Fuel Tank Safety

EASA status

24th of June 2005

EASA and fuel tank safety

1- Welcome practical arrangements

2-Presentation of Agenda

3- Introduction

4- Ignition prevention

5- Instructions for Continued Airworthiness (ICA)

6- Flammability reduction systems

EASA and fuel tank safety

7- Long term EASA requirements

8- Questions and answers not captured by the agenda items above

9-FAA presentation

10- How to maintain appropriate comment channels between EASA and Industry

11-Summary and conclusions

Harmonisation effort with FAA (1/2)

- **Harmonisation goal:**
  - To establish mutually acceptable positions between the FAA and EASA related to fuel tank safety, working within the requirements of the existing and developing rules and policies, while respecting the responsibilities of the State of Design:
    - **Resulting in a common solution set for the operators, and**
    - **Facilitating transfer of airplanes from country-to-country with minimal impact on operators.**

Harmonisation effort with FAA (2/2)

- **Harmonisation process:**
  - FAA and EASA have closed SFAR 88 open issues
    - **FAA and EASA are coordinating common SFAR 88 closure schedule letters that will be sent to manufacturers**
  - Weekly internal FAA team meetings to monitor all fuel tank safety activity
  - EASA internal team coordination
  - Biweekly FAA, EASA and TCCA teleconferences to continue and reinforce harmonization effort

Why fuel tank Safety

- Fuel Tank Safety Enhancements of Large Transport Airplanes presented by D Cheney at the:
  - 57th Annual International Air Safety Seminar, November 15-18, 2004, Shanghai, China

Ignition prevention (1/2)

All ignition prevention reviews are in the process of being closed (SFAR 88, JAA recommendation letter ref. 04/00/02/07/03-L024 dated 3rd of February 2003).

For each TC holder, this will be formalized through a statement of compliance letter issued by EASA or FAA (one for each TC holder from their certificating authority).

Ignition prevention (2/2)

The remaining outstanding issue is related to high flammability tanks for which assessment should be conducted as per EASA 25.1309 versus FAA 'latent+1'. It is unlikely this issue will be closed before a decision on flammability reduction, this affects only Airbus/Boeing at present).

Instructions for Continued Airworthiness (ICA) (1/6)

- **For ignition prevention related actions, EASA expects that TC/STC Holders will publish before 31/12/2005:**
  - All maintenance instructions, warnings and procedures necessary to ensure the ongoing integrity of the critical design feature of the identified Airworthiness Limitations Items (ALI) including Critical Design Configuration Control Limitation (CDCCL) to be approved
  - Enhanced fuel tank entry and exit procedures.

Instructions for Continued Airworthiness (ICA) (2/6)

- For all other instructions for continued airworthiness, e.g. additional scheduled maintenance tasks, EASA expects that TC/STC Holders will develop them as soon as possible but certainly by not later than 31/12/2006.
- This will be dependant on TC/STC Holders providing a plan/programme of the Maintenance Review Board (where appropriate) for their product range.

Instructions for Continued Airworthiness (ICA) (3/6)

- **In accordance with Part M.A.302, Operators will be required to take into account the above into their approved maintenance programmes within 12 months of receipt of the updates:**
  - 31.12.2006 for ignition prevention related actions
  - 31.12.2007 for all other instructions for continued airworthiness.

Instructions for Continued Airworthiness (ICA) (4/6)

3. **Due to CDCCL's being a new concept EASA recommends that TC/STC Holders consider assisting their operators by providing guidance on the unique aspects of their identified CDCCLs (and possibly ALI's) that would need including into operator and maintenance organisation training syllabi.**

Instructions for Continued Airworthiness (ICA) (5/6)

Pending finalisation of EASA thinking on the regulatory framework for retro-active requirements, EASA will have to use the following scheme to enforce the dates quoted in the previous slides :

1. Send to each affected TC/STC holder a letter requiring a formal commitment to meet those deadlines,

2. Should a TC/STC holder fail to respond, EASA will issue AD to require publication of CDCCL and ALIs.

Instructions for Continued Airworthiness (ICA) (6/6)

- **Letter to TC and STC Holder:**
  - Will be available on the EASA web-site if no confidential data

- **Attachment to letter will contain guidance (Revised TGL 47)**

Flammability Reduction (1/7)

- Any EASA decision process will be open and transparent and will provide adequate substantiation.
- EASA position is based upon an impact assessment performed in June 2004.
- Based upon this assessment, EASA will support a production cut-in of all affected center tanks (around 2008)
  - Assumption: 7% flammability exposure based on version 7 of Monte-Carlo model
- The same assessment based on information available at that time concluded that a full retrofit can not be justified. However, discussions are still being held by EASA and FAA on FRS retrofit.

