

Aging Aircraft and You

Presented to: ATA NDT FORUM

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Federal Aviation
Administration



Background



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Aging Aircraft Safety Act 1991

- **Congressional Mandate** (Congressman James Oberstar)

To assure the health of the nations aging aircraft fleet through comprehensive inspections of aircraft and records. As well as the use of improved maintenance practices i.e. damage tolerance philosophies and new generation inspection techniques.



Aviation Safety Act 1991

1. Shall require the Administrator to make inspections and review maintenance and other records of **each** aircraft an air carrier uses to provide air transportation...
2. Shall require an air carrier to demonstrate that the maintenance of the aircraft's age-sensitive parts and components is adequate and timely to ensure the highest degree of safety.



Inspections and Records Review

- **14 CFR Parts, 121.368, 135.422 and 129.33**
 - Effective 12/08/2003
- **Requires the FAA or a designee to review the records and inspect **each** airplane after the start of its 15'th year in service.**



Affects on NDI Personnel

- **Are personnel qualified to perform inspections?**
- **Are all areas required to be inspected actually inspected ?**
(station numbers transposed)
- **Is proper tooling used?**
(standards, probes, guides)
- **Is work being signed off correctly?**



Highest degree of safety (Damage Tolerance)

- **Structural fatigue cracking a major concern**
- **Original design relied on fatigue strength approach based on a design where fatigue cracking was not likely to occur during operational life.**
- **Design criteria revised in 1956 to add “fail-safe strength) as an option assuming cracking will occur but the design and maintenance program accounts for it.**



Damage Tolerance

- **1978, Amendment 25-45 to 14 CFR 25.571 requires new transport category airplanes to be designed to Damage Tolerance (DT) philosophies.**
- **DT is a method used to evaluate crack growth and residual strength characteristics of a structure. Based on the results, inspections or other procedures are established to prevent catastrophic failure.**



DT Rules

- **121.370 & 129.32 (05/25/2001), applies to the “elite eleven” and requires repair assessments applicable to the fuselage pressure boundary.**
- **121.370a & 129.16 (12/20/2010), applies to all turbine powered airplanes with a TC issued after 1/1/1958 and requires FAA approved DT based inspections and procedures for all structure susceptible to fatigue cracking that could lead to catastrophic failure.**



Affects on NDI Personnel

- **New inspections on fatigue critical structure.**
- **New inspections of current repairs and alterations.**
- **More focus on Instructions for Continued Airworthiness (ICA's) for alterations.**



Additional Aging Proposals

- **EAPAS/FTS (SFAR 88):** Enhanced Airworthiness Program for Airplane Systems/ Fuel Tank Safety
- **WFD:** Widespread fatigue Damage (Operational Limit)
- **Damage Tolerance Data for Repairs and Alterations:** Supporting documentation for AASR to include repairs and alterations (RAMS)



FAQ's

- **What qualification scheme must be used for NDI personnel?**
 - ATA Spec 105, AIA NAS 410, Mil Std 410,
- **Can an operator develop their own qualification scheme?**
 - operator generated must meet the minimums of accepted standards
- **Must an MRO meet the same qualifications as the airline for which work is being done?**
 - Yes or the airline must accept the program used by the MRO



FAQ's

- **Must NDI be listed as specialized service?**
 - Only if process is so unique that it requires a specific process spec or work is not being performed under the airframe or powerplant ratings.
- **Must NDI inspectors be certified?**
 - No, they must have proof of qualification, including requalification, vision test, recency of experience etc.
- **Can a consultant Level III be used to write workcards ?**
 - Yes but owner operator still is responsible