Meeting Minutes of the
Federal Aviation Administration
Research, Engineering & Development Advisory Committee

January 28-29, 1997

On January 28-29, 1997, the Federal Aviation Administration (FAA) held a meeting of the Research, Engineering and Development (R,E&D) Advisory Committee at the Double Tree Hotel in Arlington, Virginia. Attachments 1 and 2 provide the meeting agenda and meeting attendance, respectively.

Welcome and Introductory Remarks

Dr. George Donohue, Associate Administrator for Research and Acquisitions, introduced Mr. Ralph Eschenbach as the new R,E&D Advisory Committee Chairman.

Mr. Eschenbach welcomed the attendees and introduced the seven new members: Mr. Richard Bustelo, Mr. Viggo Butler, Mr. Robert Doll, Ms. Angela Gittens, Mr. Jean McGrew, Mr. Michael Rioux, and Mr. Edward Stimpson.

Dr. Andres Zellweger, Executive Director and designated federal official of the Committee, thanked the twelve retiring members for the time and dedication that they have given to the Committee. Retiring members were Gen. James Abrahamson, Capt. Robert Buley, Dr. Delores Etter, Ms. Mary Rose Loney, Mr. Joseph McCormick, Mr. Dale Warren, Gen. James McDivitt, Mr. Brian Rowe, Dr. Jack Snell, Mr. John Stenbit, Dr. Earl Wiener and Mr. Christopher Witkowski.

Dr. George Donohue spoke to the Committee about the challenges FAA will face in implementing the anticipated Gore Commission recommendations. The Gore Commission was established by President Clinton as the White House Commission on Aviation Safety and Security in July 1996, in the wake of concerns over the crash of Trans World Airlines Flight 800. The Commission is chartered to study matters involving aviation safety and security, including air traffic control, and to develop a strategy to improve aviation safety and security, both domestically and internationally. FAA expects the Commission's report to challenge the aviation community to accelerate a number of activities including the completion of the NAS architecture and the implementation of the communication, navigation and surveillance (CNS) and air traffic management modernization program. Also, he anticipates that the report will recommend that FAA pursue additional security research, continue capital investments to improve aviation security, and form partnerships with airlines, airports and industry to achieve these goals.

Dr. Donohue stated that close partnerships between FAA, airlines, airports and industry are the key to fulfilling the challenges of the White House Commission.

Meeting Objectives

Ms. Lee Olson, Office of Aviation Research, discussed the 3 objectives of the meeting which included: reviewing the NAS R&D Panel Report; reviewing FAA's response to 3 Committee reports including Human Factors, Security and Aviation Weather; and forming the 6 standing subcommittees that will review FAA's research and development investments.

Report of the National Airspace (NAS) R&D Subcommittee

Ms. Nancy Price, Chair of the NAS R&D Subcommittee, presented the subcommittee's draft report. The subcommittee charter was to review the content and management of FAA's current research and development program against the proposed NAS Architecture. The purpose of the review was to identify issues that required resolution in order to complete the architecture and to explore opportunities for increasing the program's effectiveness in enhancing the NAS .

Committee members were instructed to review the report and provide their comments to Ms. Price by Friday, February 14. The Committee expects to vote on final approval of the report at the April Committee meeting.

Aviation Safety Research

Mr. Charles Huettner, FAA's liaison to NASA as Director for Aviation Safety Research, presented an update on the joint FAA/NASA Aviation Safety Research Program. Mr. Huettner first introduced the program to the Committee at the September 1996 meeting. The program objective is to develop a strategic plan and an investment strategy for aviation safety research.

Mr. Huettner explained how NASA and FAA are anticipating that the Gore Commission will propose a national goal to improve aviation safety by 5 times in the next 10 years and by 10 times within the next 20 years. NASA and FAA plan to work jointly to accomplish this goal. NASA is proposing to invest $0.5 billion dollars toward safety research over the next 5 years. As part of the program, NASA is proposing a partnership with FAA and industry to achieve the national aviation safety goal.

The Aviation Safety Research Task Force will define research objectives and funding levels to guide research elements of the national aviation safety goal that are not human factors related. The Human Factors Team will develop the program to address the human factors related goals.

