National Airspace System (NAS) Operations (REDAC) | Day One Minutes -August 27, 2013

Meeting date | **Time** 8/27/2013 8:30 am | **Meeting location** Allied Technology Group, 600 Maryland Avenue, SW, Washington, DC

Purpose	REDAC Guidance for the FY 2016 R&D Portfolio
Facilitator	Eric Neiderman, DFO
Note Taker	Aisha Staples

Presentation Welcome and Overview | Presenters Steve Bussolari and Eric Neiderman

Discussion - Dennis Filler joined the meeting via teleconference. Steve Bussolari (NAS Ops Subcommittee Chair) welcomed everyone to the meeting and reviewed the agenda. He reviewed the REDAC suggestions and open actions. There were seven open actions; two of which were old (from the REDAC database). The open actions were briefly discussed.

The following areas were highlighted:

- Idea to Implementation (I2I): Surface and DataComm capture teams have been established. I2I has been institutionalized and is now a part of the formal FAA Acquisition Management System (AMS).
- There are at least three established capture teams so far for Surface. (A response to one of the open actions): Performance-Based Navigation and Data Comm. These teams are being established across multiple functions to fulfill various roles in an effort to create a continuity of operations as technology continues to go through the acquisition cycle. There were some questions surrounding how the capture teams are formed. The capture teams are formulated with a combination of individuals in acquisitions, logistics, and planning.

Presentation Welcome/Holistic View of Research | Presenter Dennis Filler

Discussion: Dennis Filler briefed the group on some of the latest changes within the Agency:

- There is a new FAA Deputy Administrator, Michael Whittaker
- The new Associate Administrator for NextGen is Major Gen. Bolton, USAF, who will start on or about September 9, 2013

The Administrator has established two groups: the Executive Council, which is more strategic and the Business Council, which is more tactical. There will be changes based on outputs of the Executive Council and the expectation is that strategic plans for the Agency as a whole will change.

Some of the areas to be impacted are the NAS and Phase I for NextGen. The changes for the NAS will include right-sizing (controlling operational costs). NextGen changes will include setting this initiative up in phases, which will be wrapping up in FY 2015. There was concern

about pushing research into future phases for NextGen; Mike Whittaker will be the lead on this task.

One of the key points mentioned was the importance of identifying high-level research needs. Dennis provided a list of the strategic initiatives set in place by the Executive Council.

- Right-sizing the NAS: This could include eliminating some legacy functions. This is seen as the most important efforts.
- UAS Integration: Deals with integration to the NAS. This is more undefined than defined; this is one of the top five priorities.
- Commercial Space: The Agency needs to leverage all of NASA's historical research so that they do not have to reinvent the wheel. In addition, the FAA needs to expand its thinking as a Research and Development Community. This is also a research priority.
- Global Leadership
- Personnel: Ensuring that FAA has a sustainable workforce.

Dennis noted that the FAA needs to make sure that the research areas are touching on the topics provided by the Executive Council (mentioned above) moving forward. He added that this looks like a five-year plan. Based on the four to five-year terms of the current FAA executive staff, there appears to be some stability in the area of leadership. Dennis stated that it will be important for the Research and development Executive Board (REB) to provide quarterly status reports on all of the Agency's R&D projects. The reports will be communicated across the Agency and to stakeholders and industry.

Dennis confirmed that although the metrics that will be used to track and monitor the progress of all the research initiatives, the FAA is still working to define details. He added that the most important consideration is the effectiveness of the report in creating transparency and accountability at an Agency level. The FAA needs to quantify the needs and the problems and develop the portfolio accordingly.

Steve Bussolari highlighted a previous recommendation from the Subcommittee requiring the FAA to use a more holistic view of the research. He reiterated that the Subcommittee would be willing to provide feedback and assist with the development of a method to produce the transparency that the Subcommittee and the REDAC have recommended.

In addressing the concern of how to reshape the research portfolio for FAA, Dennis stated that they will need to assess the adaptability of the research environment to address the Subcommittee's recommendation. He added that the expectation is that the first opportunity to adopt a more holistic view would be for FY 2016 at the earliest and more likely in FY 2017. The key is to have a manageable solution that will allow the maximum amount of value for the minimum amount of cost. Dennis anticipates various levels of collaboration across the FAA.

Human factors element impacts everything that is done at the FAA. He asked the Subcommittee to focus on human factors because there is a need for solid research requirements that are being used to solve near-term problems and deliver value to the Agency. He reiterated that research is at the intersection of people, process and technology, and he urged the Subcommittee to look at research in a more integrated way.

In response to inquiries about cyber security, Dennis stated that he is not aware of any RE&D research activities across the Agency. He did state that they are looking at security within the aircraft (work done in Facilities and Equipment (F&E) and Operations (Ops) appropriations, but no activity is taking place across the NAS. Eric stated that the Joint Planning and Development Office (JPDO) has existing work efforts in software and digital systems within an aircraft to help identify high-level issues. Dennis added that the Department of Defense is currently conducting research on specific vulnerabilities within the FAA that need to be addressed; however, there is not a focused effort on cyber security at this time.

In response to the general Committee's recommendation, Steve stated that the challenge is mapping research and personnel that is set three years in advance. They both have to align with existing needs. The mapping process is set by the FAA, it is not congressionally mandated. In theory, the change can be made, but it will be difficult.

