**U.S. Department of Transportation**
Federal Aviation Administration

# Advisory Circular

**Subject:** Incorporation of Fuel Tank System Instructions for Continued Airworthiness into Operator Maintenance or Inspection Programs

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**Initiated by:** AFS-300

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**Change:**

## FOREWORD

On November 8, 2007, the Federal Aviation Administration (FAA) published the Enhanced Airworthiness Program for Airplane Systems/Fuel Tank Safety (EAPAS/FTS) final rule. The purpose of the rule is to help ensure the continued safety of transport category airplanes by improving the design, installation, and maintenance of electrical wiring systems. The EAPAS/FTS rule includes requirements to implement FTS actions developed in accordance with SFAR 88. Integrating the incorporation of the fuel tank system and electrical wiring interconnection system (EWIS) requirements helps to ensure compatibility and to eliminate duplication. Additionally, the EAPAS/FTS rule redesignates (replaces) Title 14 of the Code of Federal Regulations (14 CFR) §§ 91.410(b), 121.370(b), 125.248(b) and 129.32(b) of the FTS rule. The new sections are 91.1507, 121.1113, 125.507 and 129.113. These new rules also clarify language with reference to the approval process of the operator's program. Even though the FAA agreed with industry that it was prudent to integrate EAPAS and FTS, the FAA has determined that it is not practical to align the EAPAS operational compliance dates with the current FTS operational compliance date of December 16, 2008. This advisory circular (AC) only addresses the fuel tank system safety requirements and describes acceptable means of compliance accordingly. A separate AC will be provided to address the EWIS requirements for the EAPAS/FTS rule.

ORIGINAL signed by
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## CHAPTER 1. GENERAL

**100. PURPOSE.** This advisory circular (AC) provides information regarding compliance with the fuel tank system maintenance and inspection program requirements in Title 14 of the Code of Federal Regulations (14 CFR) for parts 91 and 125 operators, and parts 121 and 129 air carriers hereafter referred to as operators. Instructions for continued airworthiness (ICA) (see Appendix 3 for definitions) includes fuel tank system inspection tasks, intervals, methods, instructions/procedures, airworthiness limitations, and fuel tank system critical design configuration control limitations (CDCCL) which are a specific type of airworthiness limitation item (ALI).

**101. APPLICABILITY.** This AC applies to operators of transport-category turbine-powered airplanes with a type certificate (TC) issued after January 1, 1958, that, as a result of original type certification or later increase in capacity, have a maximum type-certificated passenger capacity of 30 or more, or a maximum payload capacity of 7,500 pounds or more.

**a.** Operators are required to incorporate fuel tank system ICA into their maintenance or inspection programs. Under SFAR 88, design approval holders (DAH) are required to develop fuel tank ICA (inspections, procedures and limitations) that operators may use to comply with these operational requirements. Operators are not required to use the DAH fuel tank ICA. They are only required to incorporate ICA into their maintenance or inspection program that comply with SFAR-88 or §25.1529 and part 25, Appendix H, and that have been approved by the FAA Oversight Office[1]. While we think it is likely that operators will use the TC and STC holders ICA, we intend that they be able either to develop their own or to contract with third parties for ICA. The term DAH as used in this AC applies to holders of TCs and Supplemental Type Certificates (STC) and holders of field-approved auxiliary fuel tanks (FAA Form 337, Major Repair and Alteration (Airframe, Powerplant, Propeller, or Appliance)).

**b.** In the past, some designers and operators avoided applying requirements for airplanes over a specific capacity by getting a design change approval for a slightly lower capacity. Referencing the capacity resulting from original certification removes this means of avoiding compliance. Also, an airplane design could be originally certified with a capacity slightly lower than the minimum specified in the rule, but through later design changes, the capacity could be increased above this minimum. The reference to later increase in capacity in the rule ensures that, if this occurs, the airplane would have to meet the requirements of the rule.

**102. BACKGROUND.**

**a.** Since 1959 there have been 18 fuel tank explosions on transport category airplanes. Most notably, on July 17, 1996, a 25-year old Boeing 747-100 series airplane, operating as TWA Flight 800, was involved in an in-flight breakup after takeoff from Kennedy International Airport in New York, resulting in 230 fatalities. The National Transportation Safety Board (NTSB)

[1] See definition in Appendix 3 of this AC.

determined the probable cause of the TWA 800 accident was an explosion of the center wing fuel tank (CWT) due to ignition of the flammable fuel and air mixture in the tank. The source of ignition energy for the explosion could not be determined conclusively, though the most likely was a wiring failure outside the CWT. This failure allowed excessive electrical energy to enter the CWT through electrical wiring associated with the fuel quantity indicator system (FQIS). This accident, in particular, prompted the FAA to examine the underlying safety issues surrounding fuel tank explosions, the adequacy of existing regulations, the service history of airplanes certificated to these regulations, and existing fuel tank system maintenance practices.

**b.** On May 7, 2001, the FAA published the Transport Airplane Fuel Tank System Design Review, Flammability Reduction and Maintenance and Inspection Requirements (FTS) rule. It required operators to incorporate instructions for maintenance and inspection of the fuel tank system into their maintenance or inspection programs by December 16, 2004. The new instructions were to be developed based on the design review conducted by TC and STC holders, as required by Special Federal Aviation Regulation (SFAR) Number 88-Fuel Tank System Fault Tolerance Evaluation Requirements (SFAR 88), which was a part of the FTS Rule. Specifically, the instructions for maintenance and inspection of the fuel tank system that operators must incorporate are the ICA (see Appendix 4 for definition) that will be discussed throughout this AC. During the TC/STC review process, the FAA recognized that operators would have difficulty meeting their obligation to comply with the operational requirements by December 16, 2004 due to SFAR 88 compliance issues. Therefore the compliance date was extended to December 16, 2008.

**c.** In mid 2003, in a harmonization effort with other national aviation authorities and numerous industry groups, the FAA agreed to consider their request to mandate all fuel tank system ICA by Airworthiness Directives (AD), rather than by operational rules. What resulted was a compromise. Specifically, the agreement was that fuel tank system review would be divided into two categories, “Unsafe Condition” and “No Unsafe Condition.” Unsafe Condition ICA incorporation will be mandated by ADs, and No Unsafe Condition ICA incorporation are mandated by the operational rules. To facilitate this agreement, a fuel tank system policy statement was written and released. (See paragraph 105.)

