Research, Engineering & Development (R,E&D) Advisory Committee

Meeting Minutes

January 20 and 21, 1999

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Meeting Minutes of the Federal Aviation Administration Research, Engineering and Development Advisory Committee January 20 and 21, 1999

On January 20 and 21, 1999 the Federal Aviation Administration (FAA) Research, Engineering and Development (R,E&D) Advisory Committee held a meeting at the Holiday Inn Rosslyn Westpark Hotel in Arlington, Virginia. Attachments 1 and 2 provide the meeting agenda and meeting attendance, respectively.

Day One - January 20

Welcome and Introductory Remarks

Dr. Herman Rediess, Executive Director and Designate Federal Official of the Committee, read the public meeting notice. Mr. Ralph Eschenbach, Chairman of the Committee welcomed the attendees and a new member to the Committee: Dr. Deborah Boehm-Davis, Professor of Psychology at George Mason University. Dr. Rediess recognized members leaving the Committee: Mr. Richard Bustelo, Hon. Susan Coughlin, Dr. Satya Atluri, Dr. John Lauber,

Dr. Dennis McLaughlin and Ms. Nancy Price. He thanked them for their dedication and valuable contributions to many Committee efforts. He also thanked the retiring Chairman, Mr. Ralph Eschenbach for his dedicated support and leadership over the past two years. He announced that Mr. Robert Doll, who currently chairs the Aircraft Safety Subcommittee, would be the incoming Chairman.

Mr. Steve Zaidman, Associate Administrator for Research and Acquisitions, expressed appreciation to Mr.

Eschenbach and other departing members as well as welcoming Mr. Doll. Mr. Zaidman discussed, budget issues, the new Aging Systems Advisory Committee, the National Aeronautics and Space Administration (NASA) and FAA joint efforts, and the status of FAA's Global Positioning System (GPS) program.

- Connie Morrella's Congressional Committee has tentatively scheduled fiscal year (FY) 2000 R,E&D reauthorization hearings for March 4. House FAA appropriation hearings are planned for March 9 and 10 with discussions on ATC modernization on the 9th and safety and security on the 10th.

- FAA is trying to fit its mission into the FY 1999 budget. The Operations budget is the biggest account and poses the biggest problem. The attempt to accommodate funding requirements may necessitate FAA internal adjustment and reduction in personnel. There is an internal plan, which focuses on preserving user services. The plan will allow hiring of critical personnel and preservation of as many services as possible, but it will mean fewer personnel over the next few years.

- The Aging Systems Advisory Committee is a new committee created as a result of the Gore Commission Report. It will focus on aging aircraft systems and address inspections and other Operational activities, not research and development (R&D). Any of this new Committee's work in the R&D arena, would necessitate coordination with the R,E&D Advisory Committee. This new Committee is holding its first meeting at the FAA on January 20.

- The NASA/FAA Executive Committee met recently to share budget information, discuss metrics and goals, and explore program areas linking NASA and FAA to assure R&D activities meet sponsor expectations. Recently, the Executive Committee determined FAA's budget to be inadequate for taking NASA's prototype technology developments to an advanced stage.

- FAA announced an anticipated 14-month delay in the WAAS initial operating capability (IOC), with IOC now expected in September 2000 rather than July 1999. FAA and Raytheon will work the system's technical issues, mainly algorithm generation and integration, but also timing and safety issues. FAA's press release on the subject was made with full customer cooperation, and resulted in frank and productive discussions.

- The Johns Hopkins study on GPS and its augmentations will be released to FAA on

  January 29, 1999. The study addresses significant issues such as interference and associated mitigation factors. This study's review is anticipated to greatly perpetuate dialog among members of the domestic and international aviation communities.

In closing, Mr. Zaidman said the aviation community, for the first time on record, has experienced zero fatalities on U.S. air carriers and commuters in 1998. He pointed out that this is a remarkable performance achievement, considering U.S. commercial aviation carriers and commuters transport twice the country's population during the year.

Meeting Process and Objectives

Dr. Rediess reviewed the agenda and invited members to attend a joint FAA R,E&D and NASA Aeronautics and Space Transportation (ASTT) Advisory Committee Meeting on January 21, at 1:30 p.m. at NASA Headquarters.

