

**Research, Engineering & Development Advisory Committee (REDAC)**  
**Federal Aviation Administration**  
**September 21, 2011**

**Meeting Minutes**

On Wednesday, September 21, 2011, the Federal Aviation Administration (FAA) Research, Engineering and Development Advisory Committee (REDAC) held a meeting in the Round Room, at FAA National Headquarters in the Orville Wright Building 10A at 800 Independence Avenue, SW, Washington, DC. Attachments 1 and 2 provide the meeting agenda and attendance, respectively.

**Welcome and Introductory Remarks**

Mr. Paul Fontaine, REDAC Executive Director, read the public meeting announcement and thanked everyone for attending.

Dr. John Hansman, REDAC Chair, welcomed everyone and commented that FAA Administrator Randy Babbitt and his senior leadership team had another meeting scheduled at this time and therefore would be unable to attend. He noted that the agenda for today's meeting had been altered slightly from the version previously sent out to the group.

Mr. Fontaine then opened up the conversation with the group and noted the common concern over funding throughout the various subcommittees' findings and recommendations (F&Rs). His key message to the subcommittees was that focusing on not getting enough money was counterproductive. Mr. Fontaine explained that the FAA would rather have the subcommittees focus on advising the agency on doing the best with the available funding.

Dr. Hansman then discussed his thoughts on the overall F&Rs generated from the various subcommittee meetings. He agreed with Mr. Fontaine that it was not productive to focus on the lack or lessening of funding. He also cautioned the subcommittees not to fall into the trap of asking for more funding solely in their area. The goal was not to get entrenched in silos but rather to identify priorities within the overall FAA portfolio. He went on to advise that the REDAC should not look only at the portfolio as presented, but that the group should also take a strategic view of needs that aren't being addressed.

**Budget Status Update**

Mr. Mike Gallivan briefed the budget status to the REDAC. He explained that Congress is currently considering an omnibus bill

Mr. Gallivan explained that last year, the Office of Management and Budget (OMB) passback was later than the usual late November-early December time because of various complications. He explained that timelines for this year were still fluid.

Mr. Gallivan went on to say that in the big picture, the FAA represents only a very small piece of the budget discussions; therefore, there hopefully wouldn't be too many changes/cuts to the budget as requested. He also mentioned that in a current version of the reauthorization, the Airport Improvement Program (AIP) R&D was being put into the R,E&D budget. FAA's would prefer to keep AIP R&D in the AIP budget.

Overall, Mr. Gallivan impressed upon the REDAC that the future budget is unclear. For FY 2012, the House committee approved a \$185 million R,E&D budget and Mr. Gallivan expressed his hope that the Senate would approve this level of funding.

Dr. Hansman wished to hear more about the AIP funding issue. Mr. Gallivan said that if AIP R&D was moved into the R,E&D budget, this would mean that all the AIP R&D would have to be funded within the current level of RE&D funding. No funding was being moved with the AIP R&D. This would mean a lot of additional R&D being done from the same budget, thus significant cuts to the existing RE&D and AIP research programs. For example, funding for the Airport Cooperative Research Program (ACRP) would be zeroed out and funding for the Airport Technology Research Program (ATRP) would be reduced. Mr. Jim White said that this change would have a significant impact on the whole AIP R&D program. He mentioned that new language in the reauthorization bill prohibits the spending of money on ACRP & ATRP from the AIP budget; therefore, the Airport program would have to fund their much-needed research under the already-stretched R,E&D budget. Mr. Fontaine said that this was one of the drills that the FAA would have to run to see what would be the ultimate effect on AIP.

### **Aircraft Safety REDAC Subcommittee Report**

Mr. Joe Del Balzo summarized of the Aircraft Safety Subcommittee (SAS) findings. He stated, that based on the subcommittee's review, the FAA's aircraft safety research portfolio was sound and based on solid requirements and priorities. He felt strongly, however, that some programs remained underfunded and understaffed. He went on to say that his subcommittee felt the AVS/Sponsor/Performer process was very solid but that it would be even stronger if performance coming out of process could be measured. The subcommittee was briefed on a performance tracking system for the research programs. Mr. Del Balzo explained that the subcommittee had commented via their F&Rs on how to make the system better but that overall, they felt this system was a major breakthrough and was very well done.