**103. ADVISORY CIRCULARS (current editions).** The ACs listed below also provide information that may support the method of compliance established by this AC. An electronic copy of the following ACs can be downloaded from the Internet at http://fsims.faa.gov/. The Regulatory and Guidance Library (RGL) is a set of searchable databases that contain regulatory, guidance, and aviation product information. The RGL contains certain CFRs and SFARs from 14 CFR in their current version as well as historical versions. A paper copy may be ordered from the U.S. Department of Transportation, Subsequent Distribution Office, M-30, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20795.

- AC 25-8, Auxiliary Fuel System Installations
- AC 25-19, Certification Maintenance Requirements
- AC 25-981-1, Fuel Tank Ignition Source Prevention Guidelines

- AC 120-16, Air Carrier Maintenance Programs
- AC 121-22, Maintenance Review Board Procedures

**104. THE EAPAS/FTS RULE.** The Enhanced Airworthiness Program for Airplane Systems/FTS (EAPAS/FTS) rule (72 FR 63364 effective December 10, 2007) includes minor revisions to the operational requirements of the FTS rule. This AC describes a method of compliance with these FTS requirements.

**a.** SFAR 88 required a fuel tank system design review by DAH. The reviews have resulted in design changes mandated by AD.

**b.** SFAR 88 also required development of any specific ICA needed to maintain design features that prevent the existence or development of an ignition source within the fuel tank. These ICA must be incorporated in the operator's maintenance or inspection program by the dates specified in the operational rule or AD. The actions specified in the ICA must be accomplished at the times specified in the ICA.

**105. RELATED CFRs.** The following sections of 14 CFR apply:

- Part 25, § 25.1529, (Amendment 25-54), Instructions for Continued Airworthiness
- Part 25, Appendix H, (Amendment 25-102), Instructions for Continued Airworthiness
- Part 43, § 43.13, Performance Rules (general)
- Part 91, Subpart E, Maintenance, Preventive Maintenance, and Alterations, § 91.403, General
- Part 121, Subpart AA, Continued Airworthiness and Safety Improvements, § 121.1113, Fuel tank system maintenance program
- Part 125, Subpart M, Continued Airworthiness and Safety Improvements, § 125.507, Fuel tank system maintenance program
- Part 129, Subpart B, Continued Airworthiness and Safety Improvements, § 129.113, Fuel tank system maintenance program

**106. FAA FUEL TANK SYSTEM POLICY STATEMENT.** The FAA's Transport Airplane Directorate in coordination with Flight Standards, other national aviation authorities, and various industry representatives developed Policy Statement ANM112-05-001, "Process for Developing SFAR 88-related Instructions for Maintenance and Inspection of Fuel Tank Systems," dated October 6, 2004. This harmonized policy statement provided standardized guidance to the TC and STC holders to facilitate their conducting the SFAR 88 design reviews and development of maintenance instructions. Additionally, the document articulated how the TC and STC holders should identify and produce Unsafe Condition ICA for incorporation into the applicable Airworthiness Limitations Sections (ALS) by AD, and No Unsafe Condition ICA for incorporation into the normal maintenance program document such as the Maintenance Review

Board Report (MRBR) for incorporation in accordance with the operational rules. The policy statement could also be useful to an operator in performing a design review of any field-approved auxiliary fuel tank installations. (See paragraph 203.) A paper copy may be ordered from the Federal Aviation Administration, Transport Airplane Directorate, Transport Standards Staff, Standardization Branch, ANM-113, 1601 Lind Avenue SW., Renton, WA 98055-4056. An electronic copy of the policy statement can be downloaded from the Internet at http://www.fsims.faa.gov.

**107. INDUSTRY REFERENCES.** The Air Transport Association of America, Operator/Manufacturer Scheduled Maintenance Program Development, MSG-3 and later revisions.

## CHAPTER 2. FUEL TANK SYSTEM REQUIREMENTS

### 200. REQUIREMENTS.

**a.** This AC provides information to support operators' compliance with the fuel tank system maintenance and inspection program requirements contained in the EAPAS/FTS rule. The operational rules contained in 14 CFR parts 91, 121, 125, 129, §§ 91.1507, 121.1113, 125.507, and 129.113 require operators to incorporate FAA Oversight Office approved ICA into their maintenance or inspection program by December 16, 2008.

**b.** Policy Statement ANM112-05-001 states that the fuel tank system ICA from the SFAR 88 design review should be divided into two categories. They are Maintenance Significant Items (MSI) and Airworthiness Limitation Items (ALI). MSIs (see Appendix 4 for definitions) include the maintenance actions that fall into the No Unsafe Condition category, but are necessary to maintain continued airworthiness of the fuel tank system ignition prevention features. Operators must implement them to comply with the operational rules. The ALIs, including critical design configuration control limitations (CDCCL), fall into the Unsafe Condition category. Operators must also implement these ALIs to comply with the operational rules. In addition, these ALIs have been or will be mandated by AD.

**201. UNSAFE CONDITION.** The type certificate (TC) holders and Supplemental Type Certificate (STC) holders were required to develop design changes and instructions for continued airworthiness (ICA) to address features of the fuel tank system design that are determined to be an Unsafe Condition and require mandatory AD action. These AD-mandated actions could include design changes, operational procedures, or ALI containing repetitive maintenance and inspection instructions, or all three. ALIs also include CDCCL that are mandated by ADs (see paragraph 303 for a detailed description of ALI/CDCCL). Operators must submit any proposed changes to these requirements through the principal inspector (PI) (maintenance or avionics) who may add comments and then forward them to the FAA Oversight Office for approval.

**202. NO UNSAFE CONDITION.** The TC holders and STC holders were also required to develop ICAs for all MSIs, including Maintenance Steering Group (MSG)-3 Safety Failure Effect Category 5 and 8. Safety Failure Effect Category 5 and 8 MSIs address those features of the fuel tank system design that are determined to be a No Unsafe Condition but are necessary to maintain the continued airworthiness of the ignition source prevention features of the fuel tank system.

**a.** The TC holder, through the Maintenance Review Board (MRB) process, subjects these MSIs to maintenance program development logic such as, MSG-3 or later revisions. Inspection tasks, intervals and task instructions/procedures are developed as a result of this process. They are FAA Oversight Office approved. They will normally be found in the TC holder's maintenance program document for the airplane, (e.g., the MRBR), or other maintenance documents the TC holder chooses to provide the maintenance and inspection data for the airplane.