Flammability Reduction (2/7)

- EASA is aware of the forthcoming FAA NPRM addressing FRS retrofit.
- EASA may need to revise the impact assessment in order to take into account new elements brought by FAA (e.g. economics).
- EASA will comment to FAA and have further discussions on this topic with FAA.

Flammability Reduction (3/7)

- **Cooperation with FAA on this issue:**
  - What is the extent of cooperation?
  - Plan agreed to work toward harmonisation

Flammability Reduction (4/7)

- **The Monte-Carlo model:**
  - Which version to use?
  - Final version 7 (September 2005) incorporating lessons learned

Flammability Reduction (5/7)

- **Draft criteria for flammability:**
  - 7% Flammability Exposure (> = high flam)
  - 3% F.E and 3 % for a hot day (if FRS)
  - * Oxygen level to be reduced <12%

Flammability Reduction (6/7)

- **Regulatory impact assessment:**
  - Status of document:
  - Document will be published but may need to be revised later as discussed above.

Flammability Reduction (7/7)

- **Boeing has applied for the certification of an FRS and EASA will issue shortly the final 747-400 FRS Special Condition to permit installation of such systems , harmonized with FAA (except for some editorial differences).**
- **Consultation on the draft Special condition was organized by JAA (January/February 2004) on behalf of EASA:**
  - Special condition and Comment response document will be put on the EASA web-site
- **Other Boeing models to follow.**
- **For other products from other manufacturers, the content of the special condition will be defined by EASA with the objective to address hot day conditions. EASA will consider all technical solutions achieving this objective.**

Long term requirements

EASA will work with FAA to define necessary amendments to FAR/CS 25, with two main objectives :

a balanced approach to fuel tank safety:

- comprehensive ignition source prevention requirements and AMCs (taking into account lessons learned during design reviews),
- fuel tank flammability requirements.

EASA and FAA share common objectives.

Fuel tank safety related tasks in present EASA rulemaking programme

- **Attachment 1 provides a summary of the tasks**

Q/A not covered by previous agenda items

- **Transfer of responsibilities from NAAs to EASA:**
  - Some reports were agreed by NAAs. What are EASA plans concerning these reports?
    - **Reports adopted by NAAs before 28.09.2003 are automatically adopted.**
    - **Reports adopted after 28.09.2003 are adopted by NAAs on behalf of EASA**

Q/A not covered by previous agenda items

- **Vendors issues:**
  - How to ensure that vendors of components identified as CDCCL update their component maintenance manual (CMM)?
  - TC holder is responsible to ensure that CMM reflect CDCCL

Q/A not covered by previous agenda items

- **Enhanced Zonal Analysis Programme (EZAP):**
  - Will EZAP be a mandated process? Yes, the NPA for Electrical Wiring Systems to be published end 2005 will propose to mandate EZAP
  - What guidance will be available? 3 AMC's

Q/A not covered by previous agenda items

- **Other questions?**

FAA presentation

- **Development / Implementation of Fuel Tank System Maintenance Program Changes:**
  - Presented by M Zielinski and M Giordano

Communication channels

- **How to maintain them:**
  - One idea would be another workshop after summer
  - Other views are welcome.

Summary and Conclusions

- **Instructions for continued airworthiness:**
  - CDDCCL will only be notified by AD if TC/STC holders do not produce them in time. AD schedules for Operators will provide same delay as Part-M
  - Plan for ICA maintained as described in the slides.
  - EASA has noted concerns expressed by Operators
  - Therefore EASA is willing to organise with representatives of Industry and NAAs to evaluate if changes are needed when better knowledge of work generated by CDCCL volume

Summary and Conclusions

- **Instructions for Continued Airworthiness:**
  - EASA will write to Authorities to make clear that the dates included into the JAA Interim Policy are replaced by those described in these slides
  - EASA will publish on its Web-site the letter to TC/STC holders if no confidential data
  - PMA on CDCCL for European products will only be accepted after the modification has been approved by EASA

Summary and Conclusions

- **Flammability reduction systems:**
  - The RIA dated June 2004 will be published on the web-site in July.
  - The revision of this RIA to take into account new elements brought by the FAA NPRM consultation will done by an EASA Rulemaking Group
  - The EASA will review the results of the study done, at the request of FAA, by the Sandia Laboratory relative to the efficiency of SFAR-88

Summary and Conclusions

- **Communications channels:**
  - Keep the communication channels open:
    - **This is likely to take the form of another information meeting with a wider audience including national Authorities after summer.**
  - AEA offered a Fuel tank Safety focal points for discussions with EASA

Summary and Conclusions

- **Other points:**
  - A questions and Answer summary has been established.

