Federal Aviation Administration

Research, Engineering, and Development Advisory Committee Subcommittee on Aircraft Safety (SAS)

William J. Hughes Technical Center Building 291E Atlantic City International Airport Atlantic City, NJ 08405

April 8-10, 2014

Meeting Minutes

Purpose: Review the FY 2016 Aircraft Safety R&D Portfolio that was developed based on SAS strategic guidance from Fall 2013 meeting.

Designated Federal Official (DFO): Eric Neiderman, FAA

SAS Chair: Joe Del Balzo, JDA Solutions

Day 1 - April 8, 2014

A¹ Welcome Remarks and Agenda Review

Eric Neiderman called the meeting to order at 8:30 AM and welcomed the Human Factors (HF) and Aircraft Safety Subcommittee (SAS) members, FAA participants, and all others in attendance or on the phone. Joe Del Balzo, Amy Pritchett, HF Subcommittee Chair, and Jason Demagalski, HF DFO introduced themselves. Eric initiated an introduction of all others present and on the phone.

Joe and Amy stated that this joint HF and SAS meeting was long overdue. They informed their respective subcommittee members that the full REDAC is meeting on April 17. As a result Findings & Recommendations (F&R) from this meeting must be expedited.

Eric provided a presentation (included under tab K in the binder) *Research, Engineering, Development Advisory Committee (REDAC) Meeting - Human Factors Subcommittee Safety Subcommittee.* Eric spoke briefly about the benefits of conducting a joint HF and SAS meeting. He observed that a recent FAA Safety Briefing publication on New Technology in Aviation demonstrated the intertwined nature of HF and safety and the need to collaborate. Eric emphasized the importance of recognizing the common strategic research goal to strike a balance between the competitive nature of the industry and the public good. He showed a short Ted Talk

¹ Letter designations represent location of presentation in the binders distributed at the meeting. Some of the FY15 Budget information is lacking from the Binders. This was intentional. At the time of printing the FY15 Budget had not been released and the information was not ready for distribution. The presentations on the REDAC KSN site include FY15 fiscal information.

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video on disruptive technologies and posed a question on how the FAA would certify a 3-D printed jumbo jet for safety. He summed up by posing four strategic questions:

- Are we positioned to ensure safety given the anticipated innovations?
- Are we keeping pace with changes in technology and the industry?
- How can research effectively support certification and economic vitality?
- Are we pursuing integrated, holistic solutions?

Dennis Filler, Director William J. Hughes Technical Center Office, addressed the meeting by focusing on two of Eric's strategic questions:

- Are we keeping pace with changes in technology and the industry?
- Are we pursuing integrated, holistic solutions?

Dennis observed that the FAA spends only 1.6% of its budget on RE&D. Regarding integrated holistic solutions, Dennis emphasized that the research must have a "place to go" within the FAA. He stated that HF is pervasive across all Agency domains. The recent Asiana 214 accident is indicative of both the HF challenges and the successful implementation of aircraft safety research. He asked each of the committees to encourage complete solutions sets and to help identify challenges where the Agency may not be adequately prepared. One challenge is that FAA R&D is on a five-year cycle while industry advances on a one-year cycle. The REDAC can help by providing direction and input on the level of investment.

Joe Del Balzo observed that the Subcommittees only address programmatic issues; it is the REDAC that addresses strategic issues. Amy Pritchett recognized that AVS has compelling safety R&D needs while ATO has equally compelling operational R&D needs. John White (SAS) asked how much of an investment is necessary. Dennis replied that anything above 1.6% is an improvement. Andy Lacher suggested that the FAA look at how they compare to R&D programs in other agencies.

Eric noted that Dennis' presentation addressed both the SAS F&R from the Spring 2013 meeting (Spring_2013_23) and an observation made by the REDAC in their letter to the Administrator dated May 14, 2013. Joe Del Balzo stated his belief that Dennis properly addressed the issue and that the SAS considers it closed. The SAS members concurred. The REDAC Finding will be addressed by others.

B Roles and Responsibilities

Presenter: Cathy Bigelow (FAA)

Cathy presented *REDAC and Subcommittee: Roles and Responsibilities*. She opened by saying that this presentation is a reminder of the legislative and functional basis for each Subcommittee and the REDAC. She added that one role of the research advisory committee aligns with Dennis Filler's previous request to provide guidance on the appropriateness of resources allocated to R&D. Cathy made it clear that the timing and objective of each subcommittee is not strictly a legislative matter. Each meeting helps the FAA assemble an Agency-wide research budget. The summer/fall meeting objective is guidance for research in FY+3. The spring meeting is a review of the FAA FY+2 research portfolio. Cathy ended by presenting the responsibilities of the

Designated Federal Officials (DFO). Amy added that the DFO has the authority to end a meeting.

C Budget

Presenter: Mike Gallivan (FAA)

Mike Gallivan presented *REDAC Safety Subcommittee - R&D Budget Status*. Mike opened by stating that the FY 14 appropriation (\$158.792M) was just below the FY 14 Budget Request (\$160M). Slide 3 detailed individual program cuts and plus-ups. The Joint Planning and Development Office (JPDO) was moved to the Operations budget. Slide 4 contains relevant conference language. Especially relevant is the mention of a Center of Excellence (COE) for Unmanned Aircraft Systems (UAS) and funding in the NextGen: Air Ground Integration budget line for the Commercial Space COE. The FY 15 budget request does not include any new programs. A11.n NextGen: Advanced Systems and Software Validation was deleted due to reprioritization of NextGen programs. Mike reminded the subcommittees that sequestration may be an issue in FY 16.

Chris Benich (SAS) asked a question about a shift in the NextGen Budget Line Items that eliminated ground-based augmentation. Mike stated that it could be integrated with other parts of the portfolio. Mike agreed to take an action to get this information to Chris.

Action Item 1: (Mike Gallivan) Provide Chris Benich with information regarding status of ground-based augmentation research in the NextGen program.

Subsequent to this presentation Mike talked with Steve Bradford and they plan on funding this in FY 16 and FY 17 depending on funding levels. Chris and Steve have a meeting in a week or two and they will be able to discuss this topic. Action 1 closed.

D FY 16 AVS R&D Strategic Portfolio

Presenter: Mark Orr (FAA on phone)

Mark presented *FY 2016 Aviation Safety R,E&D*. Mark emphasized the importance of the lifecycle approach to Research, Engineering, and Development (RE&D) resources. It is outcome based, i.e., how we want the world to be. It is risk driven and actively sponsored by AVS. The intent is to approve a project-based requirement once and manage it to obtain project outputs. Slide 5 shows a diagram of this process. Amy stated that active sponsorship implies a use for the R&D. But this may lead to needed R&D that is not sponsored. How does the process account for sponsors having low information? Mark replied that the process includes many managers and sponsors throughout prioritization. The AVS Management Team AVSMT is reviewing the FY 16 portfolio in April to bring balance. In the end it is management that decides. Dres Zellwegger (member of the NAS Operations (Ops) Subcommittee) asked if the process considers outside work like NASA. Mark replied that sponsors who are vigilant would do that. The research criteria accounts for this information as well.

