INTERNATIONAL AIRCRAFT MATERIALS FIRE TEST WORKING GROUP MEETING

Hosted by Airbus Americas Engineering in Mobile, Alabama, USA

March 7-8, 2017

TUESDAY, MARCH 7, 2017

Welcome/Airbus Greeting and Logistics – Dave Trent (Airbus Site Director) / Wil Picota

Magnesium Alloy Test, Development of Advisory Material – T. Marker (FAATC)

Cargo Liner Test/Airflow Study/Seat Test – T. Salter (FAATC)

Comparative Testing between Park and Sonic Burners for Cargo Liner Applications Thomas W. Little (Boeing)

Cargo Liner Flame Penetration and Insulation Burnthrough Test Hierarchy Study – R. Ochs (FAATC)

Burnthrough – R. Ochs (FAATC)

VFP Update – R. Ochs (FAATC)

Inaccessible Area Fire Tests on Composite Structure – R. Ochs (FAATC)

Radiant Panel Update – S. Rehn

RTCA Update – S. Rehn

Evacuation Slide Test – T. Marker (FAATC)

Welcome from Mobile Mayor Sandy Stimpson

HR2 Update – M. Burns (FAATC)

HR2 Development – Brian E. Johnson (Boeing)

Characterization of OSU Airflow Using Particle Image Velocimetry – R. Ochs (FAATC)

Material Change Similarity Status – Dan Slaton (Boeing)

Policy Statement/Flammability Standardization Task Group Update – Michael Jensen (Boeing)

Approved Material List: Survey Status & Next Steps – Scott Campbell (Zodiac Aerospace)

Task Group Meetings Session I:

Magnesium Alloy – T. Marker
Cargo – T. Salter
VFP Composite/Ducting/Wiring – R. Ochs
Radiant Panel – S. Rehn

OSU/HR2 – M. Burns
Flame Retardants/Material Change Similarity – D. Slaton
Approved Material List – S. Campbell

WEDNESDAY, MARCH 8, 2017

Task Group Meetings Session II:

Magnesium Alloy - T. Marker
Seat – T. Salter
Burnthrough – R. Ochs
RTCA – S. Rehn
OSU/HR2 – M. Burns
Policy Statement/Flammability Standardization TG – M. Jensen

Task Group Reports

2016 Conference Proceedings/Additional Discussion / Next Meeting / Closing

Meeting Minutes:

TUESDAY, MARCH 7, 2017

Meeting Logistics – Wil Picota (Airbus Americas Engineering)
Welcome from Dave Trent (Director, Airbus Americas Engineering)
Welcome and Announcements by Tim Marker (WG Chairman, FAATC)

Magnesium Alloy Test, Development and Advisory Material – T. Marker (FAATC)

HP Busch: thickness of the sample was chosen to determine if it can self-extinguish by forcing it into ignition, right? Marker: yes. HP Busch: we are allowed to test real parts and what if they are a different thickness? Marker: you can make a case for it. We are trying to come up with a standard, but you may be able to apply for special conditions if the part is not less than a certain thickness. Question: would surface finish be a factor? Marker: it probably does have a little bit of an impact. The problem is it is very difficult to get samples in that thickness. Slaton: is the weight loss criteria still a guideline right now? Marker: The weight loss seems to be the most accurate when you start looking at when does it go out/when does it ignite. It is not set in stone. We only really have these two types of mag alloys that we have been using to get the data set. HP Busch: I'm thinking about corrosion protection and finishing on the surface and it might influence the test results. Marker: Again, we are stuck with what we have to work with right now. We have limited resources right now.

Tim gave a brief Aircraft Materials Fire Test Handbook Chapter 25 Update.

Tim reviewed some Potential Advisory Circular Topics for an AC on magnesium use. Gwynne: will the AC be specific to seats or clarification to the method? Marker: we could make it include everything or just the seats. We'll discuss it more in the Task Group.

