



2009 Europe / US International Aviation Safety Conference



EASA/ FAA Fuel Tank Safety

Ali Bahrami
Manager
FAA Transport Airplane Directorate

Yves Morier, EASA Rulemaking
Pascal Medal , EASA Certification



FAA Summary of Fuel Tank Safety



- Rulemaking to address ignition sources and fuel tank flammability complete.
- SFAR 88
 - ★ 260 unsafe conditions
 - ★ 147 Airworthiness Directives to date
- FAA Flammability Reduction Rule
 - ★ Final rule published July 21, 2008
 - ★ Effective December 26, 2008
 - ★ Part 26 requires retrofit of about 2800 US registered airplanes with high flammability fuel tanks
 - ★ Affects airplanes issued a certificate of airworthiness after 1991



FAA Final Rule Status



- Updated guidance
 - ★ AC 25.981-2, and
 - ★ Monte Carlo Users Manual
- New AC 120-98 for Operators developed and issued
- Training classes for design approval holders (DAHs) and operators
 - ★ Training in US (FAA) - Seattle
 - ★ Training in Europe (EASA) - Cologne



Summary of Fuel Tank Safety Compliance Status



- Compliance plans for flammability analyses in place
- Flammability analyses review in progress
- All newly produced 737 and 777 currently delivered with nitrogen generating system
 - ✦ **777 system FAA-approved February 2009**
 - ✦ **Currently over 200 737s delivered with NGS**



Lessons Learned from SFAR 88



- Significantly more ignition sources than expected
- Importance of timely service instructions
- Importance of compliance planning
- Direct involvement of authorities early



SFAR 88 Lesson Learned: Critical Design Configuration Control Limitations (CDCCLs)



- CDCCLs intended to maintain critical ignition prevention features
- DAHs identified CDCCLs in the Instructions for continued Airworthiness
- Mandated into operator maintenance programs
 - ✦ **Effective December 16, 2008**



SFAR 88 Lesson Learned: CDCCLs



- For critical fuel system components, DAHs have defined entire Component Maintenance Manuals (CMMs) as CDCCLs
 - ✦ CMMs now require strict adherence
 - ✦ CMMs now require ACO approval
- Unfortunately,
 - ✦ CMMs contain errors or insufficient instructions
 - ✦ Part shortages



SFAR 88 Lesson Learned: CDCCLs



- Numerous CMM revisions
- Supplier CMM revisions reviewed by DAHs prior to FAA approval
- Operator and repair station CMM revisions submitted directly to FAA
- FAA and industry engaged to support operators



FAA Fuel Tank Flammability Reduction (FTFR) Rule



- **14 CFR Part 25 Subpart E**
 - ✦ **Sets flammability limits for all fuel tanks**
 - ✦ **Airworthiness limitations required for all fuel tanks**

- **14 CFR Part 26 DAH Requirements**
 - ✦ **Flammability analysis of all fuel tanks in large transports**
 - ✦ **Flammability Reduction Means (FRM) service instructions for high flammability tanks**
 - ✦ **FRM on newly produced airplanes with high flammability fuel tanks**
 - ✦ **Pending certification projects**



FAA FTFR Rule



- **14 CFR Part 121 Operating Requirements – US Registered Airplanes**

- **Passenger Airplanes**
 - ✦ **Newly manufactured airplanes must have FRM**
 - ✦ **Retrofit of FRM Required**
 - ✦ **FRM must be maintained per DAHs' airworthiness limitations**

- **Cargo Airplanes**
 - ✦ **Newly manufactured airplanes must have FRM**
 - ✦ **Retrofit of FRM not required**
 - ✦ **Converted cargo airplanes must maintain FRM**



FAA Compliance Dates



- **Published effective date of the FTFR rule was September 19, 2008**
- **Revised effective date is December 26, 2008**
- **Compliance dates adjusted by 98 days**
- **Supplemental Notice will be published in the Federal Register**



FAA Summary



- Fuel tank safety program highly successful
- Two layers of protection
 - ✦ **Flammability control**
 - ✦ **Ignition source control**
- Retrofit requirements focus on newer airplanes with highest risk
- DAH rule assured availability of service instructions to support operators
- Compliance times allowed operators flexibility in modifying their fleet



Harmonization of Flammability Rulemaking



- FAA and EASA agree in principle on approach
 - ✦ Harmonized special conditions issued for Boeing 737 & 747 nitrogen generating system
 - ✦ Based upon Monte Carlo flammability analysis method
- Production incorporation agreed
 - ✦ FAA rule issued, EASA NPA on retrofit will also cover production cut-in
- Retrofit
 - ✦ EASA conducted regulatory impact assessment
 - ✦ EASA planning to issue NPA
 - ✦ Need based upon:
 - Catastrophic nature of fuel tank explosions
 - Need for harmonization and one level of safety
 - Leasing company need for standardized approach



EASA Fuel Tank Safety



➤ EASA activities on fuel tank safety

★ **Training for maintenance:**

AMC to Part-M and Part-145: decision to be effective on 31st March

★ **Task 25.056 (b)**

NPA for CS-25: CRD published 08 April, open for review until 08 June

★ **Production cut-in:**

Agreed with FAA that we would do it

★ **FAR 26 assessment**

Assistance to FAA

★ **Task 25.056 (a)**

Review of 2004 Regulatory Impact Assessment (Retrofit issue)



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- **The revised RIA submitted by the group concluded:**
 - ★ **The group does not recommend additional EASA action beyond CS-25 and production cut-in**
 - ★ **Statistical risk: 1 accident between now and 2030**
 - ★ **Cost: 2.8 Billion EUROS**