Mr. Del Balzo relayed that the most critical program his subcommittee reviewed was the digital software systems. He reiterated the SAS's longstanding warning that this area required substantially greater in-house core capability than available within the FAA at present. He went on to praise the research group for all that they have done to make up for the in-house FAA shortfall but warned that this wasn't an effective long-term solution. He reinforced that this was a highly critical situation that was important enough to warrant being addressed with the Administrator.

Mr. Del Balzo commented on the subcommittee's thoughts on various areas:

- 1) Icing Program – still doing great work; could also use additional in-house capability.

- 2) Human Factors (HF) – noted the steady funding decline; recommended that the FAA review all HF research requirements to make sure funding cuts wouldn't lead to unintended consequences.
- 3) Safety Management Safety (SMS)– encouraged the FAA to make sure that results from the Aviation Safety Information and Analysis Sharing (ASIAS) system be made available to the extent possible for public consumption (or at least across the FAA organization).
- 4) Advanced Materials – felt this program is a positive example of how to do things correctly with minimal funding and staff.
- 5) Civil Aerospace Medical Institute (CAMI) – second-to-none research group whose outputs support a broad spectrum of national events. This lab should be considered a national resource and as such, its funding should not be subject to annual fluctuations or uncertainty. Mr. Del Balzo urged the FAA to do everything possible to preserve and protect this capability in order to continue performing excellent work in the future.
- 6) Unmanned Aircraft System (UAS) – tremendous improvement; well-coordinated program.
- 7) Weather Technology-in-the-Cockpit (WTIC) – valuable research for a reasonable investment; a good, well-managed program.
- 8) Continued Airworthiness – good work being performed in this area.

All in all, the SAS felt the aircraft safety portfolio was right on target.

Dr. Hansman made a comment to Mr. John Hickey: the tracking system tracks schedule but should consider other factors, such as quality of the research. In Terminal Area Safety R&D, Dr. Hansman commented that onboard data collection was good and that he had gone to an airport briefing with some similar research. He wanted to know if there was any overlap and if the efforts were being coordinated. Mr. White said that they would make sure the groups were talking to each other.

Mr. Hickey responded to Mr. Del Balzo's comments and said he was pleased with the SAS's findings and support. He added that he was glad the SAS understood the prioritization process and agreed that the process was very effective. He then made some comments in response to the SAS's findings:

- 1) Digital Systems Safety – agreed that lack of in-house expertise was a serious issue but explained that challenges to rectify this existed. For example, the FAA went many years without a Chief Scientific and Technical Advisor (CSTA) for Software (although they now had one). It has been a challenge getting software experts into the organization due to great competition in that arena. In the past, they have worked with others like Volpe to leverage their skills and expertise. Mr. Hickey acknowledged that his organization's current in-house capability is challenged in terms of network security and welcomed any specific suggestions the SAS had to rectify this issue. He added that while the responsibility truly lies with the manufacturer to have this expertise, it was still best to have the high-level knowledge within the agency as well to assure that things were compliant; yet he was at a loss with how to improve upon the situation. Mr. Del Balzo said he should start by gaining an understanding of the long-term needs in digital systems. If the FAA could gather better data on future needs, then the SAS could help

from there. Dr. Hansman agreed and said that AVS was well aware of this need. He suggested that the FAA could attempt to grow the capability internally by creating a training program and making an investment in current staff. Mr. Hickey said that he took these points very seriously and appreciated the feedback; however, he noted that software and digital systems were very fluid and difficult to predict. He certainly couldn't predict how many people would be needed in outyears. Dr. Hansman agreed that while it may not be possible to plan for a precise number of people needed in the future, it was necessary to predict the overall need for expertise in software and digital systems.