Sonic Burner Cargo Liner and Seat Cushion Test Update – T. Salter (FAATC)

Test Cell Airflow Interlab Study: same liner type provided to all labs, use sonic burner (Handbook: Chapter 8). The results were graphed and presented. Some of the results were not what we expected. The study was inconclusive, because there were too many unanticipated variables (method of airflow rate adjustment, speed of fan, locations of intake and exhaust air, inconsistent data collection methods [airflow], and some labs did not report back at all). If you do decide to participate, please be sure to report back, because it takes our time and resources and other labs time and resources to conduct a study. Solution: perform an interlab study at the FAA Technical Center. Tim showed photos of the Adaptable R&D Sonic Burner Test Rig that is under construction at the FAATC lab. This will make it possible to generate interlab study data at the FAATC.

Fire Test Handbook Updates:
Chapter 7: Seat Cushion Test Method – air velocity around seat cushion test sample was discussed during the last Task Group meeting.
Chapter 8: The Chapter Supplement is now all sonic burner information. Park burner information is in the main Chapter.

Both will be discussed during the Task Group meetings.

Seat Cushion Sonic Burner Video: we are producing a Sonic Burner Seat Test Instruction Video based on Chapter 7 of the Handbook. Instructions will be specific to the sonic burner. It will be similar to the cargo liner video we recently produced (see: www.fire.tc.faa.gov for Cargo Liner Test Procedures Training Video on the Handbook page of the website).

Planned Research and Work:

Continue airflow study
Update Handbook Chapters based on feedback from Task Groups
Seat Cushion Sonic Burner Video production
Task Group meeting items

Jensen: air velocity measurements: what is the current guidance in the Handbook now? Salter: it is the same for the Park. We updated for the sonic burner. Campbell: where were you measuring the flow? Salter: we tried to all encompass the airflow by measuring at the thermocouple and several other specified locations.

Cargo Liner Park Oil Burner vs. Sonic Burner Comparison Testing – T. Little (Boeing)

The objective was to perform head-to-head cargo liner burnthrough testing using Park and Sonic burners to compare burnthrough times determine degree of matching between 2 burner types. Tom reviewed the details of this comparison test program. Conclusion: sonic burner is well-matched to Park burner in actual burnthrough performance (this is a snapshot in time based on a limited sample set over the range of materials tested). Danker: what is your role in this project? Jensen: Tom is our statistician.

Cargo Liner Flame Penetration and Insulation Burnthrough Test Hierarchy Study – R. Ochs (FAATC)

Rob reviewed the results of this test series.

Burnthrough Rig Test Results were reviewed. Influence of test rig significant on test results.

Summary: overall, insulation burnthrough test is more severe than cargo liner test. Various configurations were tested. Test results suggest that the insulation test can be used to show compliance with the cargo liner test per the proposed hierarchy. Conversely, the liner test is not as severe. Campbell: a lot of times we have found little fissures develop after the test during the cooling down period. Jensen: Typically, 99 percent of our testing is all features and cargo liner attachments.

Burnthrough Round Robin – R. Ochs (FAATC)

2017 Comparative Test Series: is in progress

Materials were sent to 11 labs across 3 continents. Phase I Results were presented. Four (4) labs have reported results. Insulation Blanket Burnthrough Test results were presented. Summary: Only 4 out of 11 labs have submitted results. So far, data looks good. Hopefully we will have more results in for the next Working Group meeting.

VFP Update – R. Ochs (FAATC)

VFP is the Vertical Flame Propagation Test Apparatus. We are using it for carbon fiber composites. A photo of the VFP 3.0 (the latest version) was shown. Its features were described (double door system, fixed furnace and fixed air inlet). A new power supply has been acquired (Keysight 6802A). Rob showed a video of a test conducted in the new VFP 3.0. Propane vs. Methane gas: per a request from the Working Group these were compared. Images of the Flame Profile Comparison for each gas were shown. New ribbon burners were purchased. Summary: continue development and testing of VFP 3 (develop better sample holding methods for panels, wires, and ducts); standardize test method procedure, and find materials for comparative testing with new machines.

Inaccessible Area Tests on Composite Structures - Update – R. Ochs (FAATC)

We have procured a large composite aircraft CFRP aircraft skin. We built a simulated CFRP Aircraft Structure. Next Steps: begin construction of our heat transfer apparatus on a smaller scale and then scale it up. Suggestions are welcome.

