REDAC - NAS Operations Subcommittee
MEETING MINUTES

Meeting Date March 5-7, 2013 | **Meeting Location** *Washington, DC*

Purpose	NAS Operations Guidance review for FY 2015 R&D Budget
Facilitator	Eric Neiderman, DFO
Note taker	Eric Neiderman

Presentation *Welcome* | **Presenter** *Steve Bussolari- Subcommittee Chair, and Eric Neiderman, FAA, DFO*

Discussion - Dr. Steve Bussolari, the new NAS Operations Subcommittee Chair welcomed everyone to the meeting. He encouraged members to read the budget justifications that were provided in advance. The justifications provide the research objectives and research priorities – even if there are no firm budget numbers.

Dr. Bussolari commented that there are a couple of spots on the agenda to discuss the roles of the REDAC.

Dr. Eric Neiderman, FAA, DFO, thanked Victor Lebacqz and Aaron Gellman for years of service on the Subcommittee. He reviewed the agenda and discussed possibilities for weather delays on day two.

Presentation *Welcome – REDAC Vision* | **Presenter** *John Wiley*

Discussion - John Wiley, Acting Director of the Technical Center welcomed everyone. He described his role as the Chair of Research Executive Board (REB) and as Acting Director of the Technical Center, the Designated Federal Official (DFO) for the REDAC Safety Subcommittee (SAS). He offered thanks for the work that the members do on the Subcommittee – this provides good feedback for the Agency. He also thanked Steve Bussolari, for stepping up and taking on the lead for the Subcommittee.

Mr. Wiley described what he sees as REDAC's role and provided questions below for members to consider throughout the meeting.

- Laying out the research – are we doing the right thing?
- What is industry doing that we don't know about?
- Do we have the right priorities?
- Are we coordinated with other government agencies?
- Do we have the right expertise?

Mr. Wiley encouraged the Subcommittee to allow time to write up findings and recommendations. He asked the Subcommittee to make sure the findings/recommendations are

clear so that the Agency can execute against them. The Agency needs focused outputs – what should the FAA be doing different? The goal is to make recommendations actionable.

Mr. Wiley commented that the Administrator would be attending the REDAC meeting on April 24. He asked members to provide questions that the Administrator may be able to address during the meeting.

Dr. Dres Zellweger asked about the balance of the research portfolio – short, long and how it relates to other agencies. Mr. Wiley replied that the long term plan in safety is an example of a balanced portfolio and so is the National Aviation Research Plan (NARP). He also indicated that this is a good topic to address during the briefings by Steve Bradford, Paul Fontaine, and Karlin Toner.

Dr. Mark Weber inquired about how the role of Technical Center has changed. Mr. Wiley commented that on March 24 Dennis Filler would be starting as the new Center Director. There will also be more alignment with the DOT and Dr. Mike Romanowski at the White House. He highlighted the idea of the REB being more strategic and looking all across the parts of the Agency. The key is determining if the FAA is getting the research implemented in a timely manner and identifying the research that we cannot implement.

Action – Members should provide questions for the Administrator and the senior executives to discuss at the April 24 REDAC meeting. Due to Gloria Dunderman by April 1.

Presentation *Role of the REDAC* | **Presenter** *Cathy Bigelow*

Discussion – Ms. Cathy Bigelow presented an overview of the role of the REDAC. US Code established the REDAC to provide advice and recommendations to the Administrator for the research program. Based on legislation there are two sets of meetings each year. The first meeting is strategic guidance on FY+3 research portfolio. The FAA provides input so the Committee can provide the advice. The second meeting (winter/spring) is to review the portfolio.

Dr. John Cavolowsky asked about the role of the REB. Ms. Bigelow explained that they oversee the research portfolio. The REB hears the proposed portfolios from the Product Planning Team (PPT) leads and has a more strategic point of view across the agency. They take the Agency perspective and try to balance and make sure the areas are connected. Once they are satisfied with the proposed portfolio, they approve the budget. Question was raised if NASA should provide briefings to the REB.

Action – The FAA should describe how recommendations from REDAC impact the REB. Cathy Bigelow will provide briefing at the next Subcommittee meeting.

Presentation *Writing Findings and Recommendations* | **Presenter** *Cathy Bigelow*

Discussion - Ms. Cathy Bigelow presented a "tutorial" on writing findings and recommendations. She indicated that findings set the stage for the recommendation.

Recommendations tell the Agency what to consider, or do, or present. The Agency only responds to recommendations (not findings). She urged the Subcommittee to be straightforward and concise. The audience is more than the researchers you are hearing from. She encouraged the use of action verbs - what action you want from the FAA.

Presentation *Budget Overview* | Presenter *Mike Gallivan*

Discussion - Mr. Mike Gallivan updated the members on the Fiscal Year (FY) 2013 budget, status of the FY 2014, and targets for the out years. He stated we have a current authorization through 2015 and that it is unclear regarding the future funding levels given sequestration.

Members had a discussion with Mr. Gallivan on the impact that may occur due to sequestration.