- 2) Icing – Mr. Hickey did not agree that in-house expertise was lacking in this program; in fact, he was very impressed with the current expertise in this area. He reminded the group that the last icing accident on a commercial aircraft occurred in 1997. Mr. Del Balzo commented that two experts at the Tech Center were close to retirement and that there were no back-ups ready so this was a problem.
- 3) HF – This was one of the most challenging areas. It was widely known in the safety community that HF issues contribute to two-thirds of all accidents. However, the FAA HF community is struggling to identify what R&D is needed in the near-term to generate a tangible product to be implemented in the future that will prevent or mitigate these accidents. He felt that the FAA HF sponsors were not writing good requirements and that, therefore, they were not making it through the review process. He explained that while he had been trying to work with the AVS HF community, he would welcome help from the HF subcommittee to point to tangible things to do.
- 4) SMS – very proud of the ASIAs system. Historically, the FAA had performed forensic analysis of crashes. Now, they were using ASIAs to look at pre-cursors to accidents to help predict and prevent accidents. ASIAs is complicated: it brings together many streams of available information, synthesizes the data, and produces graphs. The caveat is that the FAA needs to be very careful to ensure anonymity so that the airlines continue to provide data to the system without any fear of retribution or reprisal. Dr. Hansman asked that the group make sure that the findings were made public (not necessarily the raw data); that there should be a loosening of the protection around the results of the ASIAs analysis. Mr. Hickey explained that findings were hard to define and that certain reports would never be releasable

Mr. Hickey made the final point that output from ASIAs had already led to successful interventions. He acknowledged that while many in the industry wanted better access to ASIAs and its results, his organization was reticent to let it out due to the very strict governance model already in place. More time was needed to mature the process for commercial aviation before bringing in other groups (such as general aviation). Mr. Hickey agreed to have someone who could better answer their questions on the ASIAs program provide a briefing to the John Hansman.

***ACTION ITEM:*** Mr. Jay Pardee (from the Aviation Safety - Aircraft Certification Service, Aircraft Engineering Division) and/or Mr. Tony Fazio (Director, Accident Investigation and Prevention) will provide a briefing to John Hansman on the ASIAs program.

- 5) Advanced Materials – much broader AVS-wide training was being developed for composites and damage detection; would soon start hiring “STSs”, or junior CSTAs, to serve as a resource on composites for the whole service.
- 6) UAS – serious talk of restructuring the UAS office and combining the two current UAS offices (one in AVS and one in ATO) into a single office to possibly be led by a senior executive.

Mr. Hickey concluded by seeking advice from the REDAC on one last challenge. He suggested that maybe the Fire Research and Safety Team led by Gus Sarkos could be funded through the Ops budget for some of the more routine work they do for AVS sponsors, work that is usually a pop-up requirement and falls under the heading of continued operational safety. Dr. Hansman said that was not truly unique, as other areas had pop-ups as well. He suggested that all places considered to be national resources be identified as such to maintain and continually protect them. In other words, the agency needed to establish what core competencies it had to have to be ready to respond to various needs and pop-ups.

### **Human Factors REDAC Subcommittee Report**

Colonel Jack Blackhurst summarized the HF subcommittee’s findings by saying that they had a hard time connecting the dots between the 2/3 of accidents statistic, the HF research requirements, and the HF research projects and programs that should be addressing the requirements. His subcommittee wondered whether the right research was really being performed and felt no issues could be resolved without answering this. Therefore, the HF subcommittee suggested a separate meeting be held to help connect the dots. Dr. Hansman asked whether Col. Blackhurst wanted the whole REDAC to participate and Col. Blackhurst said yes.

Col. Blackhurst then addressed the issue of connectivity between FY 12, 13, 14 HF research programs and what would happen in the outyears if programs were cut early on due to changes in funding. He concluded by noting that the subcommittee was pleased with the addition of the Human Factors Integration Lead position.

