International Aircraft Materials Fire Test Forum Virtual Meeting Minutes

April 19-20, 2021

MONDAY, APRIL 19, 2021

Opening Remarks, Short Takes – Tim Marker (FAATC) (tim.marker@faa.gov)

Purpose of the meeting and expected outcomes: This is intended to be an interactive discussion between FAA and industry on the development, refinement, and proper execution of FAA-mandated material fire tests. An open exchange of ideas between FAA and industry. See Tim's presentation for 'Other Topics to Consider for Future' slide. Questions: Anglin: do you foresee any additional Materials meetings this year would be virtual as well? Marker: I do not think there is time to get necessary approvals for a fall 2021 in-person meeting, so if we have one this fall, it may be virtual.

Status of NPRM and Final Rule – Jeff Gardlin (jeff.gardlin@faa.gov)

We are still proceeding towards developing and putting out a final rule. The anticipated schedule has been modified quite a bit for several reasons. Canari: we established a rulemaking plan when we joined the ARAC group many years ago. Our plan is still to publish an NPA when the FAA issues the final rule. Depending on when the FAA would publish the final rule, EASA will issue during that internal cycle or the next one.

Insulation Burner Testing and Updates, Insulation Burner Video Update – Tim Salter (FAATC) (timothy.salter@faa.gov)

Test to develop new baseline data created using new insulation blanket material from Triumph Insulation to measure heat flux. The baseline data will be used as a benchmark for the updated igniterless burner configuration. Tim described the initial testing with three different fuel nozzle types. More details are available in his Powerpoint presentation available on the FAA Fire Safety website. We are ready to conduct Phase 4 of the Igniterless Sonic burner Interlab Study. We are currently seeking labs to participate who are able to return data in a timely manner.

Insulation Burnthrough Video – Tim Salter (FAATC) (timothy.salter@faa.gov)

We recently completed the final portions of filming. We have to add closed captioning to it before we can post it to the FAA Fire Safety website. This video will be available in the *Aircraft Materials Fire Test Handbook* section of the FAA Fire Safety website when it is available. Tim shared a one-minute sample of the video.

Differences between Phases of Interlab Study:

Phase 1: establish baseline data

Phase 2: testing with igniterless study,

Phase 3: added in the use of Delevan fuel nozzle, igniterless stator, tested Tex Tech felt for burnthrough times.

Phase 4: we have our new test material ready to go.

Marker: you are sacrificing a little bit of the stringency of the test for a little bit better repeatability. Salter: correct, we are trying to keep everything equivalent without making the test more or less severe.

Salter: you can see what a difference just switching out the stators makes. (Slide 11). Alcorta: Burnthrough times: (Slide 18): Tex Tech 8579 Burnthrough times: how many samples? Salter: average of three samples. For original set up for the Monarch, we did five samples. Salter: Ideally, we want to see samples be within a 10-second difference of each other. Bowden: Your heat flux vs. time graph showed that the B nozzle had a lower heat flux, and yet in your temperature chart, you were showing a higher average temp for the B nozzle. Salter: Yes, it is confusing. It is deceiving. In certain cases, I was getting flame temperatures higher yet it takes longer to burnthrough. I looked at the consistency of results, burnthrough times, etc. Then I tried the W nozzle. Once we saw how far off the B nozzle was, that is why we are relying mostly on the heat flux. Resonate labs has done an internal study. They may be happy to share that with you. Steve Summer will give Tim Salter the Resonate contact information.

Video: Salter: we recently did a final rough draft that includes the voiceover. We have gone through the video to provide any small edits/changes needed to video editing team. They will send the final version to me, and the final version will be sent to the closed captioning company. Once the closed captioning is complete, the video will be uploaded to the FAA Fire Safety website in the Handbook section. Test Center CAAC: heat flux measurement what type of gauge was used? Salter: Gardon gauge. CAAC: how about the turbulence of the air? Salter: the heat flux is measured on the backside. Marker: are these videos useful? Alcorta: yes, they are very good quality, and we try to use them for training within our company. Would it be possible to include 2 or 3 examples of flame penetration and what to do when you see that? Marker: Tim Salter may be able to put something together at a lower quality. Moussa: Related to earlier question from Robert Bowden: the temperature is measured on one side and heat flux on the other side of the sample; they do not necessarily have to match. Bowden: Observation: we have always had a disconnect between the fire testing for materials and powerplants. I would like to see an attempt to commonize the testing procedures to set up criteria, so the use of the apparatus is similar. Marker: we are trying to introduce the sonic burner and make it as common as you are saying. Summer: we are trying to make everything as common as possible with the sonic burner used for materials and powerplant testing. We have been focused on updating the material that is out there for the existing legacy burners, but as we begin to use the sonic burner more, we will harmonize as much as possible. Moussa: a burner will always have some variability. Use of an electric hot plate was mentioned. Marker: switching to an electric hot plate is a bit of a departure. Summer: I would add one clarifier, accept the variability but we do everything we can to minimize it.