Action items		Person responsible	Deadline
1.	Set aside time for Subcommittee to review the development of high level research initiatives.	Subcommittee	[Closed]
2.	Provide written material to Subcommittee prior to next meeting.	Maureen Molz (DFO)	[TBD]
3.	Provide copy of the FAA Administrator's response from Spring 2013 meeting to all members.	Eric Neiderman	[TBD]
4.	Talk to John Hansman to determine the benefits of a special study team to address issues of holistic research/metrics.	Subcommittee	[TBD]

Presentation FY 2013 NARP R&D Principles and Goals | Presenter Cathy Bigelow

Discussion: There was some discussion prior to Cathy Bigelow's presentation about the FAA National Aviation Research Plan (NARP) reorganization and the long-term plans for the NARP. Cathy began the presentation by providing background on why her office decided to reorganize the NARP (Slides 3 and 4 of the NARP presentation), and the development process behind reorganizing it (Slides 5-7). Cathy briefed the R&D goals and outcomes related to Aviation Safety, Efficiency, and Environment and Energy.

Follow-up Questions and Concerns

- In response to Debbie's question about efficiency (Slide 6), Cathy stated that the research does not address "internal" efficiency for the FAA, referencing Slide 9, the Efficiency R&D Principle and R&D Goals deal with the efficiency of the air transportation system.
- Commercial Space R&D is not reviewed by any REDAC Subcommittee. Commercial Space Transportation Advisory Committee (COMSTAC) is provides information, advice, and recommendations to the FAA Administrator on matters concerning the U.S. commercial space transportation industry, including R&D.

- It was noted that none of the goals have quantifiable metrics. Cathy stated that they will tie the goals in with Destination 2025 metrics and objectives. The challenge is the available timeframe. This will be an action item in the future.
- Slide 26: The goal was not comprehensive enough.
- Cathy confirmed that "noise" was included as a consideration within the Environmental Impact goals.
- It was recommended that the FAA change the verbiage "space safety" to "space vehicle safety" because the first term does not accurately reflect space safety operations within the NAS. Space vehicles operate in the atmosphere, not in space.
- Ken Davidian may come to brief and answer questions on Commercial Space in future meetings.
- It was recommended that the goals be restructured to address research priorities and impacts as opposed developing the goals to cover existing R&D iwhtin current budget line items (BLIs).
- Slide 26 (Efficiency R&D Goal 7) needs to be revised to provide a more comprehensive goal.
- It was reiterated that it is critical to develop a holistic view of FAA research along with developing a process for tracking how existing programs are progressing and figuring out how the data/information can be used to set up an R&D program that meets the seven focus areas defined by the Administrator's Strategic Council. There also needs to be quantitative goals and clear budget allocation.
- Recommendation from the Subcommittee is that more detail be provided on the research goals and budget prioritization of those goals for NARP. Steve will attempt to draft the first recommendation.

Action items		Person responsible	Deadline	
5.	Verbiage Change ("space safety" to "space vehicle safety").	Subcommittee	[Closed]	
6.	Provide more detail on research goals/budget prioritization of goals for the NARP.	Cathy Bigelow	[TBD]	

Presentation *Budget Overview* | **Presenter** *Mike Gallivan*

Discussion: Mike Gallivan explained that "rescission" is a term used to describe how the government disburses a specific amount of funds and then takes back a percentage of those funds.

- Slide 3: Mike briefly explained the marked differences between FAA's requested budget and the House and Senate marks. The RE&D total funding was approximately one percent (1%) of the FAA's budget. In FY 2014, there were substantial decreases in each of the appropriations (Operations, F&E, RE&D and AIP).
- Slide 4: Mike noted that most of the cuts on the House side were to the NextGen programs; zeroing out the JDPO. The Senate only reduced the JDPO budget by \$3M. He added that the budget cuts were an indication that JDPO has some work to do on Capitol Hill describing the needs for their program.

- Slide 5: Although the House and Senate did not add any money to NextGen Alternative Fuels for General Aviation (GA), they are supportive of the program. It has been the topic of discussion and is a program the FAA should look at continuing for as long as needed. Mike also noted that the Centers of Excellence require matching funds, so it creates more leverage on funding resources.
- Slide 7: For the FAA, the Senate mark of \$56.5M is more workable than the Senate mark.
- Slide 8: Based on the significant gap between the House and Senate marks, Mike stated that it is unlikely that the House and Senate can agree on a budget),. There is still a concern that FAA will be under a year-long CR again for FY 2014 (total of 7.2% off FY 2012). Under the additional CR, it is expected that the FAA will work from FY 2013 funds. Mike stated that the FAA would prefer to do cuts at the activity level because it provides more flexibility for which BLIs will be cut.
 - It was noted that the Ops Account is 70% personnel and 30% contracts.
- Slide 12: It is very unclear what the budget future is for FAA.

Mike stated that there have been no discussions about alternative funding sources.

Action items	Person responsible	Deadline
7. Distribute the Budget presentation to the	Gloria Dunderman	Done
Subcommittee and upload to REDAC site.		