Proposal for a Subcommittee to Address General Aviation and Vertical Flight

Mr. Robert Wright, Office of Flight Standards Service, provided an update on FAA's response to the Committee's proposal for a Subcommittee on General Aviation (GA) and Vertical Flight. Mr. John Zugschwert and Mr. Jack Olcott (President of NBAA) proposed the subcommittee at the September 1996 Committee meeting. The objective of the proposed subcommittee would be to investigate the current national transportation system as well as the proposed NAS architecture to determine how these systems support GA and vertical flight. FAA is in the process of generating a terms of reference for the proposed subcommittee and plans to present the terms of reference to the Committee at the April meeting.

FAA Response to the Human Factors Subcommittee Report

The Human Factors Subcommittee was formed in September 1994 as an ad hoc subcommittee under the Chairmanship of Dr. Earl L. Wiener. Its objective was to investigate, assess, and report on the status and organization of human factors in the FAA and make recommendations for change. The subcommittee published a report on August 5, 1996, entitled "Report to the Committee on the Status and Organization of Human Factors Within the FAA." The report was approved by the Committee on September 10, 1996.

Dr. Jan Brecht-Clark and Dr. Tom McCloy from FAA's Human Factors Division presented FAA's response to the Human Factors Subcommittee Report. FAA plans to provide an update to this response at the September 1997 Committee meeting.

Recommendations:

1. The FAA needs to create a centralized responsibility for human factors.

2. The FAA needs to assign resources and people to this central responsibility structure, define the expectations of the agency, and hold them accountable.

3. The FAA needs to provide a lead organization for human factors.

Response:

1. The FAA will distribute a memorandum by March 31 that outlines a concept of operations for the relationships among organizational elements for the planning and execution of human factors. (The date for the memorandum was changed from March 31

to June 30 due to a change of personnel, specifically, a new Chief Scientist for Human Factors.)

2. The FAA will publish an order in 1997 that defines the following responsibilities and expectations:

Designating the Associate Administrator for Research and Acquisition (ARA) as the lead organization for developing a unified FAA human factors program.

Designating the Human Factors Division (AAR-100) as the central focal point

-- for representing, communicating, coordinating, advocating and centrally managing FAA human factors within and outside the agency.
-- with responsibility and authority for human factors related R,E&D budget programming, planning and management.

Identifying the roles and responsibilities and organizational relationship with the central focal point for the following organizations:

-- the agency providers for human factors including FAA Headquarters, the Civil Aeromedical Institute (CAMI), and the William J. Hughes Technical Center.
-- the FAA lines of business.

3. ARA and AAR-100 along with the Associate Administrators for Regulation and Certification (AVR) and Air Traffic Services (ATS) and other lines of business will accomplish the following by June 30, 1997:

Jointly establish a human factors requirements identification and prioritization process.

Jointly establish a human factors program planning and execution process.

Jointly revise the human factors coordinating committee as a forum to define and support coordination and interface requirements.

Cooperatively identify, acquire and align resources to address agreed upon agency human factors requirements.

Jointly establish a process for and conduct regular feedback and review sessions for assessing the FAA human factors program.

Jointly develop and execute an advocacy plan to communicate agency human factors objectives.

4. AAR-100 will reorganize internal staff structure to enhance the support of research program management and serve as the human factors focal point for the following:

Assisting lines of business in (1) identifying human factors staffing and resource requirements, (2) acquiring qualified providers, and (3) allocating human factors resources effectively.

Presenting and advocating the agency human factors program within and outside of the FAA.

Providing the platform for the cooperative development of the total agency human factors program and managing human factors resources to address research priorities which are identified cooperatively.

Providing linkages that support agency human factors activities such as the following:

- translation of operational requirements
- coordinated resource allocation
- program (vs. project) development
- strategic planning
- research sponsorship
- policy development
- program reviews
- quality assurance

FAA Response to the Aviation Security Research and Development Subcommittee Report

Following the terrorist bombing of Pan Am Flight 103 over Lockerbie, Scotland, on December 21, 1988, Congress passed the Aviation Security Improvement Act of 1990 (Public Law 101-604). This legislation included a requirement that the FAA Administrator establish a scientific advisory panel as a subcommittee of its R,E&D Advisory Committee. Under its charter the Aviation Security Research and Development Subcommittee is tasked to review the progress of the FAA's R&D program and related activities for countering terrorist threats against commercial aviation.

Dr. Delores Etter Chaired the subcommittee and presented its September 10, 1996, report entitled "Aviation Security Research and Development Subcommittee Report" to the Committee which approved the report on September 10, 1996.