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Joe Del Balzo commented that the SAS has positive comments on the AVS process. It leads to strong requirements. Andy Lacher (SAS) stated that the process is good but too rigid. It takes too long to adapt to changes. Mark replied that the process allows for unbudgeted requirements. Joe asked if the SAS could get a few examples of these pop-ups over the last few years and the impact to other projects or programs.

Action Item 2: Mark Orr will provide a presentation at the next SAS meeting that shows examples of how pop-ups are working and their impact on other projects and programs.

Chris DeSenti asked if the pop-ups go through the process. Mark said they do but faster. There have been roughly five over five years. Amy asked if research gets funded outside the process. Dan Brock (FAA) replied that non-RE&D money is sometimes used for research but that is outside this process. Amy asked how the process handles broad based research and who sponsors it. Mark replied that Peggy Gilligan (AVS-1) is the ultimate sponsor of all research but she delegates it to other managers. The process captures safety risk and cross cutting research will rise accordingly.

Joe suggested to the SAS that they close an open F&R from the Fall 2013 SAS meeting (SAS Fall_2013_02) regarding pop-ups in the AVS process. Mark's presentation and the new action item make it moot. SAS agreed to close said F&R.

E Unmanned Aircraft Systems (UAS)

Presenters: Christopher Swider and Sabrina Saunders-Hodge (both FAA).

Chris presented *FY 2016 Aircraft Safety PPT Portfolio Review - Unmanned Aircraft Systems* (UAS) BLI A11.1. Chris started with a UAS program review. Slide 4 identifies program capabilities including the UAS Integration Office. The Sponsor Team and Portfolio Matrix Teams are shown on Slides 5 and 6, respectively. Amy (HF) asked where the UAS COE is positioned in the matrix. Sabrina pointed out that John Reinhardt ANG-C2 would be the project lead. Chris presented seven Quad charts representing the FY 16 research requirements. Six of the seven are a continuation of previous requirements. Dres asked if there is a team for each requirement and if NASA is involved. Chris replied that there is a team for each requirement and that there is not much NASA involvement.

On Slide 12 *Sense and Avoid System Multi-Sensor Data Fusion Strategies*, Chris Benich (SAS) asked if the timing of this research is too late. Chris Swider replied that the interim results are helpful and can support the safety case by bringing products into RTCA Special Committee (SC) 228.

On Slide 13 *Sense and Avoid System Multi-Sensor Data Fusion Strategies*, Chris explained that the FAA does not have the resources to manage the newly appointed six test sites. Consequently it does not have control of the R&D. Joe asked if the FAA has a role in the test site R&D. Chris said no, but Dennis Filler (FAA) added that Congress might step in on this issue. Amy asked if the test sites could conduct non-FAA related R&D. Chris said yes

On Slide 14 *UAS System Safety Criteria*, Amy asked if there is a line or altitude below which FAA certification is not necessary. Chris replied that although all airspace is not the same, the FAA must be cautious.

Chris then presented the UAS Integration Roadmap. This was in response to a General Observation from the Fall 2103 REDAC and Action Item 2 from the Fall 2014 SAS meeting.

Joe asked if the recent NTSB court ruling has any impact on planning. Chris replied that the FAA has challenged that ruling. Any privacy issues are not FAA issues. Alan Jacobsen said what about security issues? Chris said not from a research perspective. Bill Rogers, any ground control station research? Chris said that Kathy Abbott's (FAA) HF group covers that work. Dennis Filler asked if there is enough money to get 200 UAS into the National Airspace System (NAS) by next year. Chris replied that he doesn't cover the airspace issues. Is the UAS portfolio big enough to get UAS into the NAS? Chris said it's impossible to answer. He has no idea of the shortfall. Amy commented that there are two shortfalls, the evolution and the revolution. Alan asked what's not getting funded. Chris said there is no list available. We don't have an end-to-end requirements list.

John A. Cavolowky (NAS Ops Subcommittee) asked if there was any accommodation for autonomous UAS. Chris replied that it is not compatible with the airspace now. Andy Lacher added that ICAO identifies autonomous as something without possibility of control from the ground. He added that the controller will not assume the role of pilot.

Amy commented that the UAS Concept of Operations (ConOps) is not publically available. Chris Benich stated that the UAS Integration Roadmap is a good outline but it does not rise to the level of an actual roadmap. It does not show the right R&D at the right time. The goals do not tie to the research outcomes. The roadmap should show linkage the R&D action. Joe said that he was glad to see the Roadmap but that he could not yet comment on it. Chris Benich stated that the roadmap is not adequate. The SAS deferred further comment on the roadmap until Wednesday.

Chris then presented *UAS Research Partners and Research Gaps* in response to Action Item 6 from the Fall 2013 SAS meeting.

Joe stated that the SAS is not in a position to act on the open REDAC General Observation from the Fall 2103 meeting but Action Items 2 and 6 have been met satisfactorily.

F Flightdeck/Maintenance/Systems Integration Human Factors

Presenter: Kathy Abbott (FAA)

Kathy presented FY 2016 Human Factors and Aircraft Safety Subcommittees - BLI A11.g Flightdeck/ Maintenance/ Systems Integration Human Factors. She addressed a Quad chart for each of the seven requirements funded for FY 16. On Slide 5 Enhancing Aviation Safety Through Advanced Procedures, Training & Checking Methods, to include Jet Upset John White (SAS) asked if training was the output. Kathy replied that the output specifically addresses

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training gaps not airspace automation issues. On Slide 7, Jim Mangie (SAS) asked if Crew Resource Management (CRM) R&D is complete. Kathy replied that since Advisory Circular AC 120-51E *Crew Resource Management Training* is out of date, R&D will continue and will be an input to the AC. On Slide 10, *Avionics & New Technologies: Certification and Operational Approval Criteria* Jim asked a question about the user of this information. Kathy replied that it is used by industry and the FAA.

Kathy handed out a CD with recent HF reports. Amy asked if the HF Subcommittee supports any of the HF requirements that were set below the Mendoza Line , or the funding level for FY16.

Action Item 3: (Kathy Abbott) Kathy will provide information regarding FY 16 HF requirements that were not funded in FY 16.

Action Item 4: (Mark Orr) Mark will provide information on prioritized requirements list with Mendoza Line for FY 15 and FY 16.

Amy asked if there are any cross-cutting topics or requirements like skill degradation in the cockpit. Are there any other suggestions? Kathy replied that many HF topics have that crosscutting aspect but the HF component does not usually get ranked very high by the process. One good example is the coordinated R&D efforts around loss-of-control. Three Technical Community Representative Groups (TCRG) – Flight Control Mechanical Systems (FCMS), Terminal Area Safety (TAS), and Human Factors (HF) are collaborating to deliver upset prevention and recovery training guidance to pilots. Chris DeSenti (HF) asked if this collaboration evolved from three separate these requirements or if they were integrated from the start. Kathy replied the former; the collaborative research grew organically just to get the work done. Amy asked how tightly they are integrated. Is there a clear driver, like the depth of the stall? Kathy said they are individual elements with common useable outputs. Dres asked if the budget process allows for funding collaboration. Mark Orr said yes if planned properly and in advance. Amy asked if Mark could describe a project that was cross-cutting at the start. Mark said that some of the icing work may be integrated by sponsors.

