International Aircraft Systems Fire Protection Forum Virtual Meeting Minutes

April 21-22, 2021

WEDNESDAY, APRIL 21, 2021

Welcome and Opening Remarks – Steve Summer (FAATC) (steven.summer@faa.gov)

The purpose of the IASFPF is to provide an open exchange of technical discussion across the fire safety community. These are not the official views of the FAA. It is also important to look at future needs and challenges that need to be addressed. Steve's opening presentation is available with the other meeting presentations on the FAA Fire Safety website).

Cargo Compartment Halon Replacement MPS Document Review and Revision Updates – Dhaval Dadia (FAATC) (dhaval.dadia@faa.gov)

Halon Handbook: combine Halon Replacement Standards into a single document. Adopting a "living document" approach to be able to make changes to the document more easily. This document will be similar to the *Aircraft Materials Fire Test Handbook* (*Aircraft Materials Fire Test Handbook* location: https://www.fire.tc.faa.gov/Handbook).

Dhaval reviewed the Task Group Objectives.

Dhaval provided status of Halon Replacement Minimum Performance Standard revision.

Active Fire Suppression Task Group announcement.

Initiate Task Group focused on developing a standard for active fire suppression systems for cargo containers. The Task Group will be initiated during the fall 2021 Systems Forum meeting. Please email Dhaval Dadia (dhaval.dadia@faa.gov) if you are interested in participating in this Task Group.

Ferguson: The new Task Group, is it expected that it would evolve into an SAE or ISO standard, or is that something to be figured out at a later date. Dadia: the Task Group will focus on collecting as much information that industry has as to what we would expect out of that standard before moving towards an SAE standard. Chiesa: The idea is not to create an MPS for that specific application? Dadia: We are still trying to formulate what we want out of the Task Group. We will provide more information during the fall Systems Forum meeting. I just want to know who is interested in participating in this Task Group at this time.

Update on EPA Activities – Bella Maranion & Christina Thompson (U.S. EPA) (maranion.bella@epa.gov) (thompson.christina@epa.gov)

The American Innovation and Manufacturing (AIM) Act and First Actions: HFCs are potent greenhouse gases with global warming potentials (GWPs) hundreds to

thousands of times higher than carbon dioxide (CO_2). HFC use is growing rapidly worldwide.

AIM Act enacted at end of 2020: phasedown of HFC production and consumption. Facilitate transition to next-generation technologies. Management of HFCs. There are some very specific deadlines under the AIM Act: September 23, 2021: EPA to issue phasedown regulations. October 1, 2021: allocate allowances for 2022. HFC Phasedown Allocation Rulemaking: EPA now standing up an allocation program. Next-generation Technologies: EPA authorized to restrict use of HFCs on a sector or subsector basis to support transition to next-generation technologies. Grant or deny petitions within 180 days. As of April 13, 2021, EPA has received five petitions from industry and environmental organizations. EPA is now setting up the first regulation under the Aim Act. NPRM provided to OMB on March 26, 2021. EPA requested expedited review, planned signature late April/early May. Planning for 45-day comment period.

Onboard Aerospace Fire Suppression: EPA Sector Workshop (March 12, 2021):

Onboard aerospace fire suppression is considered to be used in fire suppression equipment onboard commercial and general aviation aircraft (private and business jets) and space vehicles (excludes military aircraft covered under "mission critical military needs"). Bella reviewed Commercial Aircraft HFC Use. Hill: Is there an allowance for general fire extinguishing agents? If you restrict general fire protection, would that not limit the availability of that agent or drive the cost of it? Bowden: Uses of HFCs other than aerospace? Maranion: Refrigeration is a big one. Maranion: We are required to provide allowances for these six uses including general fire suppression use production and consumption uses. They would be in the same pool as the other uses (refrigeration, etc.). We would love to get more information on that during the NPRM period.