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- **Review by the Agency:**
 - ★ **The Agency regards the risk of accident that implies a very high probability of loss of all lives on board as critical to its decision making process**
- **As a result the Agency has determined that it will launch a rulemaking task:**
 - ★ **envisaging as a preferred option mandating in a manner closely following the FAA final rules:**
 - a production cut-in and
 - the retrofit to the existing fleet



EASA Fuel Tank Safety



- **The new rulemaking task (I):**
 - ★ **The task will anticipate on the concept of safety directive and associated CS-26 introduced by NPA 2009-1**

 - ★ **The schedule for the rulemaking task is as follow:**
 - Meeting with stakeholders - September 2009
 - NPA - 3rd quarter 2009
 - Safety directive(s) and CS-26 – 1st quarter 2012



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- **The new rulemaking task (II):**
 - ★ **The date of publication of the safety directive(s)**

Anticipated adoption by the Commission of the concept of safety directive in 2011

The need for the Agency to take full account of the comments received on such significant issue



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- **The new rulemaking task (III):**
 - ★ **The Agency has no intentions to be more severe than the FAA:**

Comparable compliance dates for both issues will be provided taking into account that the EASA rules will be published later than the FAA's

Cargo aircraft will be excluded from retrofit as well as aircraft that have received a first certificate of airworthiness before 1993 (25 years old or more at the effective date of the rule!)



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- **Arguments for Agency decision (I):**
 - ★ **A statistical risk of 1 accident between now and 2030 exists**
 - ★ **Nature of the potential accident**



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➤ Regulatory difference with FAA

★ **Additional criteria to delineate high and low flammability exposure tanks:**

Temperature rise in any part of the tank under most critical conditions during a 4 hour ground operation, limited to 20°C;

★ **Does not apply to aeroplanes fitted with serviceable FRM, but may impact MMEL despatch conditions**



EASA Fuel Tank Safety



- **Arguments for Agency decision (II):**
 - ★ **FRM may protect from other threats**
 - ★ **The FAA's decision to mandate retrofit will likely be followed by other countries**
 - ★ **Foreign operators may use as a commercial argument that they are equipped with FRM**
 - ★ **Leasing companies desire harmonisation**

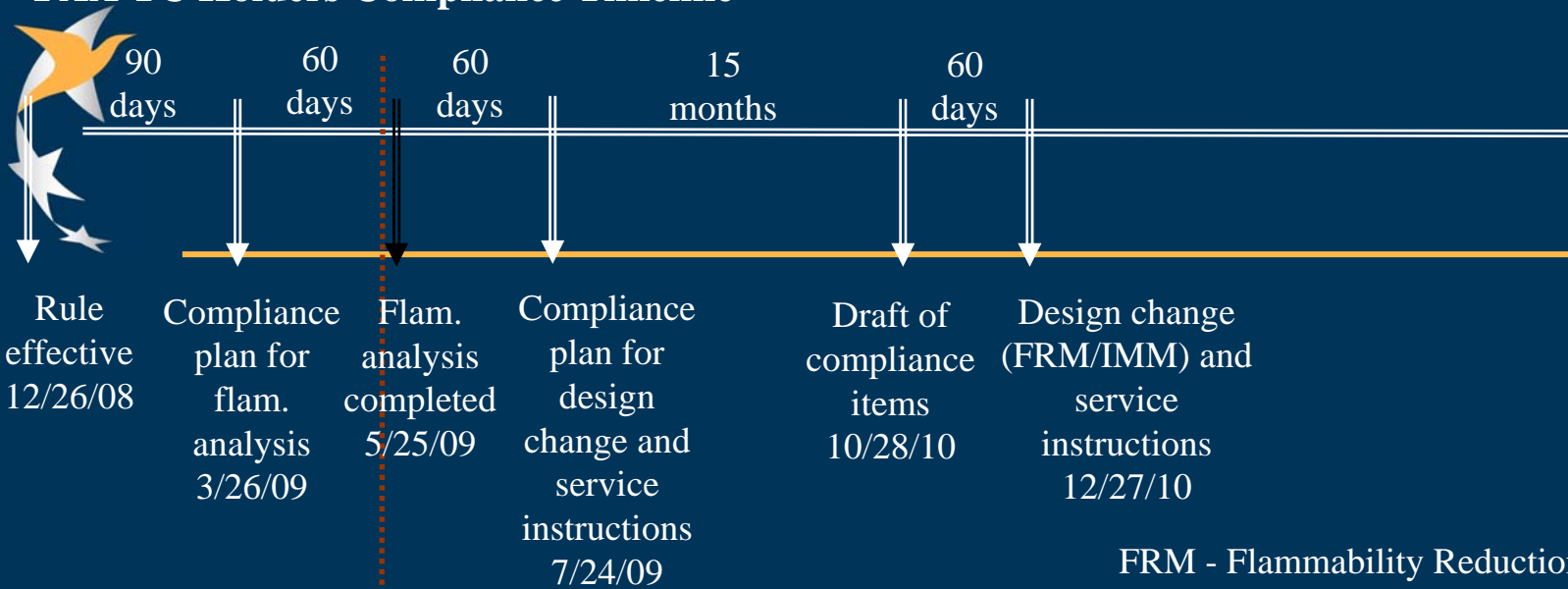


**Thank you
for your attention
Your questions are welcome**



Backup Slides

FAA TC Holders Compliance Timeline



FRM - Flammability Reduction Means
 IMM – Ignition Mitigation Means
 FIMM – Flammability Impact Mitigation Means

FAA STC Holders Compliance Timeline

