specific TSO Minimum Performance Standard (MPS)
- Article produced under approved quality control system

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TSO Approval Process Designed to Produce:

- Compliance to a minimum performance standard
- Conformity of produced article to approved design
- Instructions for Continued Airworthiness to meet TSO MPS
- Installation instructions and limitations

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TSO Approval Process does NOT

- **Guarantee compliance to airworthiness standards**
- **Approve installation**
- **Permit “Interchangeability”**
 - Example: TSO-C44b fuel flowmeter cannot be swapped for another TSO-C44b fuel flowmeter without separate compliance finding to airworthiness standards



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TSO Approval Process does NOT

**Give credit when article performance exceeds TSO MPS
(unless TSO specifically allows it)**

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Responsibility in TSO Approval

- **Parts listed on TSO drawings responsibility of TSO holder whether or not TSO addresses component**
 - Manufacturer accepts responsibility (relative to the TSO standard)
 - For design of all parts including post-approval changes
 - For production of all parts (i.e. all their suppliers are under their quality control system)
- **Parts listed on TSO drawings approved only to meeting TSO MPS**

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TSO Approval for Manufacturers located in Europe

- **FAA issues Letter of Design Approval (LODA)**
- **LODA grants design approval only**
- **Production oversight is the responsibility of manufacturer’s country’s National Aviation Authority (NAA)**

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LODA

In order for FAA to issue LODA...

- Bilateral agreement must exist
- Article must be imported into the U.S.



LODA

• Implementation Procedures for Airworthiness (IPA) provide additional details

- Which TSOs are eligible for an FAA LODA
- Marking and export of TSO articles
- How to process design changes
- Application procedure
 - Example: Is an ETSOA necessary to get an FAA LODA?

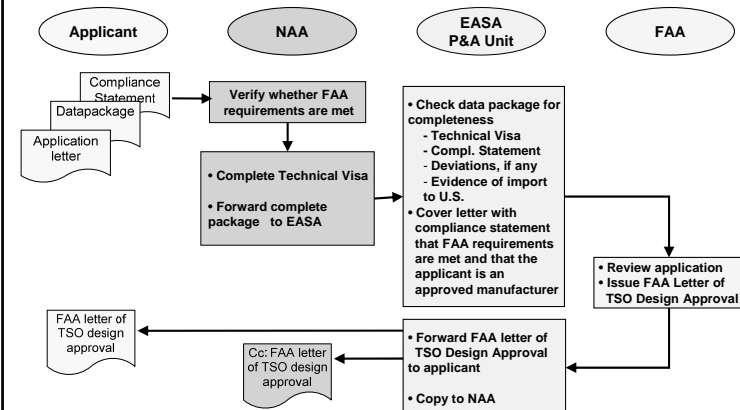


LODA for EU Manufacturers

- **European Aviation Safety Agency (EASA) is responsible authority for design approval of all EU-member appliances/articles**
- **Boston ACO issues a LODA after:**
 - Applicant submits complete data package for EASA evaluation
 - EASA certifies article meets FAA TSO
 - FAA reviews application/data package
- **For EU manufacturers, production approval remains with local NAA per EASA's direction**
 - NAA approves and oversees manufacturer's quality control system and ability to make conforming articles



LODA Process, EU Manufacturers



Areas of FAQ with TSO Approvals

- Marking Requirements
- Deviations to the TSO MPS
- Transferring TSO Approvals
- Incomplete Systems/Partial TSOs

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Marking Requirements - 21.607d

- **Permanently and legibly mark each article with:**
 - Name and address of manufacturer
 - Name, type, part number, or model of article
 - Serial number of the article - or the date of manufacture of the article - or both
 - Applicable TSO number
 - Many TSOs have additional marking requirements
- **Other markings acceptable but shouldn't interfere with required markings**

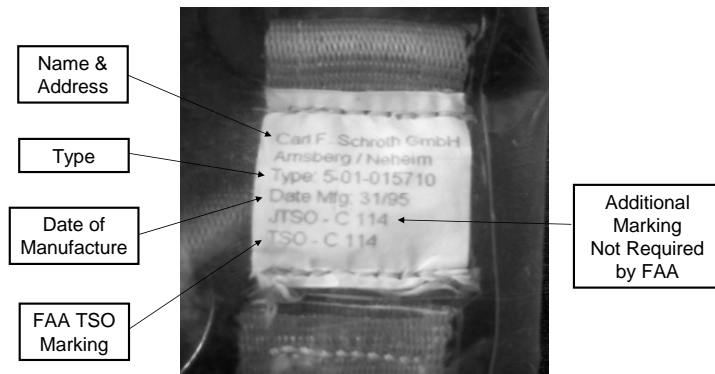
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Marking Requirements - 21.607d



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Marking Requirements - 21.607d



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How are Deviations Handled?