SNAP Updates – Christina Thompson (U.S. EPA) (thompson.christina@epa.gov)

Total Flooding Uses: two submissions. Christina reviewed these. There are also two submissions currently under review: total flooding uses and streaming agents including 2-BTP (additional commercial uses). EPA working with TSCA on this.

SNAP Notice 36: published 12/11/2020: listed Solstice Quench 55 as acceptable for total flooding fire suppression.

SNAP Listing Rule 23: June 12, 2020: proposed rule would remove restriction for Powdered Aerosol E, which limited use to normally unoccupied areas. Chiesa: What is the additional use of 2-BTP that was received? Maranion: We were asked to look at more general streaming uses not in aircraft where typical clean agents/streaming agents were used. It is difficult to be more specific. We are looking at broader uses. Chattaway: Solstice Quench is a gas generating system? Thompson: The notice has

been published if you want to read more about it. Maranion: It is a total flooding agent. We will correct that.

High Performance Gas Expansion Systems for Halon-FreE CargO Hold Fire Suppression System (ECOSYSTEM) – Adam Chattaway / Changmin Cao (Collins Aerospace) (adam.chattaway@collins.com) (changmin.cao@collins.com)

This is an EU Clean Sky 2 funded program.

This project started October 2019 and will run until September 2021. We aim to finish by the end of 2021. Previous studies were discussed. Links to presentations on previous studies are included in Adam's presentation. Adam reviewed the ECOSYSTEM project objectives. EU Funded work requires an Expected Impact of Project. Adam reviewed the project expected impact including elimination of a highly ozone-depleting and global warming substance, replace halon by nitrogen, a sustainable alternative to an ozone-depleting and global warming gas, and successfully use inert gas in aerospace. Demonstrator design needs to meet a set of requirements. Adam reviewed these requirements. Adam provided a quick description of the demonstrator.

System Design Modeling - Changmin Cao (Collins Aerospace) (changmin.cao@collins.com)

Changmin explained the modeling process for components selection and the modeling tools. HRD Mass Flow Rate – Changmin explained determining the required mass flow rate for HRD. See slide graphics in their presentation. She explained the piping network modeling for regulator and restrictor sizes selection. Agent Dispersion Modeling: CFC simulation to evaluate 3D oxygen concentration distribution in cargo compartment – a 3D oxygen volume fraction simulation was presented.

Test Facilities – Adam Chattaway (Collins Aerospace) (adam.chattaway@collins.com)

Adam described the test facilities involved in this project. ECOSYSTEM demonstrator will be installed in the Fraunhofer Flight Test facility: a 30 meter low pressure chamber with an internal diameter of 9.6 meters. Low pressure (absolute): 116 hPa. Low pressure (subject testing): 750 hPa. He explained the test setup. Project Status: system requirements defined. Demonstrator design complete, CDR signed off, components offered. Industrialization plan completed. We look forward to reporting some results of these tests at a future Systems Forum meeting. Chiesa: Please confirm that you are not considering the multi-fire threat in your design and modeling? Chattaway: That is correct but not necessarily the point of this testing. This is not MPS testing. It is not included in the scope of work of this project. This work package is specifically to evaluate an updated suppression system at a higher TRL (Technical Readiness Level). Chiesa: I noticed that you are going to introduce cold air inside the compartment? Why? Chattaway: We are looking at exploring all of the corners of the envelope. Certainly, we can ensure that all of the space outside of the aircraft is at a

lower temperature. Maloney: Has there been any consideration of looking at any other inert gases such as carbon dioxide? Chattaway: That is a very good question. We could run some CO_2 screening tests in the model quite easily. This is an EU funded project specifically to look at nitrogen, but we could look at modeling others in the future.