Presentation *NAS Operations PPT* | **Presenter** *John Marksteiner*

Discussion - Dr. Bussolari indicated that the Subcommittee had given the recommendation for a multi-year plan for ops concept and validation work. The draft plan is a list of multi-year research activities used to develop a portfolio and then to prioritize them.

Mr. John Marksteiner presented an overview of the NAS Operations PPT and the Advanced Technology Demonstration Program (ATDP). He indicated that all of the funds are F&E (not R&D). Also, within the Air Traffic Organization (ATO) there is an Air Traffic Ops Concept Development and Validation Group. ATDP is no longer under the program in FY 2015. In FY 2013 and FY 2014 the ATO will decide how the money is spent.

Mr. John Cavalowsky commented that the NASA Smart NAS initiative is still early on. He suggested that this could be a topic for NASA at a future FAA REB meeting.

Mr. Marksteiner presented the ANG-C4 Research Plan – 25 research areas. He indicated it is a working document. It will be updated on a regular basis. He is looking for input from many sources. He talked to lifecycle management, MITRE, etc. This document casts a net for new research requirements (also coordinating with Rob Hunt who works for Rich Jhelan – requirements). It was suggested to try to get Rob Hunt for a future briefing.

The Subcommittee pondered if there was anything missing or that they did not agree with? It was commented that there was no research on datalink or second human factors (of interest to the carriers). Subcommittee concluded that it does not seem like anything is really missing. The challenge is to make it more agnostic to the agency – the operators, infrastructure investors (states).

Subcommittee Discussion - Good presentation, content, and organization. The Subcommittee thinks this work is very important. Realize it is all a zero sum game. Within the portfolio is there a trade between the number of projects, funding, and ready for implementation. What is realistically going to increase capacity for an airline? Right now the airlines will only buy ABS-B out. The Agency should think through the organizational implications of trying to leverage

state investments. There could be 50 states that want to be involved. Maybe use collaborative bodies like the COEs.

Action/Homework – Members to consider the $5M budget and look at the projects that were deferred. Focus on mid-term: 2018-2020. Looks like this may be 2025 time frame. Reduced budgets may impact how these things are implemented (the timelines). Members will discuss more as they draft any findings or recommendations.

Presentation *New Air Traffic Management Requirements*| **Presenter** *Steve Bradford*

Discussion - Mr. Steve Bradford presented an overview of the New Air Traffic Management (ATM) research which is in the system development line. ATM Research was moved in to F&E during the Clinton administration. New ATM requirements are cross-cutting but not ready for investment decision in 2-3 years. Probably 3-4 years from a Final Investment Decision (FID). This is where we do the things not quite ready to go to pre-implementation.

Common trajectories. Trying to define the minimum set of requirements for ground-ground and ground-air to be able to get to TBO. Ms. Debbie Kirkman asked: How does TBO direct what FAA is doing for 214? We are working with 214 and 227. Need to modify the message set for a new leg. We are looking at this as a capability – making the message set richer to provide additional capabilities. The standard will be done this year.

Airborne SWIM. What does it mean to have access to SWIM on the flight deck and do the commercially available platforms support it? Need to understand the full range of information and the bandwidth requirements. There will be an airborne ISP. There is a planned demo of this. Goal is to negotiate over SWIM and clear over datacomm. Have to take full advantage of the size of the pipes. There are some other projects looking at airborne internet – example in weather. This is a fertile ground for information and we are trying to figure out how best to use it.

New radar surveillance requirements. In 2010 we had NPAR (weather radar). Replace Airport Surveillance Radar (ASR) 8, 9, and 11s with NPAR. Funding this with DHS. Making progress on low cost components for domestic usage. In FY15 will decide if we can replace the primary radars with this new technology (it will replace the Doppler radars as well). Use for surveillance and for weather. Had to prove that the algorithms work and then we will go to industry. Starting in FY13 there is a new gap in weather. Advanced translation of weather in to impacts. The issue is how to do the translation. This includes some standards work with ICAO. Budget in FY15 is $22M (FY14). It will probably be 5% or 6% below this given the budget. If something gets delayed it would be the FMS work. Mr. Bradford would like to accelerate the weather translations. It is important to synchronize the research with the implementation. It is a matter of timing.

Mr. Bill Leber asked about the disparity between the amount of resources (1% R&D) and the demands of NextGen. Mr. Bradford answered that the NextGen budget is $932M per year and R&D is $100M. This is adequate given the implementation stream. We are also carrying $150M in subscription fees (less implementation), so R&D is a bigger percentage.

Presentatio *NextGen Wake Turbulence* **| Presenters** *Jeff Tittsworth and Paul Strande*

Discussion – Mr. Jeff Tittsworth briefed the members on the FY 2015 portfolio for NexGen Wake Turbulence and Wake Re-Cat (1A07E).

