Research, Engineering and Development Advisory Committee
Federal Aviation Administration
800 Independence Avenue, SW Washington, DC
April 13, 2006

Meeting Minutes

On Thursday, April 13, 2006, the Federal Aviation Administration (FAA), Research, Engineering and Development Advisory Committee (REDAC), held a meeting in the Bessie Coleman Room, at 800 Independence Avenue, S.W., in Washington, DC. Attachments 1 and 2 provide the meeting agenda and attendance, respectively.

Welcome and Introductory Remarks

Dr. John Hansman, REDAC Vice Chair, welcomed the members and audience participants. He noted the meeting is compressed into one day in an intentional effort to try to focus more the activity of the REDAC into the subcommittee level.

Comments – Russ Chew

Mr. Chew commented the Agency has undergone a tremendous amount of restructuring in the last couple of years. The restructuring isn't for the sake of restructuring; it's for us to become a more effective agency. The vision of where we're headed was launched not only within the Agency itself but outside the Agency by the JPDO. That is the reason we have the growing emphasis on the subcommittee work. There's a lot of work that needs to be done to pull together what we believe is the Next Generation Air Transportation System. The work that goes on here in the RE&D and the things in the FAA rely on a coordinated effort. We have to be tied together if we're going to make this happen properly and that's the reason it's important that we have these kinds of committees. We need outside perspective to make sure the vision that we build is the vision that we want.

It is my distinct pleasure and privilege to introduce the Administrator because in all of my time in aviation, I have never seen a more focused leader. She has driven us to focus on those goals. The JPDO in particular is one of the things that is a hallmark of what we tried to put together. We got a long way to go, but we've done a lot of good work.

Comments – Hon. Marion Blakey

Ms. Blakey began her comments by expressing her appreciation for the work of the REDAC. I came to appreciate the written products, recommendations, and the commentary that came in early on when I took on this job. I've been struck by the genuine impact the work of your committee has had on the FAA. An example of this is the work done by Jerry Thompson on financing.

Ms. Blakey commented the committee structure is well. You will see from the Associate Administrators' Nick Sabatini, Russ, others, how much they are counting on the small group committee structure to work hand as we move forward. The members engaged in a discussion on the new structure of the REDAC to a smaller full committee and the expanded role of the subcommittees and working groups.

Update – Air Traffic Control Workforce – Dr. Kevin Corker

Dr. Corker discussed the findings and recommendations from the Human Factors Subcommittee. The first item is about action in the controller workforce integrated action plan. This is based on a presentation of the action plan. Maureen Knopes and her staff who have done an enormous amount work and our basic finding is that we are very impressed with the depth of response in the controller workforce integrated action plan. There has been a prestigious amount of work, coordination, thought in putting together a plan to try to respond to the controller workforce issues and in brief review of that, we think that there's some very positive aspects. First item identified which we appreciate your doing a single point of authority with respect to that issue of controller workforce, replacement and transition. There's a clear issue to be addressed and focus on matching actions and tasks in the current and future air transportation system. Air transportation service provision to metrics to determine or not those tasks are being well performed or well met and we think these are all very positive aspects of this plan. A plan has been put together that has in excess of 200 separate action items that follow very closely and expand on our committees recommendations. We also recognize however, that given the extent of this response, you have over 200 actions identified and taking all of those actions separately is one thing. Wrapping them into a unified response and ensuring the response meets the requirements of the controller workforce development is a challenge. We don't think that you're not equal to the challenge but we want to advise that this not become fragmented in terms of the individual actions across all the different responding organizations.

Transition we think can leverage the activities that you're taking with response to the immediate workforce requirements and consider it with some small modification and other efforts how that helps the transition issue into the next generation air transportation system. We think that's a great opportunity and it's built on the fact that you've made a very positive response to the requirements. Dr. Corker discussed two opportunities that we see at hand. We have work going on as you know in controller productivity enhancements and there's work that's been addressing the future on-route workstation and the intention is to increase controller productivity. Perhaps to go to a single person sector operation and to try to understand how that we be done with support to the human operator left to do the work.