- Deviation – any variation from specified criteria
- FAA Headquarters Engineering Division (AIR-100) approval is required for any deviation from the TSO MPS
 - Exceptions – Boston ACO may grant deviation:
 - Environmental test procedures to RTCA/DO-160() in lieu of TSO criteria
 - Software development to RTCA/DO-178B(or later) in lieu of earlier versions

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How are Deviations Handled?

- Deviations to TSO allowed when an equivalent level of safety (ELOS) to MPS is demonstrated
 - ELOS must be established at article/appliance level
- Deviation requests may require additional evaluation so processing may take an additional 30 days

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How are Deviations Handled?

- For LODA Applicants in Europe
 - Applicant must provide EASA with justification/data for establishing ELOS to FAA TSO
 - EASA processes request for deviation to FAA
 - Boston ACO evaluates and makes recommendation to AIR-100 to grant or deny deviation request
 - AIR-100 agrees or disagrees with Boston recommendation
 - Boston ACO responds to EASA
 - EASA responds to applicant

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Transfer of TSO Approvals

- LODAs cannot be transferred
- Changing the name of company is not a transfer
- Relocating SAME company is not a transfer
 - But requires assessment of production facility at new location
- All other situations require application for new TSO approval, or...
 - Exemption to 14 CFR 21.621 granted in accordance with 14 CFR 11

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Incomplete System (Partial TSO)

- A partial TSO approval may be issued for any component or sub-system of a complete system when:
 - Component/sub-system provides a major function or feature specified in TSO performance standard
 - Must meet all the conditions defined in TSO applicable to the function or feature
 - Deviation required if MPS is inadequate to define evaluation and testing
 - Applicant must address installation procedures and limitations to ensure that the incomplete system can be integrated into a complete system
 - Incomplete systems must be clearly marked “incomplete”

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Recently Issued FAA Policy Affecting TSOs, Articles, and/or Appliances

- Active ULD Order
- TSO-C39c/TSO-C127a Adjustable Features
- TSO-C90 Cargo Net Degradation

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Order 8150.4 Active ULD

- Active ULD is a cargo container with a self-contained temperature control system that is battery powered.
- Order 8150.4 issued 29 Aug 2007 provides standardized process for approval of active ULD's
- Active ULD's are somewhat “orphaned” in our system
 - Generally not part of the aircraft type design
 - TSO-C90c does not cover the temperature control system
 - Temperature control system can have significant safety implications to aircraft systems

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Order 8150.4 Active ULD

Approval Process:

- TSO-C90 for structural, flammability, and decompression, &
- Non-TSO functions (Notice 8150.4) to “accept” data for the temperature control system (in parallel with TSO approval), &
- 14 CFR 21.305(d) to approve the active ULD
- Order 8150.4 “in any other manner approved by the Administrator”

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Order 8150.4 Active ULD

- **Significant Technical Issues: Methods of Compliance must be coordinated with Transport Airplane Directorate. (i.e. significant project)**
 - Active ULD interaction/effect on aircraft fire detection/suppression systems
 - Lithium batteries
- **International Applications:**
 - Require bilateral agreement in place with the following provisions
 - Appliance approvals (TSO-C90)
 - Non-TSO Functions, and
 - Transport Category aircraft design data
 - No bilateral agreements currently contain the required provisions (US/EC bilateral does but is pending)

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TSO-C39c/TSO-C127a Adjustable Features

- TSO-C39c/TSO-C127a use SAE AS 8049A which requires seat adjustable features to be capable of being stowed without the occupant removing restraint
- Issued to ensure compliance to TSO and level playing field among TSO applicants/holders
- Issued November 2007

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TSO-C90 Cargo Net Degradation

- **TSO-C90c requires that:**
 - the design of the net be protected from degradation or loss of strength in service due to weathering, corrosion, abrasion or other causes
 - the manufacturer provide all data necessary for continued airworthiness with each article
- **Issued to ensure compliance to TSO and level playing field among TSO applicants/holders**
- **Issued November 2007**

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Forthcoming Policy Affecting TSOs, Articles, and/or Appliances

- **Revision to TSO Order 8150.1b (8150.1c)**
 - Improve clarity on TSO approval process
 - Incorporate existing TSO policy memos
 - Clarify differences between TSOA/LODA
 - Targeted to be issued in 2008
- **Order and AC on Approving Electronic Components in Aircraft Seats**
 - Replaces existing guidance
 - Answers many questions original memo did not
 - Targeting to have draft AC out for public comment early 2008