Radiant Panel Update – S. Rehn (FAATC)

Round Robin results from 2016 RR varied widely. Biggest difference between machines was the gaps around the drawer which allows outside air to flow in. There is nothing in the rule about the size of these air gaps. FAATC did some preliminary testing with air gaps open and with air gaps closed. Metalized PEEK from the Round Robin showed the biggest difference. An Airflow Study was conducted by four labs: FAATC, Boeing, Damping Technologies, and Triumph Insulation Systems. 240 samples in total were tested. Testing is still in progress. Tom Little at Boeing did a statistical analysis of the results. Languet: you are making statistical analysis on the flame propagation length - I have a feeling that since the flame propagation length is visual, there can be a real variation, what do you think about this? Rehn: That is why we are running them again. I think you are right on that.

RTCA Update – S. Rehn (FAATC)

RTCA DO -160G is the current international standard for environmental testing of commercial avionics. The next revision is due January 2019. We created a Draft Test Procedure in

October 2016 based on telecom industry test. Steve described this draft procedure. Steve reviewed the future work for this project.

Evacuation Slide Test – T. Marker (FAATC)

Tim reviewed the Revised Evacuation Slide Test Method. A photo of the small scale test apparatus at the FAATC was shown. Results of the Yellow/Gray and the Mustard/Mustard materials were shown for the labs that reported their data. Additional activities: furnace angle vs. heat flux.

Welcome from Mobile Mayor, Sandy Stimpson

Heat Release Rate Updates – M. Burns (FAATC)

2017 OSU Guidance Document will be chaired by Yaw Agyei, Yonus Behoud, and Martin Spencer. Update: No progress yet.

Acceptable HR2 Variability: Action Item: need to define goals during HR2 Task Group meeting.

HR2 Calibration: Mike discussed DOE, the current calibration method(Step), Modified Step Method, Marlin Engineering wrote a program for R&D software program.

Chapter HR Updates: Mike reviewed the following: Hardware Changes, System Airflow (MFC requirements), Upper Pilot Methane/Airflow (MFC requirements).

HR2 Task Group: Comparative Tests: DEATAK – Marlin Engineering HR2 Units: Mike reviewed the differences.

Thermopile Upgrade R&D: Mike will share the data with the Task Group.

HR2 Development Model and Plan – B. Johnson (Boeing)

Situation: HR2 is currently at TRL 4 (Technical Readiness Level): Robustness. Marlin Engineering prototype in use at FAATC. TRL 4 to TRL 5: incorporate recent updates and characterize variation without coupons; repeat phase one DOE testing – tighter flows, new calibration, and MFC's; generate data and access calibration factor variation (5% limit); if acceptable, move forward to coupon testing (TRL 5); if unacceptable, assess the additional sources of variation. Target: entry of TRL 5 – Repeatability: entry by end of 2017, and TRL 6: Reproducibility in 2018. Brian reviewed a broad look at the potential overall schedule.

PIV in the OSU by Rob Ochs, PhD – R. Ochs (FAATC)

Rob did some PIV (Particle Image Velocimetry) work in the OSU. He described the set up of the PIV and old OSU test apparatus. A photo of this set up was shown. PIV Measurement Details acquisition and analysis settings were explained. Rob reviewed PIV data collected. There is a high level of turbulence and non-uniform flow fields. Possible improvements will be tested to determine if turbulence can be reduced and flow field can become more uniform. We will take suggestions for other possible measurements. Question: would we look into blocking some of the holes that get clogged when testing thermoplastics? Ochs: yes, we could try that as well as other things we can try. Question: are you going to try this with glowbars on? Ochs:

yes, when we get a piece of high-temperature glass. JDavis: could you put a Plexiglass sample holder in there to see its affect? Ochs: yes, we could do that.

Material Change Similarity – Status Update – D. Slaton (Boeing)

Dan provided some background on this Task Group's creation and focus. Rich Lyon has proposed: Single MCC Criterion for Small Change (requires verification by industry). Looks at the point at which a material starts the ignition process.
Re-examine Data from Previous Study to Substantiate Paint Colors (Industry Standardization Task Group Report, 2012) – Rich Lyon went back and recalculated this.

