Aging Aircraft Program

Systems & Wiring

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Task 2 Working Group member

Seattle November 2001
General

Contents

• Airbus participation to ATSRAC phase 1
  – Sampling inspection of the fleet
  – Review fleet service history
  – Improvement of maintenance criteria
  – Electrical wiring standard practices manual
  – Aircraft wiring systems training

• Airbus participation to FAA Aging Mechanical Systems program

• Airbus participation to ATSRAC phase 2
Airbus participation to ATSRAC Phase 1

Aging transport systems rulemaking advisory committee - ATSRAC
1998 - 2000

- TASK 1: Sampling Inspection
  - FedEx
  - R. Pope
  - AIB: R. Savoie

- TASK 2: Fleet Service History review
  - FedEx
  - R. Pope
  - AIB: R. Savoie

- TASK 3: Maintenance Criteria
  - Airbus
  - T. Harbottle

- TASK 4: Std. Wiring Practices
  - SAE
  - Dave Allen
  - AIB: T. Poole

- TASK 5: Review Training
  - Boeing
  - P. Lapwood
  - AIB: JP. Capo

- Intrusive inspection
  - AIB: D. Mazzarino

- Non Intrusive inspection
  - AIB: C. Kane
## Task 1 - Airbus work

- **Phase 1 - Sampling Inspection of the fleet**

  **Situation from each of the 5 A300 significant items**

<table>
<thead>
<tr>
<th>Action</th>
<th>Issue date</th>
<th>Compliance</th>
<th>Title</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISB 24-0094</td>
<td>Planned end 2001</td>
<td>R</td>
<td>Clamp slippage on strut in zone 270</td>
<td>ESPM 20-52-13 repair section provides enhanced technical process for improved gripping of the clamping attachment when found loose</td>
</tr>
<tr>
<td>MPD-Intro</td>
<td>Planned mid 2002</td>
<td>R</td>
<td>Bundle sagging</td>
<td>ESPM 20-52-13 repair section provides enhanced technical process for improved gripping of the clamping attachment when found loose</td>
</tr>
<tr>
<td>MPD-Intro</td>
<td>Planned mid 2002</td>
<td>R</td>
<td>Conduit clamping at conduit end</td>
<td>ESPM 20-52-13 repair section provides enhanced technical process for improved gripping of the clamping attachment when found loose</td>
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<tr>
<td>MSB 24-0096</td>
<td>Planned end 2001</td>
<td>R</td>
<td>Bundle contacting structure at 811VU</td>
<td>IPC 31-16-12 will reflect the latest installation configuration after MOD/SB embodiment reporting</td>
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<tr>
<td>MSB 24-0097</td>
<td>Planned end 2001</td>
<td>R</td>
<td>Bracket unstuck in 800VU</td>
<td>IPC31-16-11 will reflect the latest installation configuration after MOD/SB embodiment reporting</td>
</tr>
</tbody>
</table>
Phase 1 - Sampling Inspection of the fleet

Task 1 - Conclusion

- Status for Airbus: No wiring / wire type airworthiness concern requiring immediate action on the Airbus fleet
- Each findings from the 10 A300 inspections reviewed & investigated due to their repeat occurrence
- None of the five classified as an airworthiness concern
- Fixes for the five items defined. SBs, enhanced guidelines and processes to prevent similar conditions provided through SIL 92-004 dated April 30 / 01

Enhanced awareness of maintenance personnel on wiring issues is necessary. Training is the key.
Phase 1 - Review of fleet service history

Task 2

• Review existing airworthiness directives, service data and service experience:

- OIT: Operator Information Telex
- SBs: Service Bulletins
- AD/CN: Airworthiness Directives/Consigne de Navigabilité
- SIL: Service Information Letter
- AOT: All Operator Telex
Phase 1 - Review of fleet service history

Task 2 - Airbus review of service history/document

- Significant numbers of documents have been scanned:
  - 273 AD
  - 93 AOT
  - 259 OIT
  - 484 CN
  - About 3000 SB
  - 750 SIL
  - About 30000 ISP