Modeling TCCs in a Cargo Compartment – Andrew Ferraro (Rutgers University) (andrew.INT.ferraro@faa.gov)

Temperature controlled cargo compartments (TCCs) have the potential to disturb the air. Objective: evaluate the effect of airflow changes in the TCC. Andrew reviewed the Test Plan Stages 1 and 2. He described the simulation model. The ongoing work was described. An initial run of an empty compartment has been done. The model has been able to show the flow pattern from the smoke generator convection current. Future work: an empty DC-10 test will be run physically to further validate the simulation. TCCs will be characterized and modeled in FDS (Fire Dynamics Simulator) from manufacturer specs. Other future work was presented. Neeld: Can you outline the timeline for this project and when it is going to be completed? Configuration of the recirculation system? Ferraro: Timeline: We are aiming to have this completed by the end of this summer. The layout for the TCCs is yet to be decided. The physical tests are still being worked out and planned. Neeld: Will you be modeling the leak rates from the doors? Ferraro: I don't know that right now. Neeld: Feel free to reach out. Liao (IATA): differences between normal aircraft containers and TCCS? Ferraro: TCCs may have fans as part of the temperature controlled system and may move around the air inside the cargo compartment.

Smoke Generator Handbook for Cargo Smoke Detection Certification – Matt Karp (FAATC) (matthew.karp@faa.gov)

This is an ongoing project. We have quantified important smoke generator parameters for cargo smoke detection – small and full-scale tests. Quantitative analysis of smoke generators used for certification – four airframe manufacturers. Next steps: Handbook: quantify requirements in Handbook for future smoke detection certification. Create list of smoke generators and prescribed settings that adhere to requirements. Smoke Production is one of the parameters. Smoke Transport is one of the parameters. Particle size was looked at as well. Next Steps: quantify requirements in Handbook for future smoke detection certification: aerosol transport, volumetric flow rate, total aerosol production, steady state light obscuration. Create list of smoke generators and prescribed settings to adhere to requirements. Chiesa: smoke generator certification? Karp: We are working on a way to simplify things for the airframe manufacturers and the smoke generator manufacturers. End goal: an effort to standardize the smoke generators that are used in the certification process. The Handbook should have information so a new smoke generator can be qualified for use because the Handbook will provide the settings required. Vallecoccia: Is there any relation to the suitcase video? Karp: The suitcase video was used as a quick means, and at this point we are trying to move forward from the suitcase video. We are deliberating now in our Task

Group to determine velocities, etc. The suitcase video has been used in the past, but we are trying to move away from that now. Vallecoccia: The only reference we have right now is the suitcase video.

Baggage Handler Exposure with the Increase in Use of Dry Ice Shipments – Dhaval Dadia (FAATC) (dhaval.dadia@faa.gov)

Covid-19 Vaccine Transport requires vials to be maintained at -70°C or -94°F. This requirement drives the use of dry ice far in excess of current guidelines. Dry Ice Concerns on Aircraft: Dry ice in solid form sublimates to CO_2 gas. CO_2 gas accumulates which could cause risk to baggage handlers upon opening the cargo door or/and flight crew if CO_2 gas migrates to flight deck. FAATC took a three-step approach to this project. Initial information we were approached with is that the vaccine shipments would be transported on a 777. We took a generic approach in developing the test setup. We also looked at the baggage handler exposure locations. Dhaval described the test setup. The test variables were presented. We conducted two different loading situations (37% loading and 93% loading) fan off/fan on. The results of the tests were presented (effects of loading and gas generation on evacuation time from the cargo compartment). These results were presented to the FAA Hazardous Materials group and a SAFO was developed (SAFO 20017). Chattaway: You talked about the time taken to clear the CO_2. Can you expand on that? Dadia: The criteria that we used was the safe limit for exposure to CO_2, the amount of time to get to safe limit was the time we used. Chattaway: The first pair of data points on the chart on page 12, the fan seems to make a bigger difference? Dadia: We did not really have a flow rate measured for the fan, it was just an industrial fan on its highest setting. It did seem that at the lower loading we saw a larger time difference. The fan helped it evacuate faster. The fan was placed on the aft location. B. Wei: The ventilation in the cargo compartment is totally shut off, right? Dadia: We decided to test without ventilation to test a worst case scenario.