Joint Planning and Development Office (JPDO) – Mr. Peggy Gervasi

Ms. Peggy Gervais briefed the members on the Next Generation Air Transportation System (NGATS)/JPDO FY 08 agency budget guidance for research. The NGATS portfolio management will develop plans for the transformation of the air transportation system. She presented a graph explaining the transition to NGATS from FY 2006 to FY 2024. She also defined what an operational improvement does which is a change to the operation of the air transportation system that produces a beneficial result and moves the system toward the NGATS goals and objectives. Another key issue that was presented was budget guidance to agencies for research and implementation.

Report Approval-Financing the Next Generation Air Transportation System
- Mr. Jerry Thompson

Mr. Jerry Thompson, Chair of the Financing the Next Generation Air Transportation System Working presented the report to members for approval. He began the discussion with the role out. The role out is the process the committee used to try to figure out how do you get to the

NGATS N-State from a current NAS. To try to figure out what it costs. What we're trying to accomplish; first was to figure out with the JPDO and other elements including ATO-P, ATO-F, The Policy and Planning Group and so forth, what is it going to cost to develop, and implement. NGATS essentially is changing paradines where you're moving from an air traffic controlled environment to an air traffic managed environment thing. Consider cost reduction activities along the way but there are other things that were not considered, which include labor contracts and controller salaries.

Members engaged in a lengthy discussion and received clarification on some issues. The members confirmed that a sentence would be added stating it is not the total expense to deliver NGATS. The report was approved. Mr. Thompson will modify the report and prepare for delivery to the Administrator.

Update – Separation Standards Working Group – Sarah Dalton

Ms. Sarah Dalton, Chair, Separation Standards Working Group updated the members on the work done by the group. The working group will examine the basis for current separation standards, and review past and ongoing studies of separation requirements. It will also consider improved methodologies for establishing separation standards, and will outline a recommendation R&D program for the FAA to determine what degree separation standards can be reduced using current and future technologies. The final report of the working group is to be completed by the September REDAC meeting.

Enterprise Architecture – Steve Bradford

Mr. Steve Bradford provided the latest on the Enterprise Architecture. He discussed the objective of an Enterprise Architecture is to be business driven in investment decisions. Mr. Bradford reviewed the relationship of ATO NAS EA to capital planning. Also discussed the GAO audit in 2005 and explained the DODAF – Department of Defense Architecture Framework. He finished by reviewing the next steps to be completed late in FY 06.

Presentation of Subcommittee Reports

In February and March, the standing subcommittees reviewed FAA's R&D investment areas, including air traffic services, airport technology, aircraft safety, human factors and environment and energy. After reviewing the respective investment portfolio proposed by FAA, each subcommittee produced recommendations and each of the subcommittee chairs presented recommendations to the Committee. Attachment 3 provides the subcommittee reports passed on to the Administrator.

Subcommittee on Air Traffic Services	Mr. Jerry Thompson
Subcommittee on Environment and Energy	Mr. Steve Alterman
Subcommittee on Aircraft Safety	Mr. Ron Wickens
Subcommittee on Airports	Mr. Ed Gervais
Subcommittee on Human Factors	Dr. Kevin Corker

FY 08 Recommendations Discussion

The members engaged in a lengthy discussion on recommendations to be consider in there guidance to FAA. Below are some of the topics discussed. Attachment 3 provides the recommendations forwarded to the Administrator.

Wake Vortex – The limitation of separation standards is going to become a wink and we need to understand way more than we have.

Separation Standards – Need to carry through with the work and think the work needs money well beyond 2006.

Unmanned Aircraft – How do we integrate into the operation of NAS, the business of moving airlines, and the robotic populace coming down the road?

Business of Transition – Need to lay out a process, money, people, organizations, etc., that carry forward so that we can take ideas and remove it from the R&D drawing board into an operational entity.

Dr. John Hansman thanked the members and directed them to send any suggestions to him by email. The meeting was adjourned.