The REDAC then took a break from 11:10 PM to 11:30 PM.

### **NAS Operations REDAC Subcommittee Update**

Dr. Steve Bussolari explained that the NAS Ops subcommittee meeting had been cancelled due to the hurricane but he and Vic Lebacqz (NAS Ops Chair) had met via conference call instead to discuss various issues. One issue discussed was the group’s concern about budget uncertainty (i.e. did the FAA have the proper mechanisms in place to let contracts go to performers as priorities change). After discussion, all felt confident that the mechanisms were indeed in place. Finally, since the group had not had the opportunity to have a full meeting, they agreed they wanted to hear more about the JPDO and the role of NAS Ops in NextGen.

***ACTION ITEM:** Dr. Hansman asked Dr. Bussolari if the subcommittee could better formulate their findings into the proper format for inclusion in the letter to the Administrator.*

Dr. Hansman explained that he was looking for specific issues of concern to flag and put in the letter. He asked Dr. Bussolari to confirm that there was nothing in particular that the NAS Ops subcommittee wished to have included in the letter; Dr. Bussolari confirmed.

Dr. Agam Sinha stated that it came across in the subcommittee briefings that everything was important; for future meetings, could things be prioritized for discussion by the full committee? Could the subcommittee chairs be tasked with this? Dr. Hansman said that they would discuss this as a group, but that it was hard to do in such limited time.

Dr. Bussolari stated that from the perspective of the NAS Ops committee, they understood that the FAA had a prioritization process and that it was working; however, they wished to see what are the high priority items at future meetings and what was below the funding line. Mr. Rob Pappas said that care had to be taken in going forward with this approach; it would be difficult to look at everything below the line given the amount of time and the number of requirements. It would be easier to look at the methods and process. Dr. Hansman said that the REDAC was not looking to do just a process review. Rather, the idea behind the REDAC was to cull expertise from industry (in the form of REDAC members) and let them give advice and guidance by seeing actual activities and those which had fallen below the line in the prioritization process. Mr. Steve Alterman added that the Environment and Energy group discussed in detail the things above and below the line.

Mr. Irvine said capabilities in Validation and Verification (V&V) were a big concern amongst all the Federal agencies that have interest in making NextGen a reality. He added that this was a case where REDAC should be aware of how little effort the Federal government is putting into it and perhaps could provide their expertise to make some recommendations. Mr. Bussolari stated that the FAA had been relying on NASA to do fundamental V&V research but that now there was a threat to NASA's ability to fund and perform this research (which introduced a risk to the FAA).

### **Airports REDAC Subcommittee Report**

Mr. Ed Gervais summarized the Airports subcommittee's findings. He explained that industry had a lot of confidence in 20-year concrete life but not as much for 40-year life concrete. Funding cuts could delay needed research in this area. He went on to say that in the early days of REDAC, Airports had competed for money within the R,E&D appropriation and had only gotten ~\$ 2-3 million. It wasn't until Airports R&D was funded with AIP money that the current breakthroughs in research were achieved. It was their wish to continue that going forward. He went on to say that the ACRP was very successful and continued to help airports deal with the day-to-day issues they face.

Dr. Hansman stated that he was disappointed by the Airports' report and wanted to see more recommendations and guidance. Mr. Jim White explained that the subcommittee was very pleased with the ongoing activities and didn't have any suggestions for change. Dr. Hansman said that the subcommittee's recommendations needed to be more specific; e.g. will it be a crisis to delay certain projects? Mr. White asked to be given the chance to look at the report with Mr.

Gervais and work on it. He reiterated that the group's biggest concern was the potential AIP move to the RE&D budget. Dr. Hansman suggested that a better approach might be to highlight the important benefits coming out of the ACRP and to show exactly what would be at risk if funding were cut or changed.

The REDAC then took a break for lunch from 12:10 PM to 1:00 PM.

