

STATUS OF TASK 3 SUBCOMMITTEE ACTIVITIES

ATSRAC MEETING

Washington DC

October 11th 2000

Status of Task 3 subcommittee activities

October 11th 2000

- Task 3 sub-committee meeting schedule:
 - 1st meeting: Washington Nov 16th-17th 1999
 - 2nd meeting: Atlanta Feb 8th-9th 2000
 - 3rd meeting: London Gatwick Mar 21st-22nd
 - 4th meeting: Toronto Jun 20th-21st
 - 5th meeting: Seattle Sep 12th-14th
 - 6th meeting: *Toulouse* *Nov 28th-30th*

- ATA MSG-3 WG meeting schedule
 - 1st meeting: Montreal Sep 1st-2nd 1999
 - 2nd meeting: Washington Mar 14th-15th 2000
 - 3rd meeting: St Louis Jun 6th-7th
 - 4th meeting: Seattle Aug 22nd-23rd
 - 5th meeting: *Houston* *Oct 31st-Nov 1st*

Status of Task 3 subcommittee activities

October 11th 2000

Conclusions

Task 3 SC strongly believe that the adoption of the recommendations developed through their activity will lead to a significant improvement in:

- the attention paid to wiring during maintenance program development
- the quality of the guidance material supporting scheduled inspections
- the scope of inspections and consistency of their application
- standard practices to minimize wiring contamination and accidental damage
- the awareness of the importance of good housekeeping
- the identification of necessary inspections of dual load path design features

provided that TRAINING is considered a key element

Status of Task 3 subcommittee activities

October 11th 2000

Summary

Task 3.1

Development of logic to enhance existing maintenance programs:

- logic diagram : completed
- explanatory text : 90% complete
- trial application : to be done

Development of logic for inclusion in MSG-3 guidelines

- logic diagram : 95% complete
- explanatory text : to be done
- present to ATA : planned Oct 31st

(see Report Chapter 6)

Status of Task 3 subcommittee activities

October 11th 2000

Summary (continued)

Task 3.2

Clarify definition and expectations of a General Visual Inspection

Definition: completed

Expectations: completed.

(see Report Chapters 5 (definition) and 7 (expectations))

Task 3.3

Development of recommendations to minimize contamination and accidental damage to wiring:

completed.

(see Report Chapter 8)

Status of Task 3 subcommittee activities

October 11th 2000

Summary (continued)

Task 3.4

Develop guidelines to ensure identification of appropriate Instructions for Continued Airworthiness of single element dual load path design features in flight controls:

completed

(see Report Chapter 10)

Prepare Final Report

Framework produced. Approx 60% complete. Emphasis has been placed on Chapters 5 to 10. Correlation with original tasking requirement to be done plus Chapter 9 to address need to promote awareness of wiring issues within management structure

Status of Task 3 subcommittee activities

October 11th 2000

Task 3.1

- MSG-3 Zonal Analysis Procedure determined as most appropriate starting point.
- Through an iterative process, an Enhanced Zonal Analysis Procedure has been developed to address issues from ASTF non-intrusive activity
- Enhancement leads to reassessment of all zones containing wiring where combustible materials may be present.
- The re-assessment logic permits identification of:
 - tasks to reduce likelihood of combustible materials in a zone
 - Detailed Inspections of some or all wiring in a zone
 - standalone GVIs of some or all wiring in a zoneor provides confirmation that existing zonal GVI is adequate

Status of Task 3 subcommittee activities

October 11th 2000

Task 3.1 (continued)

Inspection level (GVI or DET) will be determined using a rating chart that considers:

- potential effect of fire on adjacent systems
- size of inspection area
- density of installed equipment

Inspection interval will be determined using a rating chart that considers:

- potential for accidental damage
- environment

Status of Task 3 subcommittee activities

October 11th 2000

Task 3.1 (continued)

The logic diagram for the Enhanced Zonal Analysis Procedure is provided as a separate handout

This Procedure is intended to be applied retroactively to all CFR 14 Part 25 airplanes currently in commercial service. This should be done through OEM/Airline WGs.

A simplified diagram and text will be submitted to the ATA for inclusion in their MSG-3 guidelines document. Application of the enhanced process on new airplane types will thus be assured

Status of Task 3 subcommittee activities

October 11th 2000

Task 3.1 (continued)

Recommendations

(for future airplane certifications)

MSG-3 guidelines to be updated to include Enhanced Zonal Analysis Procedure. Target: 2nd qtr 2001 (final inputs Nov 2000)

(for the eight in-service airplanes addressed by ATSRAC)

Perform comprehensive review of all zones using Enhanced Zonal Analysis Procedure in a time scale determined by ATSRAC *. Resulting maintenance program changes to be introduced in operators schedules.

(for younger in-service Part 25 commercial airplanes)

A comprehensive review of all zones using Enhanced Zonal Analysis Procedure to be scheduled by the OEMs *. Resulting maintenance program changes to be introduced in operators schedules.

* For some airplanes, a formal Zonal Inspection Program may need to be established first

Status of Task 3 subcommittee activities

October 11th 2000

Task 3.2 - Definitions

General Visual Inspection

Definition now includes maximum viewing distance - previously no limitation was quoted

Definition clarified to indicate that a mirror may be needed to have visual access to all surfaces

Detailed Inspection

Definition no longer suggests that task is limited to visual inspection. Accomplishment instructions may include tactile security checks

Status of Task 3 subcommittee activities

October 11th 2000

Task 3.2 (continued) -

Expectations of GVIs performed as part of Zonal Inspection Program

Application of the logic will determine that in some cases a zonal GVI provides an acceptable opportunity to find significant deterioration in wiring.

To improve the quality and consistency of zonal GVIs, guidance on types of deterioration expected to be found and addressed by such inspections have been developed.

