

INTERNATIONAL AIRCRAFT MATERIALS FIRE TEST WORKING GROUP MEETING

November 19-20, 2003

Hosted by Boeing Commercial Airplane Group, Seattle, Washington, USA

WEDNESDAY, NOVEMBER 19, 2003

Burnthrough Presentation and Discussion – R. Hill

Dick gave the background for developing the burnthrough test program. Diagrams and photographs of the various test methods and test apparatus were presented and described. A diagram and photograph of the current test apparatus were presented.

Advisory Material for Burnthrough – R. Hill

Dick reviewed the information that was compiled and sent to the FAA Standards office to support the Advisory Circular (A/C). The basic types of insulation systems, the installation methods, and attachment methods are addressed in the A/C.

Randy Smith (Boeing): Is it appropriate for the A/C to have information as to definition of what is lower half? Dick Hill: Yes, if there is ambiguity, it can be clarified in the A/C. Mauro Dolinsky: It is also important to address the material that is bonded to the skin. How should the burnthrough test be conducted for this material? Dick Hill: This material should only be tested for burnthrough if it provides burnthrough protection. The FAA is still expecting input/comments/concerns from the Working Group members related to this A/C. Further discussion relating to this topic will take place during the Task Group meeting on Thursday, November 20, 2003.

Printed Wiring Boards – J. Peterson

Jim reviewed the concerns relating to certification testing of printed wiring boards and the work done to date on the proof of concept for similarity testing for certification of printed wiring boards. Future plans include creating additional baselines for desired materials. A report will be written on this project.

Advisory Circular for CFR 14 Part 25 25.856(a). Jim reviewed Boeing's clarification requests and other points that should be addressed in the A/C. These will be discussed further during the Burnthrough Task Group meeting.

Jim also presented some concerns and points for clarification relating to the Test Method. One specific concern is that each test specimen is considered individually not as in the past where the average results of 3 test specimens was considered. Jim refers to this as the "One Strike" Issue relating to the new rule.

Radiant Heat Panel Discussion – P. Cahill

Pat briefed the group on the development of the radiant panel test apparatus in various labs. She also briefly discussed the Task Group meeting held Tuesday, November 18. The Round Robin 6 data will be posted to the FAATC website when all participating lab data has been received and compiled.

The FAATC will be conducting training workshops on the radiant panel and burnthrough test methods for FAA ACO's at the Tech Center during the first week of December. If DERs are interested in participating in a training seminar as well, they should contact the FAA DER Coordinator at their FAA Aircraft Certification Office.

European Study on Fire in Hidden Areas – A. Mansuet

Three hidden areas have been identified: ceiling, cheek area floor/cargo, and side. A list of the materials in these areas has been compiled by DGAC. DGAC has received air ducting materials for the next phase of testing: PEI, glass/phenolic laminate, and wires and cable ties. These materials will be tested as systems as close as they are set up in the aircraft.

Calorimeter Issues: Calibration and Transducer Accuracy – R. Johnson

Dick reminded the group of the importance of careful handling and care of the heat flux transducer. Dick reviewed the NIST calibration approach. Resolving Calibration Issues: common interest group – government and industry. The information Dick presented was provided to him by NIST. The FAATC will only calibrate transducers when they are going to be used as part of an FAA-coordinated Round Robin test program. Transducers may be calibrated by Vattel (one of the manufacturers). Vattel calibrates the transducers according to the specifications. Dick Johnson will keep trying to obtain the calibration method information from Medtherm.

Contamination Issues – R. Hill

The Airline Survey questionnaire was completed and sent to Boeing and Airbus to be distributed to their customer airlines for responses.

Flammability Tests of In-Service Insulation – R. Hill

The materials used in this set of tests were taken from the FAATC 727, 737, and 747 test aircraft. Dick presented a table with links to photographs showing specifically where each material was installed in the aircraft (as installed). Video of each test was linked to the presentation chart. This chart will be on the FAATC Fire Safety website, and CDs will be available.

Aging and Contamination Evaluation Status – Insulation Blanket Films – D. Slaton

In-service Insulation Blanket cotton swab test performed on in-service blankets received from airlines. Dan presented a chart indicating the types of materials tested, their contamination levels, and the test results. In summary, in-service blankets made with AN-26 PET do not generally meet cotton swab test requirements, regardless of contamination level as evaluated by visual means. Dan reviewed the information reported during the March 2003 Materials Working Group meeting. The PET material characterization analysis done by Boeing was presented. A summary of conclusions taken from cleaning analysis and spray-on fire retardant evaluation tests was presented. Dan described the future work Boeing plans to do in this area. The artificial aging studies initiated in January 2003 using new AN-36 and & AN-47W (Orcon) insulation blanket film were described. The cotton swab test results on the artificially aged samples were presented. The proposed next steps include: continue to evaluate in-service blankets from all ages, thicknesses and types of films to determine level of flammability performance degradation across the fleet, summarize airline input to the Contamination Survey, perform more cleaning tests over a wider range of contamination types and levels, further work with polarized microscopy, DMA and other methods, and more testing of spray-on fire retardants.