### **Dynamics of Change WG Report**

After lunch, Dr. Hansman explained that Ms. Vicki Cox sent her apologies for not being present for the briefing from the Change Working Group. He explained that she had been briefed on the results from the Change WG.

Dr. Andres Zellweger summarized the results from the Change WG. He explained that based on their findings, the FAA needed to create a common vision to successfully implement NextGen. Training and coaching were also important. Leaders need to make sure that changes are so instilled in the organization that things carry on even as leadership changes. Dr. Zellweger impressed upon the group the importance of having discussions with user groups; that success should not depend upon the FAA being in charge.

Mr. Fontaine asked if, out of interviews conducted by the WG, it seemed as though participants did have a shared vision of NextGen and did they know what NextGen actually was? Dr. Zellweger said, no, they did not know. Discussion ensued surrounding the importance of properly aligning user groups and working together to successfully design things, implement changes, etc.

Dr. Hansman explained that the results of the WG were useful to understand why NextGen was struggling and what to do to help it forward. Dr. Zellweger suggested that they could start with the mid-term NextGen goals since these were still in their infancy. Dr. Hansman added that a shared vision existed on pieces of NextGen and that the goal was to apply that to all parts of NextGen. Maybe now was a good point in the course of NextGen to reset and analyze how it was going, create a vision, etc. Mr. Irvine asked if it ever came up in discussion that NextGen is or is becoming a grand societal program and not just a project. Dr. Hansman asked if Mr. Irvine was implying that NextGen should not be a grand societal change and Mr. Irvine said he himself was wondering if it was. He added that they would never get there if NextGen were posed as a massive, trans-generational change.

Mr. Fontaine summarized the results presented by saying that NextGen progress would come through cutting across the agency and banishing silos. He explained that management was currently talking about these things within the organization; in fact, Vicki Cox had formed a Change Leadership Team with members from across the new NextGen organization to push change down through the ranks. Mr. Fontaine further stated that Dr. Zellweger's WG report had come at a timely juncture and its results were in keeping with what the management team had already been thinking and doing. Mr. Alterman asked how the results of this WG could be shared with external groups. Dr. Hansman suggested that if the FAA approached outside groups with the results in mind that would work to get people together and to create a shared vision.

Dr. Hansman stated that he would make sure to include this suggestion in his final letter to the Administrator. Mr. Fontaine felt this was a great point (i.e. how to go about implementing the recommendations of the WG) since the FAA had been struggling with the broadness of NextGen.

A member of the public mentioned that the National Oceanic and Atmospheric Administration (NOAA)/National Weather Service (NWS) had similarly reached out to stakeholders via a two-day offsite meeting to foster and generate open dialogue, buy-in, and ideas from various stakeholder groups. He suggested that someone on the REDAC might want to speak with Mr. Jack Hayes and the people at NOAA/NWS to learn from their experiences. Dr. Hansman felt that it might not be as easy to do this on the FAA side due to the sheer amount and undefined nature of NextGen stakeholders; however, he planned to take the letter written by the WG and forward that up to the Administrator. Mr. Del Balzo said he felt the WG had provided a good report but wondered what the Administrator should do next with it. Dr. Hansman conjectured that Mr. Babbitt might pass the report back to Ms. Cox and have her implement the findings and suggestions wherever relevant. Mr. Fontaine agreed and said that Ms. Cox intended to share the findings with her organization. Mrs. Gloria Dunderman added that Ms. Cox had requested a condensed version of the WG's report to do so.

Finally, Dr. Hansman felt that the REDAC and the FAA could benefit from keeping the WG on-call for the future and Dr. Zellweger felt that would be reasonable. Dr. Hansman asked the group to present a motion to approve the continuation of the WG and, after being seconded, the motion was approved.

