Minutes
REDAC (Research, Engineering, and Development Advisory Committee)
Subcommittee on Human Factors (HF)
Summer/Fall 2024

Meeting date | *August 20-21, 2024*
Meeting location | **Washington, DC, FAA Headquarters-Conference room 5A/B**

Purpose: Review the RE&D accomplishments and expectations for FY25, and research plans through FY28, and advise the FAA on future research.

Tuesday, August 20, 2024

Welcome / Introductions and Update from Full REDAC Committee Meeting | Presenter
Eric Neiderman, FAA Tech Center Deputy Director, Barbara Holder, Embry-Riddle University, HF Subcommittee Chair, and Bill Kaliardos, FAA, Designated Federal Official

The subcommittee introduced the people in the room and the meeting was called to order.

Eric Neiderman provided an overview of the kickoff topics, for consideration by the REDAC subcommittee. His overview included a summary of the new FAA Reauthorization Act.

- Info and guidance for cyber security. Committee being set up.
- Safety data for aircraft without transponders and altitude reporting
- HF task force
- Aircraft evacuation
- Air traffic control training—accelerate

The subcommittee discussed:
- Will the role of the members change?
- Is the FAA bound to the AVS Strategic plan?

Barbara Holder gave the opening remarks and provided an overview of the key takeaways from the full REDAC Meeting from April 17, 2024. She reminded the Subcommittee of the current meeting's objectives:

- Review planned HF research portfolios
- Make Strategic Guidance recommendations for FY 27
- Collect feedback on the AVS Safety Roadmap

In addition to the role to advise the FAA on their R&D portfolio, including emerging needs and strategic changes.

Key Takeaways from the Full REDAC meeting in April were:
- EASA presentation by Ludovic Aron, who provided an overview of research initiatives. Mr. Aron stressed the importance of cooperating with FAA and industry to achieve greater benefits and to avoid duplicate efforts. New technologies such as artificial intelligence (AI) was also discussed.
- NASA presentation by Robert Pearce, who provided an overview of research initiatives: ultra efficient airliners, high speed commercial flight, future airspace and safety, and advanced air mobility (partnering approach).
- FAA Aviation Safety presentation by Bruce DeCleene, who provided an overview of the research strategic research plan and rationale, and that he wants REDAC feedback to help improve it.

Bill Kaliardos asked for feedback on what they wanted to hear from the subcommittee in future meetings and went over the meeting agenda. The agenda included a presentation by Kathy Abbott on some of the Human Factors content of the FAA Reauthorization Act, a series of presentations by multiple FAA offices on AI, and presentations by FAA on runway/surface safety.

Core Flight Deck Human Factors Research Portfolio Part I| Presenter *Victor Quach, FAA Core Flight Deck HF Portfolio Manager*

Bill introduces **Victor Quach** to brief the subcommittee on the CORE Flight Deck Human Factors research, also known as A11.G portfolio. Victor provided an overview of the program that addresses research, engineering, and development requirements defined by technical sponsors in the Aviation Safety (AVS) organization. Requirements are driven by the human factors needs of FAA Aircraft Certification (AIR) and Flight Standards (AFX, AFS) personnel.

- Visual scanning and the design of displays to support appropriate allocation of attention.
- Remote operations in urban airspace
- Maintenance related to Competency-Based Training Assessment (CBTA)
- Adapting training: ICAO driven, part 135 operations
- Information overload on the HUD, (head-up display) which can be considered the primary display
- Automatic take-off and Automatic landing, single pilot capabilities
- Information Automation systems
- Other aspects of Information Management and on the Flight Deck
- If advanced procedures are for airspace procedures that are already designed
- If the reports from the avionics General Guidance Document Versions 4.0 and 5.0 (for flight deck HF) will lead to an update in the HF design standard (which is for air traffic systems)

Lunch Break -11:45-1:00

Subcommittee Findings and Recommendations | All

Bill asked the subcommittee if there were any more questions from Victor's presentation; then went over the F&Rs from last meeting in March.

F&Rs from the 2024 Winter/Spring Meeting:

F&R #1-Advanced Flight Deck Alerting Systems

The subcommittee discussed:
- Is the alerting research still considered prioritized based on what was presented?
- Design of alert interaction
- If the research has already started
- Other programs that address the training aspect
- Configuring the next 3 years of research including AVS priorities

The subcommittee decided that a new F&R will have to be written for this topic with new language.