Vertical Flame Propagation (VFP) Test – Tina Emami (FAATC) (tina.emami@faa.gov)

Tina provided background and objective of the VFP test and described the test apparatus, test setup and criteria for the test. Tina emphasized several items that can affect the test and encouraged labs with VFPs who are having issues to contact her to make arrangements to discuss/review their VFP set up. Tina reviewed “What We Know Today”. She discussed Room Temp Effect on Flame Temp.

Interlab Study (Round Robin):

This interlab study is done to confirm that the machines are all running with similar results. Tina reviewed results from participating labs. She discussed specific observations made during tests of each material during the interlab study testing. One lab still has to submit their results.

Ducting:

We believe that we have tested representative materials for the Ducting Test. If you believe your company manufactures ducting materials that have not been tested, please contact Tina Emami, so that we can ensure we have a representative of all ducting materials manufactured.

Wire Sleeving:

We chose three setups. We are looking for more material types to test.

Wire Insulation:

Testing has been completed to understand that testing 3 wires is more repeatable than testing 5 wires. This is also desirable by industry. Using Marinite as a backing board produces a significant difference in the burn length of the material, and is required here. FAATC is still conducting wire testing. Marker: historically, burn length is measured post test. It seems like you are putting a little bit of spin on it (in your method here), so you are going to have to really be careful. Campbell: attached?, do you mean it bends and attaches to the wall? Emami: yes. Campbell: it is just the material sticking to the wall. Emami: yes, I know everyone has had different perceptions of it. Jensen: Tips for future: measure the heater – you mean prior to the test? Emami: yes. Feghali: The *Aircraft Materials Fire Test Handbook* Chapter 1 in Section 1.2.4a, we use this for training in our lab here. Bowden: observations: test setup: you mentioned there was a difference between an old and a new. Have you considered that the diameter and the shape of the orifices between the old and new burner setup has changed? On your change of air measurement procedure: these are relatively low velocity points, when you went to the new cone, you are now introducing a choked flow. Are you still using the same procedure? Emami: that is a good point. It is a completely different measurement, but again I am only looking at the difference with the exhaust fan on and off. We are just doing the research on this. Emami: I encourage participating labs to video at least one of their tests during the round robin. Krause: Flow Rate Effects Slide: below half percent, do you really think that this huge difference in burning is just coming from this tiny half percent? Emami: This is the only difference I observed. Bresciano: are there any plans to do round robin testing with wiring and wire sleeves? Emami: I want to run more wire tests at the FAATC before I initiate an Interlab Study. Marker: one thing we should start discussing, you indicated you saw a huge difference from the distance between the ribbon burner and the sample. Maybe you can pose this to the manufacturers: is there a way for some type of guide, so tester knows they have a firm location? Emami: we have been double and triple checking when we conduct tests now that we observed that. Shinde: did burner alignment factor in? Emami: it could have been or it could have been off by an angle that caused a lopsided burn. Shinde: flame distance – are we going to be very tight on the tolerances? Emami: I would like to be very tight on this. This makes sense when you are looking at the machine. Moussa: it seems that there is more variability in the test than there is one degree temperature. Now you are talking about the location of the burner, etc. That may explain it. Emami: that is the reference temperature for

