

INTERNATIONAL AIRCRAFT SYSTEMS FIRE PROTECTION WORKING GROUP MEETING

MAY 3-4, 2000

WEDNESDAY, MAY 3, 2000

Cargo Minimum Performance Standard – Dave Blake

Halon 1301 Final Report on MPS (for gaseous total flood agents) and testing (scenarios: bulk load, containerized load, surface burning fire, and exploding aerosol can) is in final review within the FAA.

Non-gaseous agents or systems: bulk load, containerized load and surface burning fire scenarios are identical to the requirements for gaseous agents. Further testing at the FAA Technical Center on water mist systems on the exploding aerosol can scenario will be conducted. In May 2000, John Reinhardt will be conducting tests with Yulian acoustic water mist nozzles.

Working Group members discussed the possibility of organizing a Task Group to review agents that have been investigated and provide an updated list of agents to consider. Dick suggested that this group review the draft of Bob Tapscott's last alternative agents report. Al Gupta (Boeing) will chair this Task Group. Contact Al Gupta at (phone: 425-294-3179/ fax: 425-294-7434/email: Alankar.Gupta@boeing.com) if you would like to participate in this Task Group.

Sham Hariram questioned FAR 25.831C referring to hazardous gases. FAATC will look into this.

FAATC will also look into smoke venting and hold further discussion at the next Working Group meeting.

Discussion on Handheld Extinguisher Minimum Performance Standard – R. Hill

The Handheld MPS is posted on the Fire Safety Section website at www.fire.tc.faa.gov. Any comments on this MPS may be sent to Harry Webster at Harry.Webster@tc.faa.gov. Dick reviewed the Background for the MPS. He discussed qualifications for agents used for Seat/Fire Toxicology Tests. The design/execution of the Hidden Fire Test was also discussed. The Hidden Fire Test was developed by Kidde Gravier in the United Kingdom. The European side may need to coordinate how this test can be applied on their regulatory side and also coordinate how/where these tests will be conducted. Future work includes the following issues to be resolved: toxicology of any additional new agents, publication of test results, Hidden Fire Test—-independent lab certification, and the implementation of the MPS.

Engine Minimum Performance Standard – R. Hill

Doug Ingerson has completed the mechanical assembly of the FAATC engine nacelle simulator. Dick displayed photos of the simulator and explained its design/set up. Characterization of the system is ongoing. HFC-125 will be used in the first trial of the MPSE. Doug plans to have some results by the end of summer 2000, on the HFC-125 and CF₃I tests he will be conducting in the next few months. Doug is currently beginning the process of doing some testing (robust fire scenarios) with Halon 1301 and HFC-125. Dick asked the group if there are any other agents that should be considered for engine fire protection.

Fuel Tank Explosion Protection Testing – R. Hill

Dick discussed the past, present, and future R&D dealing with aircraft fuel tank explosions and explosion protection. Past R&D included transient heating and cooling, Jet A fuel properties

distribution, benefit analysis for Nitrogen inerting. Present R&D includes Nitrogen membrane testing, Jet A fuel characterization, copper sulfide deposits, flight test for ground-based inerting, hot surface ignition of Jet A, and NASA OBIGGS/OBOGS (information gathering). Future R&D will include determination of Jet A flammability at various altitudes at reduced oxygen levels, onboard ground based system evaluation, flammability of Jet A mist, SFAR test support, NASA OBIGGS/OBOGS: system design and flight tests, and ARAC support (new ARAC group to develop regulatory draft for fuel tank inerting or explosion protection for in-service aircraft). The report entitled: Mass Loading Effects on Fuel Vapor Concentrations in an Aircraft Fuel Tank Ullage, Report #DOT/FAA/AR-TN99/65, is now available on the Fire Safety Section website. The report entitled: A Benefit Analysis for Nitrogen Inerting of Aircraft Fuel Tanks Against Ground Fire Explosion, Report #DOT/FAA/AR-99/73, is also available on the Fire Safety Section website. The report entitled: Jet A Volatility Survey is currently in draft form and should be published in the near future. Ground Based Nitrogen Inerting Flight Test Program will be initiated in May 2000. Its purpose is to determine oxygen concentration on ground and during flight under various conditions and flight scenarios. A new B737-800BBJ will be used for these flight tests. The Jet A hot surface ignition tests are currently ongoing at the FAATC. The cooperative NASA/FAA Program is a long-range program.