**b.** The FAA recognizes that some operators may not have MSG-3 maintenance programs. Those operators must still incorporate the FAA-approved fuel tank system ICAs into their

maintenance or inspection program by December 16, 2008. While they may satisfy this requirement by incorporating the ICAs made available to them by the TC and STC holders, they may also satisfy it by incorporating ICAs developed by others, as long as the FAA Oversight Office has approved them as meeting the requirements of SFAR 88.

**c.** The inspection tasks, intervals and task instructions/procedures are selected to ensure that fuel tank system protective features are properly maintained while still allowing flexibility for the operators to schedule maintenance tasks within their maintenance or inspection programs. The fuel tank system MSI list must be coordinated with the FAA Oversight Office for the TC prior to conducting the MSG-3 process. The FAA Oversight Office will then approve the final MSIs which include the inspection tasks, intervals and task instructions/procedures. The TC holder will then make these baseline (see definition of TC holder baseline ICA in Appendix 3) inspection tasks, intervals and task instructions/procedures available to the operators for incorporation into their maintenance or inspection programs in the following manner.

> **NOTE: Some TC holders have chosen not to use the MRB process but instead locate all fuel tank system ICA in their respective ALS for the airplane. Consequently, operators of such airplanes will not have baseline ICA to incorporate under the operational rule, and are only required to incorporate the approved ALIs.**

**d.** The fuel tank system ICA (inspection tasks, intervals task instructions/procedures and limitations) will typically be listed in the TC holder maintenance program document for the airplane, (e.g., the MRBR), or other maintenance documents the TC holder chooses to provide the maintenance and inspection data for the airplane. They will be identified as FTS ICA and are FAA Oversight Office approved. The TC holder will sometimes identify a separate cross referencing document where these fuel tank system ICA are located. While the FAA expects that the TC holder fuel tank system ICA MSI will be located in ATA chapter 28, “Fuel Systems,” some may also be located in other ATA chapters. The procedures to carry out the inspections such as access, equipment removal, etc., should be contained in the TC holders Aircraft Maintenance Manual (AMM) as well as be included in their applicable job/task cards. These procedures are not FAA-approved but accepted by the FAA.

**e.** In accordance with the operational rules, operators must include fuel tank system ICA in their maintenance or inspection program by December 16, 2008. Operators should establish a tracking system within their maintenance or inspection programs so they do not lose their identity as FTS ICA. Operators may incorporate all TC holders’ ICA without change. Any operator who chooses to deviate from these ICA must show compliance with SFAR 88 and obtain approval from the FAA Oversight Office. The operator should submit the data that supports any changes to approved ICA through the PI who may add comments and then forward them to the FAA Oversight Office for approval.

**f.** The TC holder and STC holder No Unsafe Condition ICA, referred to as TC and STC baseline ICA, will typically be in the form of inspection tasks and intervals and task instructions/procedures. They may also be specific instructions that are referenced in a task but are contained in other manuals such as the AMM, the airplane standard wiring practice manual (SWPM) or in the STC holder’s manual that contains the ICA for the STC. These TC and STC

holder baseline ICA must be approved by the FAA Oversight Office. For operators who choose to incorporate these ICA as made available to them by the TC or STC holders into their maintenance or inspection programs without deviation, the FAA Oversight Office does not need to approve the operator's proposed program. The operator should submit their proposed fuel tank system changes to their PI who will compare them to the TC or STC baseline ICA and approve implementation using operations specifications (OpSpecs) from the automated Operations Safety System (OPSS) database. For operator-proposed ICA deviations, see paragraph 302.

**203. FIELD-APPROVED AUXILIARY FUEL TANKS.** Per paragraph (b) of the operational rules, if an operator has any of these tanks installed in their airplanes, and chooses to continue operation with them installed, the operator must perform a design review and develop ICA in accordance with the design review requirements detailed in SFAR 88. The operator, being the DAH for these tanks, is in the best position to develop ICA for them. The operator should submit proposed field-approved auxiliary tank data through their PIs to the FAA Oversight Office responsible for approving their airplane type. After FAA Oversight Office approval, the operator must submit the approved ICA to the PI for review and approval. The PI for parts 121,125 and 129 operators will approve the operator's fuel tank program on OpSpecs from the OPSS database by December 16, 2008. In the event the operator chooses to deactivate, or remove a field-approved auxiliary tank, such action can only be accomplished using approved data.

**204. STC AUXILIARY FUEL TANKS.** According to the operational rules, if an operator has STC auxiliary fuel tanks installed in their airplanes, they must incorporate ICA meeting SFAR 88, if any, into their maintenance or inspection program. This "if any" provision means that, if an STC holder fails to develop ICA, the operator of an airplane with an affected tank is not required to incorporate ICA for them. Under these circumstances, if the FAA determines any particular STC auxiliary tank installations pose a safety risk, the FAA will issue airworthiness directive (AD) mandating such tanks be deactivated, or removed in accordance with data submitted by the operators, and approved in accordance with the AD (i.e., typically by the FAA Oversight Office). In the event operators choose to continue service with such tanks installed in their airplanes, the related ADs will offer operators the opportunity to do their own design review and present ICA to the FAA Oversight Office for approval.

**205. APPLICABLE FTS STCs**. In order for an operator to incorporate all the applicable STC Instructions for Continued Airworthiness they must first establish what STCs are installed on their airplanes. An FAA engineering-approved list of "Applicable STCs" is provided in this AC (See Appendix 2). The operators should review this list and determine if any of the applicable STCs are installed on their airplanes. Under normal circumstances a records review by the operators should be sufficient to determine which of their airplanes has any of the applicable STCs. If records are inadequate, it may be necessary to physically inspect airplanes to confirm applicable STC installation; however this should not entail physically checking the routing of wiring etc. The operator should provide the PI a list of airplanes that have any of the applicable STCs installed and present their proposed STC ICA for review and approval. (See paragraphs 309–311 for review and approval process.)

**206. HISTORY OF FUEL TANK SYSTEM MAINTENANCE PRACTICES.** Most fuel tank system maintenance involves zonal inspections to determine the condition of units or systems, with regard to continued serviceability. Corrective action is taken only when indicated

by the condition of a particular unit or system. The most common type of zonal inspection for certain components of fuel tank systems is a general visual inspection, that is, an examination of an interior or exterior area, installation, or assembly to detect obvious damage, failure or irregularity. Typically, operators conducted these general visual inspections as part of other zonal inspections of the fuel tanks. A limitation of a general visual inspection of the fuel tank system is that often the inspection does not provide sufficient information to determine continued airworthiness of internal or hidden system components. This is because certain degraded conditions or failures are difficult or even impossible to detect without extensive, detailed inspection or functional checks. Examples of such degraded conditions or failures are worn wiring routed through conduit to fuel pumps, accumulated debris inside fuel pumps, corrosion of bonding wire interfaces, and broken or missing bonding straps. As a result of the FTS review, certain general visual inspections of the fuel tank system under the zonal inspection concept may become detailed inspections, and may include specific pass/fail criteria.