Moussa: (to Adam and Changmin) What pressure value did you use for the O_2 in designing your nitrogen system. Chattaway: That information is still confidential as far as this project goes.

SAE A-22 and AC20-135 Revision–Status – John Ostic (Boeing) / Daniel Laborie (General Electric) (john.l.ostic@boeing.com) (daniel.laborie@ge.com)

John provided the background and initial program of work. The objectives of this SAE Committee were reviewed. There are over 140 participants from across the entire industry involved in this SAE Committee. Committee effort now divided into 7 different working groups: Phase 1: AS6826 Powerplant Fire Test Standard publication: end of 2021. Phase 2: remaining tasks in the 2021-2022 timeframe. The subgroup structure is available in John's presentation on the FAA Fire Safety website. John reviewed the milestones completed and status of remaining milestones. AS6826 Document for final balloting: June 2021. Moussa: One of the concerns with the engine is if you have a

leak that will then impact the hot surface of the engine, is this addressed in this standard? Ostic: We have talked about that quite a lot. We are referencing the available industry papers. The test requirement is zero leakage.

Continued Evaluation of Carlin and Sonic Burner Calibration Equivalencies – Olivia McAvoy (Resonate Testing) (OliviaMcAvoy@thenacellegroup.com)

Olivia provided the background. She described the test setup. Photos are available in her presentation. Carlin vs Sonic Burner trials – Flame Temperature Comparison results were presented. Panel burn preliminary result – photos of what was observed were shown. Panels were sent to CTL (Composites Testing Laboratory) for assessment. The Summary of Burner Calibration Data was reviewed. A comparison of data from all trials was presented. A summary of Carlin calibration data from Rounds 1, 2, and 3 was presented. A summary of Sonic burner configuration 1 was presented. The main observations were reviewed. Future work at Resonate was reviewed. Summer: I see you are running at some pretty high fuel pressures, have you looked at using a different nozzle and lowering the pressure to see if it stabilizes things a bit better? McAvoy: That is part of our future work, so we can hopefully come up with a modification that does meet the requirements. Dowey: We would have to switch the burner off to change the orientation. So, we would not know what the effect is until after we turn the burner back on. Bowden: What are the baseline fuel pressures and air pressures on the FAA sonic burner design compared to what you were using? Dowey: I don't think we know. The sonic burners we have are configured for the seat cushion tests we did. I am not sure what they find to be a good air pressure and fuel pressure for powerplant testing. Bowden: Would increasing the air flow rate drive up temperatures and decrease sooting? Dowey: We have tried that and had mixed effects. It is our opinion that it is the swirl of the flame driving it to one hot spot. Thermocouples used are 1/8" exposed tip.

THURSDAY, APRIL 22, 2021

Fundamental Processes and Design Considerations for NexGen Fire Test Burner: Experiments and High-Fidelity Simulations – Ryan Hasselbeck (University of Cincinnati) (hasseljr@ucmail.uc.edu)

Ryan provided an overview of previous work. Previously presented by Daniel Laborie. He described the testing approach and the University of Cincinnati modified burner configuration. The burner mapping was reviewed. The alternative modified configuration adjustments were discussed: static plate depth increased to 6.5" and nozzle (2.5 GPH 80-degree Type W replaced with 2.25 GPH 80-degree Type B). Ryan reviewed results with the alternative modified configuration. The burnthrough testing setup was described. Burnthrough results of FAA Configuration, Modified, and Alternative Modified configurations were presented. The future work was described. Summer: Repeatability of the temperature and heat flux calibrations that you saw? Hasselbeck: The only variation I saw was with the modified burner. The performance

was a little different but not enough to make me worry. Overall, there was very good repeatability.