### **Environment & Energy REDAC Subcommittee Update**

Mr. Steve Alterman then summarized the Environment and Energy (E&E) subcommittee's findings by saying that nothing had changed since the group's last meeting in terms of their recommendations and prioritization of efforts. He cautioned that while the subcommittee had identified priorities as less important than others, those research efforts were still important. Overall, they felt that E&E continued to do a wonderful job, both in terms of supporting the FAA and with NextGen overlays. He relayed that the subcommittee was pleased that several research programs were approaching implementation and encouraged the E&E group to keep up that momentum. He once again urged the FAA to continue the expansion of cooperation across agencies (e.g. EPA and NASA) and to be mindful of identifying and eliminating any duplication of efforts in order to better use scarce funding. Mr. Alterman used the CLEEN program as an example and said that as it developed, the FAA should put a priority on working hand-in-hand with NASA to integrate the next and newest technologies into the program.

Mr. Alterman went on to advise that, to the extent possible and to get early input and mitigate problems, the FAA should involve certification people earlier in the process as research products approached implementation. Dr. Hansman stated that this issue was broader than just E&E and suggested the subcommittee amend the finding to not specify E&E. Mr. Alterman felt the so that the research plan included an implementation plan. Mr. Carl Burleson warned against being too specific in the recommendation, since building in an implementation plan would vary by area and said that he was supportive of the recommendations made by the E&E subcommittee.



***ACTION ITEM:*** Mr. Alterman will redraft the recommendation on operational use/implementation and will then give it to Dr. Hansman to distribute to the group.

Mr. Irvine then wanted to follow up on the recommendation regarding alternative fuels, since he was concerned that the Administrator might mistakenly conclude that the Commercial Aviation Alternative Fuel Initiative (CAAIFI) group was not reaching out rather aggressively. Mr. Alterman explained that the purpose of the recommendation was to praise the effort and that it shouldn't be interpreted otherwise.

### **Group Discussion**

Dr. Hansman summarized his take-away from the meeting, which he would summarize in his letter to the Administrator:

- 1) Importance of in-house capability in digital systems research
- 2) Making sure the appropriate information from ASIAS is disseminated to as wide an audience as possible.

Dr. Hansman wanted to highlight the concern that much has been invested in ASIAS and that, as such, it was important that the FAA encourage the sharing of the results. He reminded everyone that Mr. Hickey had offered to provide a briefing on ASIAS and its governance model.

- 3) Positive note on UAS
- 4) Setting up an HF workshop or summit to look at and discuss what is driving the need for HF research.

Mr. Fontaine proposed that this discussion be combined with the ASIAS meeting. Dr. Paul Krois suggested that Dr. Kathy Abbott's report from the Performance-based Operations Advisory Rulemaking Committee (PARC) group may help, although the report was not yet available. Mr. Fontaine said that before launching any meeting, the group should strategize about what exact aspects of HF needed to be looked at, discussed, etc. Dr. Hansman said maybe the overall recommendation to the agency should be to inventory all HF activity within the agency (showing the drivers, requirements, and research plans). Dr. Krois said there were HF requirements generated from the HF TCRG that could be shown to the group. Mr. Del Balzo said that they had already gotten a briefing from Dr. Abbott (which was very data driven), but the difficulty they faced was in making the connection from the requirements to the actual research programs.

***ACTION ITEM:*** Mr. Fontaine will provide a plan to Dr. Hansman to address the HF R&D issues raised within two weeks.

- 5) V&V of NextGen software
- 6) Operational use/implementation recommendation that Mr. Alterman is charged with drafting.

The last issue Dr. Hansman wanted to discuss was whether or not the REDAC process needed to be modified. Mr. Fontaine stated that what he saw in terms of the various subcommittees'

recommendations was multiple, separate laundry lists, not a prioritized list. Dr. Bussolari stated that the NAS Ops subcommittee wished to be able to identify gaps in the research portfolio and comment on the quality of research. Dr. Hansman asked if there was a way to tweak the guidance given to subcommittees so they would provide more useful recommendations (e.g. provide strict guidance not to ask for more money, since this was not useful or helpful). He added that he liked the E&E subcommittee's approach of outlining four specific research areas that they felt were of the highest priority. Mr. Fontaine stated that the FAA was looking for confirmation and wanted the REDAC overview of the importance of various R&D activities across subcommittee boundaries to help inform how the FAA would strategically make funding cuts (if and when cuts were necessary).