the mass flow controller's calibration. There is a lot of variation, but there are easy ways to fix those variations. When I highlight on these differences, it is just to make sure labs check all of these. B. Johnson: I am not aware of the stage of the project. It looks like a wonderful opportunity for a DOE (Design of Experiments). A DOE would be a wonderful tool. Spencer: Marlin Engineering provides a tool to ensure the burner is in the correct location. Anglin: that tool works really well. Campbell: how many samples were actually burned in each of these configurations? Emami: five. Campbell: so there is a trend established. Marker: Do you want to solicit some feedback on the ribbon burner itself? Are there impurities that are clogging these up over time? Emami: I think that is what we are struggling with right now. I do not know if cleaning is going to fix what happened to our old ribbon burner. Bowden: the difference in flow rate is going to be noticeable. Campbell: I don't know if there is a microscopic tool to clean the orifices periodically. Emami: I can go and clean the old ribbon burner and measure and compare to the new one. Bowden: just from my experience, you can get a nozzle cleaner that should work at any welding supply dealer. You will have to blow out any of the contaminants that are loosened up after cleaning. Krause: would you be able to run x-ray tomography on the old and new burners at the FAATC? Lyon: I think they have C-scan capability in Building 245 (FAATC). Krause: if you have an old one, make a C-scan before you clean it to see soot and other particles that may be clogging the orifices.

Cargo Liner and Seat Cushion Shroud Testing & Thermocouple Comparison – Tim Salter (FAATC) (timothy.salter@faa.gov)

Sonic Burner Cargo Liner Shroud Update: Phase 1 indicated that the shroud improves test repeatability and temperature reading stability. Tim reviewed the cargo liner samples tested at FAATC. We are now looking to start Phase 2 of the Cargo Shroud Study. Samples and shroud supplies will be provided to participants if necessary. We are going to try to have tighter control in Phase 2. We are going to be more consistent with supplied test samples.

Seat Cushion Shroud Testing: We adapted the cargo liner air shroud to fit seat cushion test method. We are planning an Interlab Study for seat cushion shroud. The seat test frame will not need modifications for the Interlab Study.

Thermocouple Comparison Study: Study driven by issues with thermocouple degradation and decreased temperature readings after heat cycling in the burner flame. Determine if there is a more robust alternative while retaining functionality and economical practicality. Search for alternative thermocouple types and/or sheathing materials. Tim described the procedure used for the comparison testing of the thermocouples included in this study. He reviewed the results for each thermocouple. Bowden: are the 1/8" thermocouples shielded? Salter: They are enclosed bead, ceramic packed, Type K, standard. Bowden: were your thermocouples procured from the same manufacturer? Salter: Yes. Olmstead: Cushion testing: what kind of impact did it have on the char length? Salter: There are 4 burn lengths per seat cushion. I took all of the percent standard deviations for simplicity's sake; we did see a slight decrease in percent standard deviation with the shroud except for Sample C. It did not severely affect the burn length or weight loss. Campbell: are you suggesting that all new thermocouples should be cycled a few times before using them? Salter: That is why we don't have a calibration on the sonic burner. It is more like a reference that the burner should be operating in this temperature range. Are they more accurate when they do the first heat cycle or after heat cycling a couple times? Campbell: I think it would be interesting at some point in the future to see how many

cycles on the K-types before they degrade. Salter: Yes. Bowden: Heat cycling: we don't specify a number of heat cycles prior to use because we are looking for a minimum temperature. Salter: Yes, correct. You shouldn't have to.

RTCA Development of a New Flammability Test for Electronic Equipment – Steve Rehn (FAATC) (steven.rehn@faa.gov)

This testing is in support of RTCA-DO160H, and our draft is due to RTCA in December 2023. Steve described the tests conducted at the FAATC and presented the test results. Additional Testing Ideas: Continue testing with IR sensor: need to find new field of view. Test additional materials and box configurations. What if flames come outside of the box? Place sensor on side of box. Steve tested with Infrared Camera: Steve showed videos. Conclusion: thermocouple rake was not precise enough; infrared sensor shows the most promise. Infrared camera does not detect flames very well, mainly designed for hot surfaces. Campbell: Identifying the threat level that we are trying to mitigate – does it have anything to do with installation of these boxes or spacing, etc? We need to fully understand the threat we are looking at and address that. Maybe some work could be done to say 'what is an acceptable hole pattern. Rehn: I tried some of that before. Campbell: was that a worst case box? Rehn: It was a made-up worst case box. Mandatori: Regarding challenges with thermocouples, has the FAA considered infrared tech to characterize flames across the tests? Marker: It hasn't up until now. Simplicity and low cost is key for these tests. When you start to get into infrared technology, there is a change in cost. We are starting to look at it for this application. Rudebusch: I remember there was some discussion last year about providing some standardized guidance about vent opening size as a function of the length of the LRU under test. Are there still any plans to provide guidance like that? Rehn: Yes, there is. We need to define what 'sealed'/what a non-vented box is. K. Young: You might want to check with Shannon Lennon (FAA), because we did some work for her.