Presentation: *ATC/Tech Ops Human Factors (Controller Efficiency and Air Ground Integration)* F&E 1A08A | **Presenter** *Rachel Seely*

Discussion: Rachel Seely began her presentation by discussing the impact that NextGen has on the NAS actors; they are looking at the integration of the different NextGen technologies and procedures on the NAS actor (looking cross-program). Their main method of input is guidance from that cross-program perspective. This may be captured in cross-functional requirements.

- Personnel costs are a huge component of the NAS. The Human Factors (HF) Division is looking at the human factors impacts relative to the changes and will use that information to help identify areas for greater efficiency.
- The research budget is negotiated with the Chief Scientist for NextGen at the beginning of each year. The HF Division is in the process of getting their FY 2013 Program Level Agreement (PLA) signed at a funding level of \$3.6M (it is three-year money, i.e., they have three years to spend it). Each PLA presents a research plan for one year of funding (F&E or RE&D), and the funds are three-year funds.
- The Air Traffic Control impacts on UAS have not been a focus of NextGen. In the future HF Division will look at what type of training will be needed.
- There is a high-level focus on the roles and responsibilities of the controller. The core role of the controller does not change in Segment Bravo; but the method and techniques change. This will have a big impact on training.

Action items

• Rachel confirmed that they are looking at minimizing environmental impacts and the decrease in communication between pilot and controller as research topics.

Person responsible Deadline

	Action nems		
8.	Upload the strategic HF plan on REDAC KSN for Rachel Seely	[TBD]	
rev	view.		

Presentation *NextGen ATC/TechOps HF* (*RE&D A11.i*)| **Presenter** *Dino Piccione*

Discussion: Dino stated that the presentation would be given in two parts: (Program Structure/Strategy), and (Safety Training/Operations) by Jason Demagalski. Dino referenced the strategic plan, which dealt mainly with personnel selection.

- All programs are geared to achieving the main objectives outlined in the strategic plan. It was noted that all personnel selection work would be ending soon.
- They will still have continued efforts on sponsor requirements. The four research groupings will include: Human Centric Design (includes Human Factors standards), Human Systems Integration, Safety and Operations, and Training and Facility Placement.
- Human Factors Design Guide is a document used on every major acquisition within the FAA. A large number of people in/ outside of the agency use this document.
- One of the challenges will be how to get a controller to accurately interpret data on a time-based display (spatial orientation).
- There is a lot of research being done to determine how Human Factors should be integrated into the AMS.

Follow-up Questions and Concerns

- The challenge for the Subcommittee is to provide guidance of future activities in FY 2016 if the activities for that year have not been solidified. Jason presented on Human Factors and Safety Operations. The following key points were mentioned:
 - This initiative is for them to look at the end-services management component. They look at the integration of the tools and the learning. They examine it at the facility level and at the controller level individually.
 - Safety and Technical Training Service Unit (AJI) develops a list of top five safety hazards.

Jason provided a brief overview of the scope of research having to do with training, specifically dealing with Air Traffic Controllers absorbing the training information. He added that HF is broken down into the following components:

- Conceptual identifying the roles between pilots and controllers.
- Development of standards after evaluating the roles.
- Research aspect of training how to make it better.
- There was some discussion about whether the HF research is geared toward solving short-term or systemic HF issues.
- The main concern by the Subcommittee was identifying research that will tell us what we don't know, and what we need to know to make NextGen successful? In addition, what type of standards should be set for training support, etc.?

- Another concern is that the standards development efforts have been largely supported by contracts and those contracts are being cut. Do we have an idea of how that particular function will be handled in-house? If we don't, the standards development component for the various research areas becomes weakened.
- Bill Leber asked if they have looked at space where active ATC comes and goes; closing towers vs. not closing towers; staffing vs. not staffing. These are all considerations under budget constraints. Dino confirmed that they are looking at those aspects in the long-term.

Presentation NextGen System Development | **Presenter** Steve Bradford

Discussion: Steve Bradford began his presentation by providing an overview of the requirements that are mainly responsible for research related to infrastructure. He stated that he typically tries to identify areas where there are gaps between decisions, concepts, and implementation.

- By FY 2015, they hope to have all the necessary data to move the Multifunction Phased Array Radar (MPAR) project into the implementation phase (as a replacement for RADAR)
- The DataComm requirements document should be done by FY 2015.
- FAA did not have a capability to load the data from Weather research into the NAS. Starting in FY 2014 and FY 2015, that capability will be listed in the requirements for the new ATM.
- The FAA is also working on developing separate techniques to display information in the aircraft.
- There is a need to simplify the standards for aircraft procedures; there was a discussion about the problems Europe had with DataComm.

Follow - up Questions and Concerns

- Steve confirmed that they are trying to get the integration of Weather data into the NextGen.
- The NextGen System Development investment stays between \$18M \$22M annually.

Presentation Operations Concept Validation | **Presenter** John Marksteiner for Rob Hunt

Discussion: John began the presentation by providing an overview of the NextGen Concept Validation Modeling (OCVM). He noted that he would also brief portions of Rob Hunt's presentation in his absence. John stated that the Operations Concept Validation and Infrastructure Evolution (ATDP) is no longer under his purview; it is scheduled to transition over to ATO (AJV-7) under Rob Hunt by FY 2015. John went on to provides status updates for the REDAC Recommendations that were made in FY 2012:

• Slide 3: Referencing the REDAC's recommendation 1, there were some minor updates made this year and major updates are expected by Fall FY 2014. It was noted that Paul Fontaine felt that the Research Plan template was very useful in providing a summarized view of the Agency's research needs to decision-makers.