The meeting agenda for the joint meeting will address the organizational and functional activities of the two Committees and their respective subcommittees.

Air Traffic Services Subcommittee Update

The Air Traffic Services (ATS) Subcommittee is one of six standing subcommittees established in January 1997 to provide recommendations to the FAA on its proposed R,E&D investments portfolio and to conduct annual reviews of FAA's research and development program. FAA's ATS program includes air traffic management systems; communications, navigation and surveillance systems; and weather systems. Mr. Nancy Price chairs the Subcommittee.

Ms. Nancy Price provided the Committee with a report from the Subcommittee's November 1998 meeting. The Subcommittee found that FAA is not pursuing long-range R&D projects, but instead, is focusing only on the near-term. This is evident by the transfer of R&D funds to F&E and operations funds. Furthermore, the Operational Concept and National Airspace System (NAS) Architecture appear to be diverging rather than paralleling one another. An overall, integrated approach is necessary to prevent further divergence. Planning, including increasing technical competency within the FAA, as well as systems integration and funding are major NAS modernization hurdles. The report addresses these concerns, along with capacity issues.

The members discussed the report and suggested some minor changes. With the changes, the Committee voted to approve the report and provide it to the Administrator. The approved report is provided by Attachment 3.

Update on FAA/Eurocontrol R&D Committee Meetings

Mr. Paul Drouilhet commented on two international research meetings that he recently attended: the USA/Europe ATM R&D Seminar and the FAA/Eurocontrol R&D Committee Meeting.

The USA/Europe ATM R&D Seminar was held in Florida on December 1-4, 1998. The purpose was to provide a forum for researchers to share the results of current R&D. Two issues emerged from these discussions that will be pursued at the next meeting. (1) User community participation should be expanded, particularly among aircraft operators, and (2) meeting results, which are of broad interest to the aviation community, must be more widely distributed without compromising the benefit of small-group, informal interaction. [For more information on this meeting visit web site www.atm-seminar-98.eurocontrol.fr.]

The second meeting was the FAA/Eurocontrol R&D Committee Meeting, which was held in Florida on December 8-9, 1998. This is an ongoing meeting between the agencies for the purpose of collaborating and conducting cooperative R&D in areas of mutual interest.

Mr. Drouilhet found the European ATC R&D more aggressive than U.S. R&D. An example is ADS-B.

Mr. Drouilhet described the relationship between Eurocontrol and the European Commission (EC) as very complex and not well defined. Mr. Drouilhet urged the Committee and Subcommittee to understand not only NASA research, but also international research in order to advise more thoroughly. He recommended the Committee attempt to contact the EC in addition to Eurocontrol.

Architecture Database

Mr. Steve Bradford, Manager of the NAS Concept Development Branch, and Mr. Steve Decker, from TRW Systems and Information Technology Group, presented the National Airspace System Capability and Architecture Tool. The Architecture embodies a NAS modernization evolution from today through the year 2015. It is not an end-state, but a "living" representation of an integrated and evolutionary approach to NAS modernization. The tool reflects the "living" nature of the Architecture. It can be used to provide decision-makers with the NAS interdependency data necessary to make mission need, investment, and budget decisions. It can promote FAA and industry collaboration and support the FAA acquisition and budget process.

New FAA NASA Partnership Agreement

Mr. Charles Huettner, Deputy Director of Aeronautics for the NASA Office of Aernautics, reviewed the FAA/ NASA partnership agreement that was signed on October 9, 1998, by FAA Administrator Jane Garvey and NASA Administrator Daniel Golden. The thrust of the agreement is to improve aviation safety, security, and efficiency by ensuring complementary goals and coordinated planning, resources, progress monitoring, and changes, if necessary.

Mr. Huettner invited Committee members to the joint meeting with the ASTT Advisory Committee at NASA following the R,E&D Advisory Committee's meeting. These issues would be discussed there in greater detail.

Committee Restructing

Dr. Herm Rediess reviewed the Advisory Committee's role, purpose, and structure compared with RTCA and NASA. He proposed more clearly defined roles to increase effectiveness and reduce duplication of effort.