**207. OPERATOR COMPLIANCE PLAN.**

**a.** An operator compliance plan is simply a written document/matrix, developed by the operator that details specific objectives and milestones for ensuring timely compliance with FTS requirements. Although there is no requirement for an operator to develop a compliance plan, we encourage operators to develop one. A well-developed compliance plan not only aids the operator in understanding the requirements, but promotes communication between the operator and the PI to minimize confusion and resolve compliance issues. It also allows the PI to monitor the operator's progress towards compliance. The plan should be coordinated in writing between the operator and the PI, as should any operator changes to the plan.

**b.** The plan should include all the items discussed in this AC that apply to the operator. It should also include a schedule for deliverables that allows operators to achieve a specific level of compliance by a certain time. For example, the rule requires that the maintenance or inspection program be revised by a date specified in the rule to include instructions for maintenance and inspection of the fuel tank system. Operators with a small fleet of airplanes consisting of only two models, could simply state that the schedule for their deliverables is the date by which the maintenance or inspection program changes are completed for each model. Operators with large fleets, consisting of more than two models, will probably have more deliverables with timelines and completion dates in the plan.

**c.** How the operator determines the applicable fuel tank system STCs, and the installation of any field-approved auxiliary fuel tanks, are additional examples of items that should be part of the plan. If an operator develops a compliance plan, it should be structured so that 100 percent of the changes to the maintenance or inspection program are completed by the compliance date specified in the rule.

## CHAPTER 3. DESIGN MAINTENANCE AND INSPECTION

**300. AIRPLANE FUEL TANK SYSTEM.** The airplane's fuel tank system is defined by the airplane's TC, amended type design changes, and any STC and field-approved auxiliary fuel tank systems.

**301. DESIGN APPROVAL HOLDER FUEL TANK ALTERATIONS.** Generally, TC holder-developed ICA do not apply to portions of the airplane fuel tank system modified IAW an STC, or those that have field-approved auxiliary fuel tanks. The FAA has defined field-approved auxiliary fuel tank systems as design changes approved by an authorized aviation safety inspector (ASI) on an FAA Form 337, Major Repair and Alteration. STC holders of auxiliary fuel tanks are required to develop ICAs, approved by the FAA Oversight Office, that meet the requirements of SFAR 88 or part 25, § 25.1529 and appendix H of part 25, effective June 6, 2001.

**302. CHANGES TO OPERATORS' FUEL TANK SYSTEM TASKS, INTERVALS AND INSTRUCTIONS/PROCEDURES.** Fuel tank system MSI (Safety Failure Effects Category 5 and 8) resulting from SFAR 88 safety reviews are unique since the FTS rule requires FAA approval of any changes. These maintenance tasks (inspections intervals and task instructions/procedures) are necessary to prevent the development of ignition sources inside the fuel tanks. The fuel tank system Safety Failure Effects Category 5 and 8 MSIs were developed based on quantitative and qualitative safety assessments, and changes to them may have a greater effect on safety than other MSIs. The MSI intervals are selected to ensure proper maintenance of fuel tank system protective features related to ignition prevention. These intervals are also selected to allow flexibility for operators to perform these maintenance tasks within their normal scheduled maintenance checks.

**a.** Operators wanting to delete or change a task, or change a task interval, must first get approval from the FAA Oversight Office. For example, when an operator wants to escalate a normal scheduled maintenance check, i.e., "C" check that includes Safety Failure Effects Category 5 and 8 fuel tank system MSIs, the operator has two options. In either case there should be close coordination between the operator and the FAA.

**(1)** Option one: Obtain approval from the FAA Oversight Office through the PI to escalate those Safety Failure Effects Category 5 and 8 MSIs that are part of the "C" check.

**(2)** Option two: Identify the Safety Failure Effects Category 5 and 8 MSIs that are contained in the "C" check and identify those items to be done and tracked individually and separately from the "C" check.

**b.** Any proposed escalation of any fuel tank system MSIs must include data and analysis that supports the proposed change. The analysis should include reliability data from the operator's fleet experience including fleet operating hours and cycles for the airplane model, types of MSI related failures experienced, and the number of MSI-related failures for each failure type.

**c.** Airplane modifications incorporated after the airplane manufacture date could affect the data used in the analysis, so data on those changes should be included in the submittal in support

of the proposed change. The model fleet operating environment could also affect the data. Therefore, in addition to submitting its own fleet data, the operator should provide model fleet operating data from other operators and the manufacturer, if available. Any analysis that includes other operator's fleet experience should show that the data being used is from airplanes operated in an environment consistent with the operating environment of the operator's fleet.

**d.** Additional information on performing analysis of fuel tank system maintenance tasks and intervals is included in AC 25-981-1, Fuel Tank Ignition Source Guidelines, current edition, and FAA Policy Statement ANM112-05-001, October 6, 2004. Operators should submit their request to the PI who may add comments and then forward it to the FAA Oversight Office for approval. MSI task intervals for failure effects categories (FEC) other than 5 and 8 may be escalated through the normal operator and PI approval process.

**e.** Operators wanting to change FAA Oversight Office-approved Safety Failure Effects Category 5 and 8 MSI instructions/procedures such as, those contained in the MRBR for the airplane should submit their proposed changes through the PI who may add comments and then forward them to the FAA Oversight Office for approval.

## 303. FUEL TANK SYSTEM AIRWORTHINESS LIMITATIONS.

**a.** Fuel tank system airworthiness limitations include mandatory maintenance actions to ensure that unsafe conditions identified by the SFAR 88 safety review do not occur or are not introduced into the fuel tank system, and airworthiness limitations developed IAW part 25, § 25.981 for designs developed after June 6, 2001. These airworthiness limitations are established to prevent development of fuel tank ignition sources as a result of configuration changes, repairs, alterations, or deficiencies in the maintenance program throughout the operational life of the airplane. A fuel tank system airworthiness limitation may be a specific repetitive inspection or maintenance action, or a CDCCL.