Dr. Tony Fainberg, FAA's Director of Civil Aviation Security Policy and Planning, presented FAA's response to the Committee's recommendations.

1. The FAA should require phased deployment of advanced technologies beginning in 1998. Consider cost and effectiveness analysis, incorporating procedures like profiling,

and a forum to provide feedback.

Response:

FAA agrees. An Integrated Product Team (IPT) was formed to include air carrier and airport personnel. The IPT will procure equipment, determine deployment strategy and coordinate deployments as well as gather cost and effectiveness data that will be applied to future deployment decisions.

An automated profiling system is being developed and will be available by the end of 1997.

FAA is co-sponsoring a CTX 5000 users conference on February 13, 1997, to collect and share feedback. The Aviation Security Advisory Committee may also function as a forum for feedback from stakeholders.

2. The FAA should develop rapid deployment capability of enhanced security systems by 1998.

Response:

FAA did this for the 1996 Olympics with a small inventory maintained at the Technical Center. FAA will continue to maintain and make available this equipment; however, the recommendation is overcome by events based on wide-scale IPT procurements and deployments.

3. The FAA should reallocate fiscal year (FY) 1997 R&D security funds to increase long-term R&D counter measures for emerging threats.

Response:

This has been completed. Security program requirements are being modified to include more long-term research objectives. The hardening program will be expended for narrow-body aircraft. The emerging threats (CBR, SAMs, etc.) are being addressed.

The FY 1997 funding increases include adding $5.5 million to the Aircraft Hardening program for a total program value of $6.3 million including $0.5 million for threat analysis of HERF. Also, there was an increase to chemical weapon detection of $190,000 for a total program value of $250,000.

The FY 1998 funding levels include maintaining the $6.3 million level of funding in the

Aircraft Hardening program. The program includes an additional $300,000 for procedures for MANPADS and $2.0 million to initiate an assessment of hardening techniques for next generation aircraft. Also, funding in FY 1998 for mitigation techniques for CBR is increased by $1.0 million.

FAA Response to the Aviation Weather Subcommittee Report

The Aviation Weather Subcommittee was established on August 31, 1994, and Chaired by Hon. Najeeb Halaby. The purpose of the subcommittee was to identify and prioritize aviation weather research and development efforts and operational procedures and programs that should be pursued by the FAA, based on their potential payoff for the spectrum of users. The subcommittee published its report on October 31, 1995.

Mr. Richard Heuwinkel, Aviation Weather Policy Branch Manager, presented FAA's response to the Committee's recommendations.

1. FAA's Aviation Weather System Architecture should be responsive to the information needs of all users and provide a mechanism to get the same information to all users.

Response: FAA has taken the following actions to address this recommendation.

Formed the Aviation Weather Division (ATR-200) to develop and manage the process of integrating internal and external user requirements.

Developed a National Aviation Weather Strategic Plan. The plan is scheduled for publication in May 1997.

Initiated the incorporation of information needs into the NAS Architecture Baseline Version 3.0.

2. Additional focus is needed to improve the FAA's decision-making process and ability and authority to fulfill approved weather requirements.

Response: FAA has taken the following actions to address this recommendation.

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Appointed the Associate Administrator for Air Traffic Services to serve as the focal point for management of policy, planning, coordination, standards formation, evaluation, requirements generation and investment strategies for aviation weather services.

Created the Air Traffic System Requirements Service (ARS) with a direct reporting line to the Associate Administrator for Air Traffic Services (ATS) to strengthen FAA's requirements process.

Improved liaison between the Aviation Weather Program Office (ARW), the integrated product teams (IPTs) and Regulation and Certification (AVR).

3. The FAA needs to do the following: coordinate R&D activities with other government agencies; provide an annual letter of requirements to the National Weather Service; tie R&D activities to real operational problems; and prioritize R&D activities within the limited R&D funding.

Response: FAA has responded to these recommendations with the following actions.

Developed the National Aviation Weather Strategic Plan which is scheduled for publication in May 1997.

Coordinated with the Office of Federal Coordinator for Meteorology (OFCM) for development of an interagency R&D project inventory and a cross-cutting budget report for aviation weather related investments in government.

Initiated in 1997 an annual requirements letter to National Weather Service (NWS).