His briefing included the following:

- Wake Turbulence program is funded by RE&D, and F&E and the purpose of the funding.
- Goal is to increase capacity.
- The program is beginning to look at en route airspace and the 3nm separation standard given the implementation of ADS-B. Look at the wake of an A380 at 420kts. Proposing lateral offsets for the climb through and the descend through. This will start with the UASs and then move in to the commercial airlines.
- There was a discussion of stagger for dependent runways (less than 2500' separation). National rule change to 7110.308. Being implemented at SFO by September. Large aircraft are 80% of operations at an airport – so it solves 80% of the problem.
- New standards for new aircraft designs – based on NTSB recommendations were discussed. A new process has been developed doing this using LIDAR data and wake encounter data from flight tests. For aircraft smaller than a 744, they can use a sensitivity analysis. This approach takes into account wing design and approach speed.
- The longer term goal is dynamic wake separation. RED is a $9M annual program. Spend plan for FY 2015 was presented.
- F&E is the implementation side of the R&D. An example is that Wake Turbulence Mitigation for Departures (WTMD) is approved and they are conducting a field trial to determine benefits. Algorithm indicates if a runway is safe for operations given cross-winds. Re-CAT was approved last year and implemented in Memphis International Airport (MEM). Categories were inefficient given how they need to account for the extremes in the categories. The program and its research broke categories for upper and lower heavies in to two.

Presentation *Runway Incursion Reduction Program (RIRP)*| **Presenter** *John Maffei*

Discussion – John provided a program overview stating the RIRP will continue research, development and operational evaluation of technologies to increase runway safety.

Stated that the RIRP is almost all demonstration and prototyping to reduce risk at all phases of flight. The F&E sponsor is AJI-14 for all the work that is done. RWSL waterfall for the program office ends in FY16 and then the program ends in FY17. E-FAROS installing at BOS and installed at DFW. Expect IARD in FY15. LCGS will go to JRC in June for IARD. RSA-conduct HITLs with MITRE to demonstrate feasibility. Not too many changes from last 6 months. Program is fairly stable over time.

Bill Leber asked how the program makes safety tradeoffs in a statistically insignificant world? Mr. Maffei responded that they argue on behalf of safety primarily and also the efficiency

benefits. The costs of the equipment are minimal and they will make the business case even in an ASDE-X environment.

Subcommittee Discussion

The subcommittee had a discussion about determining the benefits given that we have an unprecedented level of safety. The key is to make sure there is enough investment so we don't have fly-fix-fly approach.

There was also discussion of the amount of research not getting ahead of what can be implemented.

Candidates for deep dives:
- modeling and simulations
- UAS integration
- Small airports
- Trajectory-based operations (and SESAR version)
- More detail on integrated arrival departure (does it include surface?)
- Integrated operations

Use RONA as a proxy for how the FAA can collaborate and get stakeholders to get them to bring resources. Tackle the benefits pool incrementally.
The subcommittee discussed topics for the Administrator.
- Autonomy and automation
- New propulsion (e.g., electric)
- When should we have programs and infrastructure in place? What about robotics in aviation? Example - Airport surface robotics.
- What does the airspace of the future look like? Moore's law, Guilders law.
- What do alternative flight rules for UAS look like and what are the impacts for GA?
- What are you doing about resilience and adaptability of the future system given the 20 year time horizon?
- FAA Policy and Budget Committee (at level of the NMB) to allocate budget to the strategic objectives. How do you allocate research objectives to achieve the goals/gaps? Have we spent enough on safety and capacity and now we need to focus on environment?

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Day two of the meeting was done via telcon due government closure because of weather.

Presentation *Surface R&D* | **Presenter** Paul Fontaine

Discussion -
The action from the previous meeting was for a big picture view of work in surface. Caveats – briefing is a work in progress. The information did not exist in one place. The pieces were scattered. There is not a big picture view across the agency. This is because there are different budgets and organizations. We also don't do a great job telling stories. Problem is that some people don't want things tied to OIs because then it has to have NextGen funding (which is a limited pot). There is some resistance of mapping things to the OIs. OIs were part of the NextGen construct. There is other stuff that is funded outside of NextGen (e.g., airports).

Last reorganization developed the Portfolio Managers (Jim Weatherly) for Surface. Weatherly has to bring in all the other pieces in F&D, etc. Focus has been on surface CDM activities. The agency just published an Operational Capabilities Implementation Plan (OCIP). The approach is to overcome R&D being done and then a hard wall to implementation. It is like a contract in advance that describes the transition. Transitions have been traditionally difficult. OCIPs lay out the transition in advance and get it in writing and in front of the NMB. Not every R&D project has to have a mapped out, funded transition plan. It is a way to get the landscape and to identify where the decision points need to be.

Mr. Fontaine presented a number of slides on the Surface R&D:

Slide 2 – basic OIs that are pulled out for surface: Situational awareness, runway safety, traffic management. The OIs are fairly intuitive. We don't have a problem understanding what we are trying to achieve in the OIs. There are also linkages to the implementation roadmap.

Slide 3 – OI104209 Surface management. A number of activities are based on this (ASDE data)

Slide 6 – presented timelines of how the FAA is mapping this stuff. Green, yellow, blue (concepts under exploration). TFDM is still evolving (not a baseline program yet) so it is not mapped. We have also tried to denote the various dependencies (e.g., to surveillance). There is planned R&D for each increment in the future. Bruce: taxi routing.