This is listed according to system type and should be considered additional to typical visible deterioration of the main system components

Status of Task 3 subcommittee activities

October 11th 2000

Task 3.2 (continued)

Recommendations

- Update MSG-3 to include revised GVI/DET definition
- Update operator, 3rd party maintenance organization and OEM training material for inspectors and MSG-3 analysts to ensure consistent application of :
 - (a) revised GVI/DET definitions
 - (b) expectations of a zonal GVI
- Add guidance for accomplishment of zonal GVIs in the introductory section of maintenance planning documentation

Status of Task 3 subcommittee activities

October 11th 2000

Task 3.3

Contamination and accidental damage of wiring identified as a significant concern during non-intrusive ASTF inspections.

Firstly, the new logic process will develop scheduled tasks to help minimize accumulation of contaminants.

Secondly, a need was identified to improve maintenance practices to minimize risk of contamination and accidental damage.

Twelve issues (see next page) have been assessed. Recommendations developed together with proposals on where each should be placed

Status of Task 3 subcommittee activities

October 11th 2000

Task 3.3 (continued)

Issues for which protection/caution recommendations have been established

- 1) Installation, repair or modification (to wiring)
- 2) Repair or modification (to structure)
- 3) Application of anti-icing or de-icing
- 4) Inclement weather
- 5) Component removal/installation (relating to attached wiring)
- 6) Pressure washing
- 7) Cleaning of wiring components
- 8) Servicing waste/water systems (and repair)
- 9) Servicing oil systems (and repair)
- 10) Servicing hydraulic systems (and repair)
- 11) Gaining access
- 12) Component removal/installation (relating to adjacent wiring)

Status of Task 3 subcommittee activities

October 11th 2000

Task 3.3 (continued)

Recommendations

- For Items 1 to 12, protections or cautions to be added in the specified locations.
- Standards for producing documents listed in the ‘Locations’ section of Items 1 to 12 to be updated to ensure appropriate protection and caution information is incorporated into future documents. e.g ATA Spec 100/iSpec2200
- FAA are requested to launch evaluation of the long term effects of structural anti-corrosion products on wiring.
- OEMs to develop guidance for pressure washing to minimize adverse effects on wiring and electrical components (i.e., max pressures, min nozzle-to-surface distance, max cleaning solution pH, max temps of water, max air temp, and rinse requirements). Results should become internationally accepted standards.

Status of Task 3 subcommittee activities

October 11th 2000

Task 3.4

Single element dual load path (SEDLP) design features within flying controls are required to meet FAR 25.671.

Failure of both load paths leads to safety effect. According to MSG-3 analysis, for such functional failures a repetitive task is required to assure the function of a hidden load path.

The existing MSG-3 logic is adequate providing the analyst recognizes the dual load path function. This has not always been the case.

Status of Task 3 subcommittee activities

October 11th 2000

Task 3.4 (continued)

Recommendations

for new airplane certifications:

- Add note to para 2.3 of the Systems/Powerplant Analysis Method instructions for MSG-3 to highlight the need to identify single element dual load path functions and functional failures.
- Add an example analysis to the MSG-3 guidelines to address the function of dual load paths in flight controls. To be introduced when the concept of a 'user's handbook' is developed.

for in-service airplanes

- Review existing MSG-3 analyses, and/or perform new MSG-3 analysis, on SEDLP components to ensure the dual load path function has been identified and analyzed. Operators maintenance programs to reflect results.

Status of Task 3 subcommittee activities

October 11th 2000

- **Schedule**

- **Improve Maintenance Criteria (task 3.1)** Nov 99 to end Dec 00
- Review and revise/create logic process(es) *Complete*
- Submit proposed logic to ATA *Oct 00*
- ATA revise MSG-3 guidelines Sep 99 to end Dec 00
- Prepare recommendations for in-service fleet Nov 99 to Sept/Oct 00

- **Define improved inspection criteria (task 3.2)** Nov 99 to end Dec 00
- Define GVI and clarify its intent *Complete*
- Assess existing ATA, FAA, NTSB docs *Complete*
- Assess fleet inspection lessons (non-intrusive) *Complete*
- Assess fleet inspections (intrusive) *Sept00 to end Dec 00*
- Assess service data (Task 2) *Complete*
- Develop recommendations for Task 5 May 00 to mid Oct 00
- Prepare final report Sept/Oct 00

Status of Task 3 subcommittee activities

October 11th 2000

- **Schedule (continued)**

- **Bundle contamination (task 3.3)** **Nov 99 to Sep 00**
- Develop improved practices ***Complete***
- Prepare guidance material ***Complete***

- **Corrosion criteria (task 3.4)** **Nov 99 to Sep 00**
- Review existing criteria for dual load path designs ***Complete***
- Develop new criteria for maint of dual load path designs ***Complete***
- Prepare report **Jul 00 to Sep/Oct 00**

Status of Task 3 subcommittee activities

October 11th 2000

- **Subcommittee members:**

- Tony Harbottle Airbus Industrie (Chairman)
- Frank Jaehn Airbus Industrie
- Norm Hennigs Boeing
- Gil Palafox Boeing (from Sep 00)
- Martin Knecht Fokker Services (representing AECMA)
- Fred Sobeck FAA
- George Sedlack FAA
- Henry Dyck Transport Canada
- Tony Heather CAA -UK (representing JAA)
- Ric Anderson ATA
- Tim Herndon Delta Air Lines
- Randy Boren Northwest Airlines
- Martin Cheshire Virgin Atlantic Airways
- Dave Allen SAE
- Armin Bruning Lectromec

Enhanced Zonal Analysis Procedure

(draft issue for Oct 11th/12th ATSRAC meeting)

