FAA Philosophy and Approach on Aging Airplanes

Presented to:

Aircraft Airworthiness and Sustainment (Australia)

By: Sarbhpreet S. Sawhney Senior International Representative – Asia Pacific Aviation Safety FAA



Federal Aviation Administration

Topics to be Covered

- Introduction Historical Background
- Aging Airplane Initiatives
- Aging Airplane Rulemaking
- 14 CFR Part 26 Rules Rulemaking Summary
- Supporting our Foreign Partners
- Discussion Summary
- Additional Information



Aging Airplane Program

 The FAA has successfully assured the safety of the aging airplane fleet through the FAA's Aging Airplane Program.

Three major factors prompted the FAA's actions:

- Airplanes are being operated beyond original design service goals.
- Original maintenance plans were not required to address potential age-related issues.
- 1988 Aloha accident.



Historical Background

Highlighted age-related problems with airframe structural fatigue and issues regarding maintenance, inspection, and repairs





Historical Background - AASA of 1991

Congressional Mandate:

1991 Aging Aircraft Safety Act

The Act required FAA to promulgate a rule to assure the continuing airworthiness of aging aircraft.

-Requires FAA to conduct airplane inspections and records review

-A Rule to Require operators to demonstrate their maintenance program is adequate/timely enough to assure highest level of safety for age sensitive parts and components.





Historical Background – AASR 2005

In response to the Act,

- FAA issued the Aging Airplane Safety Rule to require:
- Airplane inspections and records review
 (121.1105,129.105,135.422)
- Damage tolerance-based inspections(121.1109 &129.109)









Aging Airplane Initiatives

The FAA and industry initiated mandatory programs to ensure structural integrity and reduce reliance on repetitive inspections. The initiatives that implemented these activities were the:

- Structural Modification Program airworthiness directives (AD) mandated necessary structural modifications.
- Structural Maintenance Program Guidelines guidelines issued by the Air Transport Association summarize structural maintenance and modification actions.



Aging Airplane Initiatives

- Corrosion Prevention and Control Program (CPCP)
 - ADs mandated the incorporation of CPCP in operators' maintenance programs
 - Today corrosion tasks are included in the maintenance manuals for new airplane models when they are certified
- Repair Assessment Program operational rules mandated damage tolerance assessment of fuselage pressure boundary repairs.
- Supplemental Structural Inspection Program ADs mandated damage tolerance based inspections developed by airplane manufacturers.



Aging Airplane Initiatives

- Aging Airplane Safety Rule operational rules mandated structural inspections and record reviews of older airplanes by FAA personnel or designees, and required damage tolerance based inspections for primary structure as well as repairs, alterations, and modifications.
- Miscellaneous ADs numerous ADs, not specifically related to the initiatives listed above, mandated actions to address corrosion and cracking issues.



Aging Airplane Rulemaking

- FAA Aging Airplane Program also includes several rulemaking initiatives.
 - Addressed structural fatigue and aging systems issues
 - Developed independently as appropriate actions were identified
 - Included a new type of rule called Design Approval Holder (DAH) rule
 - Incorporated both certification and operational requirements



Aging Airplane Rulemaking

- Enhanced Airworthiness Program for Airplane Systems and Fuel Tank Safety Operational Rules (EAPAS/FTS) – Published October 22, 2007
- Damage Tolerance Data for Repairs and Alterations final rule – Published December 7, 2007
- Widespread Fatigue Damage (WFD) Published October 28, 2010



What is a DAH Rule?

The aging airplane rulemaking initiatives reduce impact and costs to industry:

- DAH rules are contained in a new FAR part (14 CFR 26)
- DAH rules are closely coordinated with operational rules
- DAH rules require DAHs to supply data in a timely manner to support the existing fleet
- DAH rules allow efficient planning of maintenance programs
- DAH rules help to minimize down airline time



Why New DAH Approach?

- Two approaches for addressing safety issues:
 - Airworthiness Directives More than 700 ADs issued
 - General rulemaking
- Operators have expressed concerns about the timely availability of data to support compliance with operational rules
- Voluntary Support Problems
- As a result, the FAA has determined that Design Approval Holder (DAH) requirements will be adopted as necessary to support certain future safety initiatives which will be implemented via operational rules



Aging Airplane Rulemaking - Part 26 Continued Airworthiness and Safety Improvements for Transport Category Airplanes



Purpose of the Part 26 Rules

- 14 CFR Part 26 was created to support fleet wide proactive approach to
 - Identify potential failures
 - Develop necessary fixes before accidents happen
- Shared responsibility between
 - CAAs
 - DAH/Manufacturers
 - Operators
- Previous attempts at proactive rulemaking were only partially successful



14 CFR Part 26 Rules

- Address safety issues involving large fleets of airplanes
 - EAPAS
 - Wide spread fatigue damage
 - Fuel tank flammability
 - Aging airplane safety
- Require design approval holders (DAHs) to
 - take action for existing airplanes
 - make data available to operators
- Does not apply directly to operators
 - Supporting guidance can be found in FAA Advisory Circular 26-1