Slides 7 – 9 Runway surface situational awareness. ASDE-X (started in late 90s) delivered to 30 airports that have been baselined (which changed 3 or 4 times). It wasn't NextGen funded but it meets these OIs. It was paid out of F&E. SDS ADSB (surveillance and broadcast services) had a requirement for 9 additional ASDE-X systems. This will give surface surveillance at 39 airports. June 2013 will be the investment analysis readiness decision. Same system, but it could be an issue if it had to

be funded out for NextGen. How do we get capability to sites 45 and beyond? Surveillance is critical to many of the other OIs – this has to be considered in making the business case. The road on LCGS will be very difficult given the budget climate and making people understand the bigger picture. The agency can't make the business case on safety alone.

Slide 15 – full surface situational information. Knew about the ground vehicle part. Did not realize the airport guys were doing the second part – prototype installed in SEA. Different pots of money and different LOBS. Speaks to the need for a broader portfolio manager construct to share info and make the alignments.

Slides 18-20 are all the projects from the airports folks. Will look at how they map to the OIs. Much of the advanced concepts work has been mapped to ATC – not to AVS and Airports. Steve- it may be an artifact of mapping it to the NextGen OIs. Putting it all in one construct allows us to see all the research being done and what it is contributing.

Subcommittee Discussion:
It was the sense of the subcommittee is that this is useful.

In surface, Paul Fontaine looked across 6 to 8 organizations to pull the information together. Maybe REDAC should reinforce the notion of portfolio management (even though it is a thankless task). Dr. Bussolari suggested that the subcommittee could ask for each program to draw a line to the OIs. This would be a better approach to see what is missing and to coordinate what is being done by other agencies. It took 3 weeks to put this together with a team. Portfolio managers are focused on NextGen – the subcommittee wondered who at FAA is doing this type of inter-organizational integration.

Action – None.

Finding and Recommendation - A finding and recommendation was drafted (refer to the section at the end of the minutes).

Presentation *Weather Program* | **Presenter** *Steve Abelman*

Discussion -
Weather program has some changes from last year. The program looked at what they are doing and why. They also looked at how to align to the NSIP. They are also working more collaboratively with the weather service for the 4D weather cube.

There are three main thrust of the R&D –

- support NextGen OIs;
- collaborate with the National Weather Service; and
- improvement of safety and efficiency.

The program has 3 FTEs and works with many labs and partnerships. The program has a process to identify and prioritize the requirements. There is an agreement with AVS that gets about 20% of the budget.

Mr. Abelman gave a presentation of quad charts for each of the FY15 requirements. The program is looking at in-flight icing commercial products and also additional focus for Alaska. The issue is getting information to the GA pilots in Alaska related to in flight icing. The challenge is getting the same number of observations as in the CONUS. They are collaborating with NASA on field campaigns. They are working with NCAR on automated turbulence forecasting. The Weather Program is adding capability down to the surface (important for GA) and probabilistic deterministic of turbulence.

The subcommittee asked how the program is able to transition products. After the R&D there is a review by a panel of SMEs, then an SMS review, then transition to NWS, or link to emerging NextGen tools.

Subcommittee Discussion - In the core weather program they work with their own sponsors. For the AVS work, they use a slightly different process and a separate AVS weather TCRG. They had reasonable research questions, but it was not clear how they related to the NextGen OIs. They should be able to point to the requirements. Increasing the accuracy of the forecasts is laudable, but it should be tied to operational utility. The subcommittee would like to see a better tie to NextGen OIs and the research.

Action – None.

Finding and Recommendation - A finding and recommendation was drafted (refer to the section at the end of the minutes).

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

Discussion -
Mr. Pokodner explained that they are really avionics guys working in weather. They have an operational focus – an applied version of the science of weather from a cockpit standpoint. The program ties to all the impact in flight that occur because of weather. Ms. Kirkman asked how the program complements private industry. The response was that the program works with industry. Airbus had many potential weather technologies but not sure which systems would be certifiable. WITC provides guidance materials so the technology will be certified and will meet NextGen capability requirements. Mr. Holmes commented that there is still not evidence that the safety related to weather (GA) has not decreased – there is a need for this type of work.

Overall, the Program assesses the utilities and benefits of commercial products. Standards and guidance provide industry the information to develop products that are useful. The key is to identify what provides utility to the NAS. There are three major goals: safety, efficiency, and reducing emissions.

Mr. Pokodner gave a presentation of the quad charts. He described improvements of MET information in the cockpit to support NextGen. This includes requirements for wind information for forecasts and FMS accuracy. RTCA will be presenting 7 to 10 enhancements for evaluation. This will lead to a better FMS being developed by industry. It will also produce a requirement for using ground weather information to make better decisions at an earlier time. Dr. Bussolari asked about the research question? The answer was that the primary customer is Part 91 since they don't have a forward looking radar. This is to look 20 minutes out as a strategic tool to avoid weather. The issue is that GA is not avoiding the weather despite all of the tools that are being produced. Thus, the research question is why GA pilots are having weather encounters despite FIS data.

Weather alerts is determining the alerts that will provide benefits. The Research question is whether the technology and the information available. The air/ground integration project is looking at the optimal way to get info to and from the cockpit. They are developing recommendation based on costs, criticality and other factors.