- John clarified that the Research Plan will be fully updated by Fall of FY 2014. He also confirmed that the Research Plan had been provided to the Subcommittee. Copies of the Research Plan were provided again to the members of the REDAC to help them understand the scope as well as a breakdown of each section.
- Slide 4: Referencing the REDAC's recommendation 2, the Research Plan entailed several action items that address the Subcommittee's recommendations. Two out of the three action items were approved, see presentation for more detail.
- John stated that some actions were funded using FY 2012 funds, and the budgets for FY 2013 and FY 2014 were adjusted based on the momentum. John noted that approval of research was based on prioritization.
- Slide 5: Referencing the REDAC's recommendation 3, John stated that four research activities were included in the Research Plan that was developed; however, none of the research activities were approved. John stated that part of that may be due to the way the proposals were written and there are research constraints.
- There was concern about how the responses to the recommendations were communicated.
- There needs to be a justification for action items not being approved. 11 out 25 action items were approved.

The Subcommittee's finding is that there is no research going on at this point that adequately addresses any of the recommendations. Although, the action items were suggested, they were not approved. It was asked that a justification be provided when the recommendation is not addressed (point to research or state that there are budgetary constraints, etc.). The Subcommittee requires an FAA response, not an ANG response.

- Slide 6: Referencing the REDAC's recommendation 4, John stated that all three of the suggested proposals were approved.
- It was asked whether "performance-based" was ever used in conjunction with vertical ascent and descent rates. John stated that this has not been seen as of yet. There is no performance –based requirement aside for the minimum of 500ft/minute as stated in the AIM.

It was decided that this action would be left open until John can validate whether the items listed in the Research Plan fully address the Subcommittees' concerns on Mixed Equipage and Complex Clearances (clarification asked for by Debbie). The response can be in the form of a letter stating that the questions were followed up.

- Slide 7: John stated that in FY 2012, he saw \$7M of the \$8M. The request for FY 2014 is \$5M; the expectation is \$3.5-\$4M.
- A question was asked as to whether ANG monitors their research activities to see if the necessary elements (ConOps Validation) are being developed for the midterm. The concern is that the research efforts may be falling short. It is really hard for the Subcommittee to judge whether the funding is enough to sustain the research efforts.
- Slide 8: The Sequestration may impact the funding for upcoming fiscal years. This presents a challenge for the FAA. For example, the ConOps are all focused on mid-term.

- The question was asked as to why there appears to be a reduced amount of control on the research efforts. John stated that reorganization and the designation of roles and responsibilities makes it difficult to synchronize research efforts.
- There was also concern about how tracking is done on funding provided for specific projects, such as ConOps. John stated that under the Application Management System (AMS), validation is a part of the process. There is no approval system other than the AMS. Overall, the Subcommittee agreed that they need to see what is actually being done with the funds provided.

There was an extensive discussion about the budget and the various line items, as it relates to checks and balances (validation of ConOps).

- Slide 9: John briefly provided a summary of the FY2014 plans as it related to Operations Concept Validation/Modeling (OCVM).
- There was a concern with the overlap of Trajectory Ops and ConOps; the Subcommittee would like to see the linkages. John stated that the Trajectory Ops document addresses the linkages and that he would provide copies. Is there taxonomy of the different levels of ConOps? John stated that there is a hierarchy system set up for ConOps.
- Slide 10: The FY 2015 Planned Activities have been broken down into more detail. Statuses were provided as to how the activities are being funded, or set to be funded through a contract vehicle.
- Slide 11: The FY 2016 Focus Areas listed were ones that were expected to carry forward based on the research currently being done and guidance provided.
- Slide 12: John highlighted the current research efforts for FY 2013. He provided subsequent slides (Slide 13-26) with brief descriptions of projects, collaborative efforts, accomplishments, milestones and projected timelines for the various research activities.

Action items		Person responsible	Deadline
8.	Re-send Multi-year Research Plan.	John Marksteiner	[TBD]
9.	Send out the TBO Con Ops.	John Marksteiner	[TBD]
10.	Send copy of the concept hierarchy.	John Marksteiner	[TBD]
11.	Send letter of response for Subcommittee's concerns	John Marksteiner	[TBD]

Presentation JPDO Overview/Update | **Presenter** Karlin Toner

Discussion: Karlin Toner began her presentation by noting that this year marks the 10-year anniversary of NextGen. She recapped the "funnel" that was discussed in the March meeting, adding that there is a lot of pre-implementation research going on in the FAA. The following points were highlighted in the presentation:

• Slides 1-2: This reemphasized the important role the JPDO has in the FAA of establishing research priorities need for NextGen 2025 and beyond. She is concerned about the gap that may be produced because the research done appears to be ahead of existing technologies.