Joe discussed an open F&R from the Spring 2013 SAS meeting (Spring_2013_24) and a similar SAS F&R from the Fall 2013 meeting related to aligning HF with other areas of non-traditional HF research. The FAA view is that the FCMS, TAS, and HF effort mentioned above demonstrate this alignment. Joe did not agree. Phil Smith added that the AVS process should account for this. Mark replied that he expects the people to do this not the process. He added that the R&D Executive Board (REB) should play a role as well. Amy asked if the REB members were executives who would be willing to vote against their own interests. Cathy Bigelow stated that they usually vote to protect their portfolios. Amy referred back to what Dennis Filler is trying to do at the REB level. The SAS voted to keep both F&Rs open.

H Performance-Based Operations Aviation Rulemaking Committee (PARC)

After a break Kathy handed out and presented the *Results of the Performance-Based Operations Aviation Rulemaking Committee (PARC)/Commercial Aviation Safety Team (CAST) Flight Deck Automation Working Group.* This is in response to Fall 2013 REDAC General Observation regarding emerging human-automation issues. The goal of the working group was to update the 1996 FAA report on *The Interfaces Between Flightcrews and Modern Flight Deck Systems.* The presentation highlighted some of the more important Findings that are relevant to Human Factors research. The presentation was very well received by both HF and SAS committees. Philip Smith (HF) stated that this is excellent. The SAS did not recommend any disposition on the REDAC General Observation.

The presentation for the Center of Excellence Partnership to Enhance General Aviation Safety, Accessibility and Sustainability (PEGASAS) was postponed until April 9, 2014.

The meeting adjourned for the day at 5:15 PM.

Day 2 - April 8, 2014

The joint meeting was called to order at 8:30 AM.

H PEGASAS – Center of Excellence for General Aviation

Presenter: Peter Sparacino (FAA)

Peter presented *Aviation Research Division ANG-E2 COE-GA (PEGASAS) Overview.* He explained that the PEGASAS acronym stood for Partnership to Enhance General Aviation Safety, Accessibility, and Sustainability. Pete spoke about different membership levels: core integration team, affiliate universities, and industry and organizational affiliates. He reminded the audience that this is a grants program with special legislative authorization regarding cooperative agreements and cost-share. A companion Indefinite Delivery Indefinite Quantity (IDIQ) contract allows some of the research to evolve from an idea to a prototype. Pete spoke about PEGASAS capabilities and addressed some of the current research activities. Pete gave an example of this flexibility to use grants and contracts. For an AFS-500 training requirement, the COE used a grant to conduct the necessary R&D and the IDIQ contract to build the training prototype. AFS-500 launched the program with Operations funding. Pete added that several schools will work collaboratively on a single issue and develop a single solution.

Dres asked if other agencies participate. Pat Watts added that the environmental COE uses NASA. John White asked if the transition from Center of Excellence for General Aviation Research (CGAR), the previous GA COE, went well. Pete said it went smoothly but it was still not easy.

Joe Del Balzo commented that this is an outstanding example of a grants program. The work is rooted in FAA needs and is managed professionally. The core fellowship is a very good idea.

Pat Watts (FAA) spoke about the larger COE program. There are seven active COEs; four of them are in phase down. A new COE for UAS will be initiated this year; the public meeting is scheduled for May 28 and 29, 2014.

The SAS then reviewed the homework from the previous day presentations. These will be rolled up and delivered to the full REDAC for disposition. There was no discussion on the homework. The SAS and HF Subcommittees did discuss the nature of evaluating process, outcomes, and pop-ups. Joe suggested that one of the SAS members rework the discussion into an F&R. Cathy Bigelow (FAA) asked if other Subcommittees will do this. Joe said he has no jurisdiction over them. Amy added that the joint Subcommittee meeting provides valuable cross-talk.

I Weather Technology in the Cockpit (WTIC)

Presenters: Gary Pokodner (FAA)

Gary presented *FY 2016 Weather PPT Portfolio Review Weather Technology in the Cockpit* (*WTIC*) *BLI A12.d.* Gary handed out a hard copy presentation to the subcommittee members. A copy of this presentation is on the REDAC KSN site. Gary emphasized the goal of WTIC research: to improve the quality and quantity of weather information in the general aviation cockpit and help improve pilot decision-making regarding adverse weather. Amy asked if the intent was to regulate use of weather information. Gary said no the research is focused on information availability and related training. On Slide 6, he addressed an open SAS F&R from the Fall 2013 meeting regarding dissemination of information to the industry. Joe recommended closing the matter and the SAS agreed.

Action Item 5: (Gary Pokodner) John White asked for a briefing on WTIC related to PART 121 operations.

J Weather Program

Presenters: Steve Abelman (FAA) and Roger Sultan (FAA on phone)

Steve presented *FY 2016 Weather PPT Portfolio Review Weather Program, A11.k.* His presentation included an update from the version in the binder. The newer version is available on the REDAC KSN site. Steve highlighted the primary purposes of the program: support NextGen operational improvements, transition legacy National Weather Service capabilities to NextGen, and mitigate safety and efficiency issues with weather. He also mentioned that the Aviation Weather Research Program (AWRP) has it is own prioritization process separate from AVS. He stated that space weather may need more attentions and it is not yet sponsored by AWRP. Roger also spoke to a dozen quad charts representing (AWRP) including two that stem from AVS requirements. Two other AVS requirement-driven Wx Quad charts will be briefed during the Aircraft Icing session.

Roger addressed two Action Items (4 and 5) from the Fall 2013 SAS meeting: Lower Visibility for CAT 1 Approaches and RVR Conversion, and Safety Driven Weather Requirements for Wake Mitigation; and QA and AWDE Differences, respectively.

For the first half of Action Item 4, Roger presented a new slide (not in binder) *PV For Lower Visibility – Benefits.* For the second part of the Action Item 4, Roger presented *Weather Data Requirements for Wake Mitigation – Benefits* that addressed design guidance documents for NextGen Operational Improvements development using dynamic wake vortex mitigation strategies. Chris Benich asked about the timing for weather data requirements for wake. Roger said it will be on-going through FY 16 but the timing for the benefit is closer to 10 years because of the time it takes for equipage. Chis followed by asking if it was useful for ground-based systems. Steve said it is used by both AVS and ATO.

Roger addressed Action Item 5 with Slide 10 QA and AWDE Differences.

Both actions items were addressed to the satisfaction of the SAS.

There was some discussion about the difference between uncertainty of the weather products and GA pilot uncertainty. Amy said that by nature humans are irrational with probabilistic information. Even the display of the weather can include a bias. What is the relationship of the decision-making tool and probabilities? Amy suggested that more emphasis be placed on modeling decision-making rather than on human-in-the-loop weather products.

After the lunch break the Human Factors and Aircraft Safety Subcommittees split up and resumed their respective meetings in separate locations. The SAS reconvened in the Directors Conference room Building 300 at the William J. Hughes Technical Center.