Human Factors is focused on the presentation so that the pilot is interpreting the information correctly. This research is resulting in standards and guidance on presentation for industry to develop tools for more consistent decision making. One issue is to time stamp the information uniformly so it is clear how up-to-date the information is. They are also looking at how to negotiate reroutes on data link to increase efficiency. This is a project that is just starting. It will develop performance requirements.

Subcommittee Discussion -
This is a large R&D investment ($20M) and there is no validated portfolio that they are working to that demonstrates buy-in from users. There does not appear to be a valid story for the $20M. How does the investment have value? Where is the pull?

The Subcommittee was concerned that this work be coordinated with other work on reroutes and stressed the importance of a literature review on the topic. The subcommittee expressed that aircraft have internet and industry has embraced iPads. Program will have to look at the impacts of bringing internet in to the cockpit.

There was a general discussion of NextGen and whether it has linkages to GA. GA does not seem to be a core part of the NGIP. The Subcommittee needs more clarity between NextGen and GA. Weather and RONA may be part of the answer to this. What is the general aviation role in all of this? The FAA should identify aircraft accident causal factors and the research initiatives. Where is the evidence that the products affect the accident rates? Aviate, navigate, communicate is killing a few GA pilots a day. We need to change the paradigm and add automate. Maybe training will have a bigger impact than the high tech solutions. There is not a strong case that FAA safety-related research, focused on GA, has a direct link between causes and solutions. The argument is the weather is a factor in GA accidents. The Agency is working to improve it; therefore they are improving it. The FAA needs to have a quantification of the benefits. There was also discussion about research and benefits. R&D is about $280M across the agency. Agency budget is $12B (so R&D is about 3%). The key is to identify the benefits pool (quantitatively) when the FAA starts a research process.

Action – None.

Finding and Recommendation - A finding and recommendation was drafted (refer to the section at the end of the minutes).

Meeting date | Time *3/7/2013 8:00 AM* |

Meeting location *Washington, DC*

Purpose	NAS Operations Guidance review for FY 2015 R&D Budget
Facilitator	Eric Neiderman, DFO
Note taker	Eric Neiderman
Timekeeper	Gloria Dunderman

Presentation Joint Planning and Development Office (JPDO) |
Presenter *Karlin Toner*

Discussion

NextGen has been around for a decade. In 2003 the JPDO was legislated to provide coordination. In 2012 it was legislated for a second time (expanded the duties). This was not necessary but done when the FAA reorganized. The program is focused in setting the big vision for 2025. In 2008 the FAA started to have a development focus, and Dr. Toner has been at JPDO for 3 years and is focusing on where the integration is absolutely critical.

The JPDO doesn't build things or turn them on – look at 3,5, and 20 years. They are looking at capability from industry and other agencies will accelerate the FAA program. It is not about the 11 FTEs, but it is about the 100s of people they bring together to advance a capability. At its peak the JPDO had about $20M of R&D and F&E funds. In 2012 the budget was cut 75% (from $17M). They expended all multi-year funds. In FY13 the JPDO will only carry out one goal – the UAS Comprehensive Plan to Congress. They will now scale back drastically unless additional budget is provided. UAS is a challenge but will also lead to capabilities in data communication, TBO, etc. In FY14 the program hopes to expand. The JPDO Board meets on a quarterly basis. There is also a senior policy committee that oversees the JPDO. They have been much more operationally focused on pushing the implementation.

Four major initiatives are planned for FY 15 (slide 3)

- UAS Integration
- System-of-systems risk management. Need to think about safety and security (cyber security of data exchange). Need to look across at the interdependencies across portfolios. Can we come up with ways to manage across the portfolios?
- Interagency Data Exchange Definition and Policies (developed a prototype test bed with DoD investment. SWIM is adopting this as a prototype).
- Challenge Areas and Interagency Capabilities. Mid-term program runs out through about 2022. JPDO has to look just beyond this horizon – things to consider for the next implementation path. This is looking at technical components and associated policies.
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Mr. Cavalowsky asked how far out in front of the research can the JPDO be before there is too much of a backlog? Dr. Toner replied that the funnel for getting stuff in place is rather small. They are setting the priorities for mid-term plus 1 year. The key is to shape it so that it is possible to shape the priorities with some strategy around it.

When times are tight, the benefits of sharing and coordination are the greatest. The industry is an important component. For example, industry is leading in the datacomm area.
Request for FY15 will be at the $12M level. Even with a bad FY12 and F13 the JPDO can ramp up in FY15 with expected budget of $9.5M. This is about the right size.

The UAS Comprehensive Plan will have 5 goals. Goal 5 calls for looking at automation. This is more a research goal. Some level of autonomy will allow these vehicles to fly more safely. JPDO is pushing the partners to address this.

Dr. Zellweger asked if other agencies provide in-kind funding and people? Dr. Toner answered that there is expected to be some level of support, but it depends on each agency. There are currently 3 employees from DoD and 1 from the Department of Commerce. This fluctuates almost quarterly. To do interagency work it is key to have a blended workforce model. Mr. Holmes inquired if the JPDO keeps track of industry resources (at the NextGen Institute). The response was that the JPDO tracks participation but not funds. The NextGen institute can do pro-bono work. Under the OTA it can also be used as a contractual vehicle. It has not been used in this way very often given the challenge of moving funds across agencies. The JPDO has had a Trajectory contract to have industry leads work with SESAR.