Tied R&D activities to operational problems for the following:

-- In-flight icing research: Aviation Weather Center (AWC) in Kansas City
-- Water vapor sensing system: United Parcel Service (UPS) and National Oceanic and Atmospheric Administration (NOAA)
-- Weather support to ground de-icing decision-making: O'Hare and LaGuardia airports
-- Turbulence: Northwest Airlines, United Airlines and AWC-Kansas City
-- Storm growth and decay: Memphis Air Route Traffic Control Center
-- Windshear: Juneau Internal Airport
-- Ceiling and visibility: San Francisco International Airport

Established R,E&D budget process to prioritize R&D activities based on external and internal users priorities.

4. The FAA needs to encourage private aviation weather enterprises through expedited acquisition.

Response: FAA has responded to this recommendation with the following ongoing activities.

Developing strategic goals under the National Aviation Weather Strategic Plan to help focus private industry enterprises. An initial draft of the plan is available.

Implementing acquisition reform to expedite acquisitions.

Expediting technology transfer through cooperative research and development agreements.

5. The FAA must provide a clear and cohesive policy statement regarding the agency's role in the provision of aviation weather services.

Response: FAA is coordinating a policy statement that clearly establishes FAA's leadership in development and execution of the national aviation weather program.

6. The FAA must clarify its mission relative to the provision of weather information that is needed to separate aircraft from weather.

Response: FAA is coordinating a separate policy that affirms FAA's resolve to improve timely dissemination of aviation weather information to users to enhance their decision-making process.

7. The FAA should set policies regarding training and certification of pilots and controllers.

Response: FAA is conducting an internal review of existing training needs of terminal controllers, en route controllers, and pilots. The review of terminal controller training needs is complete.

Follow Up on Committee Recommendations for FY 1998

Dr. Clyde Miller, Research Division Manager, provided a follow up presentation from the September 1996 meeting. The presentation completed FAA's response to the Committee's June 1996 recommendations on the proposed FY 1998 R,E&D investments. Dr. Miller noted that Congress will deliberate the FY 1998 budget over the next several months.

1. Do not fund the proposed project for back-up power systems with R,E&D funding.

Response: FAA will take this recommendation into consideration when formulating the FY 1999-2003 R,E&D investment portfolio. FAA needs to develop a viable R&D activity

for maintenance system development and looks to the ATS Subcommittee to provide recommendations in this area.

2. Provide a higher priority for weather research.

Response: In the FY 1997 R,E&D budget, FAA proposed a $5,446K weather research program. Congress increased the FY 1997 weather research program to $11,047K. In the FY 1999-2003 R,E&D investment portfolio, FAA needs to decide the appropriate level of funding for weather research and looks to the ATS Subcommittee for recommendations.

3. Is FAA giving too high of a priority to security and aircraft safety?

Response: In the FY 1997 R,E&D budget, FAA proposed $36,045K for security. Congress increased this level to $57,055K. In the FY 1997 R,E&D budget for aircraft safety, FAA proposed $38,999K, and Congress slightly reduced this amount to $36,504K.

4. Form a subcommittee to focus on the end-to-end certification process, including use of commercial off-the-shelf (COTS) systems in aircraft and in the ground system.

Response: FAA will refer this task to the ATS Subcommittee for consideration.

FY 1999 R,E&D Process, Schedule and Expectations

Dr. Clyde Miller discussed the Committee's role in the FY 1999 R,E&D process. The objective of the R,E&D process is to develop an R&D investment portfolio for FY 1999-2003 that best applies resources to meet the needs of the agency's customer community. The role of the Committee is to provide sustained, comprehensive involvement of customers, stakeholders and subject-matter experts in R,E&D program reviews and investment decisions.

Each year the Committee will conduct an investment portfolio review to determine whether or not FAA is pursuing appropriate R&D investments, effectively allocating resources among priorities, and accounting for the market environment. Each of the 6 standing subcommittees will conduct an initial review of its respective research area in February. At the April meeting, the Committee will discuss the subcommittee recommendations, hear FAA's response to those recommendations, and review FAA's proposed investment portfolio for FY 1999-2003.

(Members broke into their respective Subcommittees for a working lunch.)