L² Advanced Materials/Structural Safety

Presenters: Larry Ilcewicz (FAA on phone), Joseph Pellettiere (FAA on phone), and Curtis Davies (FAA)

Larry presented FY 2016 Aircraft Safety PPT Portfolio Review BLI All.c - Advanced Materials and Structural Safety (AMSS) - Advanced Materials and Structures Crashworthiness. Larry emphasized that bonding is an important part of all initiatives shown on Slide 5 Overview of the AVS Composite Plan. The following slides addressed bonding field difficulties and the FAA approach to composite safety and certification issues.

Larry highlighted Slide 14 Crashworthiness Issues Unique to Composite Materials (SIC-16-03). He mentioned that this program is not funded in FY 16. John White asked why and Larry replied that it was prioritized below the Mendoza Line. He and Curt Davies recommended that since there are no funded requirements for FY 16 that the Maintenance & Inspection (M&I) take on some of the non-destructive inspection and tear down inspection of composite parts that have seen service time.

Joseph Pellettiere began briefing the Structural Safety Program on Slide 17. He emphasized the importance of the Crash Dynamics Roadmap (Slide 18). He highlighted four areas: single process crashworthiness, airframe structural response crashworthiness, accident analysis, and

² Presentation K was delivered by Eric Neiderman in the Opening remarks.

transport ditching. He finished the presentation with two Quad charts representing the funded requirements for FY 16.

There was no discussion from the SAS.

M³ Continued Airworthiness

<u>Structural Integrity Metallics (SIM)</u> Presenters: Mark Freisthler (FAA on phone) and John Bakuckas (FAA)

Mark presented *FY 2016 Aircraft Safety PPT Portfolio Review - Structural Integrity Metallics (SIM) Part of BLI A11.e Continued Airworthiness.* Slide 6 provides a graphic display of the research portfolio; Slide 7 shows in-house capabilities, and Slide 8 program partnerships. He emphasized the importance of partnering with original equipment manufacturers (OEMs) to promote efficient use of FAA resources. Mark and John spoke to the five Quad charts representing the funded requirements for FY 16. Active flutter suppression on Slide 10 is a new requirement. The goal is to make sure the FAA Advisory Circulars (ACs) are up to date to promote usage. John mentioned that the resources for Durability and Damage Tolerance Issues for Emerging Technologies (Slide 12) are split up five ways to match the planned outputs. He added that he works with Larry Ilcewicz on composite sample sizes. On Slide 14 Probabilistic Approach to Detecting Fatigue Damage Before Developing an Unsafe Condition (A11E.SIM.6) Mark Orr stated that this program which began under Marv Nuss is wrapping up in FY 16.

There was no follow-up SAS discussion.

<u>Flight Controls and Mechanical Systems (FCMS)</u> Presenters: R. C. Jones and Robert McGuire (both FAA)

R. C. Jones presented FY 2016 Flight Control -Mechanical Systems Review - Transport & Small Airplane Directorates (TAD & SAD). Mr. Jones presented three Quad charts representing the funded requirements for FY 16. Jim Mangie (SAS) questioned the one year effort on tire failure characteristics (Slide 5). On Slide 7 FCMS-16-03 Preventing Loss of Control in Part 23 With Sensed Angle of Attack & Better Automation John White (SAS) commented that once the sensed angle of attack (AOA) is installed, is it assumed the pilot knows what to do with it? Mr. Jones said that displays are being studied and they will be coordinated with human factors.

There was no other SAS discussion.

Electrical Systems (ES)

Presenters: Nazih Khaouly (FAA on phone) and Michael Walz (FAA)

Nazih presented FY 2016 Aircraft Safety PPT Portfolio Review - Electrical Systems (ES) Part of BLI A11.e Continued Airworthiness. He pointed out that recent aircraft history shows specific

³ Presentation M has five separate TCRG sections. Engine NDE has no planned FY 16 activity and was not presented.

vulnerabilities to overheating of lithium-ion batteries. Cleaner energy storage and generation are also drivers towards hydrogen fuel cells. But no policy or standards exist. Nazih presented two Quad charts representing the funded requirements for FY16. These will be new starts in FY 16.

There was no SAS discussion.

<u>Rotorcraft Systems (RS)</u> Presenters: Matthew Fuller (FAA on phone) and Paul Swindell (FAA)

Matt presented FY 2016 Aircraft Safety PPT Portfolio Review - Rotorcraft Systems (RS) Part of BLI All.e Continued Airworthiness. He addressed three Quad charts representing the funded requirements for FY 16. Cathy Bigelow asked on Slide 8 Continued Operational Safety of Rotorcraft (AllE.RS.3), if the research was coordinated with the Air Force. Matt replied yes and that it included wildlife avoidance.

There was no SAS discussion.

<u>Maintenance and Inspection (M&I)</u> Presenters: Dale Hawkins and David Westlund (both FAA)

Dale presented FY 2016 Aircraft Safety PPT Portfolio Review - Maintenance and Inspection (M&I) Part of BLI A11.e Continued Airworthiness. His presentation was different from the one in the binder. The updated presentation will be posted on the REDAC KSN site. Dale explained that the M&I program dovetails with both the Structural Integrity Composite and Metallic programs. He added that the primary research need is to understand the effects of age and environmental conditions on existing/aged composite/metallic bonded repairs. He addressed a single Quad chart for the only funded FY 16 requirement, Inspection and Tear Down of Bonded Repairs (M&I-16-01). This work does not begin until FY 16.

There was no SAS discussion.

N Aeromedical Research

Presenters: Estrella Forster (FAA on phone)

Estrella presented *FY 2016 Aircraft Safety PPT Portfolio Review - Aeromedical (AM) BLI A11.j.* Estrella emphasized that the focus of the program is on the most important component of the NAS – the human. The program capabilities include people and laboratories. The wet-labs deal with human tissue related to toxicology and genomics. The dry-labs do not. Instead they deal with water survival water tanks and test dummies. Capabilities also include full-scale aircraft and virtual labs. Estrella addressed four Quad charts representing approved FY 16 requirements from the Aeromedical TCRG and four Quad charts representing approved Fire& Cabin Safety (F&CS) TCRG requirements. Jim Mangie (SAS) asked on Slide 11 *FY16 Requirement AM-2 Accident Investigation & Prevention* why the focus of toxicology studies is on opiates and anti-epileptics. Starr stated that they are involved in more accidents.

Joe Del Balzo stated that the issue related to toxicology studies could be explored in greater detail during the Aeromedical Deep-Dive rescheduled for the next SAS meeting⁴ along with succession planning. There was no further discussion.

O System Safety Management

Presenters: Danko Kramar (FAA on phone) and Hossein Eghbali (FAA)

Danko presented FY 2016 Aircraft Safety PPT Portfolio Review - System Safety Management (SSM). Danko addressed the single Quad chart representing the single approved requirement for FY 16 Helicopter FDM Data Gathering & Analysis for ASIAS (SSM-16-01). Joe Del Balzo (SAS) referred to the previous SAS meeting where it was stated that ASIAS research would be complete in FY 15. Scott Lemay (FAA on phone) stated that commercial ASIAS research is complete. Mark Orr replied that the general aviation ASIAS would be complete in FY 15 but that some need for ASIAS research may always be present. Jim Mangie asked how this related to rotorcraft maintenance and inspection. Scott said that this research looks at how to process data and the subsequent analysis. Ken Knopp (FAA) added that the research providers in the Aviation Research Division do collaborate on this topic and leverage capabilities.