F&R #2-Aviation Maintenance Training Projects

The subcommittee discussed:
- Who is doing the research?
- The possible need for a new F & R for New Technologies for Maintenance
- The maintenance research that CAMI (FAA Civil Aerospace Medical Institute) is doing.
- The AR/VR F&R from earlier REDAC. (Augmented Reality/Virtual Reality)

Actions after the discussion on the F &Rs from the 2024 Winter/Spring meeting:
1. Write a new F & R on alerting with new language.
2. Close the F & R on Aviation Maintenance

Barbara asked the subcommittee if they had any other topics that they wanted to discuss.

The subcommittee discussed:
- HUD being considered as primary display, when is there too much information on HUD?
- What is the driver behind the amount of funding on Advanced Vision Systems, HUDs, Head-Word Displays?
- Mitigating Human Fatigue: research on boredom and vigilance

_____

SHORT BREAK 1:56 be back at 2:00

_____

FAA Update on Aviation Safety R&D Strategy| Presenter *Mark Orr, FAA Aviation Safety RE&D Program Manager*

Mark Orr provided an update on the AVS R&D Program Process.

The subcommittee discussed:
- Prioritizing research projects
- Future research resulting from "encouraging new, relevant ideas and informs priority decisions."

FAA Budget Briefing | Presenter *Tennille Blackwell, FAA RE&D Budget Formulation Manager*

Bill introduced **Tennille Blackwell**, the RE&D Budget Formulation Manager,

The subcommittee discussed:
- Receiving the 2024 enacted amounts late had an impact

Break 2:30

Human Factors in the FAA Reauthorization Act| Presenter *Kathy Abbott, FAA, AVS, Chief Scientific and Technical Advisor, Flight Deck Human Factors*

Kathy Abbott provided her presentation on HF within the FAA Reauthorization Act. The key sections were identified as:
- Sec. 330. Task Force on HF in Aviation Safety
- Sec. 334. Review and incorporation of human readiness levels (HRL) into agency guidance material.
- Sec. 310. Human Factors Professionals.

The majority of the presentation was on Sec. 330. She noted that the Task Force duties are to be in coordination with REDAC. Duties include:
- Identifying the most significant HF contribution to aviation safety risk
- Identifying new research priorities
- Reviewing pilot training requirements, and providing recommendations related to understanding automated systems
- Reviewing approach and landing misalignment

- Analyzing contributions to human error, such as fatigue, tasks, workload, organizational culture, etc.

Many other duties were also discussed. Kathy also noted the challenges related to the tasking, including breadth of topics and the wording.

The subcommittee discussed:
- Task Force on HF in Aviation Safety-Is it a consensus-based body or different groups?
- How future-looking is the task force?
- The main driver behind the funding
- If training requirements are to proficiency
- Hiring Human Factors professionals

HOMEWORK and WRAP-UP-ALL

Barbara reminded the subcommittee about the questions they had for Kathy Abbott from the earlier discussions.

The subcommittee discussed:
- Updating alerting standards and the research to support that
- Reissuing an F &R on Alerting about priority
- Congress potentially implying that Human Factors is a Strategic Thrust in the reauthorization
- How the Strategic Thrusts will tie to the mission
- The process for prioritizing research and who is involved
- Uncertainty in the planned research.

New In-Progress F&R/Actions/Observation Discussions:
- HUD information
- Rewrite F&R on Flight Deck Alerting
- Information Management
- Automation capability across operations (auto take-off/landings)

Next Meeting Dates:
WINTER/SPRING 2025-March 25-26.
SUMMER/FALL 2025-August 12-13.

End of day 1

Wednesday, August 21, 2024

Day 2-Opening Remarks

Barbara Holder welcomed the subcommittee to Day 2 and Bill Kaliardos introduced the Artificial Intelligence/Machine Learning presentation.

Artificial Intelligence/Machine Learning (AI/ML) across the FAA, a high-level overview|
Natesh Manikoth, FAA, AFN, Deputy Assistant Administrator for Information & Technology Services, Chief Information Officer, Kanvasi "TJ" Tejasen, FAA, ANG, Technology and Adv. Concepts; and Bruce DeCleene, FAA, AVS, Director, Office of Senior Technical Experts

Natesh Manikoth started off with a high-level overview of the FAA AI Strategy that is in development. The FAA AI Strategy will provide preliminary guidance to compel the controlled use of AI and is intended be a living document. It aligns with the direction from executive direction (e.g., Executive Order), and will be supplemented by an AI Roadmap (different from the AVS AI Safety Roadmap).