- Slide 3: The number of documents being published does not accurately gauge the program successes. Karlin raised the concern that the FAA's NextGen research timelines are now starting to span up to 2025 and beyond, which creates a problem.
 - It was asked where the research priorities overlap on a holistic level. The intention is to develop a holistic view across the Agency under Dennis Filler's leadership.
 - Referencing Slide 1, Bruce asked for clarification on the relationship between the JPDO and industry (JPDO and NextGen Institute). Karlin explained how the JPDO engages the private sector (the Institute) and provided an overview of the research engagement process.
- Slide 8: Karlin discussed the directives set by OMB last year, specifically focusing on how the research for JDPO is selected. Further detail can be found under "Research Requirements." The funding for JDPO was at its peak (\$35M annually) in FY 2008. However, in FY 2012, House Appropriations reduced the organization's budget significantly (by more than \$25M). Karlin stated that she is working with Department of Transportation (DOT) to come up with a sustainable budget. UAS continues to be a research priority.
 - Karlin mentioned that one of the trends in research that has caused concern is the failure to conclude the efforts. It appears that the FAA may not be asking the right questions to guide the research to an appropriate conclusion.
- Slide 6: UAS continues to be valued research that JDPO anticipates continuation of in FY 2014 and FY 2015. It is imperative that cyber security become a part of the discussion when it comes to research. The reason is that we are developing capability to connect information and data on the ground with information and data in the air. Therefore, the protection of that data is a priority.
 - Automation: According to Karlin, FAA is not quite ready for automation. However, there is a need to figure out how to frame the research and bridge the communication/information gaps between organizations. There was further discussion on the benefits of autonomy and automation. In addition, the members discussed examples of what demonstrations would look like.

- What is the basis for the FY 2014 budgeting levels? Karlin confirmed that \$8M is a sustainable budget but \$5M, which was originally proposed for FY 2013 is below critical mass.
- Karlin mentioned that JDPO's role should be to bridge the gaps that are formed between research and technological capability.

There is an underlying concern about the decrease of JDPO's budget and the FAA needs to have a response. The Subcommittee is going to rewrite a recommendation with the formulation of a holistic view of research (short and long-term). This will include involving external organizations like NASA and JDPO and that collaboration validates the importance of JDPO's existence. There are two key points: 1) prioritize the research and 2) coordinate inter-agency collaboration.

The Subcommittee decided to make the importance of JDPO's function a Finding. The accompanying Recommendation will highlight the importance of the JDPO's function and deal with inter-agency collaboration; JDPO makes this a reality. Bruce was tasked with drafting the finding. There was further discussion among the members about the definition of "holistic". It was suggested that the definition also include "managing uncertainty."

Presentation *Runway Incursion Reduction* | **Presenter** *Benjamin Marple*

Discussion: Ben began his presentation by stating that there is a lot of uncertainty in what they are currently doing with Runway Incursion. His group identifies ways to reduce runway incursions through prototyping and testing new technologies. The uncertainty aspect comes in with the runway status lights and enhanced Final Approach Runway Occupancy Signal (eFAROS) project.

- Slide 2: The successes for Runway Incursion Reduction are measured through the goals identified in the Research Management Plan (RMP). The biggest success was when the Inspector General's Office (IG) audited their efforts and found that their Runway Status Lights (RWSL) decreased runway incursions by 70 percent during testing.
- Slide 3: The Subject Matter Experts (SMEs) consist of air traffic controllers and pilots. MITRE has been influential in the simulation testing.
- Slide 4: For some of the planned activities, there is a system a Dallas Fort Worth (DFW) and in Boston that is testing eFAROS, however, that site will soon be closing because they have gathered enough data at Dallas on runway status lights. The reason they were at Boston was to gather data on intersecting runways. They are currently doing installations at Boston.
- Slide 5: For future Runway Incursion projects, the sponsor is looking at what is the emerging technology that can be tested and prototyped? They are currently conducting a business case analysis for eFAROS. This is a direct-to-pilot notification to pilots that is emitted about one mile out from the runway.

Follow-up Questions and Concerns

- The RWSL program has already transitioned to an acquisition program. The concept was proven and the decision was made to move forward with the project. Terminal has started installing RWSLs at 16 airports. They are in continuous operational evaluation at Boston, San Diego and Dallas.
- ANG-C is transitioning the maintenance and monitoring for the prototype sites (includes IAD and MCO) over to Terminal.
- Slide 6: \$1.25M in CIP F&E funds will be transferred to the Program Management Office in ATO, which will handle maintenance and monitoring. As of October 1, 2013, Runway Incursion Reduction will no longer be funded through R&D.
- Slide 7: Low Cost Ground Surveillance (LCGS) did not prove to have a positive business case because the benefits pool was not large enough (smaller airports). Therefore, it will not move forward.
- There was discussion about the impact of the Runway Incursion Reduction being removed as a budget line item (BLI). Does the program lose its integrity? Cathy Bigelow stated that the BLI removal will not impact the program's effectiveness.