Discussion on Ground Based Inerting – R. Hill

Cost of Ground Based Inerting System: Dick reviewed the presentation entitled: “Cost of Implementing Ground Based Fuel Tank Inerting in the Commercial Fleet” given at the SAE Advances in Aviation Safety Conference in April 2000. Bill Cavage (FAATC) worked with Delta Airlines and Air Liquide at the Atlanta Airport (big airport sample) and with the Atlantic City International Airport (small airport sample) to determine what the cost would be to operate a ground based inerting system. These costs do not include costs to modify the aircraft for use of ground based inerting system.

Onboard Ground Based Inerting System Testing – R. Hill

The FAATC is investigating the use of an onboard system, because it may be more cost effective to install the system on certain types of aircraft only rather than have the system installed at all airports around the world. The FAATC Fire Safety Section is in the process of purchasing a 737 aircraft to use for testing an onboard ground based inerting system. The bid for this aircraft will be sent out very soon. Once the Fire Safety Section physically has the aircraft, it will request bids for the onboard system.

OBIGGS/OBOGS – R. Hill

Bottled oxygen is used in the cockpit and in some passenger areas in case of cabin depressurization. The FAATC believes that bottled oxygen is very dangerous, and there are documented fatalities where the bottled oxygen has played a role. In some cases bottled oxygen has contributed to the loss of the aircraft also. The FAATC will investigate the oxygen percentages required for breathing at/for what altitudes/times. This information can be obtained from FAA Civil Aeromedical Institute (CAMI).

THURSDAY, MAY 4, 2000

FAATC Smoke Detection Test Program – D. Blake

Covered in FAR 25.858. Reviewed Tasks of FAATC smoke detection test program. Presented and discussed test article that will be used to produce smoldering fire source that may occur in cargo compartments. The goal is to produce smoke that contains the gases that would be found in the smoke of a smoldering fire source in cargo compartments. Dave reviewed the intended results of this program. Sandia National Labs is currently developing the mathematical model. The model should be completed in approximately two years. The remainder of the test development and work is ongoing at

the FAATC. Some discussion occurred concerning the environment in which the tests will be conducted (ie: air pressure, temperature, etc.).

Smoke Detection Topics – Klaus Schmoetzer (Daimler Chrysler Aerospace Airbus)

Presentation title: “Improvement of Smoke Warning Reliability in Aircraft Applications”—copies of this presentation were available to meeting attendees.

Presentation title: “Verification of Systems in the Aircraft—Smoke Detection Tests” (comments for Advisory Circular 25-9A). Copies of this presentation were available to meeting attendees.

Copies of these presentations are posted to the Fire Safety Section website. See “Presentations” section.

FIREDETEX Update – Konstantin Kallergis (Daimler Chrysler Aerospace Airbus)

FIREDETEX stands for “New Fire/Smoke Detection and Fire Extinguishing Systems for Aircraft Applications.” It is funded by the EU 5th Framework.

Update on the Draft EC Regulation – Mike Diprose (Pacific Scientific)

EC Control of Ozone Depleting Substances – copies of this presentation were available to meeting attendees. See “Presentations” section of this website for a copy of this presentation.

Hydrofluorocarbons Draft UK Climate Change Proposals – John O’Sullivan (British Airways)

See “Presentations” section of this website for a copy of this presentation.

Passive Tank Explosion Suppression Device – Luciano Borghetti (Hughes Associates)

These tests are being conducted on lighter aircraft and helicopter fuel tanks at the politecnico milano. See “Presentations” section of this website for a copy of this presentation.

NEXT MEETING

The next meeting will be held at the Sheraton Atlantic City West in Egg Harbor Township, New Jersey, USA, August 29-30, 2000. See “Upcoming Meetings” section of website for complete details.