**b.** Section 25.981 requires the development of CDCCL. A CDCCL is any information necessary to maintain those design features that have been defined in the original type design as needed to preclude development of ignition sources. The purpose of the CDCCL is to provide instructions to retain the critical ignition source prevention feature during configuration change that may be caused by alterations, repairs, or maintenance actions.

**(1)** A critical ignition source prevention feature may exist in the fuel system and its related installation or in systems that—if a failure happens—could interact with the fuel system resulting in an unsafe condition without this limitation. CDCCLs must be included in the ALS of the ICA.

**(2)** CDCCL are the primary means of managing and controlling the configuration of the ignition source prevention features of the airplane's fuel tank system. CDCCLs are not inspections, maintenance actions, or life limited items and therefore do not have a specific task or interval associated with them. Appendix H to part 25 was also revised to add a requirement to provide any mandatory fuel tank system inspections or maintenance actions in the ALS of the ICA. Both fuel system airworthiness limitations and CDCCL will normally be found in the

airplane manufacturer's maintenance data or other documents which are specifically approved by the FAA.

**(3)** The following tables are examples of how two fuel tank system airworthiness limitations are identified; one is an ALI, and the other a CDCCL. The first table identifies an airworthiness limitation in ATA chapter 28 for the fuel tank system. The task is an ALI with an assigned interval, airplane applicability, and a description of the airworthiness limitation task to be performed. The second table identifies an airworthiness limitation with the task being a CDCCL. There is no assigned interval because a CDCCL is not an inspection. It refers to information for maintenance personnel to follow when performing maintenance, to protect the critical design features of the fuel tank system.

**Table 1**

| AWL Number | Task | Interval | Applicability | Description |
|---|---|---|---|---|
| 28-AWL 01 | ALI | 12 Yrs/36000 Hrs | All Models | External wires over center fuel tank.<br>Concern: Potential for chaffing and arcing to center fuel tank upper panel. |

**Table 2**

| AWL Number | Task | Interval | Applicability | Description |
|---|---|---|---|---|
| 28-AWL 02 | CDCCL | N/A | All Models | External wires over center fuel tank.<br>Concern: Potential for chaffing and arcing to center fuel tank upper panel. |

**c.** An example of a CDCCL for current designs would be maintaining wire separation between FQIS wiring and other high power electrical circuits. The original DAH defined a method to ensure that this essential information will be evident to those who may perform and approve repairs and alterations. The DAH provided visual means to alert maintenance personnel of areas in the airplane where inappropriate actions may degrade the integrity of the design configuration.

**(1)** The FAA approved this necessary information and the information is communicated by statements in appropriate manuals, such as wiring diagram manuals (WDM) manufacturer's airplane maintenance manual (AMM) the standard wiring practices manual (SWPM), or the component maintenance manual (CMM). The FAA Oversight Office must approve any operator changes to this necessary information.

**(2)** Operators must include these CDCCLs in their maintenance or inspection program, CDCCL instructions should be included in the operator's maintenance manual and in the job cards. Any request for change must be submitted to the FAA Oversight Office. Operators must submit their requests through the PI, who may add comments and then send it to the appropriate FAA Oversight Office.

**(3)** The following is an example of a CDCCL and how it is identified, and the associated precautionary statements to alert the operator or maintenance technician that they must comply with the instructions in the CDCCL or other acceptable procedure approved by the FAA Oversight Office.

**(4)** Alternating current and direct current fuel pumps have been identified as being subject to a CDCCL. Assume that a fuel pump is repaired or overhauled, but certain critical ignition source prevention features within the pump are not installed or are not overhauled IAW the CMM. An instruction is included in the CDCCL to ensure that certain critical ignition source prevention features of the fuel pump will be maintained IAW the CMM or with other acceptable procedures approved by the FAA Oversight Office.

**(5)** In this example the DAH will list the CDCCL-applicable parts or components for the fuel pump in the service information referenced in the AD that mandates the ALI. This ensures that the operator or maintenance technician repairing or modifying the pump is aware of the need to maintain these critical ignition source prevention features.

**(6)** In order to establish continuity between the CDCCL and the various manuals that contain the necessary information, such as the AMM and CMM, the DAH will insert cross-references in the manuals stating that the fuel pump may be repaired or overhauled only IAW the CMM or other acceptable maintenance procedures and parts approved by the FAA Oversight Office.

**(7)** Another example is the installation of a fuel pump in the tank. The CDCCL includes an instruction to ensure that the bonding strap is properly attached as part of the fuel pump installation.

**304. OPERATOR DEVELOPED SHOP INSTRUCTIONS.** In the past, CMMs were accepted by the FAA, not approved. The FAA Oversight Office will approve certain CMMs and certain parts of CMMs IAW the requirement in § 25.981(b) to establish CDCCL.

**a.** An example is the CMM for overhauling or repairing fuel pumps. In this case the entire manual is FAA Oversight Office-approved and a statement is contained in the manual to that effect. The FAA Oversight Office must approve any operator changes to the CMM.

**b.** Another example is a CMM where the entire manual is not FAA Oversight Office-approved, but it contains specific FAA-approved data such as maintenance instructions, inspections, and procedures. This data will be flagged as FAA-approved data.

**c.** Operators who develop their own shop manuals and instructions need to ensure that the FAA-approved data used in their manuals and instructions are identified as FAA-approved data.

The FAA Oversight Office must approve any changes to the FAA-approved data in the operators' shop manuals or instructions.

**305. EXCEPTIONAL SHORT TERM EXTENSION OF FUEL TANK SYSTEM AIRWORTHINESS LIMITATIONS.** The FAA has determined that an operator may extend certain fuel system airworthiness limitations by up to the maximum number of days specified in the applicable airworthiness limitations document for a specific airplane without FAA engineering approval. The FAA-approved airworthiness limitations document includes a statement subject to that the exceptional short-term extensions of fuel tank system airworthiness limitations, subject to the procedures in the document, are FAA-approved. The FAA defines an exceptional short-term extension as an increase in a fuel system ALI interval that may be used by the operator to cover an uncontrollable or unexpected situation where the airworthiness limitation cannot be performed within the ALI timeframe. For example, an operator's airplane is scheduled for an airworthiness limitation inspection but cannot enter the hangar bay because it is still occupied by another airplane. In this case the operator in accordance with the procedures in the airworthiness limitations document must request an exceptional short-term extension through the PI who must approve in advance any operator exceptional short-term extension.