SAS member Andy Lacher initiated a discussion on priorities. He stated that MITRE identifies requirements each year that are organized around projects. The tradeoffs between risk, impact, and return on investment are considered in the context of each requirement. Dres agreed with this approach of looking at the total investment over the life cycle of the requirement. Mark Orr added that the Office of Management & Budget (OMB) process forces the FAA to take a year to year approach. Andy stated that the location of the Mendoza Line⁵ does not account for level of risk, technical approach, or execution quality. Joe Del Balzo concurred and added that the prioritization process serves its purpose but asked if there was some way to improve it. Mark replied that the AVS REDMT is looking at that.

Action Item 6^6 : Mark Orr will set aside one hour at the next SAS meeting to discuss improvements to the AVS prioritization process that focus on other successful programs like MITRE. Joe asked that principal participants be there in person. Topics will include risk tradeoffs in technical approach and execution quality for both short- and long-term frameworks. Joe added that Dres and Dennis Filler should participate and Andy should show examples of successful prioritization at MITRE. This is not intended as a redesign of the AVS Prioritization Process but FAA customers and their need for products should be identified. There should be a balance between short- and long-term research activities.

⁴ This addresses Action Item 1 from the 2013 Spring SAS meeting. It is being postponed with the intent to conduct the Deep Dive at CAMI.

⁵ Mendoza Line separates funded and non-funded AVS prioritized research requirements.

⁶ The SAS members added more elements during the 'homework" review. See the Appendices for the full Action item wording.

Day 3 – April 10, 2014

Eric Neiderman called the SAS meeting to order at 8:00 AM.

SAS members discussed the previous day activities and reviewed the homework assignments. They expanded on Action Items 5 and 6, and Action Item 1^7 from the 2013 SAS meeting.

For Action Item 5, they asked that the WTIC presentation identify the correlation between better weather information in the cockpit and weather related accident reduction and PART 121 efficiency.

For Action Item 6 they added specific items to be addressed in the Prioritization process improvement discussion.

For Action Item 1 from Spring 2013 they asked that the CAMI Deep Dive include discussion that provides insight regarding the selection of certain substances like opiates and anti-epileptics for research analysis and in-house succession planning for key personnel.

V⁸ Terminal Area Safety

Presenters: Jeff Schroeder (FAA on phone) and Andrew Cheng (FAA)

Jeff presented FY 2016 Aircraft Safety PPT Portfolio Review - Terminal Area Safety (TAS) Part of BLI A11.h System Safety Management. He mentioned that all the research is aimed at changing standards. He added that TAS program capabilities include NASA Ames B-737 and A-330 simulators. He presented Quad charts for each of the three FY 16 requirements. The Advanced Maneuvers work on Slide 5 is really about stall modelling. Slide 6 describes both a flight data model and an analytical model. Dres asked if the analytical model is useful with new airplanes. Jeff replied that they are because the OEMs use enough data. The work focuses on Part 121 operations due to legislation but could be expanded to GA. Slide 10 *Real-time runway friction estimate* compared two current research approaches: maximum available friction model and braking action analysis. He added that the Airport R&D Technology Branch is conducting related research. Jim Mangie added that this is a very daunting challenge and that the researchers should not be discouraged. Something is better than nothing. Jeff addressed Slide 15 *Helicopter Operational Safety Improvements Using Advanced Vision Systems (TAS-16-05)* by mentioning that the work has not started yet but that DOD is looking at this using Honeywell and Blackhawk helicopters.

Jim Mangie commented on Slide 5 *Advanced Maneuvers (TAS-16-01)* regarding the number of aircraft types necessary to study. Jeff replied that he intends to create a cookbook for others to create the models under Part 121. Jim then asked why there was no research for unstable approach. Jeff replied that the FY 16 funding was cut off by the prioritization process. John

⁷ CAMI Deep Dive

⁸ Presented out of sequence to accommodate remote participants

White asked if there is an explanation as to why you stop a project when it is near completion. Mark Orr replied that AVS managers decide the fate of a program. Jeff said he feel it was likely that funding could be restored in FY 16.

P Software and Digital Systems (SDS)

Presenters: Barbara Lingberg (FAA on phone) and Alanna Randazzo (FAA)

Barbara presented FY2016 Aircraft Safety PPT Portfolio Review - Software and Digital Systems (SDS) BLI A11.n: Advanced System and Software Validation BLI A11.d (partial): Aircraft Icing/Digital System Safety. Barbara addressed the program covered under BLI A11.d Digital System Safety. The research focused on technology changes in the industry. She presented Quad charts representing three of the four FY 16 research requirements. Barbara made the point on Slide 4 SDS Program Overview that as long as the technology continues to change the work will never be done.

During the presentation, Ed Bolton, Assistant Administrator for NextGen, made an impromptu visit to the meeting to both thank the SAS members for their guidance and to share hisvision. He stated that the four priorities are: to execute programs, to deliver capabilities, to advance collaboration, and to know how to do better. He added that the REDAC and the Subcommittees help build the foundation for NextGen.

Andy Lacher asked on Slide12 *SDS-16-04 Airborne Electronic Hardware Development Techniques and Tools funded by A11.d – Aircraft Icing/Digital System Safety* if the emphasis was being placed on commercial off-the-shelf (COTS) hardware or software. Barbara replied that the focus is on hardware as a platform.

Ray DeCerchio (FAA on phone) presented FY2016 Aircraft Safety PPT Portfolio Review -Software and Digital Systems (SDS) BLI A11.d (partial): Aircraft Icing/Digital System Safety – Onboard Network Security and Integrity. Ray explained that the program is actually broader that just network security. It should be labeled wireless security instead. Ray stated that the Boeing 787 demonstrates a significant increase in wireless connectivity to aircraft systems. The intent is to identify and mitigate aircraft system cyber security vulnerabilities and threats before the bad guys get there. The benefits of the program include new regulations, standards, guidance, and training. Ray presented the fourth SDS research requirement for FY 16 that focused on network security and integrity.

Joe Del Balzo commented on both programs with a focus on content and capability concerns. He is confident that the content is well covered but he needs to know that the research capability is keeping pace. He requested an explanation of SDSS core capability at the next SAS meeting.

Action Item 7 (Barbara Lingberg): Provide an explanation of SDSS core capability at the next SAS meeting.

Richard Barhydt (NASA on phone) presented NASA-FAA research Collaboration in Software and Digital Systems Safety Assurance Research Transition Roadmap (RTR). Richard provided

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hard copy handouts of his presentation. He stated that the RTR is similar to the research transition teams (RTTs) used by NASA and FAA NextGen office. It has been adapted to FAA AVS customers and the research is focused more on knowledge and analyses, rather than prototype hardware/software or field demos. The joint products will provide the FAA with information to support guidance, handbooks, ACs, or other aircraft certification documents. Dres asked if there are any tools to track safety cases. Richard stated that NASA Ames has such a tool.