EAPAS and **FTS**

- Rule requires:
 - New safety requirements for electrical wiring systems and fuel tank systems
 - DAHs to develop enhanced maintenance actions
 - Ie. New wiring inspections
 - Produce new FAA approved Instructions for Continued Airworthiness (ICA)
 - Operators enhance their maintenance programs by incorporating new approved ICA
- Applicable to airplanes
 - \geq 30 pax or \geq 7500 lbs max payload



Widespread Fatigue Damage (WFD)

- Rule requires:
 - New safety requirements for fatigue critical structure
 - Establish limit of validity of the engineering data that supports the structural maintenance program (LOV)
 - WFD must be shown not to occur within that limit
 - DAHs to develop enhanced maintenance actions if needed
 - Incorporate LOV into FAA approved Airworthiness Limitations Section (ALS) of the maintenance manual
 - Operators enhance their maintenance programs by incorporating the LOV into their maintenance program
- Applicable to airplanes
 - > 75,000lbs max takeoff gross weight



Fuel Tank Flammability Rule (FTFR)

- Rule requires:
 - Operators implement approved changes to maintenance programs
- Applicable to airplanes
 - \geq 30 pax or \geq 7500 lbs max payload



Damage Tolerance Data for Repairs and Alterations Final Rule

- Closely associated with Aging Airplane Safety Final Rule
- Rule requires :
 - DAHs to develop enhanced maintenance actions
 - Develop damage tolerance (DT) based inspections
 - Produce new FAA approved ICA, including these inspections
 - Operators to enhance their maintenance programs by incorporating new ICA
- Applicable to transport airplanes
 - \geq 30 pax or \geq 7500 lbs max payload



Rulemaking Summary

- FAA has finalized Aging Airplane rulemaking initiatives
 - Enhances airplane systems
 - Ensures airplane structural integrity
 - Reduces impact and costs to industry
- Implementation is shared responsibility
 - Design Approval Holders/Manufacturers
 - Operators
 - CAAs



Supporting CAAs

- As an International Civil Aviation Organization (ICAO) signatory we have a responsibility to the international aviation community
- As a State of Design (SoD) we have a responsibility to support our approvals on products and articles within our purview
 - This includes assisting foreign States of Registry (SoR) when design issues arise



Supporting CAAs

Foreign Operator





Impact on Foreign Operators

- How does 14 CFR part 26 affect a non-U.S. operator?
 - Your operational responsibilities flow back to your CAA (the applicable SoR)
 - Your CAA will dictate to you their "Part 26" (or similar) responsibilities
 - These may or may not derive from U.S. design approval holders
 - Your CAA will work with the FAA as needed for any technical assistance issues that may arise
 - Typically only required when the FAA is the cognizant SoD



Philosophy on "Aging Airplanes"

Age is not a major issue if the airplane is maintained in an airworthy condition.

Note: Airworthy is defined as a airplane conforming to its type design or properly altered condition and is in condition for safe flight.

Proper maintenance, performed at regularly scheduled intervals and by qualified personnel is a key element in assuring the continued airworthiness of airplanes.



Discussion

- Imposing an arbitrary age limit on aircraft may have an unintended chilling effect on public perception of the safety of aircraft.
- Over 5,000 aircraft originally certificated as airworthy over 10 years ago are still in safe operation.
- As aircraft are safely operated around the globe that exceed 10, 20 or even 30 years of age, it is not in the best interest of the international aviation community for authorities to suggest or imply that older aircraft are unsafe.



Summary

- The work accomplished by the FAA, other authorities, and industry since 1988 has resulted in an excellent safety record for aging airplanes.
- Maintaining this philosophy and approach regarding aging airplanes will continue to ensure the operational safety of the aging fleet.



Additional Info

FAA Philosophy on Aging Airplanes



Effect on U.S. Operators, Cont'd

• FAA AC 26-1; Continued Airworthiness and Safety Improvements

- Per paragraph 4. f. highlights the relationship between the DAH, the operators, and the FAA
 - Operators are not typically involved in the certification or data development/approval phases of the process
 - Primarily operators are expected to ensure incorporation of the DAH's changes into their effected fleet
- PS-ANM110-7-12-2005, effective July 2005
 - Has more information about the DAH's and operators' responsibilities
 - Also outlines how the FAA and operator work together when a DAH no longer exists



Effect on U.S. Operators, Cont'd

- The U.S. operator should propose a plan based on data and documents approved by the FAA Oversight Office in consideration of the following:
 - Incorporating airplane ICA
 - Changing its CAMP
 - Including compliance schedule(s) for the operational rules
 - Revising its minimum equipment list (MEL)
 - Submitting the proposed changes to their PI or the cognizant FSDO for review and approval



Contact Info

Sarbhpreet S. Sawhney Senior Representative Asia Pacific Region International Office Aircraft Certification Service Aviation Safety, FAA

T: 65.6476.9039 M: 65.9187.9505 Sarbhpreet.sawhney@faa.gov

Questions