Forming Standing Subcommittees

Dr. Clyde Miller discussed the forming of the 6 standing subcommittees: (1) Air Traffic Services, (2) Airport Technology, (3) Aircraft Safety, (4) Security, (5) Human Factors and (6) Environment and Energy. The subcommittees will be comprised of R,E&D Advisory Committee Members with additional representatives that balance the involvement of agency customers, stakeholders and subject-matter experts. Subcommittees generally will be limited to 8-10 members consisting of a minimum of three R,E&D Advisory Committee Members. All Members will serve on at least one subcommittee. The subcommittees' Terms of Reference were provided to the Members.

DAY 2

Systems Architecture Briefing

Mr. Greg Burke, Manager of the NAS Architecture, provided an overview of the FAA's National Airspace System (NAS) Architecture. He explained Version 2.0 of the architecture, the alternative architectures considered and the proposed architecture with its associated costs. The proposed architecture requires Congress to increase FAA funding and users to share costs with FAA.

The schedule for the NAS architecture is as follows. On October 1996 Version 2.0 was released for comment. Version 2.5 is planned for release on February 14, 1997. Version 2.5 will assist in development of the final comments on Version 2.0. On April 15, 1997, the final comments are due on Version 2.0. Release of the baseline architecture, which will be Version 3.0, is planned for October 31, 1997.

The system architecture and comments on it are available on the world wide web at http://www.faa.gov/ara/arahome.htm.

Halaska Project Briefing

Dr. George Donohue, Associate Administrator for Research and Acquisition, provided a briefing on the proposed Halaska project. (The project name has been changed to Flight 2000.) Two major barriers impede the implementation of free flight: high cost avionics and lack of a concept of operations. A beta test in Alaska and Hawaii would allow FAA to create two controlled, free flight environments. The test would (1) force an integrated, system-level approach to implementing CNS equipment, (2) provide a focus for human factors efforts to refine a concept of operations, (3) explore certification improvements to reduce avionics costs, and (4) allow FAA to gather real benefit data on the efficiency and safety gains of the free flight environment.

The cost of the effort would be $300 million over 2 years or $150 million per year. This

represents a 75% increase in FAA's R&D account. Currently, there are no funds available for this effort in FAA's existing F&E or R,E&D budget. Industry would also participate in the effort.

At the end of two years, after the demonstration and validation of the beta site, the system would be left in place. Alaska and Hawaii would be the beginning of a transition to free flight. Over 5-years or so, the capability would be expanded from Alaska and Hawaii to other locations in the continental U.S. such as Seattle, Oakland, Los Angeles, Denver and Salt Lake City. In order for the Halaska project to succeed, there must be joint participation between Federal government, State governments and industry (both operators and suppliers).

Adjourn

The Chairman thank the Members and adjourned the meeting.

ATTACHMENTS
1. Agenda
2. Attendance

Research, Engineering and Development Advisory Committee

January 28 & 29, 1997

<u>Tuesday, January 28</u>

9:00 am	Welcome	Mr. Ralph Eschenbach, Chairman
	- Introduction of New Members	Dr. Andres Zellweger, FAA
	- Presentations to Outgoing Members	Dr. George Donohue, FAA
9:45 am	Report of the NAS R&D Panel Subcmte.	Ms. Nancy Price
	BREAK	
11:00 am	Status report from the team formulating the FAA/NASA Aviation Safety Research Program	Mr. Charlie Huettner, FAA

11:30 am	Discussion on the Proposed Subcommittee on General Aviation and Vertical Flight	Mr. Robert Wright, FAA
12:00 noon	LUNCH	
1:00 pm	FAA Response to Committee Reports	
	- Human Factors Subcommittee Report	Dr. Tom McCloy, FAA
	- Aviation Security Research & Development Subcommittee Report	Dr. Tony Fainberg, FAA
	- Challenge 2000 Subcommittee Report (deferred)	
	- Aviation Weather Subcommittee Report	Mr. Richard Heuwinkel, FAA
	BREAK	
3:30 pm	Follow up on Committee Recommendations for FY 1998	Dr. Clyde Miller, FAA
4:00 pm	FY 1999 R,E&D Process, Schedule and Expectations	Dr. Clyde Miller, FAA
4:30 pm	Form Standing Subcommittees	Dr. Clyde Miller, FAA
	- Air Traffic Services	
	- Airports	
	- Aircraft Safety	
	- Security	
	- Human Factors	
	- Environment and Energy	
5:00 pm	Meeting Adjourned	

<u>Wednesday, January 29</u>

8:00 am	System Architecture Briefing	Mr. Greg Burke, FAA
10:00 am	BREAK	
10:15 am	Halaska Project Briefing	Dr. George Donohue, FAA

