

INTERNATIONAL AIRCRAFT SYSTEMS FIRE PROTECTION WORKING GROUP MEETING

August 29-30, 2000

Held at Sheraton Atlantic City West Hotel, Pleasantville, New Jersey, USA

TUESDAY, AUGUST 29, 2000

Cargo Minimum Performance Standard – J. Reinhardt

John provided a background summary of the Cargo MPS Program including test requirements and an explanation of each of the cargo compartment tests and their acceptance criteria. There was some discussion on how the measurements are taken for bulk load, containerized, and flammable liquid tests (based on worst case measurement). He will start testing with HFC-125 in these tests in early September 2000 (duration of tests will be approximately 30 days). Once the HFC-125 testing has been completed, water mist and nitrogen tests will be conducted at the FAATC after that test method has been defined.

Note: CF₃I tests will not be run in one of these configurations, because the FAATC believes enough CF₃I cargo tests have already been run at the FAATC which proved that too many toxic gases would go to the cabin area. A concentration of toxic gases that are known to be dangerous to life and health was measured as what would enter the cabin area when the previous CF₃I tests were conducted.

Thermocouples: Request from Working Group members for more details on type of thermocouples that will be used in FAATC tests (include brand of thermocouples and bead size).

Test Set Up: How many other labs/companies plan to set up these tests? Response: Two as of this meeting.

Byproducts: Are there any words in the MPS that address combustion byproducts? FAATC Response: The FAR for allowable concentrations of noxious gases in the cabin is cited in the Cargo MPS.

Carriage of Aerosol/Hazardous Materials by Passengers or Airlines: Manufacturers produce non-aerosol products for consumers, however, some travelers prefer to use aerosol products (i.e.: hairspray, deodorant). There is a limit on the amount of aerosol products allowed per passenger. The FAATC tests are conducted using a lower amount of aerosol. Limitations/Restrictions on Airlines: There are limitations/restrictions on the airlines on the transport of oxygen containers. However, there have been a number of cases where they have been illegally transported. The FAATC has conducted a number of tests on oxygen generations, and the results of these tests have been very dramatic.

Handheld Extinguisher Minimum Performance Standard Discussion – H. Webster

MPS Status: The draft MPS has been posted to the FAATC Fire Safety Section website for approximately one year for comments. It includes both the hidden fire test and the seat fire/toxicology test information for tests conducted at the FAATC. The test work was recently completed at the FAATC.

One Remaining Issue: How will future or existing agents be handled?

Timeframe: The goal is to have the MPS published by early 2001.

UL Testing Program (Bill Carey): Certification program in existence with the U.S. Coast Guard for approximately 40 years that is similar to the FAA Handheld Extinguisher MPS testing program. UL should be able to begin testing once the test article/apparatus is received at the UL facilities. The MPS will be published as a Technical Document through the FAATC. The next step is to produce some FAA guidance material/policy information through the FAA Regulatory group. Further discussion between the FAA and UL is required to coordinate the testing program. UL will need a document they can make reference to prior to putting the UL seal on the alternative agent extinguishers. T. Eklund: Will UL do both the hidden fire test and the seat fire test? The seat test/toxicology test was designed to look at the toxicity when putting out the largest fire that would occur within the cabin. There should be enough data available on the possible alternative agents to preclude doing the seat fire/toxicology test in the future. The FAATC believes different criteria may be developed that may be used so that the seat fire/toxicology test would not need to be conducted.

Nacelle Halon Replacement Progress – D. Ingerson

Test Apparatus: A detailed schematic and construction information for the engine nacelle simulator apparatus will be posted to the FAATC Fire Safety Section website.

Engine MPS: HFC-125 testing was conducted at the FAATC per the MPS and results were presented during this meeting.

Fire: The fire testing will likely be more challenging. A heat transducer was placed in the test article. Doug presented results of tests conducted with hot plate and described results of these tests.

The Engine Nacelle Task Group will meet on August 31, 2000, for a detailed look at and discussion on the nacelle simulator work.

Fuel: Are you testing fuel samples? Response: There is a facility at the FAATC where the fuel can be tested (to obtain flashpoint, etc.). FAATC is currently using Jet A/JP-8 fuel.

