

ARAC MFWG CONTINUATION OF TASK

STATUS UPDATE

October 20, 2015

BACKGROUND

- On December 17, 1903, The Wright brothers made the first controlled, powered and sustained heavier-than-air human flight.
-then a bunch of other stuff happened.....

Background

- ARAC: Aviation Rulemaking Advisory Committee, created in 1991
- Tasks: Proposed by FAA
- TAE: Transport Airplane and Engine Sub-Committee
- Working Group: Given a specific task with a time limit, then disbands.

.....Continuation of Task?

- What was the ORIGINAL Task?
- Review of a proposed re-organization of flammability regulations
- Re-organization foundations:
 - Move from reactive, list based regulations....
 - Create a safety based structure for regulations

What is Safety?

- In-Flight
 - fire threats should not present a direct hazard to the occupants and should allow the safe flight, landing and potential evacuation of the aircraft
- Post-Crash
 - sustain survivable conditions long enough to evacuate the aircraft

Original Task Results

- Threat / Safety based organization is logical, practical and a more effective framework for regulation going forward than the current published regulations.
- The new structure, along with appropriate advisory material, would ultimately be simpler and more easily understood and enforced.

Original Results: Biggest Hurdle: Benefits versus cost

- The current system, while flawed, maintains a VERY safe aviation industry.
- Since “low hanging fruit” have been harvested....
- And industry has in place MOC’s to do things in accordance with current regulations....
- Hurdle: How to move to a better organized, logical system if fewer immediate safety benefits are seen.



**IT'S
A
TRAP!**

NEW TASKING

1. **Review the ORIGINAL Report**
2. **Provide quantitative cost/benefit data for each recommended change**
3. **Provide in-service data regarding incidents (precursors) or accidents**
4. **Write a report about the cost and benefit results for the recommended changes.**

FRAMEWORK FOR COST AND BENEFIT ANALYSIS

Development Costs

New Test Equipment (Development)

New Material/Specification Development / Revision of Current Specs due to new requirements.

Non-recurring Costs

New Test Equipment (Purchase and Production Approved)

New Design Development

New Methods of Compliance

Regeneration of Existing Flammability Certification Data (Existing materials/designs)

New Certification Data (New materials/designs)

Recurring Costs

Material/part cost.

Weight increases – airline operational cost

Customer Introduction Certification Requirements

Maintaining Separate Requirements, Documentation, and Test Data for In-Production Airplanes vs. New

Certification Basis Airplanes

Testing Reliability

Unclear Initial Requirements and Guidance Materials Could be Costly

Cost Decreases (Benefits):

Simplified test methods and requirements

Simplified compliance activities/reports, reduced documentation

Reduced Testing

Hierarchy testing

Robust AC Guidance

Approved Materials list

Use of Industry Test Data

In-Flight Regime

1. Accessible areas within the cabin Test: BB (Bunsen Burner)
2. Areas that are non-accessible. There are a large number of potential ignition sources and the size of the ignition source varies. Tests: BB, IRP (Insulation Radiant Panel), VFP * (Vertical Flame Propagation)
3. Waste containment receptacles. The likelihood of an ignition source is high due to illegal smoking and the disposal of flaming or near flaming materials on the commercial aircraft (or legal smoking if permitted). Tests: BB, FC (Fire Containment)
4. Cargo compartments. The likelihood of ignition sources is high and the size of the fire can be large due to the less controlled nature of cargo. Likelihood of detection is good due to detection systems. Ability to mitigate varies depending on the classification of the cargo compartment and the fire suppression systems. With respect to a fire threat, there is minimal proximity to occupants, but higher proximity to flight critical systems, though aircraft design considerations enforce extensive critical system separation. Tests: BB, COB (Cargo Oil Burner)

Post crash regime:

1. Protection for escape equipment. This brings in to the actual regulations the testing currently done to support TSO approval for evacuation slides. By setting a threat based standard for this type of equipment, expectations are set for any future evacuation aids. Tests: Slide Radiant Panel (SRP)

2. Limiting flame penetration into the passenger cabin. For aircraft with 20 or more passengers, protection will be provided which keeps the pool fire outside the cabin for a period of time. This protection is proposed regardless of the method used to provide it, so that methods other than the currently-mandated insulation will be held to a consistent performance level. Tests: BT (Burn Through)

3. Limiting flame spread within the cabin due to the involvement of cabin materials. The large exposed interior panels and seating systems must not become heavily involved in the fire until evacuation has been achieved. Tests: BB, HR (Heat Release), ST (Smoke Test: while considered in the original report, it is assumed in this report that the smoke test will be eliminated), SOB (Seat Cushion Oil Burner), MOB (Magnesium Oil Burner)

Report

- No ultimate conclusion – no Net Cost/Benefit number
 - Some area results were qualitative, not quantitative

Quantitative Example - Seats

- For Business Class Seats, the overall ARAC report and FAA assumptions have an overall positive impact to non-recurring and recurring costs. The most positive impact is due to elimination of smoke emissions and hierarchy of testing. The most negative impact is due to elimination of heat release special conditions for seats. Pass/fail methodology consistency across all test methods also has a negative impact since multiple cushion combinations are required and recovery times are limited.
- Business Class Seats has the following overall impact summary per seat place for the specific case study presented:
 - Non-Recurring: Cost savings \$13,185
 - Recurring: Cost savings \$4,485

Qualitative Example - Inaccessible

- The Inaccessible Area Team has completed the tasks as outlined in the ARAC re-tasking notice. The team has concluded that the cost impact associated with the in-flight inaccessible area new regulation is high. Type certification of an all new aircraft model to the proposed new amendment level would be substantially more costly than it would be compared to using the flammability regulations that exist today. A majority of the costs are the result of the following:
 - -New testing and new material development and certification activities due to the more stringent test requirements for air ducting and electrical wiring/sleeving.
 - -New compliance activities due to the new regulatory coverage for the inaccessible areas where there was not regulatory coverage before. This includes new compliance test plans and reports, new conformed and officially witnessed tests, and new compliance documentation.

Biggest Cost Movers

- The proposed change with the greatest potential to increase costs is the new inclusion of the inaccessible areas regulations. The proposed changes with the most potential to reduce costs are the elimination of smoke testing, and the broader and simpler handling of exceptions to certification testing (small parts, listed parts, use of industry tests, etc.).

Report

- No ultimate conclusion – no Net Cost/Benefit number
 - Some area results were qualitative, not quantitative
- Stoplight chart for each area.
- Spreadsheet / Dollar totals for SOME areas
- Report issued to TAE
- TAE meet November 4, 2015 to consider report for referral to FAA



Questions?