4 components of strategy:
- Adopt and promote AI
- Increase workforce AI proficiency
- Ensure safe ethical and reliable AI deployment (focus internally)
- Collaborate and adopt lessons learned.

Near-term Activities include documenting AI use cases to comply with OMB guidance, working to establish an AI governance framework, hosting informational sessions, and workforce development.

TJ Tejasen (remote) gave the next presentation on FAA NextGen Research Artifacts, which include the AI Certification Framework, and the Responsible AI (RAI) Framework. The AI Certification Framework includes considerations to the steps and considerations to certify AI/ML from a regulatory standpoint. The RAI framework will begin with a focus on ATM applications and will be a living document. Engagement will include listening sessions, coordinated through NASA and others active in the AI/aviation domain. Both will be living documents that will be updated and will involve engagement activities that include NASA.

Bruce DeCleene closed out the AI/ML section of the meeting with the FAA AVS (Office of Aviation Safety) Roadmap on Artificial Intelligence Safety. In 2022 REDAC had recommended that FAA start working on AI Assurance, and the FAA hired a chief scientist in AI/ML in June 2022, and initiated the roadmap in May 2023. This roadmap was finalized and published by FAA in July 2024.

The guiding principles are:
- Focus on safety
- Do not personify AI
- Differentiate between learned and learning AI
- Use as much existing regulation as possible

The approach will be incremental and leverage the safety continuum as well as industry consensus standards. The relationship to other US Policies, such as the AI Executive Order, was also discussed.

Supporting research will explore alternative framework in SW Assurance for inclusion of AI, and wijll use computational data analytics to support specific verification needs. Feedback on the roadmap is valuable, and the FAA expects to learn and evolve strategy and plans. FAA will work with EASA and other authorities with the goal of mutual acceptance of design approvals.

Questions from the Subcommittee included:
- What are you doing to ensure we use AI to support people?
- This is a fast-paced area, how do you ensure the FAA stays coordinated?
- Will FAA engage universities in this plan?
- What research is needed to help the FAA flesh out some of these principles?

The subcommittee discussed:
- Future research that will help build AI solutions
- Availability of the use cases to the public
- Engagement/participation with University AI programs including Maintenance Operators
- Special considerations for approval processes
- Certification framework
- Differences from other safety critical applications

The term, "Responsible AI"
- Standards for building language models
- What does "Trustworthy AI" mean
- Personification of AI

Break-10:30

FAA Enterprise Human Factors and ATC/Tech Ops Research Part I, NextGen | Presenter
Karl Kaufmann, ATC/Enterprise HF Portfolio Manager

Karl Kaufmann briefed the subcommittee on the current Enterprise Air Traffic Human Factors research and the planned activities for beyond FY25.

The subcommittee discussed:
- What is holding up the ATC Task Automation and ATC Task Changes with Highly Automated Vehicles research

FAA Enterprise Human Factors and ATC/Tech Ops Research, Part II| Presenter *Karl Kaufmann, ATC/Enterprise HF Research Portfolio Manager*

Karl Kaufmann briefed the subcommittee on the ATC/Tech Ops Human Factors research and the planned activities for the near term.

The subcommittee discussed why Human Factors is not integrated into some activities. This propagates the misconception that one needs to build something before HF needs to be involved. The users (NATCA) are questioning why human factors does not get involved earlier. On the acquisition side, FAA sometimes sees human factors issues because of the delay in incorporating human factors early in the process. The "Human Readiness Level" (HRL) framework is being explored to provide the FAA with a method to incorporate human factors activities into milestones through the development and acquisition process. Other topics included controller visual scanning patterns, information sources for acquisitions management, and mitigating fatigue.