It was emphasized that the regulatory material must be specific.

The Navy's Responsible Use Policy and Halon Alternative Implementation Opportunities – B. Leach

Bill provided information on the teams responsible for the Navy's Fire Protection Program and explained the Navy's Halon 1301 Responsible Use Policy and some of the work that has been done and implementation of halon alternative systems within the Navy to date. A copy of Bill's presentation is available on the Fire Safety Section website (www.fire.tc.faa.gov).

(Navy) Full Scale Aircraft Cabin and EE-Bay Test Results from Greenwood, MS- (Aerosol and misting technologies)- J. Wulff (Lakehurst NAWC)

Joe described the B-737-200 Tests. One set of tests conducted was in the following aircraft areas: lavatory, galley, stow bins, ceiling wire arc fire and the EE-Bay. Data on the ceiling wire arc fire tests was presented. Data on the Aerosol Generator Tests were conducted in the EE-Bay. Question: Did you do a trade study to determine which technology to use to protect the cabin area? Response: No, a commitment had already been made to test the water mist system in the cabin area. Question: Did you do any baseline tests without extinguishment? Response: We did some preliminary cup tests as our baseline tests. Fire extinguishers are not typically used to put out ceiling wire arc fires. Report: Contact Joe if you would like a copy of the final report. . A copy of Joe's presentation is available on the Fire Safety Section website (www.fire.tc.faa.gov).

Fuel Tank Explosion Protection Testing (FAATC)– D. Hill, B. Cavage, S. Summer

Ground Based Inerting Overview – B. Cavage

Work performed (Cost Analysis of Ground Based Fuel Tank Inerting in the Commercial Fleet)—the final report is available on the FAATC Fire Safety Section website (www.fire.tc.faa.gov), click "Reports", then "DOT/FAA/AR-00/19".

Work in progress (currently planning a BBJ [B-737NG] ground based inerting test)—Steve Summer is currently doing Fuel Tank Flammability at Increased Altitude and Decreased Oxygen Concentration work (currently planning to continue this work to 40,000 feet altitude). The BBJ test is designed to test the venting system.

Proposed work (Full-Scale Ground Based Fuel Tank Inerting work using a B-737 aircraft & an On-Board OBIGGS Feasibility Study).

The FAA has formed an ARAC (Aviation Research Advisory Committee) to make recommendations for rulemaking on ground based and on-board fuel tank inerting within one year. Much of the research will be done through this Working Group.

Fuel Tank Ignition Studies at Reduced Pressure & Oxygen Concentration at FAATC – S. Summer

Steve explained the goals of this test program and outlined the tests included in this test program. The apparatus was described (a schematic of the test article was shown). The results to date were discussed for both the

Preliminary Methane Tests and the Sea Level JP-8 Tests. Future plans include repeating the sea level tests with pressure instrumentation and continue on with altitude tests (reduced pressures). . A copy of Steve's presentation is available on the Fire Safety Section website (www.fire.tc.faa.gov).

NEA Ullage Washing Testing with a Vented Fuel Tank – B. Cavage

The test article and set-up was described. Bill presented and explained the model created by Ivor Thomas. The Future Work planned was discussed. The tank used in this test is an 88 cubic foot vented, rectangular tank. . A copy of Bill's presentation is available on the Fire Safety Section website (www.fire.tc.faa.gov).

Those companies interested in participating with the FAATC in any aspect of the Fuel Tank Explosion Protection Testing Program are welcome to participate.

ARAC Perspective – I. Thomas

The ARAC group went into this with the FAA's approach to put a benefit cost to this system by looking at the accident history and the benefit of the accidents prevented over the next 10 years. The financial and technical aspects are being considered in this program.

FAATC Fire Safety Section Website- D. Hill

Dick presented and explained the set-up and information available on the Fire Safety Section website (www.fire.tc.faa.gov).

WEDNESDAY, AUGUST 30, 2000

OBIGGS/OBOGS

NASA/FAA Program – B. Palaszewski (NASA)

A 5-year program coordinated with the FAA. One area is Fire Prevention (detection, suppression, inert materials, fire safe materials). NASA/FAA are jointly funding smoke detection modeling at Sandia National Labs. NASA/FAA coordinated to look at OBOGS in the long term. Fire safe fuels: reduce flammability of fuels, building facility at NASA Glenn to do this research. Also doing some joint research with Rich Lyon at FAATC.