MCC Test Results on Sample of White Paint (2016): Rich Lyon has generated the MCC data. We are in the process of waiting for the OSU data to do statistical analysis on that data. Dan reviewed the next steps: Rich Lyon is looking to do a new Round Robin including low flammability material like phenolic) – we need participation from OEMs; define standard methodology to define Tig; modification to ASTM standard to include Tig; definition of reproducibility limit for HR/Tig. We are looking toward mid-2017 to update the draft guidance. Campbell: did you have any materials to test that had just the FR treatment change? Slaton: I don't believe we had any with just FR changes. Campbell: are you only looking for monolithic materials? Slaton: not necessarily only monolithic materials. HPBusch: what is your baseline for OSU chambers? Slaton: these 5 samples will be run in one OSU chamber and then go back to this MCC data. It is not really multiple OSU machines at this point. Marker: don't you need to support all these theories Rich has by test data? Slaton: yes, this is one of those ways. Marker: to me, you still have to run many, many test cases to support a theory. This seems to be the important part of this. Slaton: we are at the point for labs to step up and generate some data.

Flammability Standardization Task Group – M. Jensen (Boeing)

Questions of Interpretation:
FSTG Sharepoint: hosted by Zodiac Aerospace)

Michael reviewed some of the items in the Policy Statement that could use some additional information. He presented a Status of Submittals that indicated which Submittals have been completed and submitted to FAA and EASA. Updates on each item: this presentation will be included with the others from this meeting on to the FAA Fire Safety website. Question: when will this become policy? Jensen: whenever the regulators are able to process the AC and get it out. I don't know at what point in the process the FAA is currently at with the AC. Campbell: we would also entertain the thought of an updated Policy Statement instead of an AC.

Approved Materials List Update– S. Campbell (Zodiac Aerospace)

We're working on a database of qualified raw materials/ constructions that have been regulatory certified to FAA flammability requirements. Scott reviewed the benefits of an Approved Materials List. He reviewed the Key Activities for the database. The survey of interest only received a few responses. Scott reviewed the goals of today's Task Group meeting: 'Go' or 'No Go' on this project.

HRR: Mechanically Fastened Materials – S. Campbell (Zodiac Aerospace)

Long Standing Question: what gap (if any) is necessary before an exposed substrate may be separated from a mechanically fastened back substrate and tested for HRR and smoke independently? Scott explained why he is bringing this up now. We will discuss this further during the Task Group meeting.

WEDNESDAY, MARCH 8, 2017

Task Group Reports:

Magnesium Alloy Flammability Test Task Group – T. Marker

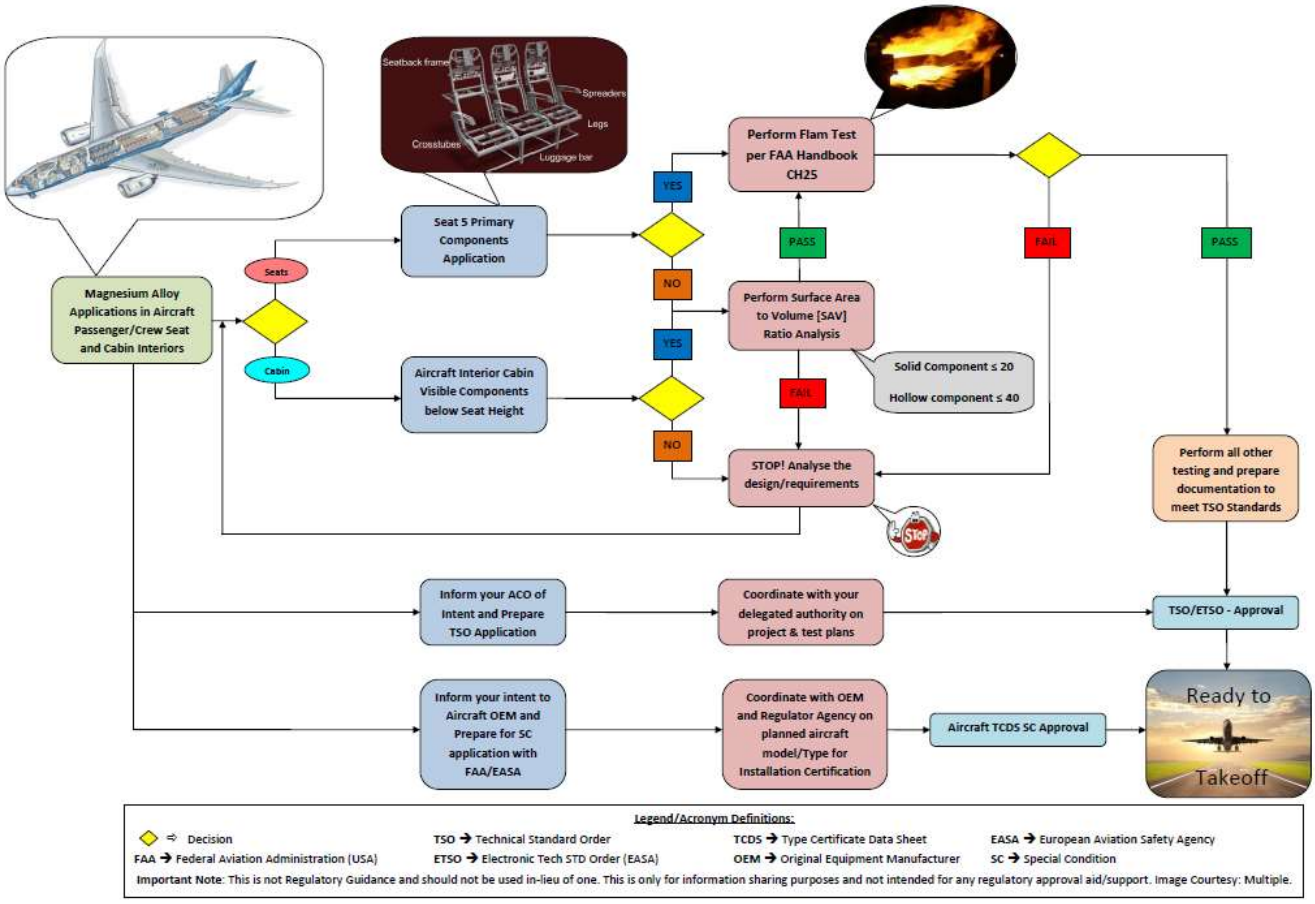
Summary provided by Tim Marker

1. Continue with the development of a flammability test for magnesium alloy used in inaccessible cabin areas. The FAATC discussed the results of the most recent tests conducted using the radiant panel apparatus and thin magnesium alloy test samples. Over 125 tests have been conducted to date. A majority of the tests were conducted using 0.025-inch thickness samples, which were laid flat on top of ceramic fiber board prior to being inserted into the radiant panel test chamber. The FAATC concluded that test repeatability could be improved by preventing the thin samples from warping when exposed to the heat and ignition source. Numerous sample holder concepts were conceived and tested to determine the most appropriate methodology. A 3-sided perimeter-style sample holder frame, with one of the edges truncated, seemed to provide the best results. The sample holder is simple and effective, keeping the edges of the sample from curling, and also keeping the sample at the correct distance from the radiant panel and pilot ignition. Heat transfer to the magnesium alloy test sample to the steel sample holder is minimal. Results from these tests also lined up fairly well with initial test results when the samples were laid flat on the ceramic board without restraint. The Task Group participants agreed that the FAATC should continue development of this sample holder with additional testing, since there are presently only 2 magnesium alloys (EL21 and EL43) that meet the proposed test requirements. Magnesium Elektron (Prem Mahendran) agreed to supply additional samples of ZE41, a popular casting alloy, to supplement the existing test results. As soon as samples are received, testing can resume at the FAATC. Once the test methodology is determined to be repeatable, a new “strawman” procedure will be written up by the FAATC for future placement in the Fire Test Handbook. The draft procedure will be circulated to Task Group participants for their comments.