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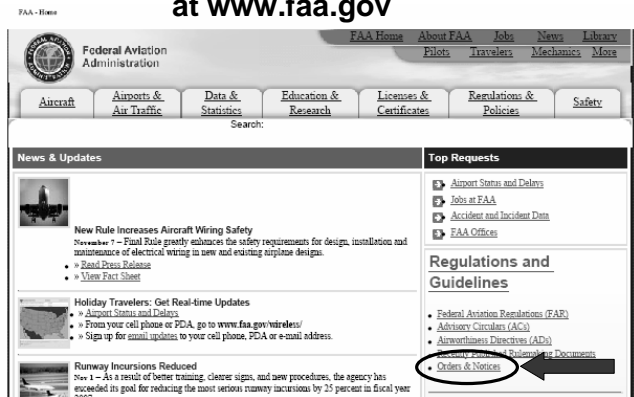


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Where Can I Find the TSOs?

at www.faa.gov



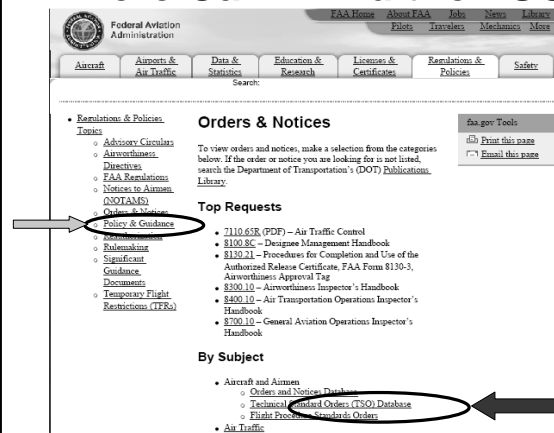
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Where Can I Find the TSOs?



TSOs issued/revised in
the past year:

http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgTSO.nsf/MainFrame?OpenFrameSet

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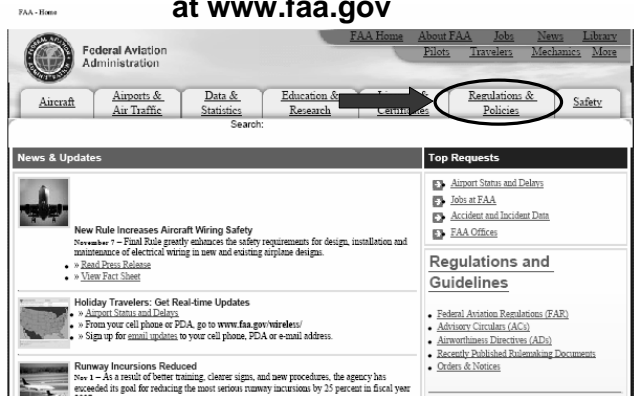


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What about draft TSOs?

at www.faa.gov



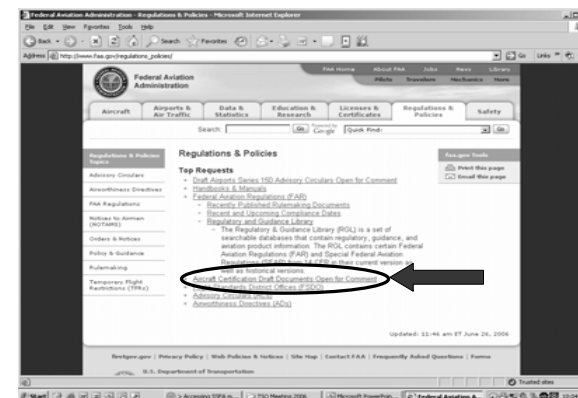
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What about draft TSOs?



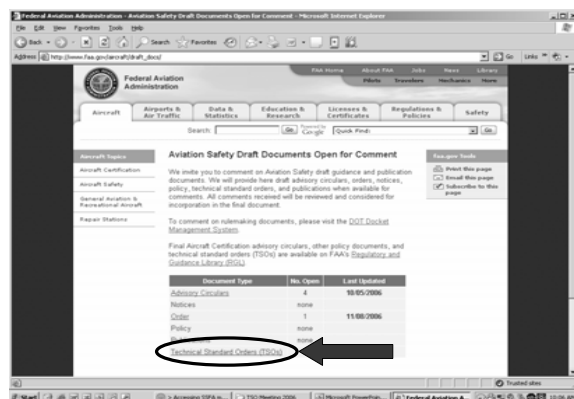
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What about draft TSOs?



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Summary

- Application for TSO made through EASA to Boston ACO
- Boston ACO coordinates any deviations through FAA headquarters (AIR-100)
- FAA TSO policy is continually updated to meet technology changes and business needs
- TSO information and policy may be accessed on the FAA website

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Questions?



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