- 52 documents (mainly SB’s) further reviewed for reassessment of Failure Mode Effect Analysis (FMEA)

- Result:
  - 1 CN to be revised to reflect content of AD 84.066.061
  - 3 SB’s upgraded from recommended to mandatory
  - 5 SB’s upgraded from desirable to recommended
Phase 1 - Review of fleet service history

Task 2 - Conclusion

- All ASTRAC queries have been fully answered
- Status for Airbus: few SB revisions issued, Customers informed with OIT’s and SIL 92-004
- A300 recommendations validated on A310/A300-600 A/C (Airbus voluntary basis)
- Similar A310/A300-600 service history/document review planned in 2002 (Airbus voluntary basis)
Phase 1 - Improvement on Maintenance Criteria

Task 3 - Implementation of new logic on A300

- Airbus plan to apply EZAP to the A300 as soon as possible - target mid 2002
- An industry working group will be formed with operators and Authorities
- A new Zonal Inspection Program will be developed using MSG-3 logic
- For A300, promulgation of the new ZIP and the tasks to be added to operators Systems & Power Plant programs will be by Inspection Service Bulletin (ISB),
- reflected in the Maintenance Planning Document (MPD)
Implementation of new logic on A310/A300-600

- Time scale for application on A310/A300-600 not yet identified

- Work will be done through the existing Industry Steering Committee under the Maintenance Review Board (MRB) process

- New tasks developed will be added to an updated MRB Report and reflected in the MPD
Phase 1 - Improvement on Maintenance Criteria

Task 3 - Conclusion

- EZAP developed to enable closer attention to be given to wiring during maintenance program development.

- Operators will need to address the consequences of the Task 3 activity relating to new maintenance tasks, revised inspection criteria and enhanced maintenance practices.

> Taken together, these actions will result in a significant enhancement in the condition of wiring installations.

- Airbus has initiated the process that will lead to application of EZAP on its aircraft types.
Phase 1 - Electrical wiring Standard Practices Manuals

Task 4 - ESPM & Associated Documentation

Scheduled maintenance

AMM MPD Task

ESPM

Unscheduled maintenance

Airbus launched Generic ESPM - April 2001

Aircraft Maintenance Manual

MPD Maintenance Planning Document

Inputs from WG 4

Inputs from WG 3

Inputs from WG 1, 2 & 4

Trouble Shooting Manual

Airbus launched Generic ESPM - April 2001

Phase 1 - Electrical wiring Standard Practices Manuals

Task 4 - ESPM & Associated Documentation

Scheduled maintenance

AMM MPD Task

ESPM

Unscheduled maintenance

Airbus launched Generic ESPM - April 2001

Aircraft Maintenance Manual

MPD Maintenance Planning Document

Inputs from WG 4

Inputs from WG 3

Inputs from WG 1, 2 & 4

Trouble Shooting Manual

Airbus launched Generic ESPM - April 2001
Phase 1 - Electrical wiring Standard Practices Manuals

Task 4 - Scheduled Maintenance Links

Probable future implementation for the A300/A310/A300-600

ESPM 20-53-00 Inspection criteria

24-92-19 Page 601

ESPM

20-10-00: Safety Practices
20-42-XX: Sleeves, Caps, Shield Terminations
20-43-XX: Splices and Pressure Seals
20-44-XX: Connectors
20-45-XX: Direct Connection Components/Relay
20-48-XX: Terminal Lugs and Contacts
20-50-00: Electrical Standard Processes
20-61-00: General Rules
20-52-00: General Processes
20-53-00: Repairs Processes
20-54-00: Miscellaneous Processes
20-56-00: Standard Tools
20-57-00: Wires Protections and Attachments
20-71-00: Engine data
Task 4 – Conclusion (as applicable to Airbus)

ASTRAC Task Groups’ recommendations are being applied in Airbus documentation

Airbus generic ESPM applicable to all Airbus a/c is available

Enhanced ESPM will include “Maintenance Tips” resulting from ATSRAC recommendations