2. Development of an Advisory Circular (AC) for magnesium alloy use in the cabin. Task Group participants agreed that an AC would be a very useful document in the future use of magnesium alloy components in the cabin. The AC would be based largely on work done by the FAATC and discussed at previous IAMFTWG Task meetings. The AC would include guidance on the use of magnesium alloy in both seat structure and other cabin areas, including inaccessible areas. Magnesium Elektron (Prem Mahendran) had developed a draft flowchart to better illustrate the necessary steps required to obtain acceptance of magnesium component use in the cabin (draft

flowchart is shown below). Magnesium Elektron agreed to consult with the European Aviation Safety Administration (EASA) and the FAA on updating the draft flowchart, adding detail where necessary.

Magnesium Alloys Application in Aircraft Seat and Cabin Interiors – Installation Compliance & Approval Process



Legend/Acronym Definitions:

◇ ⇨ Decision

TSO → Technical Standard Order

TCDS → Type Certificate Data Sheet

EASA → European Aviation Safety Agency

FAA → Federal Aviation Administration (USA)

ETSO → Electronic Tech STD Order (EASA)

OEM → Original Equipment Manufacturer

SC → Special Condition

Important Note: This is not Regulatory Guidance and should not be used in-lieu of one. This is only for information sharing purposes and not intended for any regulatory approval aid/support. Image Courtesy: Multiple.

3. Full-scale testing to determine risk of using magnesium alloy components in areas above seat back height. At the previous Task Group meeting, the FAA indicated the accessible areas above 60 inches from cabin floor would need further analysis, and could possibly require full-scale testing to determine the appropriate laboratory-scale test for magnesium alloy components located in these areas. One Task Group participant questioned whether the FAA had decided on a way forward for this application. While the FAA is still considering the application, it had not made any determination on the appropriate flammability test, and will continue to focus on the development of a flammability test for magnesium alloy use in inaccessible areas.

4. Lack of current research projects involving magnesium alloys submitted to airworthiness authorities. EASA pointed out that despite the progress made on the development of appropriate flammability tests for magnesium alloy, there were still no formal proposals submitted to the airworthiness authorities on magnesium alloy use. Magnesium Elektron (Bruce Gwynne) indicated that several projects were in the works, and would likely be proposed in the near future (note: Due to the proprietary nature of these projects, the details could not be disclosed). EASA (Enzo Canari) agreed to reopen the Certification Review Item (CRI) for magnesium alloy use in the cabin, which would provide a better description on the approval process for prospective applicants planning to use magnesium alloy in cabin applications.

Spencer: have you thought about using the VFP for the thin magnesium? Marker: we tried that, and it did not work. The samples stretched out too much.

VFP Task Group – R. Ochs

Ribbon burner was discussed. We noticed some differences in manufacturing from the company we are purchasing them from, so Martin Spencer will look into manufacturing them. We can use PIV to get velocity coming out of ribbon burner.
Martin Spencer and Deatak will build some prototype units and send to FAATC to check.

Burnthrough Task Group – R. Ochs

Everyone is pretty happy with the data we are getting back so far. Some members had volunteered to go through the current Handbook Chapter and the AC to see what areas need to be updated. Maybe we will start working as a Task Group to update the Handbook Chapter.

Cargo Liner Task Group – T. Salter

We were asked to put a date and revision number on the Chapter, so if someone prints a hard copy they know when it was revised.
Suggestion to make an additional video i.e.: how to run a corner test, etc.
It was mentioned that there has been some hesitation on the use of the sonic burner for certification. I can tell you that the design of the sonic burner has not changed for over a year. We encourage people to accept it for cargo liner testing.

Seat Task Group – T. Salter

We want to increase the airflow velocity requirements for use with the sonic burner. We propose to increase the max vertical velocity to 100 ft/min, and horizontal to 50 ft/min. We want to change some wording in Chapter 7 for some of the material moved from the Supplement into the main Chapter.
There were questions regarding the updated seat AC. We are hoping to see that in the coming months.
How often you do the fuel calibrations and flame validation were discussed.
Make recommendation on a hot wire anemometer and how to place it on a seat stand was requested.
HP Busch: it might be a good idea to name which burner has been used on the test report. Salter: that is a very good idea, so certainly include which burner was used for the test(s). Question: can you comment on comparing sonic to Park burner for seat tests? Salter: we did back to back comparisons and the flame looks different. Those results are available from the 2016 conference presentation and from a Materials Working Group presentation from a few years ago.