Mr. Burleson mentioned that the FAA had a new strategic plan (Destination 2025) and said it would be helpful if the subcommittees would take this plan into account when looking into the activities going on at the FAA. Dr. Hansman said he could provide guidance to the subcommittees to evaluate the research portfolios within the context of the new strategic plan. He added that it would help if the FAA directly related their research plans to Destination 2025 in the presentation made at the subcommittee meetings. Mr. White cautioned that the high priority items are generally always funded and that the real problem needing to be addressed was how to balance the 'below the line' items from all of the different lines of business (e.g., AVS and AIP). What would be an equitable way of comparing these across vastly different groups?

Dr. Hansman said his goal was to find a way to recommend something that will be acceptable to and used by the FAA. He explained that he was happy to adjust the tasking to the subcommittees to make the results of the REDAC process more tailored to what Mr. Fontaine and the FAA needed. Mr. Fontaine agreed that all involved needed to do a better job of framing the thought process for REDAC to maximize the quality and effectiveness of its outputs.

The meeting was adjourned at 2:51 PM.

## **Attachment 1**

**Research, Engineering and Development Advisory Committee**  
**Federal Aviation Administration (FAA)**  
**800 Independence Avenue, SW Washington, DC - 10<sup>th</sup> Floor Round Room**  
**September 21, 2011**

### **Agenda**

9:30 am	Welcome	Paul Fontaine John Hansman
9:45 am	Update – Organization, etc.	Paul Fontaine
10:00 am	Update – Budget	Mike Gallivan
10:15 am	Subcommittee Report – Aircraft Safety	Joe Del Balzo
10:45 am	Subcommittee Report – Human Factors	Jack Blackhurst
11:15 am	Break	
11:30 am	Subcommittee Report – NAS Operations	Steve Bussolari
12:00 noon	Lunch	
1:00 pm	Out brief of Change Working Group	Dres Zellweger
2:00 pm	Subcommittee Report - Environment and Energy	Steve Alterman
2:30 pm	Subcommittee Report – Airports	Ed Gervais
3:00 pm	Committee Discussion	John Hansman
	- Recommendations	Paul Fontaine
	- Future Committee Activity	
3:30 pm	Adjourn	

**Members:**

Dr. John Hansman – REDAC CHAIR (Massachusetts Institute of Technology)  
Mr. Paul Fontaine – REDAC EXECUTIVE DIRECTOR (FAA)  
Dr. Steven Bussolari (MIT Lincoln laboratory)  
Mr. Edward Gervais (Boeing Commercial Airplane Company)  
Dr. Agam Sinha (MITRE/CAASD)  
Mr. Joseph Del Balzo (JDA Aviation Technology Solutions)  
Mr. Jack Blackhurst (USAF – Air Force Research Laboratory)  
Mr. Steve Alterman (Cargo Airlines Association)

**Other Attendees:**

John Somensky (TASC)	Siddharth Gijji (FAA)	Micheal Dudley (JPDO)
Cathy Bigelow (FAA)	Ken Knopp (FAA)	Steve Vail (SEWE)
Jim White (FAA)	Andrew Lacher (MITRE)	Robert Pappas (FAA)
Matt Crouch (FAA)	Dale Hawkins (FAA)	Paul Krois (FAA)
Lee Olson (FAA)	Nick Stoer (Stoer & Assoc.)	Dres Zellweger (Self)
Steve Zaidman (Noblis)	Julie Thompson (Evans)	Marcy Babizz
Xiaogong Lee (FAA)	Mike Gallivan (FAA)	Jim Knight (FAA)
Gloria Dunderman (FAA)	Aisha Staples (ATG)	Alexandra Papantoniou (ATG)
Denise Davis (FAA)		