Relationship Between 3-D Printed Materials and Flammability – Steve Rehn (FAATC) (steven.rehn@faa.gov)

3D printing introduces all new variables in material construction including printing orientation, infill percentage, raster angle, raster width, and layer thickness. Steve described the tests conducted at the FAATC and presented the results. Steve reviewed plans for future work. M. Miler: Any thoughts of doing any heat release testing? Rehn: That would be up to Mike Burns, but a lot of these thermoplastics melt. Marker: I think that is the issue – the melting. I think we need to get the AC worked out first. Imamura: we only tested PEI material. Are we trying to test different types of materials? Rehn: We have tested other materials before. We are looking into testing other materials. Some are too bad and just burn up, and we are limited by the materials our printer can print. We can test samples printed by other labs. Krause: I think we can see the continuation of this trend. Alcorta: How difficult was it to determine the endpoint of burn length for the first materials you presented? Rehn: That is kind of a problem. A lot of it just melts away, so it can be difficult to tell what is burned and what is melted. I looked for what is charred. I try to be consistent with the way I do all of the samples for the tests I run. Agyei: For the raster angles, are those the only printable angles? Rehn: Those are just the angles I chose. Agyei: Do you plan to add more angles? Rehn: It is something we could look at. Shinde: Have you seen the melt of the material influence the burn length? Rehn: I tried to measure only the areas that were charred and not melted following Chapter 1 of the *Aircraft*

Materials Fire Test Handbook. Krause: I think we talked about a DOE in the group about 18 months ago, but we had no one to execute it at that time. Agyei: We can set that up if you are interested in it. Imamura: There are so many variables into the samples that can be covered by testing the actual part. Rehn: You will always be able to test the actual part. We are trying to simplify the whole process by doing this test program. Question: Was there any test with infill at lower percentage but a shell of 100% on the faces (like as actual 3D printed part)? Rehn: The only way to get a difference if you are testing Ultem™ 9085, is testing it this way. The machine sets extrusion. We cannot vary that. Alcorta: If you were to take your 45/45 layer and then a 60/30 layer, and then so on like that? Customers are pretty specific on what they want. Do you think about looking at that? Rehn: It is something we can try in the future.

TUESDAY, APRIL 20, 2021

Bunsen Burner – Scott Campbell (SAFRAN) (scott.campbell@safrangroup.com)

These are a few things that came up during the past year regarding the Bunsen burner.

Aircraft Materials Fire Test Handbook (II), Chapter 1, Flame Temperature, 1.6 does not require a flame temperature when using methane gas, but the attached sample data sheet requires a flame temperature be recorded (Consistent with Handbook III). Scott reviewed the suggested recommendations from industry.

Bunsen Burner Worse-Face Burn Length: for substrates over .25" thick, the Bunsen burner flame positioned on the test face wraps around to also impact the non-tested face creating a burn length on both sides. Which burn length should be recorded for the test results? Scott reviewed the recommendations. What about flame time? Recommendation: after-flame time is measured to when the last flame extinguishes. It doesn't matter the flame's location (test face, bottom or non-test face).

Tips for Bunsen Burner Test Configuration were reviewed. There was some discussion on such things as after-flame, and terminology/wording used in Systems Forum is residual. Tim Marker suggested that a couple videos posted to the FAA Fire Safety website might be helpful. Spencer: If you do a video, you should include where the temperature is measured in the video. Suggestion to standardize some of the terminology used in various tests. Mandatori: Bunsen burner flame temp. Rehn: When you use methane, you do not need to measure the flame temperature.