Radiant Panel Task Group – S. Rehn

Summary provided by Steve Rehn - FAATC

- Discussed the test results we have so far about our chamber air flow study.
- Reviewed the timeline for completion (it should be done by the June 2017 meeting) and discussed any improvements that can be made.
- We decided that we will all use the same calorimeter for our testing so that will not be a source of error. It will be sent around to each lab and we will test one at a time.
- The FAA received new metalized PEEK material to test and the preliminary test results look good in that we saw a much bigger difference in results between air gap configurations than in the previous test.
- New material samples are being constructed now for upcoming testing (240 samples).
- Discussed the possibility of adding a laser at the two inch mark away from the zero position in order to better determine if the flame propagated past that point – some labs already have this setup.
- Discussed how the speed at which the burner is lifted can affect the test results. If it is lifted up slowly, it could re-ignite the cover material at the back of the bore hole. We could add a way to standardize this by using a counterweight to lift the burner or something similar.
- If the air flow study goes well we could do another round robin with standardized air gaps.

RTCA Task Group – S. Rehn

Summary provided by Steve Rehn - FAATC

- Reviewed timeline and worked back from Spring 2018 (when draft procedure is due for review and comment at SC 135 RTCA DO 160 committee) to set goals.
- Evaluated current inventory of avionics boxes and discussed how to share between FAA Tech Center, Airbus, and Element Minneapolis.
- Discussed materials to add to inside of boxes that would burn in order to evaluate failures.
- Distributed draft test procedure to the group. We will expand/modify based on lab results from testing at Tech Center. Anyone in the group is free to offer any comments or recommendations.
- At this point, Steve at the FAA Tech Center needs to perform a variety of tests, collect data, and results will be reviewed at June meeting.
- Testing will be split into two parts: (1) Finding the limit of the amount/size of air holes in a box where combustion can no longer be sustained due to lack of oxygen and (2) Testing the draft test procedure on a variety of boxes in order to refine/improve upon it.
- We may meet at FAA Tech Center in the future to burn boxes together
- In addition to refining the test procedure, guidance regarding box design and applicability of methods will be added to procedure.
- We reviewed our timeline and approach with Jeff Gardlin, Transport Airplane Directorate, and our plan to move forward is sound to meet deadlines.

HR2 Task Group – M. Burns/B. Johnson

We will work on HR2 Electronic Thermopile Upgrade. Glowbar leakage: I will try to quantify how much is leaking at the FAATC. That would be using an anemometer on the exhaust stack. By the June timeframe, the HR2 should pretty well be locked into its final configuration.
We discussed the OSU Guidance Document and asked labs to work with the three labs I talked about yesterday.
Brain Johnson: we agreed that we are at TRL 4 for the HR2. We are looking forward to locking down the configuration by June for both the instrument and the procedure. We discussed a standard panel. We have an Action Item to look at individual variability in machines experienced during last Round Robin. HP Busch: I think it is not necessary to use expensive alloy for the reference/standard panel.

Flammability Standardization Task Group – M. Jensen

Summary provided by Michael Jensen – Boeing

FSTG Meeting Minutes for March 8, 2017, Mobile, AL
Please add Kimberly Orlando (Kimberly.Orlando@zodiacaerospace.com) to the group.

UL V0 should be brought up and mentioned that it is part of the ARAC committee

Wire Discussion
Discuss common MOCs that are utilized for wire but aren't formally documented

People Willing to Help:

• Kimberly Orlando (Zodiac Kimberly.orlando@zodiacaerospace.com 714 642 1113),
• Andre Pinard (Astronics Armostrong Aerospace andre.pinard@astronics.com, 630 285-0200, ext 139
• Steve Charleson (Cotney Aerospace Inc steve@cotneyaerospace.com 205-620-4973

Thinnest for a lower grade

Color of wire

Two jacket twist for three with same shielding

Braiding two to three very thin (high gauge wire) for test

Issue with using AC 43 repair as an MOC is that AC 43 is being used for AC part 121 aircraft type cert aircraft

Mil-Spec wire and EN equivalent

Woven, textiles, draperies, Upholsteries and Carpet
Would not be applicable to seat upholstery [853(c)] since this already allows similarity. A note should be added

Perhaps the two paragraphs should be re-worded (combined?) so it states “same” or “different” color. Same weave should also be stated.