11:45 pm Discussion of Plans for Future Meetings Mr. Ralph Eschenbach
Dr. Andres Zellweger

1:00 pm Adjourn

Research, Engineering and Development
Advisory Committee Meeting

January 28-29, 1997

DoubleTree Hotel,
Arlington, VA

LIST OF ATTENDEES

Dr. Andres Zellweger, Executive Director, R,E&D Advisory Committee
Mr. Ralph Eschenbach, Chairman

Gen. James Abrahamson	Capt. Patricia Andrews
Dr. Satya Atluri	Mr. Viggo Butler
Capt. Robert Buley	Mr. Richard Bustelo
Mr. Frank Colson	Hon. Susan Coughlin
Mr. Robert Doll	Dr. Delores Etter
Dr. Aaron Gellman	Hon. Najeeb Halaby
Ms. Angela Gittens	Mr. George Howard
Dr. Wesley Harris	Mr. Bruce Landsberg
Ms. Margaret Jenny	Mr. Joseph McCormick
Dr. John Lauber	Dr. Dennis McLaughlin
Mr. Jean McGrew	Mr. Edward Stimpson
Mrs. Nancy Price	Mr. John Zugschwert
Dr. Robert Whitehead	

Other Attendees

Clyde Miller, FAA	Lee Olson, FAA	Richard John, DOT/VOLPE
Randy Stevens, FAA	Tom Proeschel, FAA	Vivian Hobbs, DOT/VOLPE
Joan Hannan, FAA	Arthur Feinberg, FAA	David Watrous, RTCA
Dennis Weed, FAA	Geoff McIntyre, FAA	Chuck Hedges, FAA
Jack Wojciech, FAA	S.B. Poritzky, Consultant	Art Physter, FAA
Chris Seher, FAA	Jim Hardy, Hughes	Louis Kleiman, SAIC

Hugh McLaurin, FAA Tom McCloy, FAA Paul Drouilhet, FAA
Bob Wright, FAA Jim Rogers, FAA Jim Wichmann
Raymond LaFrey, MIT/LL Anne Harlan, FAA Peter Chalan, FAA
Richard Young, FAA Larry Stotts, FAA Gail Cochrane, TRW
George Skalotis, VOLPE James Poage, VOLPE Ed Timm, ATCA
Jim Banks, ATCA Herm Rediess, FAA Eileen Verna, FAA
Bruce Singer, FAA Jan Brecht-Clark, FAA Mike Goldser, FAA
Frank Tung, VOLPE Virgenia Embrey, FAA Paul Kelleher, FAA
Tony Fainberg, FAA Paul Polski, FAA Ava Mims, FAA
Harold Smetana, FAA David McKeeby, SSTI John Olcott, NBAA
Fred Messina, Hughes Paul Smith, NBAA John Fielding, Raytheon
Joe Dinsmore, FAA Charlie Huettner, NASA David Cherry, FAA
Larry Staudmeister, ALS John Burks, NASA Paul Dykeman, FAA
Shelly Myers, DOD L.W. Motzel, ERAU Paul Abramson, SRC
Richard Taylor, Boeing John Enders, Enders Assoc. Garrison Rapmund, OAM
Paul Fiduccia, SAMA Nick Stoer, Self Lillian Ryals, MITRE
Dorothy Buckanin, FAA Nelson Miller, FAA Victor Ilenda, JHU/APL
Mark Phillips, CTA John Bednarz, Gallium Brenda Boone, CGH Tech.
Loni Czekalski, FAA Lyle Malotky, FAA Richard Weiss, EAA
Ted Davies, FAA Dave Sankey, FAA Warren Felner, AMTI
Paula Lewis, FAA Chuck Ruehle, FAA Glen Hewitt, FAA
Rick Heuwinkel, FAA Calvin Mitchell, FAA Quentin Taylor, FAA
Bennie Sanford, FAA Lynne O'Rourke, TRW Stephen Giles, AMTI
Lockett Yee, FAA Kenneth Zemrowski, TRW Gregory Burke, FAA
Terry Kraus, FAA Annette Bauman, FAA Mike Hawthorne, FAA
Ken Clark, FAA Carole Schmidt, AMTI Mary Barboza, FAA
Gloria Dunderman, AMTI Lorraine Iritano, SRM