Karl Kaufmann's presentation will continue after lunch and the Runway/Surface Safety presentation

Lunch Break -until 1:00

Runway/Surface Safety: historical and current R&D| Presenter *Matthew McCann, FAA, ATO Surface Team and Robert Higginbotham, FAA, ANG Technology and Adv. Concepts*

Matt McCann (AJM-421) provided the presentation on Surveillance and Broadcast Services-Surface Surveillance Program. Information included:
- ASDE-X: Airport Surface Detection Equipment, Model X (at 35 airports)
- ASSC: Airport Surface Surveillance Capability (at 9 airports)
- RSL: Runway Status Lights (at 20 airports)
  - Runway entrance lights and takeoff hold lights, which signal to aircraft
- RID: Runway Incursion Device (prototypes at 5 sites)
  - Memory aid to indicate occupied and closed runways
- Surface Awareness Initiative (at 4 airports, with 14 planned through 2024)
  - Tech solutions to airports without existing surface surveillance capabilities
  - Visual display of targets, without safety logic
  - Modeled off ASDE-X/ASSC displays

The subcommittee discussed:
- Are Human Factors involved in the development of Runway Incursion Devices (RID)
- Visual and Oral Alerts-What information do they alert to
- Approach Runway Verification
- Overarching questions about the incorporation of HF into these systems and initiatives

Rob Higginbotham starts his presentation on Runway Incursion Prevention through Situational Awareness (RIPSA) Project Status. First, he discussed the Runway Incursion Reduction Program (RIRP), which develops and deploys various technologies. This program initiated RIPSA to develop a toolkit of technologies at airports outside the core 44.

RIPSA
- NextGen is evaluating the prototype RIPSA system at San Antonio International Airport (SAT)
- "Direct to pilot" safety solutions
- Situation Awareness only; not clearance to enter runway
- Uses surveillance input, and safety logic to drive a field lighting system, including runway entrance lights (REL)
- RELs located between hold line and near runway center line

The subcommittee discussed:
- RIPSA Operational Concept, and how HF is being addressed
- Selecting San Antonio for Runway Entrance Light (REL) location research
- RIPSA Evaluation Timeline-Before and After data on Runway incursions

Continued-FAA Enterprise Human Factors and ATC/Tech Ops Research, Part II| Presenter
Karl Kaufmann, ATC/Enterprise HF Portfolio Manager

Karl Kaufmann continued his brief on the ATC/Tech Ops Human Factors research.

The subcommittee discussed:
- Early involvement with Human Factors to influence requirements
- Alarms/alerts research: Does the method address requirements for hit and false alarm rates?
- User Acceptance research: What scale are they using to capture the acceptance?

Break-until 2:55
_____
Potential F&Rs:
- Head-Up Display Information
- Information Management Strategy
- Advanced Flight Deck Alerting Systems
- Human-automation interaction and complexity

ACTION:
- Briefing on AAM/UAS Status

OBSERVATION:
- FAA Roadmap for AI Safety Assurance (wording changes for clarification)

Feedback on AVS Safety Strategy
- More research on Human Factors issues that don't fall into one of the Strategic thrusts
- There needs to be explicit Human Factors within each thrust
- Leadership roles and implementation

Next Human Factors REDAC Meeting Winter/Spring 2025-March 25-26

End of Day 2, Meeting Adjourned

REDAC Human Factors Subcommittee Meeting Agenda

DAY 1 – Tuesday, Aug 20, 2024

FAA HQ, 800 Independence Ave SW, 20591, 5th Floor Conf Room, 5 A/B

Time (ET)	Topic	Presenter
9:00 (30 min)	Welcome / Introductions	**Eric Neiderman,** FAA Technical Center Deputy Director **Barbara Holder,** Embry Riddle Aeronautical University, HF Subcommittee Chair **Bill Kaliardos,** FAA, Designated Federal Official, HF Subcommittee
9:30 (45 min)	FAA flight deck HF research portfolio, Part I	**Victor Quach**, FAA, ANG, Flight Deck Core HF Research Portfolio Manager
10:15 (15 min)	Break	
10:30 (75 min)	FAA flight deck HF research portfolio, Part II	**Victor Quach**, FAA, ANG, Flight Deck Core HF Research Portfolio Manager
11:45 (75 min)	Lunch Break	
1:00 (60 min)	Subcommittee Findings and Recommendations (last meeting and present meeting)	**All**
2:00 (30 min)	The New FAA Aviation safety (AVS) R&D Program	**Bruce DeCleene**, FAA, AVS, Director, Office of Senior Technical Experts **Mark Orr,** FAA, R&D Program Manager
2:30 (15 min)	Break	
2:45 (15 min)	FAA budget briefing	**Tennille Blackwell,** FAA, ABP, RE&D Budget Formulation Manager
3:00 (30 min)	HF in the FAA Reauthorization Act	**Kathy Abbott,** FAA, AVS, Chief Scientific and Technical Advisor, Flight Deck Human Factors
3:30 (30 min)	Homework, wrap-up	**All**
4:00	Adjourn	**All**