The concept of CDCCL and examples

- **Critical Design Control Configuration Limitation:**
  - Feature of the fuel system design which must be maintained for the operational life of the aircraft to ensure that unsafe conditions do not develop.
- **Fuel Pumps**
- **Bonding leads**
- **Wiring separation**

EASA maintenance requirements and fuel tank safety

- **Link with the European regulatory system**
  - Maintenance programmes
    - **Part-M M.A.302 requires maintenance programmes to be based on data produced by TC holders, STC holders or organisations required to by Part-21.**
    - **Anything else requires the approval by the competent authority. In the case of ALIs this is EASA. No change with the introduction of CDCCLs**
  - Maintenance Data
    - **Part-145 145.A.45 requires AMOs to hold and use current maintenance data.**
    - **The maintenance instructions can only be modified with the approval of the competent authority. No change with the introduction of CDCCLs**

EASA maintenance requirements and fuel tank safety

- **Link with the European regulatory system**
  - Maintenance Training
    - **Part-145 145.A.30(e) and Part-M M.A.706 require personnel to be competent and this competence to be evaluated in view of their tasks.**
    - **This is part of the organisation's expositions that is approved by the competent authority. No change with the introduction of CDCCLs**
  - Control of aircraft configuration
    - **Part-M M.A.301 requires operators to control the configuration of their aircraft and to have an embodiment policy for non mandatory modifications and for repairs**
    - **Furthermore, M.A.304 requires modifications and repairs to be accomplished in compliance with Part-21. The resulting maintenance data will then become maintenance data that needs approval to be changed. No change with the introduction of CDCCLs**

EASA maintenance requirements and fuel tank safety

- **Shared responsibility**
  - In the EU system, the responsibility is shared between the operators, the maintenance organisations and the design organisations.
  - This is the main difference between the EU system and the policy.
  - The safeguards are already built into the European structure and it is not planned to redistribute the responsibilities.
- **Modifications**
  - EASA does not foresee any rule change necessary nor any change to existing practices as they are today
  - EASA is studying the possible introduction of TGL 47 into AMC 20 for the airworthiness issues and modifications to AMC and guidance material for continuing airworthiness in order to highlight the importance of fuel tank safety.

Attachment 1

- **Fuel tank safety related tasks in present EASA rulemaking programmes**

FUEL TANK SAFETY RELATED RULEMAKING ITEMS

25.012 APU Installation and Fuel Tank Safety

Amend requirement relative to fuel tank ignition (JAA NPA 25E-342):

CS 25.981 “Fuel tank ignition prevention”

New AMCs 25.981(a) and 25.981(c)

NPA 10/2004

CRD 10/2004 published 19-04-05

CS 3q 2005

FUEL TANK SAFETY RELATED RULEMAKING ITEMS

25.056 Inerting / fuel tank safety:

Establish criteria allowing the identification of high flammability tank.

A Regulatory Impact Assessment (RIA) has been developed, may need to be revised and based on this regulatory proposals will be made to address flammability reduction

NPA 1q 2006
CS 2008

FUEL TANK SAFETY RELATED RULEMAKING ITEMS

MDM.002 Ageing Wiring

- TC and STC holders to review their existing designs in light of amended certification standards for an enhanced zonal analysis procedure (EZAP):
- New CS-25 Subpart H containing all wiring related requirements in one place, titled Electrical Wiring Interconnect System (EWIS).
- Amendment to appendix H of CS-25 Instructions for Continued Airworthiness with associated AMC
- Creation of new material in CS-25 book 2 to support the new Subpart H and CS 25.1357(f) (Circuit protection)
- AMC.M.A.302 for maintenance programmes, and
- M.A.706 for training requirements
- Amendment to Part 66 syllabus to reflect EWIS training
- three new AMC 20 to support
- EZAP
- Training
-Electrical Standard Wiring Practises Manual

Start 2004
NPA 3q 2005
CS/AMC : 3q 2006

FUEL TANK SAFETY RELATED RULEMAKING ITEMS

MDM.022 Fuel tank safety issues - AMC/GM

Work has been going on for several years now on fuel tank safety. The first results should be published soon. If necessary these results should be integrated into Part-M/-145/-66/-147 AMC/GM material.

1q 2005
NPA 3q 2005
AMC 4q 2005

FUEL TANK SAFETY RELATED RULEMAKING ITEMS

MDM.023 Fuel tank safety issues - Rule

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NPA 2007
Opinion 2008