Action Item 8 (Eric Neiderman): Provide information regarding the NASA Ames tool to track safety cases.

Andy Lacher asked if there was any work or test cases related to adaptive systems. Richard replied that current case studies may not feed into this phase of the research.

Joe and John White commented that this is an excellent example of FAA and NASA collaboration.

Q Aircraft Icing

Presenters: Tom Bond (FAA on phone) and Jim Riley (FAA)

Tom presented FY 2016 Aircraft Safety PPT Portfolio Review - Aircraft Icing 6DB With an update on Icing Weather Tasks A11.K. Tom provided the program overview and Jim Riley presented the four Quad charts representing the FY16 research requirements from BLI A11.d and two research requirements from the AVS wedge of the BLI A11.k Weather Program. On Slide 7 Simulation Methods Development/Validation to Support Appendix C Icing Certification & COS (AI-16-03) Jim stated that the emphasis is on validation of the industry developed codes and that the costs are shared equally with industry. On Slide 9 Simulation Methods Development/Validation to Cost Certification & COS (AI-16-03) Jim stated that the emphasis is on validation of the industry developed codes and that the research effort is focused on atmospheric conditions. The Darwin campaign was about two thirds through when it was halted by aircraft issues. When the work resumes may be shifted to Costa Rica due to loss of Rapid Scan Satellite in Darwin. On slide 10 Terminal Area Icing Weather Information for NextGen (TAIWIN) – A11.K: WX-03 Jim stated that the research will result in a new rule that could impact new designs for Part 25 aircraft.

Ken Knopp (FAA) added that he expects more staffing in the Aircraft Icing program, including a research meteorologist.

John White complimented the program. There was no further discussion.

Eric Neiderman called attention to the fact that this was Joe Del Balzo's last SAS meeting as Chair. Eric thanked Joe for his excellent service and leadership.

R Fire Research⁹

Presenters: Jeff Gardlin (FAA on phone) and Gus Sarkos (FAA)

Jeff presented *REDAC SAS FY 2016 By: Jeff Gardlin/Gus Sarkos - Fire Research and Safety Portfolio Review.* Jeff explained that the program has two drivers. The first is the inherent fire risk in aircraft operation due to fuels and flammable parts. The second is environmental restrictions on effective fire safety technologies. Jeff showed several slides related to recent accidents related to lithium batteries as cargo and in on-board systems. He emphasized the role of the research program in supporting the right standards and that the outputs are used in other Directorates like Security and Hazardous Materials Safety (ASH).

Gus Sarkos presented the program capabilities with an emphasis on the people, laboratories, and partnerships. He added that the work his people conduct is recognized world-wide because the laboratories enable the right projects. Gus presented the single Quad chart for the FY 16 research requirement. He provided contract funding levels on Slide 19 *Fire Research and Safety* (*FCS-16-01*): FY12 - \$3,240; FY13 - \$3,070; FY14 - \$3,910; and FY16 - \$3,000.

John White (Acting SAS Chair) asked Gus about his plans for succession planning. Gus said that he uses the Aviation Grant program as a mechanism to identify and recruit new people. Eric Neiderman added that the student intern program feeds the new hire pipeline as well.

Jim Mangie made a statement that the research work in this program related to identifying the source of smoke in the cockpit is timely and very relevant. Since the SAS meeting began, he has knowledge of four aircraft returns due to smoke.

S Propulsion and Fuel Systems

Presenters: Jay Turnberg, Tim Mouzakis, John Fisher, and Michael Gorelik (all FAA on phone) and Dave Galella (FAA)

Jay presented FY 2016 Aircraft Safety PPT Portfolio Review - BLI A11.b Propulsion and Fuel Systems PS-16-01: Advanced Damage Tolerance and Risk Assessment Methods for Engine Life-Limited Parts (Advanced Materials) and PS-16-03: Volcanic Ash Engine Ingestion. Jay differentiated between program capabilities for PS-16-01 and PS-16-03. The former uses Southwest Research Institute (SWRI) and four engine manufacturers and the later uses the Vehicle Integrated Propulsion research (VIPR). Both collaborate with NASA and the US Air Force under the lead of one engineer at the Technical Center. He presented a Quad chart for each of the two research requirements.

Michael Gorelik (FAA on phone), the newly named Chief Scientist and Technical Advisor (CSTA) for Fatigue and Damage Tolerance noted that DARWIN could be used also for nonengine critical components and engine static parts with some modification. John White asked which manufacturers were involved with the NASA VIPR to test a P&W F117 engine under varying degrees of ingested volcanic ash concentrations. Dave Galella stated that Pratt & Whitney and Rolls Royce are involved with the VIPR testing.

⁹ John White assumed the SAS Chair position after Joe departed.

T Catastrophic Failure Prevention

Presenter: Jay Turnberg for Jorge Fernandez and Bill Emmerling (all FAA)

Jay presented FY 2016 Aircraft Safety PPT Portfolio Review - Catastrophic Failure Prevention A11.f - Advanced Analysis Methods for Impact of Composite Aircraft Materials in Rotor Burst and Blade Release. Jay emphasized that the Advanced Analysis Methods for Impact of Composite Aircraft Materials in Rotor Burst and Blade Release Program (AMRBI) is the only research program that addresses engine installation issues for safety at the aircraft level. One of the tools supported by the program, LS-DYNA, is a complex tool that requires user's guide that may work its way into certification. John White asked if the tool is moving from metals to composites. Bill replied yes. Bill then presented the Quad chart for the FY 16 research requirement.

There was no further discussion.

U Alternative Fuels for General Aviation

Presenter: Jay Turnberg for Peter White and Dave Atwood (FAA)

Jay presented *FY 2016 Alternative Fuels for GA Portfolio Review – NextGen BLI A11.m.* The program was driven originally by a destination 2025 performance metric "A replacement fuel for leaded aviation gasoline is available by 2018 that is usable by most general aviation aircraft" and section 910 of the 2012 FAA Modernization and Reform Act. The research program relies almost exclusively on the FAA Aviation Fuel and Engine Test Facility (AFETF) and staff at the William J. Hughes Technical Center. Partnerships include the Coordinating Research Council (CRC), ASTM International Aviation Fuels Subcommittee, and the Piston Alternative Fuels Initiative (PAFI). Jay presented the Quad chart representing the one FY 16 research requirement.

There was no discussion.

Wrap up

John White indicated that the formal presentations were complete and that the remaining SAS members would complete their homework and submit them to Gloria Dunderman by the next day. The general consensus was that a joint meeting with Human Factors Subcommittee should be considered once a year. The SAS should also consider what type of presentation would be most beneficial in the future.

Eric closed the meeting with thanks to the FAA staff that handled all the logistics for the meeting; to the SAS members for their efforts and expertise; and the all the research presenters for their excellent work.

No dates were discussed for the Fall meeting but March 24 -26, 2015 was offered as a possible date for the next Spring meeting, location TBD.

Eric adjourned the meeting at 1:46 PM.