**a.** After an operator uses an exceptional short-term extension of a FTS airworthiness limitation, that airworthiness limitation interval must revert back to the original interval in the maintenance program. Extensions are only allowed on an individual airplane. Under the procedures in the airworthiness limitations documents, repeated use on the same airplane or on similar airplanes in the operator's fleet is not allowed.

**306. CHANGES TO OPERATORS ALI TASKS OR INTERVALS.** ALI extension requests, other than those described in paragraph 305, must be submitted to the PI who will forward the request along with comments to the FAA Oversight Office for approval. Any such request must include substantiating data. If approved by the Oversight Office, the PI will then approve the change to the maintenance program. (For the purposes of the FTS requirements and this AC, short-term escalation procedures authorized by air carrier OpSpecs cannot be used for exceptional short-term extension of fuel tank system airworthiness limitations.)

**307. CHANGES IN ALI RESULTING FROM ALTERATIONS.** The EAPAS/FTS final rule requires that after December 16, 2008, before returning an aircraft to service after any alteration for which fuel tank ICA are developed under SFAR 88, or § 25.1529 and part 25, appendix H, in effect on June 6, 2001, the operator must incorporate the fuel tank ICA into it's maintenance or inspection program.

**a.** The only alterations for which fuel tank system ICA will be developed are those for which compliance with either SFAR 88 or § 25.1529 must be shown. These are major alterations approved under STCs or amended TCs.

**b.** These alterations would normally be scheduled by an operator to occur during a period of allocated downtime such as a scheduled maintenance "C check." Operators should include in their maintenance planning for such modifications actions necessary to incorporate fuel tank ICA into their maintenance or inspection program.

**308. FUEL TANK SYSTEM IGNITION PREVENTION TRAINING.** The Enhanced Airworthiness Program for Airplane Systems/Fuel Tank System rule introduced new requirements that affect DAHs and operators.

**a.** To fully realize the objectives of fuel tank system ignition prevention the operators need to rethink their current philosophical approach to maintaining, inspecting, and altering aircraft wiring and systems that could affect the fuel tank system ignition prevention features. This approach has begun at the airplane manufacturers with maintenance program enhancements that address fuel tank system ignition prevention. It is incumbent that the operators include these TC and STC holder fuel tank system maintenance program enhancements into their respective programs. Furthermore, they should commit to training their maintenance and inspection work force to understand the new philosophical approach to fuel tank system ignition prevention.

**b.** In addition to CDCCLs, there will be new maintenance manual and job card procedures, inspection devices, graphical information showing required tasks, or changes in tasks such as wiring splicing. Operators should provide training to maintenance, inspection, and engineering personnel, including persons who write and edit job cards and engineering orders. Heightened awareness of these critical areas is needed. Additionally, operators must have procedures in place that ensure maintenance record entries for complying with a CDCCL are consistent with §§ 43.9, 43.11, or IAW the applicable provisions of the part 121 or 129 certificate-holder manual.

**c.** Maintenance and engineering personnel can ensure that the fuel tank system airworthiness limitations are properly performed throughout the operational life of the airplane by having a thorough understanding of the airplane fuel tank system critical design features.

**d.** Operators should take advantage of any airplane manufacturer-developed training programs that address fuel tank ignition prevention.

## 309. OPERATOR'S CAMP APPROVAL UNDER §§ 121.1113 and 129.113.

**a.** Parts 121 and 129 air carriers and part 125 certificate holders will be issued OpSpecs from the OPSS data-base to implement FTS requirements. The operators must submit their proposed fuel tank system changes to their PI who will compare it to the TC or STC holder's baseline ICA, and approve operator incorporation with OpSpecs. The initial program and any subsequent operator proposed changes must be submitted to the PI for review and approval.

**b.** Any changes to the operators FAA-approved ICA will be handled as stated in this AC.

## 310. OPERATOR'S INSPECTION PROGRAM APPROVAL UNDER § 125.507.

**a.** Part 125 operators who are currently authorized to conduct operations in accordance with a letter of deviation authority (LODA A125) will be issued a Fuel Tank System Letter of Authorization (LOA), from the 125M OPSS data base. The operators must submit their proposed fuel tank system changes to their PI who will compare it to the TC or STC holder's baseline ICA, and approve operator incorporation with OpSpecs. The initial program and any subsequent proposed changes must be submitted to the PI for review and approval.

**b.** Any changes to the operators FAA-approved ICA will be handled as stated in this AC.

## 311. OPERATOR INSPECTION PROGRAM APPROVAL UNDER § 91.1507.

**a.** Part 125 operators who are currently operating under a "full deviation" will be issued a Fuel Tank System Letter of Deviation Authority from the 91 J data-base of the Operations Safety System (OPSS) database. The operators must submit their proposed fuel tank system changes to the PI who will compare it to the TC or STC holders' original ICA, and approve implementation by issuing a letter of authorization (LOA). The initial program and any subsequent operator proposed changes must be submitted to the PI for review and approval.

**b.** Any changes to the FAA-approved ICA will be handled as stated in this AC.

## APPENDIX 1. ACRONYMS

| | |
|---|---|
| **14 CFR** | Title 14 of the Code of Federal Regulations |
| **AC** | Advisory Circular |
| **ACO** | Aircraft Certification Office |
| **AD** | Airworthiness Directive |
| **AEG** | Aircraft Evaluation Group |
| **AFS** | Flight Standards Service |
| **ALI** | Airworthiness Limitation Item |
| **ALS** | Airworthiness Limitation Section |
| **AMM** | Aircraft Maintenance Manual |
| **ASI** | Aviation Safety inspector |
| **ATA** | Air Transport Association of America |
| **ATSRAC** | Aging Transport Systems Rulemaking Advisory Committee |
| **CAMP** | Continuous Airworthiness Maintenance Program |
| **CDCCL** | Critical Design Configuration Control Limitations |
| **CMM** | Component Maintenance Manual |
| **CWT** | Center Wing Fuel Tank |
| **DAH** | Design Approval Holder |
| **EAPAS** | Enhanced Airworthiness Program for Airplane Systems |
| **EWIS** | Electrical Wiring Interconnection System |
| **EZAP** | Enhanced Zonal Analysis Procedure |
| **FAA** | Federal Aviation Administration |
| **FEC** | Failure Effects Categories |
| **FQIS** | Fuel Quantity Indicator System |
| **FTS** | Fuel Tank Safety |

| | |
|---|---|
| **IAW** | In Accordance With |
| **ICA** | Instructions for Continued Airworthiness |
| **LOA** | Letter of Authorization |
| **MRB** | Maintenance Review Board |
| **MRBR** | Maintenance Review Board Report |
| **MSG** | Maintenance Steering Group |
| **MSI** | Maintenance Significant Items |
| **MWG** | Maintenance Working Group |
| **NTSB** | National Transportation Safety Board |
| **OEM** | Original Equipment Manufacturer |
| **PI** | Principal Inspector |
| **RGL** | Regulatory and Guidance Library |
| **SFAR** | Special Federal Aviation Regulation |
| **STC** | Supplemental Type Certificate |
| **SWPM** | Standard Wiring Practice manual |
| **TC** | Type Certificate |