Subcommittee Discussion -
There was discussion about the OTA approach and the utility of the NextGen Institute to leverage the investments and get things accomplished in half the time. Governance of JPDO should be with Dr. Toner and a Board of Directors from other agencies and industry partners. They would each identify the resources they have to bring. There should be shared decision making with the industry. What motivates the industry to bring money to the table? Industry is interested in the UAS Automation Roadmap and has resources to provide.

An issue is that no government agency is willing to subordinate themselves to an interagency group like the JPDO. Design guidelines, systems standards, and means of compliance are where the industry wants to be involved. Industry wants to "think through" these issues in collaboration with the government (e.g., JPDO as the host for this discussion).

The subcommittee discussed that the key is system-to-system risk analysis in terms of the goal setting. There was also discussion about the extent has the FAA used the output of JPDO to make decisions and prioritization? The subcommittee considered a recommendation that the FAA use the outputs of the JPDO.

Action – None.

Presentation Air Traffic Control Technical Operations Human Factors |
Presenter *Dino Piccione*

Discussion -
Mr. Piccione introduced Dr. Rachel Seely (who will brief NextGen). Mr. Piccione reminded the subcommittee that they a link to the strategic plan – the foundation for the program. A new thrust area is that they are reaching out to the operational community. There was an OIG report just last week that indicated some operational HF issues. Operational input has given the program a different perspective about operational issues and design issues. It also provides the field info about the role of HF. This is a direct link to the user.

Mr. Piccione had planned to talk about work in HF in UAS. Instead he talked about major changes to the program (from the OMB examiner). There is major uncertainty with FY15. He completed the budget white sheets yesterday to reflect the FY14 changes. As a result the program will have to revisit the strategic plan and change the implementation plan – no contract funds in the future. He will review and revise commitments in the NARP and the Business Plan. OMB directed that there not be any personnel selection research. OMB indicated that this should be done by Human Resources. The FAA has not lost a single case since the personnel selection tools are valid, reliable, and fair (in terms of adverse impact). OMB does not object to the research, just that it should be done by HR. As a result the program will have to redirect in-house resources (the researchers at CAMI).

The other area of focus in the program is HF standards (in demand from PMO) for development. Some of the benefits relate to RNAV/RNP procedures. Total FTE staff is 40: 5 at HQ; 14 at RDHFL; and 25 at CAMI. Three out of four research requirements remain, but contract funding has been reduced to about $250k. This is about a 40% reduction in resources.

Mr. Piccione gave a presentation of the Quad Charts and a focus on the outputs. He highlighted the final delivery of HF design standard which has been used extensively used by the acquisition programs. For the planned update, the program will have a cross-agency collaboration to try to get this done. The NextGen OIs get integrated at the controllers' workstation. The impact is that the data block is growing. The program is working on an integration approach – they will use internal resources.

Tech Ops has largely been not included on NextGen. How does the agency deal with leased services? What is maintenance going to be like in the NextGen future. The HF Program is working on a concept of use.

Individual and Team performance is looking at the operational implementation in impacts. How do we ensure benefits? There is a renewed focus on the in-service management aspect of the lifecycle.

Action – The subcommittee suggested that Mr. Piccione take a look at the REDAC culture report to examine NextGen culture issues (Gloria Dunderman was asked to provide the document).

Presentation NextGen Air Traffic Control /Tech Ops HF F&E |
Presenter *Rachel Seely*

Discussion -
Dr. Seely described that integration is one of the major issues they are pursuing. If things are not integrated then it is the user who has to do the integration. How do the tools work given the integration of the controllers, pilots, and how everything ties together? One of the benefits of the research is to reduce program risk. Which tools will not provide benefit to the user when they become operational?

Dr. Seely presented a table of requested, enacted, and funding via the Program Level Agreement (PLA). The NextGen Chief Scientist provides input about what the program actually get in the PLA. One example is air/ground integration HITLS that identify interactions between controllers and flight crews. HF is involved in NavLean on procedures and safety assessments. As a result of input, they are reducing the steps from the current 18. Mr. Holmes asked if there are any training issues for controllers in mixed-equipage. It was replied that traditionally, unless there is 80-90% usage then the procedures are not being used. The HF program is looking at job task analysis and where training impacts acceptance of new procedures. A tie in to the Ops is the "Lantini Report." This is NextGen F&E 1A08A which is now under System Development. Mr. Cavalowsky asked why the program is not getting what is enacted? The response was that there was a 20% cut to the 1A08A overall (from $109M to $85M). FAA has the flexibility to reprogram it based on prioritization. The Agency can move 10% on the F&E, but not on the R&D side.

Action – None.