Attachment 1

Research, Engineering and Development Advisory Committee
800 Independence Avenue, SW – Bessie Coleman Room
Washington, DC 20591

April 13, 2006

Agenda

9:00 a.m.	Welcome	John Hansman Vicki Cox, FAA Joan Bauerlein, FAA
	Remarks	Hon. Marion Blakey
9:30 a.m.	Committee Discussion	John Hansman Joan Bauerlein, FAA
10:15 a.m.	Update – Air Traffic Control Workforce	Kevin Corker
10:45 a.m.	Break	
11:00 a.m.	JPDO Report Summary	Peggy Gervasi, FAA
11:45 a.m.	Update – Separation Standards Working Group	Sarah Dalton
12:00 noon	Lunch	
1:00 p.m.	Enterprise Architecture	Steve Bradford, FAA
1:45 p.m.	JPDO Agency Guidelines for formulation of FY 08 Budget	Steve Bradford, FAA
2:00 p.m.	Report Approval-Financing the Next Generation Air Transportation System	Jerry Thompson John Fielding

Presentation of Subcommittee Recommendations for FY 08

2:30 p.m.	Subcommittee on Aircraft Safety	Ron Wickens
2:45 p.m.	Subcommittee on Airports	Ed Gervais
3:00 p.m.	Subcommittee on Human Factors	Kevin Corker
3:15 p.m.	Break	
3:30 p.m.	Subcommittee on Environment & Energy	Steve Alterman
3:45 p.m.	NAS Subcommittee	Jerry Thompson
4:00 p.m.	Committee Discussion – FY 08 Recommendations and Future REDAC	John Hansman
5:00 p.m.	Adjourn	

Attachment 2

Research, Engineering and Development Advisory Committee (REDAC)
April 13, 2006

Attendance

REDAC Members

Dr. John Hansman, Vice Chair
Ms. Joan Bauerlein, Executive Director
Mr. Steve Alterman
Dr. Michael Bragg
Dr. John-Paul Clarke
Mr. Kevin Corker
Mr. Jim Crites
Ms. Sarah Dalton
Dr. Colin Drury
Mr. Ed Gervais
Mr. Albert Kaehn
Mr. Ray LaFrey
Mr. Jerry Thompson
Mr. Ron Wickens
Mr. Jim Wilding

Audience

Jeri Alles, FAA
Howard Aylesworth, AIA
Mike Basehore, FAA
Cathy Bigelow, FAA
Marion Blakey, FAA
Steve Bradford, FAA
Fenton Carey, BAE
John Cavolowsky, NASA
Russ Chew, FAA
Susan Conry, FAA
Vicki Cox, FAA
Gloria Dunderman, FAA
Warren Fellner, FAA/Titan
Ed Feddeman, U.S. House
Frank Frisbie, APPTIS
Mike Gallivan, FAA
Peggy Gervais, FAA
Peggy Gilligan, FAA
Maureen Knopes, FAA
Paul Krois, FAA
Patrick Lewis, FAA
George Maranizi, FAA
Kevin Mattison, FAA
Lourdes Maurice, FAA
Tom McCloy, FAA
Monique Morris, FAA
Lee Olson, FAA
Barry Scott, FAA
John Rekstad, FAA
Randy Stevens, FAA
Nick Stoer, NSA
Steve Van Trees, FAA
William Wall, FAA
Jean Watson, FAA
Jim White, FAA
John Wiley, FAA

Attachment 3

PROFESSOR OF
AERONAUTICS AND ASTRONAUTICS
DIRECTOR
INTERNATIONAL CENTER FOR AIR TRANSPORTATION

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June 20, 2006

The Honorable Marion C. Blakey
Administrator
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Dear Administrator Blakey:

On behalf of the Research, Engineering and Development Advisory Committee (REDAC), I wanted to again thank you for your participation in the April 13 meeting.

Enclosed are the recommendations of the standing REDAC subcommittees on Aircraft Safety, Environment and Energy, Air Traffic Services, Airports, and Human Factors. I have also sent you the report of the working group on Financing the Next Generation Air Transportation System under a separate cover.