## APPENDIX 2. LIST OF APPLICABLE STCS

| STC Number | STC Holder | Airplane Models | Description | Operator Actions |
|---|---|---|---|---|
| ST00069BO | Goodrich Corporation | DC8-62, -62F, -63F, -72, -72F, -73F | Fuel Quantity Indicating System (external to tank) | STC Amended 1/5/04, Operators must incorporate ICA T3068-0005-0101, Initial issue, dated Oct 23, 2003 (or later version). (At D check interval, inspections of flight deck wiring and connectors) |
| ST00020BO | Goodrich Corporation | B747-100, -100B, -100B SUD, -200B, -200C, -200F, -300, B747SP & B747SR | Retrofit of entire Fuel Quantity Gauging System | STC Amended 10/19/04, Operators must incorporate ICA T3070-0005-0101, Initial issue, dated July 2, 2004 (or later version). (At D check interval, inspections of wiring separation, shielding, bonding) |
| ST00142BO | Goodrich Corporation | B737-300 | Isolation Fuel Quantity Transmitter System | STC Amended 2/10/04, Operators must incorporate ICA T3072-0005-0101, Revision A, dated Jan 22, 2004 (or later version). (Periodic inspections of wiring and bonding) |
| SA298NE | Goodrich Corporation | B727-100, -200 | Computerized Fuel Quantity Indicator System | STC Amended 4/19/04, Operators must incorporate ICA T3066-0005-0101, Revision D, dated March 10, 2004 (or later version). (Inspections to determine the condition of the wiring and connector interfaces, every 16,000 flight hours) |
| ST00053BO | Goodrich Corporation | B727, -100, -100C, -200, -200F, 727C | FQIS Indicators w/VTO & optional FSU, In-tank harnesses. | STC Amended 4/19/04, Operators must incorporate ICA T3065-0005-0101, Revision D, dated March 10, 2004 (or later version). (Inspections to determine the condition of the wiring and connector interfaces, every 16,000 flight hours) |

**NOTE: These STCs have mandatory actions associated with them in accordance with §§ 91.1507, 121.1113, 125.507 and 129.113. Other STCs may be addressed via AD.**

## APPENDIX 3. DEFINITIONS

**A. Aging Transport Systems Rulemaking Advisory Committee (ATSRAC).** A committee established by the FAA to provide advice and recommendations to the FAA Administrator on airplane system safety issues, such as aging wiring systems. This committee is made up of representatives of aircraft manufacturers, transport airplane operators, aerospace and industry associations, and governmental agencies.

**B. Aircraft Evaluation Group (AEG).** Flight Standards Service representatives who know the operational and maintenance aspects of the certification project and are responsible for determining the operational acceptability and continuing airworthiness requirements of newly certified or modified aircraft, engines, and propellers intended to be operated under the provisions of the Title 14 of the Code of Federal Regulations (14 CFR). This function includes providing the cognizant Aircraft Certification Office (ACO) support in the review and approval of the initial and subsequent changes to the type design.

**C. Aircraft Maintenance Manual.** A manual developed by the manufacturer of a particular airplane that contains information necessary for the continued airworthiness of that airplane.

**D. Airworthy.** An aircraft, aircraft engine, or component that conforms to its type design and is safe to operate.

**E. Airworthiness Limitation Item (ALI).** Mandatory maintenance of the fuel system that can include Critical Design Configuration Control Limitations (CDCCL), inspections, or other procedures determined necessary to ensure that fuel tank ignition sources do not occur and are not introduced into the fuel system as a result of maintenance actions, repairs, or alterations throughout the operational life of the airplane.

**F. Auxiliary Tanks.** Fuel tanks installed which make additional fuel available to increase the flight range of that airplane and are secondary to the airplane's main fuel tanks. Auxiliary tanks have been installed in various locations including center wing structure, horizontal stabilizers, wings, and cargo compartments.

**G. Component Maintenance Manual (CMM).** A manual developed by a manufacturer that contains information necessary for the continued airworthiness of a particular component.

**H. Continued Airworthiness.** Certified aircraft, engines, propellers, and appliances are safe to operate for the intended purpose; they are maintained safely throughout their service life; the product meets its type design; and is in a condition for safe operation.

**I. Critical Design Configuration Control Limitations.** A CDCCL is an airworthiness limitation requirement to preserve a critical ignition source prevention feature of the fuel system design. The CDCCL provides instructions to retain the critical ignition source prevention feature during configuration change that may be caused by alterations, repairs, or maintenance actions. A critical ignition source prevention feature may exist in the fuel system and its related installation or in systems that—if a failure condition were to develop—could interact with the

fuel system in such a way that an unsafe condition would develop in the fuel system without this limitation.

**J. Design Approval Holder (DAH).** The holder of any design approval, including TC, amended TC, STC, amended STC, parts manufacturer approval, TSO authorization, letter of TSO design approval, and field approvals (FAA Form 337).

**K. Exceptional Short-Term Extension.** An increase in a fuel system ALI interval that may be used by the operator to cover an uncontrollable or unexpected situation where the ALI cannot be performed within the ALI timeframe.

**L. Electrical Arc or Spark.** The transfer of electrons across a gap.

**M. Enhanced Zonal Analysis Procedure (EZAP).** A logical process for developing maintenance and inspection instructions for the Electrical Wiring Interconnection System (EWIS).

**N. EWIS.** Any wire, wiring device, or combination of these, including termination devices, installed in the airplane for transmitting electrical energy between two or more termination points.

**O. FAA Oversight Office.** The ACO or the office of the Transport Airplane Directorate having oversight responsibility for the relevant TC or STC, as determined by the Administrator.

**P. Flammable.** With respect to a fluid or gas, flammable means susceptible to igniting readily or to exploding (14 CFR part 1, Definitions).