The meeting was adjourned at 5:20 pm

NAS Operations (REDAC) | Day Two Minutes August 28, 2013

Meeting date | **time** 8/28/2013 8:30 am | **Meeting location** JMA – 400 Maryland Avenue, SW, Washington, DC

Purpose	REDAC Guidance for the FY 2016 R&D Portfolio
Facilitator	Eric Neiderman, DFO
Note taker	Aisha Staples

Presentation Review of Day 1 | **Presenter(s)** Steve Bussolari/Eric Neiderman

Discussion: The second day of the Subcommittee meeting began with a review of the Findings and Recommendations from Day 1. Two items that came up for discussion were:

- Take a hard look at Human Factors: what are the high-level research requirements across the Agency and the development of metrics. This is more deserving of a study.
- Holistic View of Research FAA's research prioritization process.

It was suggested that virtual meetings (conferences) could be used to address the challenge of meeting physically (travel).

Action items	Person responsible	Deadline
Discuss HF study/holistic research view with John.	S. Bussolari	[TBD]

Presentation *NextGen Wake Turbulence (RE&D, A12.b)* and *NextGen – Wake Turbulence Re-Categorization (F&E 1A07E)* | **Presenter(s)** *Jeff Tittsworth and Paul Strande*

Discussion: – Jeff Tittsworth began the presentation with an overview of the FAA Wake Turbulence R&D Program. He reviewed the definition, mission, and various objectives of the Program.

- Slides 1-4: After reviewing the purpose for RE&D funding, Jeff stated that the process is for getting procedures approved once they are developed is defined through the SMS process.
- Slide 5: Jeff reviewed the accomplishments and ongoing efforts, citing various airports throughout the US.
- Slides 7-9: Jeff briefly described the real-time capacity gains in the NAS as a result of Wake Turbulence RE&D investments. For example, San Francisco saw eight additional arrivals per hour. The benefits of Wake Turbulence research exist, but it has not been quantified at a level that can be measured as a significant cost-saving.
- Slide 10: The \$9.5M invested over seven years is a combination of FAA and NASA funding.
- Slide 12: Jeff stated that the LIDAR data provides the best results for larger aircrafts. If they used models, they would be left with conservative answers and that would affect capacity levels.

- What else would be needed to provide the improved models to allow better use and less data and measurement? Jeff stated that the most critical factor is the B-Knot value needed to create better design models. However, Jeff explained that this value is an "implied" measurement. It was concluded that the designer does not have the capacity to predict the wake category of the aircraft when they design it. This is an advanced aeronautical research (NASA) question.
- The Subcommittee asked, "What are the research needs?" There is a concern that after 40 years of research, there still is not a concrete design or model that takes into consideration real-time capacity as it relates to wake and separation.
- From the REDAC's perspective, they are interested in the impact that the data on Wake Turbulence allows the FAA to manage en route and arrival/departures better.
- There was a question as to whether this program has impacted any other initiatives as a result of the data. Jeff stated that the changes to the data are having an impact on automation.

The finding from the Subcommittee is that there has been excellent progress in Wake Turbulence research program; however, they are having difficulty designing a model that can predict wake categories. The recommendation is to request feedback from the aircraft manufacturers if they are confident in that their models can predict wake categories for an aircraft? If not, what are the research gaps, what additional research is needed to be able to do so?

Action items	Person responsible	Deadline
Add updated Wake presentation to folder	Eric Neiderman	[TBD]

Presentation Weather Program | **Presenter** Warren Fellner

Discussion: Warren Fellner from ANG joined the meeting via telecom. He began the presentation by providing a broad overview of the type of research that the Weather Program is responsible for. He highlighted the following points:

- Slide 4: John Cavalosky from NASA asked if the Inflight Icing research that is done in collaboration with National Oceanic and Atmospheric Administration National Weather Service is for aircraft or engine icing. Warren stated that it is both; specific atmospheric icing forecasting and analysis.
- Slides 5- 10: Warren spoke briefly about the anticipated research activities in FY 2014 and FY 2015. Also discussed were the emerging focus areas for FY 2016.
- Slide 11: Funding for FY 2015 was significantly increased. The increase will be used to support a field program that will help them collect data sets for aircraft icing surveying efforts.

Follow-up Questions/Concerns

• Steve Bussolari reiterated the finding and recommendation from the Subcommittee to come up with a benefits pool, related to both operations and safety. He noted that the

Administrator set the expectation that Weather, in collaboration with MITRE, would provide an analysis of the benefits. Steve asked if Warren was going to provide the Subcommittee with monetized benefits from the Weather Program research projects listed in the presentation. The reason for the question was that the presentation appeared to lack "outputs" of the research results to address the Subcommittee's prior recommendations. Warren indicated that the requested outputs were not in the presentation.

Warren's group needs to provide the Subcommittee with monetized benefits for the Weather Program before the next meeting to address the Subcommittee recommendation.

Follow-up Questions/Concerns

- Steve Bussolari asked whether the information provided by MITRE would address the safety and operational benefits. It was confirmed that the information focused on capacity efficiency only. Steve stated that the research efforts did not have anything to do with teasing outdetermining causality. Warren stated his group will need to work on addressing the issue. The recommendation is that AWRP needs to come back to the Subcommittee and address the quantified benefits of Weather research and provide a GA safety analysis (citing the reason for high accident rates).
- On Slide 6, Bill Leibert asked about the anticipated R&D to develop a tool for isolating compression on final approach, stating that may be reaching for the wrong traffic flow solution. Warren added that they are focusing on the wind forecast.

The Subcommittee's recommendation for the Weather Program remains open.