HR2 TRL6 – Reproducibility Assessment Test Results – Brian Johnson (Boeing) (brian.e.johnson@boeing.com)

Brian reviewed the HR2 goal. The NASA Technical Readiness Level (TRL) model was adopted. We are currently in TRL 6 (reproducibility). Brian explained the TRL 6 Test Plan: approach, instruments, and details of test specimens. Brian reviewed Phase 2 tests, and general observations. See Brian's presentation for photos of the Marlin Engineering Upper Pilot Extinguishing with BPD Coupons. TRL 6 Test Results were presented. The Post Test Actions were reviewed. We noticed that the Marlin Engineering unit at the FAATC had not had major maintenance since installation (7 years). The next step was to perform maintenance on the Marlin Engineering unit in the weeks following testing. Several components (insulation), mechanisms were also replaced and unit is being calibrated. Schedule: we are anticipating doing a retest on the Marlin Engineering unit at the FAATC and need a larger coupon count for

the retest. Boeing will be receiving an HR2 in July 2021 and should have it up and ready to test by September 2021. Airbus is also anticipating some upgrades to its unit. We are looking to test at FAATC again later this year (approx. October 2021). Campbell: what were the expectations for the variability for the HR2 again? B. Johnson: that is a great question, Scott. We have talked back and forth about that. In this case, we used a 95% confidence is the criteria we were looking at. The end goal, I don't think we have the answer to that yet. We have a situation where we have about 100% standard deviation in the industry. We know we want to do better than that. That is a question for discussion. Lyon: Did you consider doing any single processing on this thing? These things aren't absolutely calibrated, it is a relative calibration. B. Johnson: we have the calibration factor. Burns: No. We have talked about this offline before. Lyon: that puts a lot of pressure on things like whether the gasket is making a good seal, etc. Maybe the calibration factor is good enough. I don't know. Burns: each time we run a test, we zero out.

HR2 Calibration Factor Averaging – Yaw Agyei (Boeing) (yaw.s.agyei@boeing.com)

Discussed in this presentation: Operating Response Specification Limits Recap and Reducing Calibration Factor Variation Impact on Heat Release Properties. Yaw explained the daily HR2 operations assessment. Calibration Factor Correction was described. Marker: Are you still going to proceed with this even though you do not have the 5 units online yet? Agyei: We should have the 5 units online by later this year. Campbell: CPK analysis, it assumes that every machine is correctable, is that a fair assessment? Are we saying that every new machine is correctable? Agyei: yes, that is a correct assumption.

Heat Release Rate Updates – HR2 Background/Methane MFC Matrix Testing – Mike Burns (FAATC) (mike.burns@faa.gov)

TRL5 completed in May 2019. NPRM released in July 2019.

HR2 Methane MFC (Mass Flow Controller) Validation: The FAATC currently has two operating HR2 units fabricated by two different manufacturers (Marlin Engineering and Deatak). An independent mass flow controller was purchased through MKS, Inc.

HR2 Methane MFC Matrix: Mike reviewed the concept design. End goal: to compare percentage difference between HR2 manufacturers in three configurations: OEM, MKS, and swapped MFC. The test plan was described. Marker: were you expecting more of a delta percentage change, or were you surprised at how tight these were? Burns: I didn't know what to expect. In the end, I was very happy with how it worked out. Speitel: how did you calibrate your mass flow controllers? Burns: they came calibrated from the manufacturers with a calibration sheet. Burns: It is very important that you let the manufacturer know what reference temperature you want. Speitel: I noticed there was no water level indicator. Burns: In my photo? Speitel: Yes. Burns: Yes, it is there, you just cannot see it in the photo in this presentation. Mike described calibration of the wet test meter. Marker: when you had that calibrated, did they give you a calibration sheet? Burns: No, they did not, but some do provide a calibration sheet.

HR2 Sonic Choke Research – Mike Burns (FAATC) (mike.burns@faa.gov)

Background: There is some interest in replacing the costly/bulky main airflow mass flow controller (requiring annual calibration) with a sonic choke. Mike reviewed the concept design

and cost comparison to current MFC. During this test series, there was a desire to record pressure values in two areas using a digital manometer with a 1/8" stainless steel probe. The test plan was reviewed. Mike presented test results. Summary: Data showed very good correlation between all four configurations for both sonic choke manufacturers. Marker: A mass flow controller is about $4,700, with annual calibration costs about $1,500, correct? With the sonic, you are looking at $1,700-$1,800 with transducer, right? Burns: Correct. B. Johnson: which unit? Burns: Only on the Deatak unit. Burns: You may need two pressure regulators: coarse and fine adjustments.