Fundametnal Processes and Design Considerations for NexGen Fire Test Burner: Experiments and High-Fidelity Simulations – Prashant Khare, Ph.D. (University of Cincinnati) (kharept@ucmail.uc.edu)

Prashant reviewed the overall goals: identify the detailed flow physics in the current and modified FAA NexGen burner systematically using high-fidelity LES (Large Eddy Simulation) computations and establish a reference database using high-fidelity LES simulations for the above conditions. Approach: Large Eddy Simulation (LES). He explained the computational grid. Locations of cross sectional planes for instantaneous visualization were discussed. The detailed flow dynamics were discussed. Cold Flow: FAA Burner Geometry, Case II: inlet airflow @ 3.86m/s results were presented. Fuel Spray: Code Validation I: two different cases were conducted. Results of both cases were presented. Mean diameters were also compared and results were presented. Prashant reviewed the planned work. Bowden: Suggestion to include bolt drop results for Carlin burner. Hasselbeck: We do not have a Carlin burner. Summer: We have a Park burner and have some data we can share with Ryan. Dowey: In your modification of the burner have you disconnected everything, taken it down, and fired it up again three days later and got similar results? Hasselbeck: Yes, we have gotten similar results. Dowey: It would be nice to see the data over several runs. Summer: Ryan, I think you did a presentation several years ago where you had done several runs over 6 months or a year and looked at the data over that period. Hasselbeck: Yes, but we haven't done that with this modification yet. Dowey: So, Ryan you might be up for some comparison testing? Hasselbeck: Yes.

Combustion Potential: Nature and Behavior of Fire in a Compartment – Aeon Brown (FAATC) (aeon.s.brown@faa.gov)

Objective: to understand the effect that dimensions, fuel flow, and airflow have on combustion inside of an engine nacelle compartment. Aeon reviewed the background for the work: space between an aircraft's engine, and its nacelle houses many lines carrying fluids that are flammable. The project method was described. FAATC will fabricate a compartment that will mimic the space between an aircraft's engine and the engine's nacelle. A number of assessments will be done. Aeon presented a schematic of the test compartment design and described the design and dimensions. Compartment includes: fuel heater and fuel delivery system. A photo of the compartment with the top plate removed was shown. Aeon explained the recordable data that will be collected and the locations of the thermocouples. He described the Test Path and plans to get as much video as possible of the tests conducted at FAATC. Laborie: How is the fuel introduced into the compartment? Aeon: We are going to do increments using nozzles of 1 to maybe 4 GPM. The spray angle will be recorded as well to input into the modeling program. We are also thinking about the idea of using a fabricated leak by attaching a line that is sliced or hidden holes. We will start with the

nozzles for a good baseline for reproducibility. Laborie: Are you going to keep the ignitor on? Brown: The ignitor will be kept on. Laborie: You should consider turning off the ignitor for a time as well to see what is going on. Ferraro: What CFD program are you going to use? Brown: We have access to Fluent and FDS here at the FAATC. I want to use as many programs as possible because this project is to aid in validating different models. Ferraro: As you design your experiment, be wary of the limitations of the software and be sure you can measure everything as accurately as possible. Brown: The heater for the fuel lines: FDS requires the temperature of the fuel, so I will have the temperature of the fuel just before it is delivered into the compartment. Ingerson: Andrew, the idea here is not to assess how the fuel is heated. Aeon is focusing on what is going on in the compartment. He doesn't necessarily need to know how the fuel got heated. Brown: That is exactly what it is. G. Roberts: Are you planning on decreasing the flow area as well? Brown: Yes, that was part of the compartment design to be flexible. I noticed the widest clearance from the cowling to the engine without obstruction was 12" and minimum clearance was 6". Dalrymple: You never know if there is a leakage that represents a big airflow. We did an engine running and introduced smoke with a smoke generator just to see the leaks. We measured with Venturis the leakage of the cell.

FAA Test Results for UN Propagation Test Setup – Tom Maloney (FAATC) (thomas.maloney@faa.gov)

Background: Multiple labs around the world have been conducting tests to come up with a proposed hazard based reclassification for lithium batteries. A first round of tests was performed looking at propagation. Multiple labs participated and met to compare their test results. Based on the first round of tests, modifications were made to the procedure and a second round was conducted (the focus of this presentation).

