



Event / Department (optional)

NTSB Fuselage Structural Integrity Forum Panel 5: Continued Airworthiness

Presented by
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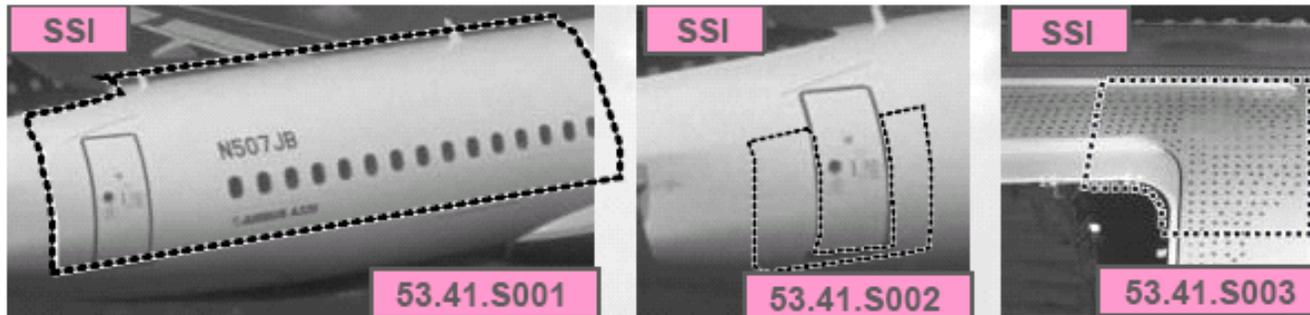
1. Maintenance Program development: Prior to Type Certification (TC)

- **25.571 requires a Maintenance Program (MP) based on Fatigue and Damage Tolerance (F&DT) evaluations**
- **Airbus approach is to provide most of the program's content at TC**
- **Maintenance program defines inspections for areas identified from:**
 - **Fatigue and crack growth areas more exposed**
 - **Findings on Full-Scale Fatigue Tests available at TC or from previous programs including tear down findings**
 - **In-service findings or areas reported by operators on previous programs**

1. Maintenance Program development: **Prior to TC**

The F&DT assessment used to establish the necessary maintenance actions:

- Description of the location to be covered by an inspection task
- Access and level of inspection (General Visual, Detailed Visual, Special Detailed)
- Accidental damage considered
- The related inspections must be included within the Aircraft Justification Document
- All influence such as access, environmental influence considered in frame of MSG3 analysis



1. Maintenance Program development: **Prior** to TC

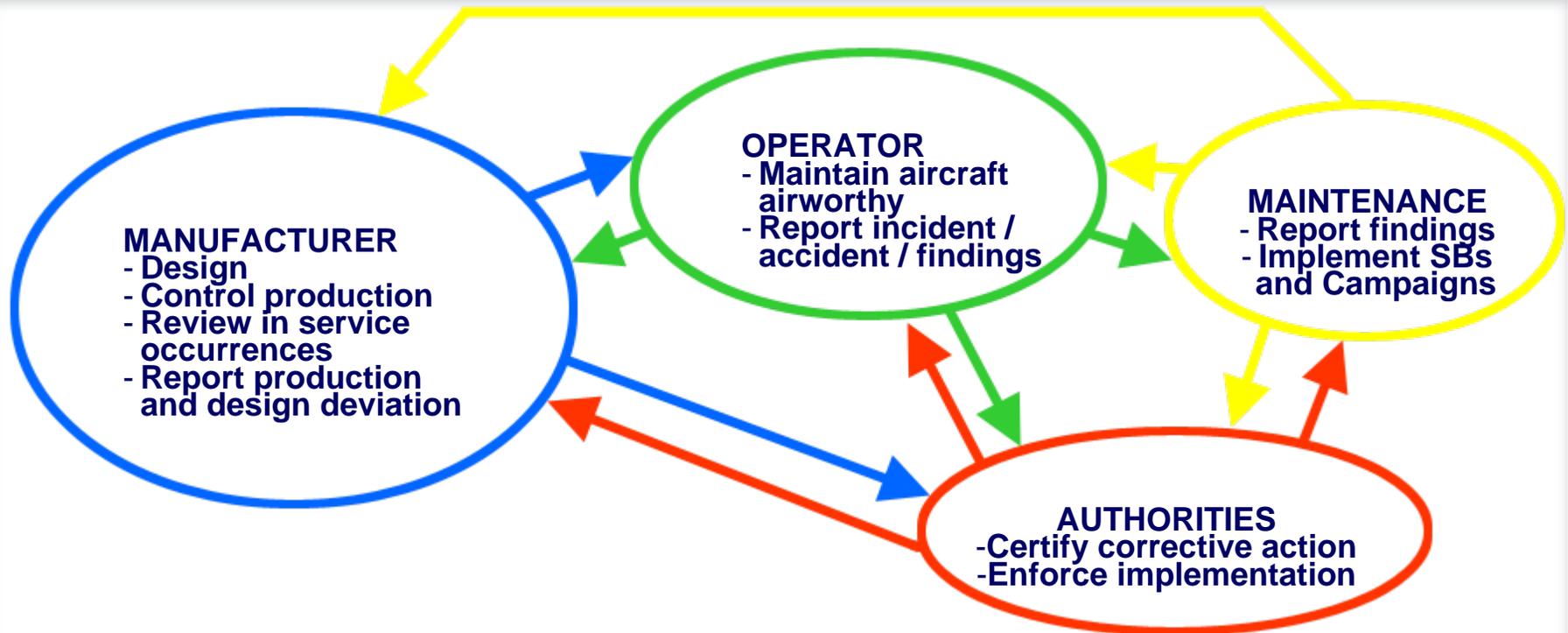
- **The Maintenance Program is developed from several sections:**
 - **Scheduled maintenance:**
 - Airworthiness Limitation Section (ALS) Part 1 provides Life Limits for Safe Life components
 - ALS Part 2 provides mandatory Damage Tolerant Inspections (Airworthiness Limitation Item, ALI)
 - Maintenance Review Board (MRB), including fleet sampling program:
 - Anticipated inspections on a reduced number of high time a/c to confirm the validity of the typical assumptions
 - Scheduled maintenance establish with Airworthiness Authorities (AA) and Operators (MRB working groups)
 - **In-service experience (scheduled or unscheduled requirements):**
 - Service Bulletins (inspection and/or modification) for particular issues
 - Service Information Letter, Operator Telex
 - Standard repairs (Structural Repair Manual, SRM), specific repairs