Heat Release Rate Updates – Mike Burns (FAATC) (mike.burns@faa.gov)

HR2/NBS Smoke Monitoring Research at FAATC: there is interest in looking to replace this technology with lasers. In order to do this, there are a number of differences to consider. Mike reviewed these differences. He has included a table of these differences in his presentation. Mike showed photos of the set up. Mike reviewed the results to date and hopes to be able to generate some more data for the next meeting. Anglin: can you explain why we are trying to turn the HR2 into a smoke chamber? Marker: the proposal in the new rule was the removal of the NBS chamber requirement. The comments that came back were largely accepting of that, but there was some concern about panels being manufactured after the removal of the NBS test, that would meet the heat release requirement, yet produce high smoke output in a fire, so there was some interest in researching if there was a way to use the HR2 to monitor smoke output of these types of components. Campbell: Even though the NPRM talked about the smoke requirement, is there any reason to make any heat release apparatus into a smoke monitoring machine? Trying to correlate data on a new HR2 apparatus, correlating to the NBS chamber, could be difficult. Gardlin: the intent was to simplify and streamline the overall process. We are not losing anything in the requirement, and it will add safety and not have loopholes that we didn't intend for. We got a lot of pushback in the NPRM that the NBS was in use before it was mandated. We are definitely aware of all of the factors and are trying to take everything into account. Anglin: as we change the sonic choke and potentially a new heater and functionality, I hate to take steps back in our TRL process, we will be here forever; the more change we introduce in this journey, the longer the TRL process is going to take. I just wanted to mention that. C. Thomas: I am very happy to see more of the smoke monitoring research. I think there is enough technology such as the FM Global FPA or the cone calorimeter that have been used in other industries for these types of applications.

HR2 Zone Heater Development Update – Martin Spencer (Marlin Engineering, Inc.) (mspencer@marlinengineer.com)

Background: zone heater developed to eliminate globars and to provide a uniform and safer heater assembly. First prototype had two heating zones. More zonal adjustment was needed, so we developed a three-zone heater. Photos of the unit were shown. The new unit has been tested with 48V DC output. New heater will be installed and tested in FAATC unit in May 2021. Results will be provided at next Materials Forum meeting. With the new unit, we can control three horizontal zones. Burns: we are going to first see if it works and then determine a test plan. Agyei: are we thinking that these changes like sonic choke will be added before resuming testing in TRL6? Burns: the plan is not to, however, we are going to have to look at what does HR2 generate as compared to industry OSUs.

HR2 Upper Pilot Investigation – Martin Spencer (Marlin Engineering, Inc.) (mspencer@marlinengineer.com)

Background: during the recent HR2 TRL6 exercise at the FAATC, it was noted on the Marlin Engineering machines most of the Boeing standard panels caused the upper pilots to extinguish longer than the required 3 seconds. This brought up a discussion between us while there. NAT in Everett, WA, offered their lab for the initial tests: For the initial exercise, four separate sets of tests were proposed. Baseline sample without deflector and baselines sample with deflector. Sample sets of 5 each were tested. Results of these tests were presented. The data for the baseline panels was too scattered to be of real use. Next Steps: Boeing has offered to provide more samples of their panels. We will try to increase the upper pilot flames on one set and to introduce a smaller foil deflector integral with the foil rap. Campbell: we know that most of the panels that I have seen that put out the upper pilots have decorative laminates on them. Do you think the deflector will reduce the burning off the gases from the panels? Spencer: I think you are on the right track. I was a little bit discouraged by the impact the deflector had. On your machine, I know you have a separate reignitor, but not all labs have that. C. Thomas: Is a premixed pilot an option in this configuration as the upper pilot burner? Spencer: There already is premixed air and methane up in that upper pilot area. C. Thomas: can you change the ratio to make it a blue torch-like burner? Spencer: the ability to change the ratio is certainly there, and we are going to look at that to see what impact that has. Scott, do you have any there that consistently blow the upper pilot flames out? Obviously, there is a limit to what we can come up with here.

Similarity Project Update – Natallia Safronava/Rich Lyon, PhD (FAATC) (natallia.i.safronava@faa.gov)

Natallia reviewed the Similarity Project Goals. The presentation includes a list of FAA Technical Notes and journal articles published since the June 2020 Materials Forum meeting. Current focus: efforts are focused on improving the reproducibility of the MCC (microscale combustion calorimeter) test method by developing rules for baseline correction that can be automated to eliminate operator judgement.