18650s and Pouch Cells at various states of charge were tested. Photos of 18650 test setup were shown. A video sample of what the tests look like was shown. Pouch cells test setup photos was shown. Each lab was given a document that included what the test setup should look like, so the photo is FAATC's interpretation of what test setup should look like. This gave us a good idea of how to word the document to ensure that any lab following instructions in document sets up the test in the same way. The FAATC test results were presented.

Flammable Gas Analysis – UN Lithium Battery Working Group – Matt Karp (FAATC) (matthew.karp@faa.gov)

The Test Procedure was described: 21.7 liter stainless steel pressure vessel. General test procedure found in Thermal Runaway Initiation Methods for Lithium Batteries. The Scope of the Test was explained. Photos of the test setup for the pouch cell were presented and described. Pouch cells test results were presented (Pareto chart). 18650 test setup photos were shown and the setup was described. The results of the 18650 cell tests were presented (Pareto chart). Combustion energy was presented.

Conclusion: Heating rate affects the combustion hazards due to thermal runaway. Dalrymple: DOE 11 offers pass/fail criteria, was this test represented for configuration like an aircraft battery? Maloney: One important difference to make, in these tests we are working to classify the batteries not how they are packed. What the group ultimately decided for these tests was to insulate all the sides and they gave specs for the insulation. I think ultimately they decided that the lid didn't make enough of a difference. As of now, it is just fully surrounded, so the gases do not have a lot of contribution. Summer: Here we are looking at an installation system for cargo-related shipping hazards. Dalyrmple: FYI, the chemistry of some lithium batteries can be hazardous. Buston: Do you know what chemistry the cells were that you were using? We have done lithium-ion phosphate cells tests recently. Karp: Lithium carbon oxide. Maloney: There should be a report on the FAA Fire Safety website that breaks down the different energies produced. Safronava: What did you use for the gas analysis? Karp: We used GC. After thermal runaway, we added additional nitrogen to the pressure vessel.

Status of SAE G-27 Lithium Battery Packaging Performance Committee – Doug Ferguson (Boeing) (douglas.e.ferguson@boeing.com)

AS 6413 Development – standard development. This committee has three Working Groups: External fire considerations, initiation cell, and round robin test team. This standard provides a test method to demonstrate and document the control of the potential hazards from Lithium metal batteries (UN 3090) and Lithium ion batteries (UN 3480) when transported as cargo on aircraft. It addresses the need to control the hazards which might arise from a failure of an individual cell. The SAE G-27 projected timeline as of January 2021 was presented and explained. Near-Term Activities: Ballot with Option A/B statements for contentious issues is expected to be posted by the end of April 2021, no firm date set. There will be some discussion/dialogue with the regulatory bodies and members of G-27 Committee to discuss questions: what requirements are expected to be contained within standard, and how is standard expected to be incorporated into regulations. Questions expected to be initiated within the next 4 weeks: ICAO DGP (Dangerous Goods Panel), ICAO Safe Carriage of Goods Specific Working Group, and US DOT Lithium Battery Air Safety Advisory Committee. There are also Appendices associated with this Standard. Doug explained these. Summer: You mentioned that there are allowances in there demonstrating that your cell is benign. Is that test required for each cell type or is it for a family of cells? Ferguson: It is not intended to apply to everything. If you can demonstrate that your cells are ok, then you don't have to do the more complicated test.

G-27 Initiation Cell Test Results – Tom Maloney (FAATC) (thomas.maloney@faa.gov)

A group has been meeting to come up with recommended procedures for how to heat an "initiating cell" into thermal runaway. Thermocouple locations and types of heaters allowed are being discussed by this group. Tom described test plan developed by the group. Photos of FAA test setup were presented. Summary of FAA Findings: the specific 1"by1" heater that the group selected does not provide enough heat unless

voltage is increased past the manufacturer's spec. Any thermocouple can be used and any temperature gradients can be taken into account numerically if needed. However, the most convenient location for an easy test setup is on the backside of the cell, and the location that will have the least variability due to a variation in heater and type and size, is the furthest away from the heater on the backside of the cell. The group is still having ongoing discussions to finalize this. Buston: It seems as if the group is struggling with the heater. Has the group considered going towards a bigger heater, since the cells being produced are going to get bigger? Maloney: There has been a lot of discussion within the group about the size of the heater. Canari: I have been leading this group for one year now. This is one of the points we have been working on. We have some additional testing planned. There have been some delays in testing due to the pandemic. We have only been able to test the 18650 cells so far.