DAY 2 – Wednesday, Aug 21, 2024
FAA HQ, 800 Independence Ave SW, 20591, 5th Floor Conf Room, 5 A/B

Time (ET)	Topic	Presenter
9:00 (60 min)	Artificial Intelligence/Machine Learning (AI/ML) across the FAA, a high level overview	**Kanvasi "TJ" Tejasen,** FAA, ANG, Technology and Adv. Concepts **Natesh Manikoth**, FAA, AFN, Deputy Assistant Administrator for Information & Technology Services and Chief Information Officer **Bruce DeCleene**, FAA, AVS, Director, Office of Senior Technical Experts
10:00 (30 min)	FAA air traffic HF Research, Part I	**Karl Kaufmann**, FAA, ANG Air Traffic HF Research Portfolio Manager
10:30 (15 min)	**Break**	
10:45 (60 min)	FAA air traffic HF Research, Part II	**Karl Kaufmann**, FAA, ANG Air Traffic HF Research Portfolio Manager
11:45 (75 min)	**Lunch Break**	
1:00 (60 min)	Runway/Surface Safety: historical and current R&D	**Robert Higginbotham,** FAA, ANG Technology and Adv. Concepts **Matthew McCann,** FAA, ATO Surface Team
2:00 (30 min)	Subcommittee Findings and Recommendations (new)	**All**
2:30 (15 min)	**Break**	
2:45 (45 min)	Subcommittee Findings and Recommendations (new), and wrap-up	**All**
4:00	Adjourn	**All**

Acronyms
ANG=Office of NextGen; AVS=Office of Aviation Safety; ATO=Air Traffic Organization;
AFN=Office of Finance and Mgmt; ABP=Office of Budget and Programs

Attendee List

Human Factors Subcommittee REDAC
Summer/Fall 2024
Tuesday August 20, 2024

Participant Name & Organization	Attended
Achal Singhal, FAA	X
Alex Fu, FAA	X
Alexandra Papantoniou, FAA	X
Amber Cole, FAA	X
Andrew Cheng, FAA	X
Angel Milan Briceno, Boeing	X
Anthony Pocchio, Changeis Inc (CTR)	X
Barbara Holder, Embry Riddle Aeronautical University (ERAU)	X
Ben Willems, FAA	X
Beth Arnz, Changeis Inc (CTR)	X
Beth Blickensderfer, Embry Riddle Aeronautical University (ERAU)	X
Beth Lyall-Wilson, MITRE CAASD	X
Beverly Hite, FAA	X
Bill Kaliardos, FAA	X
Bobby Bourke, FAA	X
Brandon Graham, FAA	X
Carla Hackworth, FAA	X
Cathy Swider, FAA	X
Chanda Sanders, FAA	X
Chinita Roundtree-Coleman	X
Chris Reed, JetBlue	X
Chuck Perala, FAA	X
Dan Brock, FAA	X
David McKenney, MITRE CAASD	X
Deborah M Shaibe, FAA	X
Divya Chandra, Volpe	X
Eddie Austrian, Fort Hill Group (CTR)	X
Florian Jentsch, University of Central Florida (UCF)	X
Husni Idris, NASA AMES	X
Ian Johnson, FAA	X
Jerry Crutchfield, FAA	X
Jessica Cruit, Oasis Systems	X
Jon Schleifer, FAA	X
Julie Holley, FAA	X
Kathy Abbott, FAA	X
Katrina Avers, FAA	X