Motivation for Developing MCC Baseline Correction Rules – Rich Lyon, Ph.D. (FAATC) (richard.e.lyon@faa.gov)

For low heat release aircraft materials MCC (microscale combustion calorimeter) data must be corrected for baseline drift to be accurate. MCC baseline correction is currently a user-dependent process. Rich discussed how they are approaching this issue. Rich explained why the process is arbitrary. We investigated four different approaches. Rich explained these four methods. The Summary of Baseline Endpoint Selection Methods (Thermal Baseline) was discussed. The Summary of Baseline Endpoint Selection Methods (Linear Baseline) was discussed. Next Steps: Finalize this process, publish a report, and draft guidance material. J. Harris: We need data. We need to understand the amount of variation without data sets. We are probably going to reach out to try and set these up. Lyon: Rich Walters is ready to get started here at the FAATC. Campbell: Natallia showed a photo of different colors of insulation, are we looking at MCC as a predictor of other test methods? Is this being identified for other test methods other than heat release (ex. colors of insulation)? Lyon: we did a lot of work with different colors of paints and insulation. Read our report on that testing. We gave up on using

the MCC to predict heat release rate. We are taking individual components like the fiberglass with a little bit of color, to see if the difference in the color makes any difference in the flammability.

Waste Compartment Fire Containment MOCs and Test Harmonization – Scott Campbell (SAFRAN) (scott.campbell@safrangroup.com)

A Task Group meeting is scheduled for May 11, 2021, to go over all of our test method recommendations that we have previously presented. We hope to mark up a copy of Chapter 10 of the *Aircraft Materials Fire Test Handbook* with our proposals to be considered for implementation. Fleshing out similarity substantiation MOCs stalled. And now, more interest in touchless waste flaps.

Touchless Waste Flaps Discussion: Currently, most lavatory cabins do not have touchless waste flaps. Scott reviewed several considerations for powered waste flaps in the case of a fire. He reviewed test considerations.

Waste Compartment Fire Containment – Similarity MOCs: this will be next focus after redline of Chapter 10 of Handbook.

A WEBEX Task Group meeting is planned for Tuesday, May 11, 2021, 7-9 AM PST.

Speitel: if you are going with touchless waste compartments, wouldn't you go with touchless lavatory doors? Campbell: Industry, regulators, and airlines are all considering what type of features can be considered for minimal handling.

Disinfection Agents Impact – Jim Davis (AccuFleet International) (jim.davis@accufleet.com)

IAMFTF Objective: Study effects of disinfectants' impact on flammability of interior cabin materials.

Jim provided an overview of efforts by industry organizations:

SAE

RTCA DO-388

IATA: January 2021 'Aircraft Cleaning and Disinfection during and post pandemic'

EASA: 'Guidance on aircraft cleaning and disinfection'

Aircraft Interiors Materials Hygiene Working Group

Jim's presentation contains links to a number of industry groups and their efforts.

Observation of aircraft disinfection efforts: There is a great difference in the number of times/how often different carriers disinfect their planes and the type of disinfectant they use.

Imamura: what are we doing to determine if these disinfection agents affect flammability? J. Davis: you want to get the SAE report for information about the testing done at NIAR. They did a good job. Bowden: is the outside of the aircraft being disinfected at the baggage handling and maintenance controls? J. Davis: we are not involved in that. SAE was able to do some work. The broader focus was on what materials to use in cargo hold in the areas that are

accessible to baggage handlers and disinfecting the pushback tractors. The higher level organizations have looked into some of these. The FAA is still wrestling with some of these issues including disinfecting the cockpit (effects on avionics equipment, etc.). Marker: for the purposes of this group, we are interested in effects of disinfection agents on soft materials and interior materials in the aircraft interiors. Marker: (read from Zoom Chat): is toxicity being studied? J. Davis: Toxicity is being studied but not by us. Jensen: In your efforts in the past months, have you come across guidance from any of the regulatory agencies for antimicrobial coatings that remain on the material for a period of time? J. Davis: no, we have not. As an airline contractor, we do exactly what the airline tells us. The airline gives us instructions on how to apply any new solution/chemical. Vallecoccia: how are people approving these agents? Is it strictly through OEMs? Do you have any experience? J. Davis: the regulatory issues are complex. What the airlines are doing is within the purview of their operating certificates. Eventually they have to show that the agents are safe and good.