Each group has specific objectives, which are clearly defined in their charters. The Advisory Committee's primary role is to review R&D issues, regardless of where they are funded. RTCA's primary focus is on implementation including providing advice on the Operational Concept and NAS Architecture; therefore, it is not effective for the Advisory Committee to spend time on these issues.

The restructuring proposal includes the following. (1) Linking-members between RTCA and the R,E&D Advisory Committee to convey information between the two groups and prevent duplication of effort. (2) R,E&D Advisory Committee provides briefing to RTCA on research issues, as needed. (3) Linking members between the FAA R,E&D and NASA ASTT Advisory Committees; (4) Common subcommittees between the two advisory committees in the areas of safety, NAS efficiency and capacity, and environment.

Subcommittee Updates

Mr. Eschenbach asked each subcommittee chairperson to provide a brief status report on his or her subcommittee's recent efforts and future plans.

- **Ms. Nancy Price, Chair, Air Traffic Services Subcommittee**

  The Subcommittee will meet on February 23-25, 1999. The plan is to review how the research maps to the

Architecture tool including NASA efforts.

- **Angela Gittens, Chair, Airports Subcommittee**

  The Airport Technology budget has been cut to $5 million. However, FAA has continued to prioritize and has managed to complete the pavement test facility. The test facility will open in April 1999. Ms. Gittens congratulated FAA for its foresight in working with wildlife and setting up a Center of Excellence.

- **Robert Doll, Chair, Aircraft Safety Subcommittee**

  The Subcommittee will meet on March 2- 4, 1999. Mr. Doll will continue to Chair the Subcommittee until a replacement is named. The Subcommittee met in August and delivered a report to the Committee in September 1998. Mr. Doll applauded the creation of the Aging System Advisory Committee and suggested an update on the Centers of Excellence at the April 1999 meeting to acquaint the Committee with the program's scope

- **Jim Pierce, Chair, Security Subcommittee**

  The Subcommittee will meet on February 23-24, 1999, to review recommendations for April meeting. Mr. Pierce announced a need for additional Committee members to participate on the Security Subcommittee.

- **John Lauber, Chair, Human Factors Subcommittee**

  The Subcommittee will meet on March 11, 1999. The Subcommittee will focus on the Flight Deck Training Program and address recommendation from the last Subcommittee meeting.

- **Dr. Wesley Harris, Chair, Environment & Energy Subcommittee**

  The Subcommittee will meet on February 18, 1999. Dr. Harris introduced Mr. Howard L. Wesoky, the FAA's Designated Federal Official for the Environment and Energy Subcommittee. Dr. Harris discussed national and international initiatives in environment and energy, NAS modernization and its impact on the environment, the FAA and NASA relationships with respect to environment and energy research, the Environmental Research Beyond 2000 effort, and Subcommittee membership.

Day Two - January 21

Mr. Eschenbach convened the meeting at 8:30 a.m., and Dr. Rediess reiterated the terms of the public meeting announcement.

Update on Free Flight Phase 1 (FFP1)

Dr. Clyde Miller, _____Free Flight Phase 1 Office, presented the FFP1 program, which provides early operational benefits by evaluating products and performance through limited deployment to determine whether further deployment is warranted. The program is scheduled for completion no later than December 2002. There are five products being deployed including Surface Movement Advisor (SMA), Collaborative Decision

Making (CDM), User Request Evaluation Tool (URET), Traffic Management Advisory (TMA), and Passive Final Approach Spacing Tool (pFAST). These are controller decision support tools designed to help controllers better manage air traffic.

Update on Safe Flight 21

Ms. Shelly Myers, Director of the Office of Communication Navigation and Surveillance Systems, presented the Safe Flight 21 program. To allay misconceptions about this program, Ms. Myers emphatically stated that Safe Flight 21 is not Flight 2000.

Safe Flight 21 is an operational evaluation of nine NAS enhancements, which were determined by the RTCA Select Committee. These nine enhancements include: providing weather and other information to the cockpit; using affordable means to reduce controlled flight into terrain; improving capability for approaches in low visibility conditions; enhancing the capability to see and avoid adjacent traffic; enhancing the capability to delegate aircraft separation authority to the pilot; improving the capability for pilots to navigate airport taxiways; enhancing the capability for controllers to manage aircraft and vehicular traffic on airport surface; providing surveillance coverage in non-radar airspace; improving separation standards.