As you know we are currently in the process of trying to increase the value of the REDAC to the FAA by focusing more of the effort at the subcommittee level and strengthening the relationship between the subcommittees and the relevant parts of the FAA. There has been a very positive response for this approach from both the committee and FAA leadership.

One area of concern has emerged regarding the partnership between the FAA and NASA. NASA is reducing and refocusing its aeronautics efforts. While it is too early to fully assess the impact of these changes, it appears that there will be gaps in content and technical maturity between FAA needs and NASA's plans in ATM and Safety research. If this is correct, it would impact the ability of the FAA to meet it's near term goals and the nation's ability to transition to the Next Generation Air Transportation System. We will continue to monitor this.

Thank you again for your interest and participation. I, and the other members of the REDAC, are available if you would like to discuss these, or other, issues in more detail.

Sincerely,

R. John Hansman
Co- Chair, Research, Engineering and Development Advisory Committee
Professor of Aeronautics and Astronautics
Director, MIT International Center for Air Transportation

Enclosure

REDAC Subcommittee Recommendations for FY 2008

Subcommittee on Aircraft Safety

Recommendation #1

The FAA needs to make an assessment of the impact of the budget cuts in NASA's aeronautics R&D. Subcommittee on Aircraft Safety is concerned that there may be inadequate resources in the FAA's budget for taking on safety-related research that NASA used to perform in the past but won't be funded to cover in the future.

Recommendation #2

The FAA should initiate a project to develop a common and standard approach for "risk assessment". This standard should become standard throughout the FAA for all departments. Today each department appears to be developing its own method for assessing risk.

Recommendation #3:

Research should be conducted on advanced materials and joining processes being introduced on new aircraft; on new wiring technologies and on large by-pass engines. Also, on aircraft modifications designed to mitigate the risk of MANPADS, on fires due to non HAZMAT-declared shipments, on expanding operational deployment of UAV's and on reversing the trend toward a dwindling pool of qualified AMT's.

Subcommittee on Environment and Energy

1) Subcommittee members expressed widespread concern that we need to be proactive in addressing fuel availability/energy independence.

Recommend that the Administrator direct AEE to work with DoE, DoD, and NASA to identify commercial needs and leverage research to commonly address this challenge.

2) The subcommittee members continue to be concerned about the balance of FAA environmental investment in mitigation (via AIP) versus RE&D.

The FAA needs to evaluate the balance between investment in mitigation activities ($300 million plus) and development and engineering efforts to enable near term pioneering solutions to address environmental issues. This should be done taking into account the relative benefit of each investment.

3) The subcommittee endorsed the above target initiatives. In particular, the FAA should provide additional funding to address pressing particulate matter (PM) and hazardous air pollutants (HAPs). The new initiative should also include work to address the need for alternative fuels to meet commercial needs. The 70% increase reflects the remarkable growth in environmental requirements imposed by NGATS. It also denotes the subcommittee's appreciation of the quality of the work. And it reflects the view of a very diverse set of stakeholders (airports, airlines, manufactures, environmental organizations, academia, and other government agencies).

The subcommittee also made some additional recommendations specific to the detailed program review:

1) PARTNER research could have long-term policy implications (i.e., noise metrics) and FAA needs to start considering how the research will be translated and applied.

2) The Advisory Board noted that Project 13, Lateral Alignment, while having noble goals had questionable benefit; the general sense was that AEE investment should cease.

Subcommittee on Human Factors

Selection, Training and Staffing of Air Traffic Control

Recommendation 1: The Human Factors Subcommittee applauds the comprehensive response of the Controller Workforce Integrated Action Plan. The subcommittee strongly recommends that the efforts in that plan (directed to current work force selection and training) be leveraged to provide task analyses, procedural development and metrics for evolving capabilities in en route automation modernization (ERAM) and NGATS early products. The subcommittee sees an opportunity for human factors input early in the transition process to new paradigms of air traffic service provision. The subcommittee does not want to divert effort form the current CWIAP efforts, but rather to amplify these to lead research in t4echnology transition with respect to training, selection and evaluation processes.