AGENDA (v8)

Federal Aviation Administration REDAC Subcommittee on Aircraft Safety (SAS) William J. Hughes Technical Center April 8-10, 2014 Joint HF and SAS Subcommittee Meeting Building 291E Dial in Access: 888-924-3230, Passcode: 207756 **Tuesday, April 8, 2014**

	Tuesday, Tipin 6, 2011	
8:30 - 9:00	Welcome/Opening comments	Amy Pritchett/Joe Del Balzo
	• Introductions	Jason Demagalski/
	Review of Subcommittee action items	Eric Neiderman
9:00 - 9:15	Welcome	Dennis Filler
9:15 - 9:30	Roles and Responsibilities	Cathy Bigelow
9:30 - 10:15	Budget Update	Mike Gallivan
10:15 - 10:30	Break	
10:30 - 11:15	Planned FY16 AVS R&D Strategic Portfolio	Paula Martinez/Mark Orr
11:15 – 11:30	Subcommittee discussion	All
11:30 - 12:30	Lunch	
12:30 - 2:00	UAS	Chris Swider/
	- FY 2016 Research Portfolio	Sabrina Saunders-Hodge
	- Roadmap	
	- Research collaboration (e.g., with DOD,	
2.00 2.20	NASA-Ames, etc.)	A 11
2:00 - 2:30	Q&A/Findings and Recommendations Discussion	All
2:30 - 2:45	Break	
2:45 - 3:20	Flight Deck FY2016 Requirements Briefing: Core	Kathy Abbott
	Program (Flightdeck/Maintenance/System Integration	
	Loss of Control Research Coordination	Jeff Schroeder/Andrew Cheng
	- Loss of Control Research Coordination	James Wilborn/Bob McGuire
3:20 - 3:45	Q&A/Findings and Recommendations Discussion	Subcommittee members
3:45 - 4:10	Final Report of the Performance-based Operations	Kathy Abbott
	Aviation Rulemaking Committee (PARC) Commercial	
	Aviation Safety Team (CAST) Flight Deck Automation	
	Working Group Report	
4:10-4:30	PEGASAS Center of Excellence	Pete Sparacino
4:30 - 5:00	Wrap up – Homework Assignments - Review of Action	
	Items	
6:30	Dinner: TBD	

Dial in Access: 888-924-3230, Passcode: 207756 Joint HF and SAS Subcommittee Meeting until 10:00 AM

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8:30 - 9:30	Review of Homework Assignments from Previous Day – Findings and Recommendations Discussions	All
9:30 - 10:05	NextGen - Weather Technology in the Cockpit	Gary Pokodner
10:05 - 10:30	Weather Program	Steve Abelman
10:30 - 10:45	Q&A/Findings and Recommendation Discussion	All
10:45 - 11:00	Break: <i>HF and SAS Subcommittees separate for</i> <i>individual Subcommittee meetings</i> . Shuttle bus will transport all members to Building 300.	HF – Director's Conf. Rm. SAS – CAD 2&3
11:00-11:20	SAS Opening Remarks	Joe Del Balzo, Chair Eric Neiderman, DFO
11:20 - 11:40	ANG-E2 R&D Overview	Eric Neiderman
11:40 - 12:40	Lunch	
12:40 - 1:10	Advanced Materials/Structural Safety	Larry Ilcewicz/Joseph Pellettiere/Curt Davies
1:10 - 1:20	Findings & Recommendation discussions	SAS members
1:20 - 2:45	Continued Airworthiness	Mark Orr
	Structures – Metallic (SAD & TAD)	Ian Won/John Bakuckas
	Flight Control & Mech. Systems – (SAD & TAD)	Robert C. Jones/Bob McGuire
	Electric Systems (TAD)	Paul Siegmund/Mike Walz
	$ \begin{array}{c} \text{Kotorcraft} - (ASW - KD) \\ \text{Engine NDE} & (EPD) \end{array} $	Matt Fuller/Paul Swindell
	Maint. & Inspection – $(AFS-300 \& TAD)$	Jorge Fernandez/Ed Weinstein
		Dale Hawkins/David Westlund
2:45 - 2:55	Findings & Recommendation discussions	SAS members
2:55 - 3:10	Break	
3:10 - 3:40	Aeromedical Research	Estrella Forster/
		Jean Watson
3:40 - 3:50	Findings & Recommendations Discussion	SAS members
3:50 - 4:20	System Safety Management	Danko Kramar/
		Hossein Eghbali
4:20 - 4:30	Findings & Recommendations Discussion	SAS members
4:30 - 5:00	Wrap up – Homework Assignments - Review of Action Items	All
7:00	Get-together happy hour - hors d'oeuvres (HF & SAS) 3 South Buffalo Ave., Ventnor, NJ 08406	Eric's Bungalow

Wednesday, April 9, 2014

	inuisuay, April 10, 2014	
8:30 - 9:00	Review of Homework Assignments	SAS Members
9:00 - 9:30	Software and Digital Systems	Barbara Lingberg/Ray DeCerchio/Alana Randazzo
9:30 - 9:45	NASA Research Transition Roadmap (RTR)	Richard Barhydt (NASA)
9:45 - 9:55	Findings & Recommendations Discussion	SAS members
9:55 - 10:10	Break	
10:10 - 10:40	Aircraft Icing	Tom Bond/Jim Riley
10:40 - 10:50	Findings & Recommendations Discussion	SAS members
10:50 - 11:35	Fire Research	Jeff Gardlin/Gus Sarkos
11:35 - 11:45	Findings & Recommendations Discussion	SAS members
11:45 - 12:45	Lunch	
12:45 - 1:15	Findings & Recommendations Discussion	SAS members
1:15 – 1:45	Propulsion and Fuel Systems	Jorge Fernandez/
		Dave Galella
1:45 - 1:55	Findings & Recommendations Discussion	SAS members
1:55 - 2:25	Aircraft Catastrophic Failure Prevention Research	Jorge Fernandez/
		Bill Emmerling
2:25 - 2:35	Findings & Recommendations Discussion	SAS members
2:35 - 3:05	NextGen – Alternative Fuel for GA	Peter White/Dave Atwood
3:05 - 3:15	Findings & Recommendations Discussion	SAS members
3:15 - 3:30	Break	
3:30 - 4:00	Terminal Area Safety	Jeff Schroeder/
		Andrew Cheng
4:00 - 4:15	SAS Open Action Item #3 –AVS Strategic Guidance	Mark Orr
4:15 - 4:30	SAS Recommendation Review	Eric Neiderman/Joe Del Balzo
4:30 - 4:50	SAS Feedback	Joe Del Balzo
4:50 - 5:00	Future Meeting Planning and Discussion	Joe Del Balzo
5:00	Adjourn	
5.00	rajoan	

Thursday, April 10, 2014

DISPOSITION OF SAS FINDINGS AND RECOMMENDATIONS

SAS Spring_2013_23: RE&D Planning Process (CLOSED)

SAS Recommendation: To best deal with the current environment of budget instability, the Subcommittee on Aircraft Safety (SAS) recommends that FAA consider establishing a process for establishing and reassessing research priorities across all Lines of Business. There are needs to be a single focal point responsible for the agency's research strategy (including priorities) guided by executive oversight from within the FAA. Advisory committees (such as the REDAC) might be used as a sounding board.