In FY 1999, Safe Flight 21 is funded under F&E; however, plans are to fund it entirely with R,E&D funds beginning in FY 2000. A plan, detailing the program's initiatives, is being written and will be available soon.

Proposed Subcommittee on General Aviation and Vertical Flight

Mr. John Zugschwert, Vice President of TEXTRON, presented a proposal to reestablish the Subcommittee on General Aviation and Vertical Flight. The proposed subcommittee would address the challenges of implementing tilt-rotor technology with respect to the NAS and civil aviation. He asked the Committee's approval to form a team to write the Terms of Reference for the Subcommittee, which he proposed to present at the Committee's April meeting. The Committee approved the proposal to form a team to prepare the Terms of Reference.

Closing Comments

Mr. Eschenbach thanked members for their participation. Meeting adjourned at 11:30 a.m. Members were reminded about the joint FAA R,E&D and NASA ASTT Advisory Committee meeting starting at 1:30 p.m. at NASA Headquarters.

Attachment 1

Research, Engineering & Development Advisory Committee

Holiday Inn Rosslyn Westpartk Hotel

1900 North Fort Myer Drive, Arlington, VA 22209

(703) 807-2000 FAX: (703) 522-7480

January 20-21, 1999

Agenda

DAY 1 - JANUARY 20

9:00 am-9:30 am	Welcome and Introductory Remarks	Mr. Ralph Eschenbach, Chair
	• Farewell to Retiring Members • Welcome New Members	Dr. Herman Rediess, FAA
9:30 am-9:45 am	Update on R,E&D Budget	Mr. Steve Zaidman, FAA
9:45 am-10:00 am	Meeting Process and Objectives	Dr. Herman Rediess, FAA
10:00 am-10:30 am	Air Traffic Services Subcommittee Update	Ms. Nancy Price
10:30 am-10:45 am	BREAK	
10:45 am-11:00 am	Update on FAA/EUROCONTROL R&D Committee Mtg. Held in Florida	Mr. Paul Drouilhet
11:00 am-12:00 noon	Architecture Database	Mr. Steve Bradford, FAA

12:00 noon	LUNCH	
1:00 pm-2:00 pm	Architecture Database - Continued	Mr. Steve Bradford, FAA
2:00 pm	BREAK	
2:15 pm-2:30 pm	New FAA NASA Partnership Agreement	Mr. Charlie Huettner, NASA
2:30 pm-4:30 pm	**Committee Restructuring** -- Committee Role vs. RTCA Role -- NASA/FAA Advisory Committee Relationship -- Committee Meetings -- Subcommittees -- Budget Process Management	Dr. Herman Rediess, FAA
4:30 pm-5:00 pm	**Subcommittee Updates and Future Meeting Plans**	
	Subcommittee on Air Traffic Services	Ms. Nancy Price
	Subcommittee on Airports	Ms. Angela Gittens
	Subcommittee on Aircraft Safety	Mr. Robert Doll
	Subcommittee on Security	Mr. James Pierce
	Subcommittee on Human Factors	Dr. John Lauber
	Subcommittee on Env. & Energy	Dr. Wesley Harris

5:00 pm	Adjourn	

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Day 2 - January 21

8:30 am	Meeting Convened	Mr. Ralph Eschenbach, Chair
8:30 am-9:15 am	Update on Free Flight Phase 1	Dr. Clyde Miller, FAA
9:15 am-10:00 am	Safe Flight 21 Update	Ms. Shelly Myers, FAA
10:00 am	BREAK	
10:15 am-10:30 am	Discussion on the Proposed Subcommittee on General Aviation & Vertical Flight	Mr. John Olcott Mr. John Zugschwert
10:30 am-11:30	Committee Discussions	
11:30 am	Meeting Adjourned	