AC25.853-1 has a % difference for blend for allowed similarity- the blend stated should perhaps be updated to reflect the same as stated in AC? +/- 6% difference on the material blend. But if this is updated, how does this impact the +/- 5%

Definition of Same
More review/discussion is needed (note- from my experience, Bombardier will not allow this for either situation (e.g. internal specs which control everything including flam with QPLs or industry specs without flam for lesser parts).

Additive Manufacturing
ECD for data is approximately 3 months for test data. (Chuck Wilson)

Placards
Perhaps a note should be added that defines a placard as a necessary sign required to operator the aircraft (as opposed to an advertising). If a placard is large enough to require HR/SD evaluation, one should refer to the MOC for decorative laminate for allowed 25.853(d) MOCs.

Composite Panels Will Substantiate Aluminum
Submit item 121 and add to the tracking list

Approved Materials List Task Group – S. Campbell

Summary provided by Scott Campbell – Zodiac Aerospace

The task group decided to continue the project with the following actions for the next meeting:

- Develop straw-man specification
- Determine with PRI the minimum critical mass for them to develop a listing database.
- Does PRI provide any marketing of their tool? Or will industry users self-promote?
- Consider new survey after the above actions are complete to give material manufacturers more information. Target company decision makers.

Material Change Similarity Task Group – D. Slaton

Summary provided by Dan Slaton – Boeing

MCC Material Change Similarity:
Dan Slaton presented a status presentation summarizing a proposal from Rich Lyon to include the ignition temperature as part of the comparison criteria. Tim Marker asked, "How will you prove this approach works?" Slaton responded that there are a few data sets being analyzed and we're requesting additional data sets from industry. The task group session had about 15 participates. Some folks want more background on the 20W/g approach versus 5% conversion versus tangent line approach. Rich Lyon paper from the Materials and Fire Conference in February 2017 provides more details. Anyone interested in being involved to provide material change case studies should contact Dan Slaton or Rich Lyon. Hoping to have an industry teleconference towards the end of April.

There were other comments about how MCC relates to smoke density or VBB or radiant panel. Since this is a comparison method (current material to a new formulated material), it provides the confidence that there is not a significant change in material flammability performance. Some folks thought that perhaps a representative FAR test would need to be run to have better confidence in the MCC results. This approach could be described in the guidance to provide a confidence level and/or to help minimize any FAR testing that might need to be performed if there is not clear MCC equivalence.

Some people are still having a hard time with this approach to evaluate a raw material in MCC when the material may only be one part of a complicated composite panel which is the actual test configuration for OSU testing. The synergy of multiple components in a multi-material buildup is still on people's minds. Since this is a comparison approach, we are simply reducing the risk that the modified material will have any appreciable effect in the overall performance of a multi-material buildup. Ultimately the data analysis of the case studies will validate the guidance and help relieve these concerns. Patrick Zimmerman of 3M said he has some adhesive data that can be used for performing the analysis approach since he has both VBB and MCC.

Another question that came up was who has MCC machines. FAATC, Boeing, 3M, Deatak (previously Govmark), and UL have machines. Are there others? It might be handy to have a listing of the labs that have MCCs.

2016 Conference Proceedings

Available on the Conference Page of the FAA Fire Safety website. www.fire.tc.faa.gov

Next Meeting

June 7-8, 2017
EASA Headquarters
Konrad-Adenauer-Ufer 3
D-50668 Cologne, Germany

There will be no hotel room block. Cologne is a very walkable city. There are several hotels within walking distance of EASA Headquarters.

Future Meeting Registration:

Be sure to register online at www.fire.tc.faa.gov, and if your plans change later on, be sure to log-in and cancel your registration to open a space for someone else to attend. Thank you.