2. Maintenance Program: Validation/ Post TC

Maintenance Program is a continuous process throughout the a/c operational life to ensure the continuous airworthiness:

- Revision of MP following Full-Scale Fatigue-Test results
- Revision of MP following in-service occurrence
- Adjustments of MP due to change in fatigue mission linked to a/c usage following in-service feedback:
 - Regular reviews of the typical usage based on in-service feedback (Monthly Service Report and/or Fleet survey)
 - In-service measurements to refine loads & frequencies (e.g. towing, dynamic landing, long term measurements)
 - Revision of the MP figures (e.g. inspection interval) in line with 25.571
 - Consideration of different usage of one operator (environment, mission, history of the fleet) via customized Maintenance Program
- Maintenance approved by local Airworthiness Authorities

3. Safety review process: Collect



The Airworthiness is the collective responsibility of:

- Operators
- Authorities
- Manufacturers
- Maintenance Organisations

3. Safety review process: Report

- **Continuous Screening of all reported In-Service occurrences**
 - **Analysis of the available data**
 - **Additional information request towards operators whenever necessary**
 - **Classification of the occurrences, and regular review with the Airworthiness Authority**

4. Service Bulletin (SB) Origin

- **Airline:**
 - **In Service Experience**

 - **Service Bulletin from customer Request For Change (RFC)**

- **AIRBUS:**
 - **Inspection Program Proposal (IPP). Generally used for inspections linked to an airworthiness issue**

 - **QSR (Quality Survey Report) from manufacturing**

 - **Modification Service Bulletin**

5. Communication to operators (structural items)

- **MPD: Maintenance Planning Document:**
 - **Summary of all tasks (ALI, MRB, SB, SIL, AD)**
 - **Basis for the MP of the operator**
 - **Operators MP to be agreed by local AA**

- **AMM: Aircraft Maintenance Manual**
 - **Includes equipment and system**
 - **Detailed instructions for scheduled maintenance based on Maintenance Review Board, Airworthiness Limitation items (structure, fuel....)**
 - **Defines deactivation/reactivation procedures relative to Master Minimum Equipment List (MMEL)**

5. Communication to operators (structural items)

- **SRM:** Structural Repair Manual
 - Description of structure, repair materials, tools and processes
 - Definition of allowable damage limits
 - Definition of typical repairs of structural components
- **AOT:** All Operator Telex used for quick information
- **NTM:** Non Destructive Testing Manual
- **RAS:** Repair Approval Sheet to justify daily repairs not covered by SRM
- Airline symposiums, direct contact between operators and Airbus

Conclusions

- **Maintenance program is a living document (start before TC, with many updates based on close link between operator, manufacturer and aviation authorities)**
- **Safety review process available to collect, report and analyze issues, including airworthiness directives**
- **Service bulletin process well established**
- **Full set of communication tools, handbooks, etc. available**

Thank you!





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