Presentation Weather PPT Portfolio Review | **Presenter** *Steve Abelman*

Discussion -
Mr. Abelman presented an overview of the Program Planning Team (PPT) and the members. There is initial screening and then there is a prioritization scoring system. Prioritization is based on 3 equal weights – increase capacity; increase safety; satisfies official documented internal and external drivers. They are rated on a scale.
The new approach that was started in December 2011 is the Research Evolution Plan. This has input from industry which provides understanding of the community that uses the weather products. This process addresses shorter term needs and transitions to NextGen. The key is to have involvement from Strategic Planning Teams that includes a diverse mix of subject matter experts, government, and industry individuals. This leads to recommended research priorities. Ultimately, the PPT prioritizes across the REP outputs. The team includes FAA, NWS, research, NASA, airlines, and other stakeholders. This process and team has been put together to help the weather research program prioritize.

Mr. Abelman also described the alignment with NSIP for Improve in-flight icing forecast; improve turbulence detection and forecasts; improve C&V analyses and forecasts. These are R&D initiatives that are specific OIs.

At future NASOps meetings it may be useful to look at the ATM Weather Integration. This has been NextGen funded. This is a cross-cutting initiative. It has partnerships with Surface Trajectory Based Operations (STBO), Time Based Flow Management (TBFM), and Collaborative Air Traffic Management (CATM-T) to determine the weather inputs and needs associated with these programs.

Dr. Bussolari noted that there is a lot of focus on GA. He asked where is the study that shows a direct benefit that can result from the research? Mr. Abelman responded that is it really a better forecast or getting the information in a more timely manner? They are working on metrics to quantify the benefits that weather information is making.

Subcommittee Discussion -
The connection between the GA accident rate and the research benefit needs to be quantified. It may be necessary to think more broadly about the benefits than safety. For example, thinking about efficiency as well.

The OIs are very broad statements. At some point there are diminishing returns – to statements like "improve." Purpose of research is to turn the general statements into specifics. There is a need for this level of detail from the Solution Set Coordinators.

Findings and Recommendations (DRAFT)

Topic: Prioritization of Research across FAA portfolios and lines of business

Findings:

1. The NASOPs subcommittee has previously recommended that the FAA undertake a broader management framework for its research and development. This would enable FAA to manage its research portfolio across funding lines to focus on achieving specific operational benefits to the NAS. At its summer 2012 meeting, Paul Fontaine agreed to develop a portfolio view of FAA activities related to NAS surface operations. The subcommittee found this portfolio view to be excellent. The graphical depiction of related efforts highlighted the interplay between requirements sources, funding sources and projects within the portfolio and could easily be expanded to include more detail on FAA R&D and related research projects from other government agencies (e.g., DoD and NASA)

2. A true portfolio view and management of research priorities across the portfolio will require the right level of aggregation and oversight by an executive-level governance body such as the REB, the NMB, or the SBC. The subcommittee realizes that asking for this information places workload on already highly loaded managers; however, we believe that there is high value to the FAA being able to see the integrated view to identify research gaps and synergies. The NextGen portfolios are a good start to taking a portfolio perspective; expanding these portfolios beyond projects with NextGen funding is a critical next step.

Recommendation: The FAA should build upon the work that Paul Fontaine presented to the subcommittee and present a similar portfolio view of FAA research for one or more additional NAS domains during the next subcommittee meeting. This portfolio view should include a first-order, quantified description of the benefits pool(s) that drive the decision for the projects (e.g, safety case, security case, efficiency case, reliability case, etc.). In addition, the portfolio views should include more detail of FAA R&D activites and the research activities of inter-agency and non-governmental organizations. The subcommittee will work with the FAA to define which domain(s) will be presented and how to maintain them as the research activities evolve.

Topic: Weather PPT Portfolio and Weather Technology in the Cockpit

Finding: The subcommittee observed that the Weather PPT Portfolio research requirements, while directly linked to NextGen Segment Implementation Plan (NSIP) Alpha and Bravo, were too broadly stated and open-ended. Examples included: "enhanced turbulence forecasts and graphical guidance information, enhanced ceiling and visibility analysis and forecasts, and enhanced aviation specific weather hazard diagnosis and forecast information". While there may be an operational need in NextGen for enhancement to these forecast tools, it was difficult for the subcommittee to ascertain just how much enhancement was needed and what NextGen

operational benefits would be achieved with each incremental enhancement. Moreover, the research prioritization process employed by the FAA for the Weather PPT Portfolio appears to be internally focused within the weather research organization. Individual components of the weather research portfolio are prioritized within the A.11k Budget Line Item (BLI) rather than prioritized relative to what is needed to achieve NextGen Operational Improvements. The subcommittee recognizes that this BLI is not controlled by the NextGen Program. However, the principal justification for this investment of RE&D funds are Operational Improvements defined in the NextGen Segment Implementation Plan, (i.e., OI 103119-13A, B, and C). These Operational Improvements, in their present form, do not specify the required improvements in weather forecast products in sufficient detail to allow for appropriate assessment and prioritization of the research.

Finding: One of the principal justifications for both the Weather PPT Portfolio and the Weather Technology in the Cockpit programs is that they would provide a safety benefit to General Aviation (GA). Both programs cite the 75% average fatality rate in GA weather-related accidents and the fact that GA accounts for 88% of weather-related aviation accidents. However, the subcommittee was presented with no evidence of any systematic study of the causality of these accidents that leads to the conclusion that better forecast tools or cockpit display of weather will substantially reduce the GA weather-related accident rate.