Kelvin L Courtney, FAA	X
Kendal C Callwood, FAA	X
Kenneth Allendoerfer, FAA	X
Kevin Siragusa, Fort Hill Group (CTR)	X
Lauren J Thomas, FAA	X
Lauren J. Thomas, FAA	X
Lisa Thomas, FAA	X
Maggie Ma Boeing, Boeing	X
Mark Hale, JMA Solutions (CTR)	X
Mark Orr, FAA	X
Marlo E Allen, JMA Solutions (CTR)	X
Mary Johnson, Purdue University	X
MaryAnn Bernacki, Diakon Solutions (CTR)	X
Michael Dorneich, Iowa State University	X
Michael S Bartron, FAA	X
Michelle Harper, MITRE CAASD	X
Monique Moore, FAA	X
Nichola Lubold, Honeywell	X
Okoineme Giwa-Agbomeirele, FAA	X
Pam Munro, FAA	X
Phil Bassett, Cavan	X
Phil Smith, The Ohio State University (OSU)	X
Rany Azzi, FAA	X
Reshma Kumar, FAA	X
Russell Tokarski, FAA	X
Sabreena Azam, FAA	X
Sarah Ligda, FAA	X
Sarah Yahoodik, Volpe	X
Sarah Zak, FAA	X
Sonia Dodd, Honeywell	X
Stephen Plishka, FAA	X
Steve Lang, Cavan	X
Tara M Gibson, FAA	X
Tennille Blackwell, FAA	X
Thomas A Van Dillen, FAA	X
Tiayonna Hawkins, FAA	X
Todd Truitt, FAA	X
Tracy Lennertz, Volpe	X
Vicki Ahlstrom, FAA	X
Victor Quach, FAA	X
Wes Olson, Massachusetts Institute of Technology (MIT)	X
Wes Ryan, Northrop Grumman	X

Human Factors Subcommittee REDAC
Summer/Fall 2024
Wednesday August 21, 2024

Participant Name & Organization	Attended
Alex Fu, FAA	X
Alexandra Papantoniou, FAA	X
Amber Cole, FAA	X
Andrew Cheng, FAA	X
Angel Milan Briceno, Boeing	X
Anthony Pocchio, Changeis Inc (CTR)	X
Barbara Holder, ERAU	X
Ben Willems, FAA	X
Beth Arnz, Changeis (CTR)	X
Bill Kaliardos, FAA	X
Bobby Bourke, FAA	X
Braden Tanner, FAA	X
Bruce Holmes, Alakai Technologies	X
Carla Hackworth, FAA	X
Carrie Smith, FAA	X
Cathy Swider, FAA	X
Chinita Roundtree-Coleman	X
Chris Reed, JetBlue	X
Chuck Perala, FAA	X
Dan Brock, FAA	X
David McKenney, MITRE CAASD	X
Deborah M Shaibe, FAA	X
Divya Chandra, Volpe	X
Evelina Bern, FAA	X
Florian Jentsch , University of Central Florida (UCF)	X
Husni Idris, NASA AMES	X
Jerry Crutchfield, FAA	X
Jim Kuchar, Massachusetts Institute of Technology (MIT)	X
Joe Bertapelle, Joe Bertapelle LLC	X
Julia Beckel, FAA	X
Julie Holley, FAA	X
Karl Kaufmann, FAA	X
Kathy Abbott, FAA	X
Katrina Avers, FAA	X
Kelvin L Courtney, FAA	X
Kenneth Allendoerfer, FAA	X
Kevin Comstock, Air Line Pilots Association (ALPA)	X
Kevin Siragusa, Fort Hill Group (CTR)	X

Kristina Carr, FAA	X
Lisa Thomas, FAA	X
Maggie Ma , Boeing	X
Mark Hale, JMA Solutions (CTR)	X
Mark Orr, FAA	X
Marlo E Allen, JMA Solutions (CTR)	X
MaryAnn Bernacki, Diakon Solutions (CTR)	X
Matthias Steiner, National Center for Atomspheric Research (NCAR)	X
Michael S Bartron, FAA	X
Michelle Harper, MITRE CAASD	X
Monique Moore, FAA	X
Nichola Lubold, Honeywell	X
Okoineme Giwa-Agbomeirele, FAA	X
Patrick Eigbe, FAA	X
Phil Bassett, Cavan	X
Phil Smith, The Ohio State University (OSU)	X
Purvi Sharma, FAA	X
Rany Azzi, FAA	X
Reshma Kumar, FAA	X
Sabreena Azam, FAA	X
Sarah Ligda, FAA	X
Sarah Yahoodik, Volpe	X
Steve Lang, Cavan	X
Tara M Gibson, FAA	X
Tennille Blackwell, FAA	X
Thomas A Van Dillen, FAA	X
TJ Tejasen, FAA	X
Todd Truitt, FAA	X
Vicki Ahlstrom, FAA	X
Wes Olson, Massachusetts Institute of Technology (MIT)	X
Wes Ryan, Northrop Grumman	X
William R Rosenkranz, Booze Allen Hamilton (CTR)	X