Attachment 2

Research, Engineering & Development (R,E&D) Advisory Committee

January 20-21, 1999

Attendance

	Members	
Mr. Ralph Eschenbach	Lt. Gen. Spence Armstrong	Mr. Viggo Butler
Hon. Susan Coughlin	Mr. Robert Doll	Mr. Paul Drouilhet
Mr. Paul Fiduccia	Ms. Angela Gittens	Dr. Wesley Harris
Mr. Bruce Landsberg	Dr. Dennis McLaughlin	Mr. Jack Olcott
Mr. James Pierce	Mr. Neil Planzer	Ms. Nancy Price
Mr. Edward Stimpson	Dr. Deborah Boehm-Davis	Dr. Herman Rediess
	Audience	
Steve Zaidman, FAA	Quentin Taylor, FAA	Rudy Ruana, Jeppesen
Jim White, FAA	Joseph Pino, FAA	Tom Proeschel, FAA
Earl Weener, Boeing	Richard Young, FAA	Edward Spitzer, Volpe
Roy Reichenbach, NASA	Mike Versage, FAA	Bob Tyler, FAA
Jon Baldwin, FAA	Virgenia Embrey, FAA	Jim Poage, Volpe
Mark Rodgers, FAA	Lee Olson, FAA	Keith Murray, SETA
Richard John, Volpe	Fidel Cornell, DOT/IG	Bennie Sanford, FAA
C.T. Ruehle, FAA	Rosanne Marion, FAA	Nick Stoer, Stoer & Assoc.
Geoff Mumford, APA	Robert Jacobsen, AMES	Charles Huettner, NASA
Randy Stevens, FAA	Cathy Myers, CTA	David Goehler, Jeppesen
Mike Gallivan, FAA	Terry Kraus, FAA	Michael Shapiro, SETA

Joseph McCormick	Howard Wesoky, FAA	Sieg Poritzky
Brent Foote, NCAR	Nancy Lane, FAA	Bruce Carmichael, NCAR
Lynne O'Rourke, TRW	David Johnson, FBPCS	Patrick Lewis, FAA
Diana Liang, FAA	Paul Jones, FAA	William Thedford, SRC
Raymond LaFrey, MIT LL	Warren Fellner, FAA	Edward Gervais, Boeing
John Fielding, Raytheon	Fred Broadway, FAA	Dennis Filler, FAA
Anne Harlan, FAA	Herb Bachner, FAA	Bill Edmunds, ALPA
Bill Bozin, ATA	Al Albrecht	Hugh McLaurin, FAA
Jim Banks, ATCA	Glenn Orthmann, ACI	Wilson Felder, TRW
Chuck Friesenhahn, FAA	Hugh Bergeron, FAA	Kenneth Cobb, TRW
Lawrence Buehler, FAA	Lauren Grace, FAA	Vivian Hobbs, Volpe
Paul Abramson, SRC	Tisha Colvin, SRI	Steve Bradford, FAA
Steve Decker, TRW	Mike Harrison, FAA	Phil Yu, TRW
Jeff Grove, Science Cmte.	Bob DeRoode, Gallium	Charles Fluet, FAA
Jan Brecht-Clark, FAA	Lyle Malotky, FAA	Joe Justiniano, FAA
Jim Wilson, Science Cmte.	Al Babbitt, TRW	Diane Boone, MITRE
Paul Polski, FAA	Glenn Smith, NASA	Robert Wright, FAA
Chris Seher, FAA	Mike Prendergrast, P&W	T.J. O'Brien, FAA
Jim Banks, ATCA	Hank Cabler, FAA	Michael Flores, FAA
Jim Herbert, FAA	Shelly Myers, FAA	Hal Bell, FAA
Mark Rockman, MITRE	Don Streeter, FAA	Clyde Miller, FAA
Sieg Poritzky	Hans Weber, WTA	Dwight Love, MITRE
J. Zugschwert, TEXTRON	Glen Martin, FAA	Gloria Dunderman, Crown
Mary Barboza, FAA	June Lidder, TRW	Denise Davis, FAA

Carole Schmidt, Crown	Marcie Romagnoli, TRW	

Attachment 3

March 5, 1999

The Honorable Jane Garvey
Administrator
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Dear Ms. Garvey:

The recent meeting of our R,E&D Advisory Committee and the work of our Air Traffic Services Subcommittee impels me to offer some thoughts of our Committee to you directly.