Joe Del Balzo stated that Dennis Filler's presentation properly addressed the issue and that the SAS considers it closed.

SAS Spring_2013_24: Flight Deck/Maintenance/System Integration Human Factors and NextGen Human Factors (**REMAIN OPEN**)

Recommendation: The Subcommittee recommends that, for funding and functional purposes, AFS and AVS explore the possibility of closely aligning human factors research requirements with the other research areas they support, even though those issues fall outside of the traditional human factors portfolio. For instance, research on artificial vision and the complexity of instrument approaches both support increasing airspace capacity, which is a NextGen issue. Additionally, the Subcommittee recommends that more support and priority be given to human factors research that supports significant new or revised regulation.

The SAS stated that they did not see enough progress in this area to warrant closing the issue.¹⁰

SAS Fall_2013_1: WTIC use of COTS (CLOSED)

Recommendation: The Subcommittee recommends that the sponsors of this research interface with other Research, Engineering, and Development (R,E&D) areas to explore COTS possibilities and with the appropriate areas in FAA to facilitate dissemination of tools and information to industry.

Based on Gary Pokodner's presentation, the SAS agreed to close this recommendation.

SAS Fall_2013_2: AVS Pop-up Process (CLOSED)

Recommendation: The Subcommittee recommends that the FAA review the process for reallocation of funding for current year or following year pop-up requirements to assure this process is user-friendly and encourage its use when research needs arise from rapidly changing situations.

Based on Mark Orr's presentation and the newly created Action Item 2, the SAS agreed to close this recommendation.

¹⁰ Spring_2013_24 and Fall_2013_3 were addressed by the SAS at the same time.

SAS Fall_2013_3: Alignment of Human Factors Research (REMAIN OPEN)

Recommendation: The Subcommittee recommends that, for funding and functional purposes, FAA explore the possibility of closely aligning human factors research requirements with the other research areas they support, even though those issues might fall outside the traditional human factors portfolio.

The SAS stated that they did not see enough progress in this area to warrant closing the issue.

ACTION ITEMS

Carryover from Fall 2013 Meeting

- 1. Provide deep-dive of Aeromedical program at the Spring 2014 meeting (this is a carryover from the Spring 2013 SAS meeting). (Robert Johnson) REMAIN OPEN
- 2. Present UAS Integration Roadmap (this is a carryover from the Spring 2013 SAS meeting). (Jim Williams) CLOSED
- 3. AVP will brief the SAS on the development of the list of emerging risks in the AVS Strategic Guidance. (Rob Pappas) REMAIN OPEN
- 4. Provide additional information on outcomes for Lower Visibility for CAT 1 Approaches and RVR Conversion, and Safety Driven Weather Requirements for Wake Mitigation. (Roger Sultan) CLOSED
- 5. Provide additional information to the members to clarify the distinction between the Quality Assessment (QA) and AWDE (Aviation Weather Demonstration & Evaluation) bullets on slide 5 with slide 17 of the Weather Program. (Warren Fellner) CLOSED
- 6. Provide a briefing on FAA efforts to document UAS research linkages with NASA, DoD, and DHS as well as efforts to identify potential research gaps. (Jim Williams) CLOSED

New Action Items:

Action Item 1: (Mike Gallivan) Provide Chris Benich with information regarding status of ground-based augmentation research in the NextGen program. CLOSED

Action Item 2: Mark Orr will provide a presentation at the next SAS meeting that shows examples of how pop-ups are working and their impact on other projects and programs.

Action Item 3: (Kathy Abbott) Kathy will provide information regarding FY 16 HF requirements that were not funded in FY 16.

Action Item 4: (Mark Orr) Mark will provide information on prioritized requirements list with Mendoza Line for FY 15 and FY 16.

Action Item 5: (Gary Pokodner) John White asked for a briefing on WTIC and Part 121 operations. Identify the correlation between better weather information in the cockpit and weather related accident reduction and PART 121 efficiency.

Action Item 6: Mark Orr will set aside one hour at the next SAS meeting to discuss improvements to the AVS prioritization process that focus on other successful programs like MITRE. Joe asked that principal participants be there in person. Topics will include risk tradeoffs in technical approach and execution quality for both short- and long-term frameworks. Joe added that Dres and Dennis Filler should participate and Andy should show examples of successful prioritization at MITRE. This is not intended as a redesign of the AVS Prioritization Process but FAA customers and their need for products should be identified. There should be a balance between short- and long-term research.

Action Item 7: Eric Neiderman will provide an explanation of SDSS core capability at the next SAS meeting.

Action Item 8: Eric Neiderman will provide information regarding the NASA Ames tool to track safety cases.

SAS members	HF Members
Joe Del Balzo (Chair)	Amy Pritchett (Chair)
Chris Benich	Chris DeSenti
Andy Lacher	Alan Jacobsen
Jim Mangie	Bill Rogers
John White	Phil Smith
Eric Neiderman (FAA DFO)	Jason Demagalski (FAA DFO)
Walter Desrosier (phone)	Jack Blackhurst (on phone)

ATTENDANCE

Participants: Kathy Abbot Steve Abelman Allan Abramowitz Kenneth Allendoerfer Dave Atwood John Bakuckas Richard Barhydt (phone) Cathy Bigelow **Regina Bolinger** Ed Bolton (Assistant Administrator for NextGen) Tom Bond (phone) Matt Brackmann **Daniel Brock** John Cavolowsky (NAS **Ops Subcommittee**) Andrew Cheng **Bill Crossley Curtis Davies Raymond DeCerchio** (phone) Gloria Dunderman Steven Edgar Hossein Eghbali William Emmerling Jorge Fernandez **Dennis Filler** John Fisher (phone) Estrella Forster (phone) Mark Freisthler (phone) Mark Fuller (phone)

Dave Galella Mike Gallivan (phone) Jeff Gardlin (phone) Jim Gregory Michael Gorelik (phone) Larry Ilcewicz **Dale Hawkins** John Hensyl **Cliff Johnson Robert Jones Rusty Jones** Nazih Khaouly (phone) Chuck Kilgore Ken Knopp Danko Kramar (phone) Paul Krois John Lapointe Xiaogong Lee Jim Lignugaris Barbara Lingberg (phone) Rich Lyon Srini Mandalapu **Carol Manning** Tom McCloy **Robert McGuire** Nelson Miller Tim Mouzakis (phone) Bridger Newman Kerin Olson (phone) Mark S. Orr (phone) Joseph Pellettiere (phone) Lynn Pham Gary Pokodner

Shawn Pruchnidli Steve Ramdeen Alanna Randazzo Jim Riley Mark Rodgers Gus Sarkos Sabrina Saunders-Hodge Andrea Schandler Jeff Schroeder Chris Seher **Tim Smith** Peter Sparacino Roger Sultan (phone) Chris Swider Paul Swindell Jay Turnberg (phone) Warren Underwood (phone) **Isidore Venetos** Tong Vu Chinh Vuong Michael Walz Jean Watson (phone) Pat Watts Ed Weinstein Dave Westlund Jim White Michelle Yeh Dres Zellwegger (NAS **Ops Subcommittee**)