Aircraft Cargo Compartment Detection Test Program – D. Blake

Dave mentioned the FAR, TSO and Advisory Circular on smoke detection in cargo compartments. He briefly discussed the cooperative research with NASA. Sandia Labs is developing a CFD model to predict transport of smoke throughout cargo compartments. The report that documents the false alarm rate was published about two months ago. This report is available on the FAATC Fire Safety Section website. Dave presented data from some of the tests he has conducted. Some discussion took place on using the same amount of smoke to detect a fire for any size cargo compartment. FAATC is doing research into defining the fire that needs to be detected. Question: What will the output of this work be? Response: Definitely an Advisory Circular and possibly changes to the existing TSO and FAR. Comment: This research is headed in the right direction, because a specific fire signature is exactly what detector manufacturers need to design detectors.

Task Group Discussion/Other Discussion & Presentations

Engine/Cargo Alternative Agents Task Group – A. Gupta

During the May 2000 meeting an Advisory Team was established to make recommendations on the alternative fire suppression agents the FAATC should test for cargo compartments and engines. This team is chaired by Al Gupta (Boeing). There were six agents proposed by the members of this team through proposals, comments were made on the proposals, and comments were addressed, once everything was coordinated a draft was compiled that has been posted to the FAATC Fire Safety Section website. It is still in draft form, because all the signatures of the team members have not been acquired at this time. This team will meet this afternoon to vote on what agents to recommend to the FAA.

Environmental Issues Update – J. O’Sullivan

One publication that is currently available and approved by the EU covers the control of halons within Europe and other CFCs effective October 1, 2000. We do not know where the bulk of the halon stores are. Emissions already began to take place as soon as the EU signed the document.

The second publication (Halon Management Strategy) is currently not official, but it is planned to be available in the near future (a definitive date has not been given). A team of 4 or 5 people in Europe has put this document together without user participation. This will prevent the trade and movement of halons (critical use) for the certain period of time as stated in the Montreal Protocol. HTOC has put together a small team that will meet in approximately three weeks to put together recommendations to the Montreal Protocol based on the actions that have recently been taken in Europe with no user participation. It is unknown who (what organization) will be responsible for enforcing and policing this strategy.

U.S. EPA Update – M. Victor

Meg read the March 1998 EPA ruling on the unnecessary release of halons. This rule became effective April 6, 1998.

Use of HFCs in fire protection: the U.S. EPA does not anticipate restrictions on the use of HFCs in the United States in testing (there is no guarantee that the restrictions will never be made by the EPA). All the halon alternative agents must go through SNAP approval. Global warming potential and atmospheric lifetime are looked at in the use of halon alternative agents. For example, approximately one year ago Jeff Cohen (at a meeting of this Working Group) explained that the EPA does not support the use of SF-6 because of its global warming potential and its atmospheric lifetime.

Water Mist Proposal – J. O’Sullivan

John presented and discussed the use of water mist. A copy of John’s ‘Water Mist Proposal’ is available on the Fire Safety Section website (www.fire.tc.faa.gov).

New Task Groups:

Seat Test for Handheld Extinguishers—look at this test and determine what other test could be used to replace this test. Harry Webster will chair this Task Group. Contact Harry or April if you would like to participate in this Task Group.

T. Reynolds (Boeing) – Suggested separating Halon Replacement from Inerting issues into two Working Groups per Boeing perspective. FAATC Response: The charter of this group was expanded to cover both issues, because there are a number of the same people who would participate in both groups if the issues were separated into two separate groups/meetings. Determination: An effort will be made to segment topic areas so that Working Group members may more easily attend discussions/presentations directly related to their area of interest/work.

Next Meeting:

The next meeting will be held at the United Kingdom Civil Aviation Authority (CAA) at Aviation House in Gatwick, United Kingdom, on the afternoon of December 11 and all day on December 12, 2000. Additional details will be posted to the Fire Safety Section website (www.fire.tc.faa.gov) when available.