Recommendation 2: The Human Factors Research and Engineering Division should work closely with other offices developing partnerships with advanced technology developers (e.g., NASA Airspace Systems program and projects to anticipate transition requirements for NGATS developments. Theses impacts will be felt in the human factor systems engineering, workforce planning, and air traffic training to model the impact of future concepts of operation, technology, and procedures on controller staffing, selection and training requirements. The development of methods, tools, and processes for modeling the evolving air traffic service provider work process is needed as part of that collaboration.

Flight deck/Maintenance/System Integration

Recommendation 3: The subcommittee recognizes and endorses the need for air ground integration research in response to advanced information-centric distributed air traffic management initiatives. The subcommittee suggests that these research initiatives be coordinated with safety assessment and procedures development. In order to extend and position past safety assurance and certification work to support new technologies transition
Recommendation 4: Subcommittee finds that the FAA Human Factors Office is uniquely placed to support a responsive transition strategy to future operations. We suggest that the office consider broadening the activities in air-ground integration with partnerships with NASA and JPDO.

NAS Operations Subcommittee

Recommendation re Wake Vortex Research: Continuation of research funding in this area at the current expenditure level is appropriate. Currently available improvements in navigation and surveillance technology could produce major improvements in terminal area capacity if the wake vortex hazards can be understood and efficiently avoided. The current program is producing new procedures that will go into effect this year at St. Louis that will provide operational benefits. Recent investment in wake research has validated additional operating benefits that may be appropriate at other airports. However, the suggested out-year funding for implementing these new procedures does not reflect the importance of the wake vortex in enabling terminal area capacity improvements.

Recommendation re Separation Standards: A NAS Operations Subcommittee working group is currently looking at this issue and will shortly be making recommendations regarding research on separation standards. We expect that this working group will suggest that separation standards could be safely reduced or redefined as to the way they are structured and applied (a la stochastic separation.). Defining the details of these new approaches to safe separations will require new research into the statistics of flight technical error (in the context of modern FMS capability), into blunder statistics and recovery mechanisms, and into the impact of a stochastic separation approach. These efforts will require close coordination with the developing NGATS definition. The budget projection for separation standards (no money after 2006) will not support this urgent need.

Recommendation re Unmanned Aircraft Systems: We need an R&D program that assesses the impact of integrating UAS into the NAS. "The funding for RE&D related to Unmanned Aircraft Systems in FY08 and beyond does not reflect the complexity of the technical and operational issues associated with their routine integration into civil airspace. This is a critical national priority for both homeland security and national defense missions as well as the emerging commercial potential enabled by this new species of aircraft.

Recommendation re R&D Transition to Operational Utility: The committee notes that the transition from R&D product to operational utility is very long. Promising R&D products (at Technology Readiness Level 6) typically take more than 10 years to initial operational capability. In addition, recent cuts in funding levels in NASA Airspace System Program research and increased emphasis on earlier technology readiness levels is likely to widen this gap and thus the committee is concerned that in the coming years this transition delay will grow. In anticipation of the acceleration of technology deployments required to realize NGATS, the committee recommends that the FAA assess the costs of NGATS deployments and apply sufficient funds to accelerate the technology transfer and implementation.

Subcommittee on Airports

1. Subcommittee reconfirmed the proposed program for FY 06 and FY 07 research. FAA needs to continue to coordinate with the new and growing ACRP research program to assure that the two programs are complimentary.

2. Subcommittee supports the increased funding in FY 08 for friction and winter operations research. Additional friction research and data collection on winter runway braking characteristics is needed (following up on the Midway accident). The research should include modification to simulators to include runway surface characteristics, and the development of aircraft-derived braking data into the research as well.

3. In FY 08 the Airport R&D Branch at the Technical Center should have a head count increase from 20 to 22 heads. The Subcommittee has stated previously that if the program grew from the historic $5.5M level to the higher levels that are now in place, the requested increase should be implemented. The two engineers should be included in the Airport Technology FY 08 budget request.

4. Subcommittee suggested that the FAA should initiate research on EMAS systems to consider stopping characteristics within shorter distances by perhaps allowing higher deceleration capabilities.