The Subcommittee quickly reviewed the presentation slides (Slide 21-Slide 28) on AVS-sponsored weather research presented by Roger Sultan.

- Slide 21: Low Visibility for Category I Approaches, they have just completed the project plan. AVS is moving forward with enhanced vision systems, lowering Category I Approaches at all airports. Also with regard to weather camera equipment installation, NTSB recommended the FAA place weather cameras at airports in CONUS, starting with Hawaii.
- Slide 22: This project focuses on determining icing conditions and being able to use those predictions to better direct air traffic (avoidance of icing conditions). There is a new aircraft certification rule to come out by Jan-Feb of 2014; Appendix O Icing Deregulation. It was clarified that the "system" terminology refers to capability.

The Subcommittee would like to see a more crisp and defined overview of the Terminal Area Icing Weather Information System (TAIWAS) at the next meeting. For example, describe in detail (with the benefits) what is the 'system.' Is the FAA developing a ConOps and how does the R&D product fit into the system/solution?

Action items	Person responsible	Deadline
Provide monetized benefits to the Weather Program.	Warren Fellner	Sept. 16, 2013
Provide a comprehensive overview of TAIWAS.	Roger Sultan	[TBD]
REPs for more than small subset of the research	Warren Fellner	[TBD]

Presentation: *Operational Weather Requirements* | **Presenter(s)** *Rick Heuwinkel/Mark Huberdeau*

Discussion: Rick Heuwinkel started the two-part presentation by providing an overview of the Operational Weather Requirements Analysis Methodology. He provided some background information to set the stage to address the Subcommittee's recommendation to provide NextGen weather requirements.

- Slide 3: The Aviation Weather Requirements Process Overview, Rick highlighted that the diagram illustrates a dual approach to defining mid-term requirements. They will work with SMEs from ATO Operational Concepts, Validation & Requirements Directorate (AJV-7) to assess user needs. Those needs will be converted to performance requirements.
- **Slide 4:** The work performed with MITRE will generate a set of requirements for each NextGen Portfolio. From that, the FAA can identify where they need to do more research and what can actually be implemented.

Mark Huberdeau, from MITRE, provided the second half of the presentation.

- Referring back to Slide 3, Mark explained that the diagrams provide a framework to help with integrating different research components to get a desired outcome. It also helped to identify impacts.
- Slides 5 11: Mark discussed the decision-making model. He provided examples of projects that have been vetted through the decision-making model. The red and yellow boxes were put in to help identify funding streams, per Steve Bradford's request.

Recommendation: The Subcommittee recommended that they revisit the framework of the Aviation Weather Requirements Process at the next meeting when the FAA can provide concrete measurable results using examples that lead to accurate forecasts for requirements.

Action items	Person responsible	Deadline
Provide monetized benefits/outputs from each	Rick Huberdeau	Sept. 16, 2013
research project. Provide example of a validated requirement or set of requirements describing the process from start to finish.	Rick Huberdeau	[March 2014]

Presentation NextGen - Weather Technology in the Cockpit | **Presenter** Gary Pokodner

Discussion: Gary Pokodner joined the meeting via teleconference. He began his presentation by providing an overview of NextGen - Weather Technology in the Cockpit Program (WTIC).

• Slide 3: This chart listed the benefits that the program provides to the FAA and what determines the program's success. Gary highlighted the bullets dealing with enhancement of GA safety through data analysis and improved training. In addition he noted that the enhancement of NAS efficiency was another important target. With regard to program success, it is measured by the conversion of research inputs to standard guidelines and policies.

Follow-up Questions/Concerns

Has any analysis has been done to see the level of contribution for information in the cockpit shortfalls and training. Gary stated that those items are discussed further into the presentation.

- Slide 4: The WTIC program has been very proactive in trying to use existing facilities to maximize funding.
- Slide 5: The focal areas for WTIC will be consistent over the next few years. The commonality in the focal areas was the use of research and data to improve operations using technology in GA.
- Slides 6-8: For most of the research efforts, WTIC is hopeful to get research products in use by the GA community by FY 2017, despite continuous funding challenges. Gary emphasized that they are looking at better ways to train and incorporating new methodologies into modules for Part 121/135. WTIC is not doing research to train pilots; they are interested in identifying research to create better strategies for training.
 - In the previous meeting, the assertion was made by the REDAC that GA was experiencing a high volume of accidents and that WTIC research would help positively impact that issue. Steve reviewed the finding and recommendation for WTIC from the previous Subcommittee meeting; he said that there has not been any evidence presented to address the recommendation. Gary stated that they were prepared to present research to answer that at the Spring 2014 meeting.
- Slide 10: It was asked why the FAA is funding research that has not yet been justified by NextGen. If there is inefficiency with a NextGen operation due to incorrect weather being uplinked to the aircraft, would that fall under the operational inefficiency that MITRE is examining.

Gary will come back to present a safety analysis showing how WTIC research will positively impact the high volume of accidents experienced by GA at the Spring 2014 meeting.

There was further discussion on the affect that different displays have on pilot decision-making and aircraft safety.