**Q. Failure Effect Categories.**

- Category 5 are functional failures that have evident safety effects.
- Category 6 are functional failures that have evident operational effects.
- Category 7 are functional failures that have evident economic effects.
- Category 8 are functional failures that have hidden function safety effects.
- Category 9 are functional failures that have hidden function non-safety effects.

**R. Field approval.** Is a method for obtaining FAA approval of a design change to the airplane. An FAA Flight Standards inspector can approve the design change using FAA Form 337.

**S. Flammable Fluid Leakage Zones.** Any area where flammable liquids or vapors are not intended to be present, but where they might exist due to leakage from flammable fluid carrying components (e.g., leakage from tanks, lines). Examples of these areas include:

- The wing leading (including any adjacent compartment such as the strut) and trailing edges,
- Farings located below the fuel tanks,
- Wheel wells,
- Fuel pump enclosures,
- Unpressurized areas of the fuselage surrounding fuel tanks, and
- Areas containing flammable fluid lines or tanks.

**T. Flight Standards Service.** Offices located in FAA headquarters responsible for developing guidance and policy applicable to transport category airplanes for AEG personnel and AFS field personnel (maintenance, avionics, and operations ASI) in the conduct of their responsibilities.

**U. Functional Failures.** The failure of a component or subsystem to perform its intended function within specified limits.

**V. Hidden Functional Failure Safety Effect.** A combination of a hidden functional (or latent) failure and one additional failure of a system-related or backup function that will have an adverse effect on operational safety.

**W. Hot Short.** Electrical energy introduced into equipment or systems as a result of unintended contact with a power source, such as bent pins in a connector or damaged insulation on adjacent wires.

**X. Instructions for Continued Airworthiness (ICA).** The information developed IAW applicable airworthiness requirements that include the applicable inspection tasks, intervals, methods, processes, procedures, and airworthiness limitations to keep the product airworthy throughout its operational life.

**Y. Latent Failure.** A failure whose presence may not be readily apparent to the flightcrew or maintenance personnel.

**Z. Maintenance and Inspection Instructions.** Information that provides, for each part of the airplane and its engine auxiliary power units, propellers, accessories, instruments, and equipment, the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods needed to provide for the continued airworthiness of the airplane. The recommended overhaul periods and necessary cross-reference to the Airworthiness Limitations Section of the manual are also included.

**aa. Maintenance Planning Data.** Data developed by the manufacturer of a particular airplane which contain the information each operator of that airplane needs to develop a customized, scheduled maintenance program.

**bb. Maintenance Review Board (MRB).** An FAA group that supports industry development of the MRBR and approves the final MRBR.

**cc. Maintenance Review Board Report (MRBR).** A report which contains the initial minimum scheduled maintenance and inspection requirements for a particular transport category airplane and on-wing engine program. Air carriers may use those provisions—along with other maintenance information contained in the ICA—in the development of their maintenance programs.

**dd. Maintenance Significant Item (MSI).** Under MSG-3, items other than ALI, that are identified by the design approval holder whose failure could cause one of the following effects:

- It could affect safety on the ground or in flight,
- It could be undetectable during operations,
- It could have a significant impact on operations, or
- It could have a significant economic impact.
- In terms of development of maintenance and inspection instructions, MSIs include systems, sub-systems, modules, components, accessories, units, or parts.

**ee. Maintenance Steering Group-3 (MSG-3).** A voluntary structured process developed by the industry and maintained by ATA to make decisions used to develop maintenance and inspection tasks and intervals for an airplane.

**ff. Maintenance Working Group (MWG).** A working group of maintenance specialists from participating operators, the prime manufacturer, and the regulatory authority whose function is to develop airplane maintenance programs. The MWG should have representatives knowledgeable about the fuel tank system under analysis and about the requirements of SFAR 88.

**gg. Mandatory Action Advisory Board.** A committee composed of representatives from the cognizant Aircraft Certification Office and the Transport Airplane Directorate whose function is to review the findings from the SFAR 88 safety review for determination of an unsafe condition.

**hh. National Aviation Authority.** The aviation authority responsible for the certification and continued airworthiness of those airplanes having U.S. TC within its state of design as established IAW agreements with the United States.

**ii. Products.** Products are certified aircraft, engines, propellers, and appliances.

**jj. STC Baseline[2] ICA.** The STC holder baseline ICA consists of the inspection tasks, intervals, methods, processes, and procedures to keep an alteration affecting the fuel tank system approved under an STC airworthy throughout its operational life. The STC holder baseline ICA must meet the requirements of SFAR-88, or § 25.981 and appendix H of part 25, and be approved by the FAA Oversight Office.

**kk. TC Holder Baseline ICA.** The TC holder baseline ICA consists of the inspection tasks, intervals, methods, processes, procedures to keep the product's fuel tank system airworthy throughout its operational life. It is typically the result of the MRB process. During this process the TC holder develops maintenance significant items (MSI) and subjects them to maintenance program development logic, such as in MSG-3 or later revisions. The TC holder baseline ICA must comply with the requirements of SFAR-88, or § 25.981 and appendix H of part 25, and be approved by the FAA Oversight Office.

[2] In the context of this AC, "baseline" has a different meaning than in the context of the Aging Airplane Safety Rule, where the term "baseline structure" refers to the airplane structure as originally manufactured.

## APPENDIX 4. FAA OVERSIGHT OFFICES BY AIRPLANE MANUFACTURER

| Airplane Manufacturer | FAA Oversight Office |
|---|---|
| Aerospatiale | Transport Standards Staff, International Branch, ANM-116 |
| Airbus | Transport Standards Staff, International Branch, ANM-116 |
| BAE | Transport Standards Staff, International Branch, ANM-116 |
| Boeing North | Seattle Aircraft Certification Office |
| Boeing South (McDonnell-Douglas) | Los Angeles Certification Office |
| Bombardier | New York Aircraft Certification Office |
| CASA | Transport Standards Staff, International Branch, ANM-116 |
| De Havilland | New York Aircraft Certification Office |
| Dornier | Transport Standards Staff, International Branch, ANM-116 |
| Embraer | Transport Standards Staff, International Branch, ANM-116 |
| Fokker | Transport Standards Staff, International Branch, ANM-116 |
| Lockheed | Atlanta Aircraft Certification Office |
| McDonnell-Douglas | Los Angeles Aircraft Certification Office |
| SAAB | Transport Standards Staff, International Branch, ANM-116 |