Recommendation: In future subcommittee reviews of the Weather PPT portfolio and Weather Technology in the Cockpit Programs, the FAA should present a clear justification for the research investment, tying the research to the operational improvement that is expected to be achieved. The FAA should provide quantitative (e.g., monetized) estimates of the NextGen safety and operational benefits achievable with the research results when applied to operations. Where the justification for the research requirement comes from the NSIP, the FAA should define specific requirements for weather technology improvement, based upon the safety and operational requirements of NextGen. If these requirements have not been defined and quantified, the FAA should orient the Weather PPT research portfolio to define these requirements. The FAA should also provide specific quantitative estimates of the safety benefit for those research investments targeted for GA safety.

Actions

Action – By 1 APR – The Subcommittee should provide questions for the Administrator and the agency senior executives.

Action – The FAA should describe how recommendations from REDAC impact the REB. This will require a briefing on how the REB works.

Action – To the Subcommittee. Take a look at the projects that were deferred (homework over the next 24 hours) keeping in mind a $5m budget. Focus on mid-term: 2018-2020. Looks like this may be 2025 time frame. Reduced budgets may impact how these things are implemented (the timelines).

Action – The subcommittee suggested that Mr. Piccione take a look at the REDAC culture report to examine NextGen culture issues (Gloria Dunderman was asked to provide the document).

Next Meeting Date: August 27-29, 2013

Location: Washington, DC – Allied Technologies

Attendance

Members:

Steve Bussolari, Chair	John Cavolowsky	Mark Weber
Deborah Kirkman	Bruce Holmes	Joe Bertapelle
William Leber	Dres Zellweger	Eric Neiderman, FAA – DFO

Other Attendees:

Cathy Bigelow, FAA	Rachel Seely, FAA	John Marksteiner, FAA
Mike Gallivan, FAA	Gloria Dunderman, FAA	Andrew Henderson, TASC
Steve Bradford, FAA	Jeff Tittsworth, FAA	Jillian Cheng, Engility
John Maffei, FAA	Dino Piccione, FAA	Steve Abelman, FAA
Karlin Toner, FAA	John Wiley, FAA	
Paul Fontaine, FAA (telcon)	Gary Pokodner, FAA (telcon)	

REDAC – NAS Operations Subcommittee Allied Technology Group – 600 Maryland Avenue, SW Suite 900 West Washington, DC 20024 March 5-7, 2013 (FINAL)		
Day 1 – March 5		
8:30 - 9:00 am	Welcome	Steve Bussolari
9:00 – 9:15	Introductory Remarks / Welcome	John Wiley
9:15 – 9:30 am	FAA Input on Subcommittee Role & Expectations	Eric Neiderman
9:30 – 10:00 am	FAA Guide for Authoring Findings and Recommendations	Cathy Bigelow
10:00 – 10:30 am	Budget Overview	Mike Gallivan
10:30 - 10:45 am	Break	
10:45 – 11:45	NASOps PPT Operations Concept Validation NextGen – Ops Concept Validation NextGen – Staffed NextGen Tower	John Marksteiner
11:45 – 12:30	Subcommittee Discussion – Findings and Recommendations (Homework)	All
12:30	Lunch	
1:30 – 2:30 pm	ATC/Tech Ops Human Factors NextGen ATC/Tech Ops HF Strategy Plan for Human Factors*	Dino Piccione Rachel Seely
2:30 – 2:45 pm	Break	
2:45 – 3:45 pm	Runway Incursion Reduction	John Maffei
3:45 – 4:00 pm	Subcommittee Discussion – Findings and Recommendations (Homework)	All
4:00 pm	Adjourn	
Day 2 – March 6		

8:00 – 9:00 am	Subcommittee Discussion – Previous Day Findings and Recommendations	All
9:00 – 9:45 am	Surface Discussion*	Paul Fontaine
9:45 – 10:00 am	Break	
10:00 – 11:30 am	Weather Program/Weather PPT Prioritization Process* Weather Technology in the Cockpit	Steve Abelman Gary Pokodner
11:30 – 12:00	Subcommittee Discussion – Findings and Recommendations (Homework)	All
12:00 – 1:00 pm	Lunch	
1:00 – 1:45 pm	JPDO	Karlin Toner
1:45 – 2:30 pm	Update/Discussion – Previous Subcommittee Recommendations	All
2:30 – 3:00 pm	Update – REDAC Working Group	Cathy Bigelow
3:00 – 3:30 pm	Future Subcommittee Activity	All
3:30 pm	Adjourn	
TBD	Dinner - TBD	
Day 3- March 7		
8:00 – 9:00 am	Subcommittee Discussion – Previous Day Findings and Recommendations	All
9:00 – 10:00 am	NextGen Wake Turbulence Next Gen Wake Turbulence Re-Categorization	Jeff Tittsworth Paul Strande
10:00 – 11:00	Subcommittee Discussion - Finalize Findings and Recommendations - Confirm Action Items - Future Meeting Logistics	All
11:00	Adjourn	

* Addresses Previous Subcommittee Recommendation