The Subcommittee requested that WTIC and AWRP come back to the Subcommittee to justify the type of work being done as it relates to NextGen benefits to address the recommendation from the Summer 2013 meeting. Steve Bussolari requested that for the March 2014 meeting that the Weather Program and WTIC focus only on quantifying the safety and operational benefits that will results from their research. Gary reiterated that the linkages with the research are provided in the quad charts within the presentation (Slides 5-6).

Action items	Person responsible	Deadline
Present a safety analysis to show how WTIC research	Gary Pokodner	March 2014
will positively impact the high volume of accidents experienced by GA		
Justify type of work done relating to NextGen benefits Provide comprehensive set of operational requirements (MITRE analysis based)	Warren Fellner and Gary Pokodner Rick Huewinkel and Mark Huberdeau	March 2014

Presentation Review of Findings/Recommendation/Actions | **Presenter** Subcommittee Members

Committee Discussion

The Subcommittee members reviewed the action items for accuracy. The Subcommittee requested that they get the detailed material (e.g., quad charts) to review well in advance of the meeting, so at the meeting they can focus on broader issues such as developing a holistic view, the weather and WTIC benefits justification.

Action items	Person responsible	Deadline
Provide the REDAC database site URL for	Gloria Dunderman	Sept. 16, 2013
presentations		

The meeting was adjourned at 12:32 pm.

Consolidated Action Item List

Action item	Person responsible	Deadline
1. Set aside time for Subcommittee to review the	Subcommittee	
development of high level research initiatives		
2. Provide written material to Subcommittee prior to next	Maureen Molz, DFO	02/14/2014 (2
meeting		weeks before next
		subcommittee
		meeting)
3. Provide copy of the FAA Administrator's response	Eric Neiderman	
from Spring 2013 meeting to all members		
4. Talk to John Hansman to determine the benefits of a	Subcommittee	
special study team to address issues of nonstic		
Tesearch/metrics 5 Varbiaga abanga ("anaga aafatu" ta "anaga yabiala	Unknown	Dona
safety")	Ulikilowii	Done
6. Provide more detail on research goals/budget prioritization of goals for the NARP	Cathy Bigelow	
7. Distribute the Budget presentation to the Subcommittee and upload to REDAC site	Gloria Dunderman	Done
8. Upload the strategic HF plan on REDAC KSN for review	Rachel Seely	Done
9 Re-send multi-year research plan	John Marksteiner	
10. Send out the TBO Con Ons	John Marksteiner	
11. Send copy of the concept hierarchy	John Marksteiner	
12. Send letter of response for Subcommittee's concerns	John Marksteiner	
13. Discuss HF study/holistic research view with John	S. Bussolari	
14. Add updated Wake presentation to folder	Eric Neiderman	
15. Provide monetized benefits for the Weather Program.	Warren Fellner	02/14/2014 (2
		weeks before next
		subcommittee
		meeting)
16. Provide a comprehensive overview of TAIWAS	Roger Sultan	
17. REPs for more than small subset of the research	Warren Fellner	09/16/2013
18. Provide monetized benefits and outputs from each	Rick Huberdeau	02/14/2014 (2
research project.		weeks before next
		subcommittee
	D' 1 II 1	meeting)
19. Provide example of a validated requirement or set of	Rick Huberdeau	02/14/2014 (2
requirements describing the process from start to finish.		weeks before next
		subcommittee
20 Present a safety analysis to show how WTIC research	Gary Pokodnor	02/14/2014 (2
20. The sent a safety analysis to show how with research will positively impact the high volume of accidents	Gary rokoullel	$\frac{02/14}{2014} (2)$ weeks before next
experienced by GA		subcommittee
		meeting)
21. Justify type of work done relating to NextGen benefits	Warren Fellner and	02/14/2014 (2
	Gary Pokodner	weeks before next
		subcommittee

		meeting)
22. Provide comprehensive set of operational requirements	Rick Huewinkel and	02/14/2014 (2
(MITRE analysis based)	Mark Huberdeau	weeks before next
		subcommittee
		meeting)

Attendance List -

August 27, 2013

Subcommittee Members: Steve Bussolari (Chair) Joe Bertapelle Bruce Holmes Deborah Kirkman William Leber Mark Weber Andres Zellweger

Other Attendees:

Dennis Filler (FAA, REDAC Executive Director) Eric Neiderman (FAA, Subcommittee DFO) Cathy Bigelow, FAA Stephen Bradford, FAA Jason Demagalski, FAA Mike Gallivan, FAA Paul Krois, FAA Xiaogong Lee, FAA Benjamin Marple, FAA John Marksteiner, FAA Alexandra Papantoniou, JMA Dino Piccione, FAA Rachel Seely, FAA Aisha Staples, JMA Karlin Toner, FAA Dawn Zimmer, FAA

August 28, 2013

Subcommittee Members:

Steve Bussolari (Chair) Joe Bertapelle Bruce Holmes Deborah Kirkman William Leber Mark Weber Andres Zellweger

Other Attendees:

Eric Neiderman (FAA, Subcommittee DFO) Cathy Bigelow, FAA Warren Fellner, FAA Richard Heuwinkel, FAA Mark Huberdeau, MITRE Xiaogong Lee, FAA Gary Pokodner, FAA Aisha Staples, JMA Paul Strande, FAA Roger Sultan, FAA Jeff Tittsworth, FAA