Fire in Hidden Areas Presentations

Wiring in Hidden Areas – P. Cahill

Pat showed a video of the series of wire tests conducted at the FAATC. The FAATC is in the process of determining what test apparatus to use for wire and cable testing. Presently, the Radiant Heat Panel test with some modifications is being considered. Scott Campbell: From time to time the

subject of tie wraps comes up. Does this testing consider tie wraps as a small part? Dick Hill: No, that wasn't part of this program. CEAT is going to be doing some testing involving tie wraps.

The FAATC plans to address the other materials in the hidden areas including ducting materials and composite materials as well as others.

Aircraft Materials Fire Test Handbook – Final Discussions/Presentations

Chapters 1-4 (Jim Peterson): He received 1 question which he believes is already covered in the Handbook. Heinz-Peter Busch: 60-degree, how do you test thermoplastic in 60-degree test? Jim will address this and provide some information on how to test this material in the 60-degree test.

Chapter 5 – OSU (Heinz-Peter Busch): There is one small correction that he will send to FAATC. Two questions will be added to the list for Chapter 5: one from Heinz-Peter Busch and one from Scott Campbell.

Chapter 6 – NBS (Jason Rathbun): Jason reviewed the comments/questions he received.

Chapter 7 – Oil Burner for Seat Cushions (Heiko Neussel): He received two comments recently. He suggests starting a Task Group to research this test from the beginning including the oil burner set up, calibration, variations in test results, repeatability, etc. Dick Hill: Write up the comments you have received and your suggestions and forward them to April. Jim Davis: We have a few more comments on the seat test that we will write up and forward to Heiko Neussel.

Chapters 8 – Oil Burner for Cargo Liners/Chapter 15 – Repaired Cargo Liners (George Danker): George reviewed the areas for consideration including: better definition of burnthrough and improve and standardize burn apparatus. The areas of concern fall into two general categories: test methodology and regulatory issues. George then broke down the comments he received into which of these two categories they fell into. Some suggested language for those definitions needing clarification was presented.

Ingo Weichert presented a video demonstrating some of the difficulties in conducting the burnthrough test on a ceiling and wall panel as installed in the aircraft. It was difficult to determine (based on the regulatory documentation) if this material passed or failed the test as there was no 'burnthrough'. Dick asked that this case be written up by the Task Group to be taken into consideration by the FAA.

Scott Campbell asked if anyone is covering the chapter on waste bin fire containment.

THURSDAY, NOVEMBER 20, 2003

Task Group Reports

Radiant Heat Panel Task Group Report - P. Cahill

This meeting was a continuation of the Tuesday Task Group meeting. A few key issues were addressed during this meeting including the 'One Strike' Issue presented by Jim Peterson on Wednesday and the 'flashing' question was discussed again. Pat asked TG members to write up these questions/concerns and send them to her so that she can pursue clarification from the regulatory side. She asked the Round Robin participants to send their data/results to her as soon as possible.

HANDBOOK: Dick asked if it would be beneficial to have video clips built into the electronic version of the Handbook to visually demonstrate the definition of some terms such as flame propagation and burn length? The group consensus was 'yes', this will be useful.

Contamination Task Group Report – D. Slaton

A smaller subgroup will be created to address some specific issues. The subgroup's first teleconference will most likely be held in January 2004. There was a significant amount of discussion on the Contamination Survey forms and the need for clarifications from the airlines based on some of the responses received to date. Boeing will discuss some of the issues brought up in this Task Group meeting with a representative from the FAATC. This Task Group will hold a meeting the day prior to the next full Working Group meeting.

Burnthrough Task Group Report – R. Hill

A number of topics were addressed. The definition of 'halfway' as written in the rule was discussed. A presentation was given on alternate definitions that were thought to be similar to the one in the rule. The FAATC will discuss these other interpretations of the rule with the FAA regulatory side. The FAATC will try to address some of the issues brought up during this Task Group meeting under "Burnthrough" on its website as updates, etc., once these issues are discussed with the regulatory side.

FAATC Lightweight Seats Test Update – R. Hill

Tim Marker has conducted some tests on the newer lightweight seats. Dick presented information Tim compiled related to the problem with these non-traditional lightweight seats and the testing criteria. Diagrams of the full-scale test set up, the seat identification, and thermocouple locations were presented. Photos of the full-scale test configuration were shown. Post-test photos were shown as well as data charts from the tests. The preliminary conclusions were reviewed.

Creation of New Task Groups – R. Hill

Oil Burner for Aircraft Seats Task Group: Dick suggested that this Task Group first outline its focus, goals, etc., keeping in mind what has been learned about the oil burner during the burnthrough test development and how some of these things learned can be applied to the oil burner for seat tests.

Dick presented the idea of creating a Task Group to evaluate the possibility of an alternative to the Oil Burner. He suggested that the Working Group think about this topic and come to the March 2004 meeting with their thoughts/comments/suggestions.

A small Task Group is being formed to look at hook and loop and run some full-scale tests. If anyone is interested in participating in this group, contact Jim Peterson at Boeing. This is going to be a quick results Task Group that hopes to have an answer by the March 2004 meeting.

Next Meeting

The next meeting will be held March 2-3, 2004, at the Trump Taj Mahal Hotel-Casino in Atlantic City, New Jersey, USA.