Airbus will continue to promote the efficient use of all maintenance manuals by

- Documentation familiarization courses (on-site)
- “How To Use” section in the “Introduction” of all manuals, including practical examples
- User-friendly training and consultation media (Cadets)
Phase 1 - Aircraft wiring systems training

→ Task 5 - Airbus wiring systems course project

- Airbus course program development planned
- Customized to cover all Airbus aircraft family
- Based on ATSRAC task 5 curriculum and lesson plans
- Theoretical: 50% / Practical: 50%
- Minimum 1 week course (expandable as required or necessary)
- Course development completion and availability planned end 2002
Task 5 - Airbus wiring systems course (cont’d)

- Objective is to develop an effective and attractive training course, balancing
  - Media, films, pictures presentation
  - Hands-on components / documentation familiarization
  - Troubleshooting exercises with
    - Line-oriented scenarii to solve problems
    - Actual standard tool kit for practical repairs
Phase 1 - Aircraft wiring systems training

Wide range of training media

- CD-ROM
- Hard-copy + CD-ROM
- Wiring
- ESPM
- Systems
- Microfilms
- Training
- WDM (AWM, ASM, AWL)
- Course
- CD-ROMs
- Video clips
- CAATS
- Pictures
- ADRES
- TPCI
Phase 1 - Aircraft wiring systems training

→ Standard tool kit for hands-on repair practice

- Connector Assembly
- Disassembly
- Wire stripping
- Contact crimping
- Insertion Extraction
- Splice assembly
- Solder Sleeve & sleeve heat-shrink
- Electrical test meters
Phase 1 - Aircraft wiring systems training

Task 5 - Conclusion

- Feedback received from airlines, repair stations & industry
- Recommendations from task 1, 3, and 4 WGs
- Assessment of the effectiveness of current training programs

= Model Curriculum with detailed lesson plans on aircraft wiring systems developed & provided to operators (SIL 00-076)

This training Model will effectively focus greater attention on the issue of aging wiring systems

- Airbus course availability planned end 2002
Phase 1 - Conclusion

Atsrac phase 1 (1998-2000) - Summary

- FAA has launched an ambitious & aggressive program on Aircraft system aging
- Airbus has actively participated in ATSRAC, providing expertise and resources to all working groups
- Airbus operators have been regularly informed through the Operator Information Telex (OIT) channel
- More details on the ATSRAC tasks and results are provided through Service Information Letters (SIL)
- Airbus also encourage operators to visit the FAA web site (www.mitrecaasd.org/atsrac/)
Airbus participation to FAA’s Aging Mechanical System program

Phase 1 (2001-2003) - Flight Control Systems

- Airbus supports the new FAA’s research program to evaluate aging mechanical system processes to continued operational safety

- Airbus will contribute to:
  - the assessment of design & manufacture’s maintenance instructions on the A320 Flight Control system Yaw axis
  - the assessment of maintenance & service history associated with this flight control system
  - the assessment of the condition of flight control linkages on aging aircraft (SEDLP)
Airbus participation to ATSRAC Phase 2

Atsrac phase 2 (2001-2002) - On-going

Aging transport systems rulemaking advisory committee - ATSRAC 2001 - 2002

- **TASK 6**
  - **Wiring certification**
  - Airbus / Boeing
  - AIB: Jean-Luc Ballenghien

- **TASK 7**
  - **Electrical Std Practices**
  - Airbus / Boeing
  - AIB: Tony Poole

- **TASK 8**
  - **Wiring Systems Training**
  - FDX / DLH
  - AIB: Jean-Pierre Capo

- **TASK 9**
  - **Maintenance criteria**
  - NWA / VIR
  - AIB: Tony Harbottle
Atsrac phase 2 (2001-2002) - On-going

- FAA & JAA will implement ATSRAC recommendations
- Proposed rulemaking advisory material expected from 2002 onwards
- OAMs, STC applicants, operators, PMIs, ACOs will be affected
- Airbus, Boeing, Bombardier, Dassault, Embraer fully involved with FAA and ATSRAC to enhance aircraft design, maintenance and safety
Thank you for your attention