As always, the meetings have been informative and the obvious dedication of the briefers has been gratifying. Yet the meetings have been disturbing in several respects, - among them:

a. the lack of any real long range research and development programs,

b. the transfer of funds from R&D to F&D and Operations which further weakens and confuses the R&D program and

c. virtually no focus on the major challenge of system and airport capacity, of which capacity-increasing technologies and procedures are a part.

Based on the priority being given to near-term system improvements, we note again that the current efforts are seemingly all directed at implementing things on which the real R&D was done years ago. These things need to be implemented rapidly and we support them enthusiastically. However, there appears to be little, if any, real R&D efforts associated with the integration of the near-term improvements to a more capable system for the future. There is acknowledgement within the FAA that the absolutely crucial work for the future is not being addressed. Without a vigorous R&D program, nothing will be ready to be implemented after Free Flight Phase 1. This lack of early planning could easily lead to a long gap in implementation of completed research. Our NASA friends have pointed out that NASA's research stops short of fieldable systems and requires important FAA R&D to complete the efforts if the NASA research is to be successful. Other outside the United States are doing meaningful R&D and the U.S. will inevitably lose its eminent role.

The R&D situation has been further aggravated by the shift of money to F&E and Operations. Congress moved

most of the Air Traffic Management programs and all of the Airports technology programs to the Facilities and Equipment (F&E) budget, reflecting the emphasis on the near-term at the expense of the longer-term. With the R&D funding and responsibilities for implementation separated into so many different pots, the R&D management, focus and effort have been seriously compromised.

The new Architecture and the new Operations Concept, on which ARA and ATS have been working hard and effectively, are of limited value if they don't clearly show where we need to go – regardless of funding. However, without adequate funding, solutions will neither be achieved promptly or easily. The FAA should not indulge in the pretense that system modernization can be carried out with the present funding. Ms. Garvey, the FAA must find a way to convince Congress that the R&D budget must be increased. This budget issue requires exceptional action.

We were briefed on the development and active pursuit of a new "Architecture" tool (which is an overall planning and scheduling tool depicting the steps to NASA modernization) being developed by FAA with its TRW contractor. It is potentially a very powerful tool, and we strongly encourage its wide internal and external use. Further work is required to evolve the system to provide a time-phased architecture showing how specific products evolve to provide the service evolution, as well as work to define the metrics of resultant benefits. It may be tempting to some to downplay or hide this powerful tool, because it will show starkly the consequences of inadequate funding, inadequate organization and inadequate system engineering, but it deserves your strong support.

Several of us have the impression that the close melding of the ARA Architecture and the ATS Operations Concept, which has been a major and highly welcome FAA accomplishment, is perhaps unraveling a bit. There is great value and importance of them staying close and fully tracking in unison, just as it is important that the new "Architecture" tool remain in lock step with these activities.

We had a good briefing on the evolution of Flight 2000 (intended as a real life "beta test" of some of the new technologies) to SafeFlight 21. While this redirection is brand new, it is highly promising and we think it deserves strong support. While FAA is using RTCA as its advisory body on operational matters of Safe Flight 21, we stand ready to help on the R&D aspects of it.

The lack of adequate and enough technical competence in FAA remains a critical matter, one which can not be resolved by hiring more support contractors and external body shops – it requires a critical mass of good people inside the FAA. Additional good program and technical managers, system and software engineers are needed.

FAA and NASA are trying, at the top level, to work together a bit more closely that before. However, the union is not yet nearly close enough, especially since NASA has a substantial part of the available R&D funds. We know about, and support, the efforts of Steve Zaidman and Sam Armstrong to bring the agencies together. As noted above, our NASA friends have pointed out that NASA's research stops short of fieldable systems, and requires an important FAA R&D effort. It will need unflagging attention from the highest levels in FAA – both ARA and ATS – if the money and efforts are to result in useful and timely products.

Finally, we urge you to reinstate and reinvigorate FAA's emphasis on our most challenging problem for the future – meeting the nation's needs for adequate system and airport capacity. We stand ready to help.

Sincerely,

Ralph Eschenbach

Chairman, R,E&D Advisory Committee