Extinguishing Agents Against Lithium Battery Gases – Tom Maloney (FAATC) (thomas.maloney@faa.gov)

Background: replacement of Halon within cargo compartments. Previously, experiments had been performed to look at the effectiveness of Halon 1301 against lithium battery gases. Lithium battery fires are becoming more common. As new extinguishing agents become available, it is important to know how effective the agents are against lithium battery fires. The main source of fuel for lithium battery fires is generally the flammable gases generated from thermal runaway. Three main flammable gases: hydrogen, hydrocarbons, and carbon monoxide. Tom presented the Test Plan. The test setup was described. Some of the experimental validation test results were presented. Results of initial tests – halon and hydrogen and methane and CO_2 were presented. Flammability curves of initial testing were discussed. Tom discussed the comparison of gases. We plan to run others in the simulation. Summary: the greatest quantity of extinguishing agent is required at or near equivalence ratio of 1. Not all hydrocarbons behave the same. Ferguson: Do you have any plans to include nitrogen in your potential plans? Maloney: It wasn't initially, but after the presentation yesterday, we could. We will look into some simulations with nitrogen. Freiling: Does this have any impact on the MPS or possibility for future halon replacement agents to suppress these kinds of gases? Maloney: That is not something that we are actively discussing. It is more to just get an idea. Summer: It is more just trying to understand the effect of these agents on battery gases to see if there are some of these agents that perform better on battery gases.

Potential Hazards of Handheld Extinguishers Containing Halon 1211 & Halotron BrX(2BTP) used in Lithium Ion Fires – Aeon Brown (FAATC) (aeon.s.brown@faa.gov)

Background: lithium-ion fires produce high temperature environments which could lead to the decomposition of halocarbon extinguishing agents. Aeon described results of previously conducted tests. The upcoming tests will be done in an unventilated room. He described the test room size. The tentative test plan was described and a schematic of the acid gas collection system was shown. Louise Speitel (FAATC) provided some

explanation of the gas collection system. Colton: Was there consideration to do this in the same setup as the seat toxicity test? Or, do you plan to run some Class A type fires in the new mock up to compare what you are getting in lithium-ion? Brown: There was no plan yet to do that. We can consider that. Speitel: One of our concerns is what the hazards from lithium-ions in small spaces like fight decks, etc. This is a starting point. R. Hill: To answer Bradford's question, the seat tests were already done a number of years ago with 2BTP for the MPS. One of the main reasons for this, when we put together the AC for the 2BTP extinguishers going into aircraft, we always get questions from flight crew 'is this toxic?'.

AC 120-SRACC, Safety Risk Assessments Involving Items in Aircraft Cargo Compartments, and Accompanying Website – Dick Hill (FAATC) (richard.hill@faa.gov)

The FAA is now reviewing/responding to the AC 120-SRACC comments. Genesis of AC and website: accidents and incidents on aircraft involving lithium batteries. The FAA recognizes the need to have not only a published guidance but a real-time tool. The website can be found at http://www.fire.tc.faa.gov/cargosafety. Dick showed a sample from the website. Bowden: A comment form on website for users to submit suggestions. Hill: We may take that into consideration.

Active Fire Suppression Task Group – Steve Summer (FAATC) (steven.summer@faa.gov)

Initiation a Task Group focused on developing a standard for active fire suppression systems for cargo containers. Please contact Dhaval Dadia (dhaval.dadia@faa.gov) if you would like to participate in this Task Group.