Minutes

REDAC (Research, Engineering, and Development Advisory Committee)
Subcommittee on Human Factors (HF)
Winter/Spring 2023

Meeting date | *March 28-29, 2023*

Meeting location | *955 L'Enfant Plaza (7th Floor) AND Zoom*

Purpose: Review the RE&D accomplishments and expectations for FY23, and research plans through FY25, and advise FAA on future research

Tuesday, March 28, 2023

Opening Remarks | Presenter *Eric Neiderman, FAA Deputy Director of William J. Hughes Technical Center*

Dr. Bill Kaliardos (Designated Federal Official, DFO) reviewed the agenda and the meeting was called to order. Bill introduced Eric Neiderman, the Deputy Director of the William J. Hughes Technical Center to provide the opening remarks.

Eric discussed the Strategic Messaging Initiative and the Strategic Outlook for Research (SOR) Charts. They were used on Capitol Hill in testimony and they intend to have deeper discussions about these SOR charts in the full REDAC. He asks the subcommittee if they are focusing on and doing the right things, and are they managing change.

The subcommittee discussed:
- The target level of detail slide and how to identify the targets to put into the boxes (cast a wide net)
- Is this a roll up of the Agency's research planning (mostly to provide guidance and structure)
- Timeline for Artificial Intelligence (AI) (the intention is to augment human capabilities, and not replace)

Welcome / Introductions and Update from Full Committee Meeting | Presenters *Dr. Barbara Holder, Embry-Riddle University, HF Subcommittee Chair*

Dr. Barbara Holder welcomed the committee for attending in person and virtually. She walked thru the key takeaways from the full REDAC meeting on October 5, 2022, which occurred after the last HF Subcommittee meeting. The full REDAC included a briefing from NASA, and from the FAA's Energy & Environment research portfolio. The main focus from NASA was Advanced Air mobility and Air Traffic Management and the use of more automation. Energy and Environment's focus is on sustainable fuels and getting to Net Zero. The Human Factors subcommittee can make recommendations to NASA.

Barbara reviewed the F&Rs and Actions from the last meeting. She also provided a reminder of how the Findings and Recommendations should be written.

Flight Deck Human Factors Research (Part I)| Presenter *Dr. Victor Quach, FAA NextGen Air/Ground Integration Portfolio Manager*

Bill introduces Dr. Victor Quach to brief the subcommittee on the NextGen Air/Ground Integration Human Factors research, which is also known as "NextGen Flight Deck Human Factors Research". Victor began with an overview of the program before briefing the FY23 highlights from the research accomplishments and ongoing and anticipated research in FY27+.

Session Break-10 minutes. Return at 11:15am

The subcommittee discussed:

- How this brief connects to the EFB F&R and the simultaneous display of information
- If any research was covering the altimeter interference (5G) issues
- Research being done on Synthetic Vision Systems and straight-in approaches

Katrina Avers volunteered to send Don Kauffman from Honeywell the list of Synthetic Vision Guidance research they are currently working on to help address his question.

Flight Deck Human Factors Research (Part II)| Presenter *Dr. Chuck Perala, FAA Core Flight Deck HF Portfolio Manager*

Bill introduces Dr. Chuck Perala to brief the subcommittee on the Core Flight Deck Human Factors research, which is also known as "Core Flight Deck". Chuck began with an overview of the program before briefing the FY23 highlights from the research accomplishments and ongoing and anticipated research in FY27+.

A question was asked if reduced crew meant single pilot. Chuck answered that it is undecided at the moment. Kathy Abbott added that there are different concepts with single pilot being one of them, with fatigue as the focus.

Chuck's presentation will begin again after lunch.

Lunch Break 12:00-1:15pm

Chuck resumed his presentation after lunch, with Emerging trends in Helicopter Air Ambulance Operations.

The subcommittee discussed:
- Providing guidance to future rotorcraft/unmanned operations
- If reduced crew includes overarching activity with Fatigue study from the Air/ground Integration brief
- Advanced Warning systems and 14 CFR 25.1322 guidance

AVS Human Factors Research Roadmap Update | Presenter *Colleen Donovan and Lisa Thomas*

Colleen Donovan presented the work AVS has been doing on the Human Factors Research Roadmap. She feels the subcommittee should have more input into the NARP next year. They are planning on capturing the budget information from the NARP in the roadmap. Chinita Roundtree pointed out to contact ANG-E4, the Research and Management Division, branch manager Lisa Smith in order to add to the NARP. Jon Schleifer added in the chat that his organization (ANG-E4) authored the NARP and the DOT Annual Modal Research Plan and looks forward to working with the team.

The subcommittee discussed:
- Administering the program to not have gaps in interactions with other areas
- Communicating clearly that system safety includes human factors and not just equipment malfunctions
- Overarching view of the research
- Trend in the funding for research and matching it to the gaps

Augmented Reality (AR)/ Virtual Reality (VR) Human Factors AR/VR Research Updates | Presenter *Katrina Avers and Cliff Johnson*

Katrina Avers provided an overview of the Extended Reality (XR) research at the FAA Civil Aerospace Medical Institute (CAMI).

The subcommittee discussed:
- Extended reality changing the visual environment and the perceptual requirements, and if there is a way to revert to the traditional visuals

Cliff Johnson presented his overview of the Virtual/Augmented Reality Research at the FAA William J. Hughes Technical Center.

The subcommittee discussed:
- AR/VR technology for outside visuals and well as inside instrumentation and the human performance issues across the two
- Pursuing a path to operational credit
- If the XR work has been integrated with the Enhanced/Synthetic Vision systems work.

Break 2:00-2:15

Air Line Pilots Association Human Factors Views on Emerging Technologies | Presenter *Captain Jack Barker (ALPA)*

Captain Jack Barker provided an overview of the Air Line Pilots Association policy on emerging technologies. He emphasized that all the topics discussed revolve around having the highest level of safety possible.

The subcommittee discussed:
- 1 to 1 Operations and contingency plans
- Automation and the reasons for requiring more training
- What is meant by Automation Management
- Reduced crew operations
- Ground Control Station Standardization and how much standardization is required for regulations
- Standardized training for when you have to move from one system to another

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F &R #1- Competency based training for Maintainers

Bill summarized the last two F&Rs relevant to AVS, from the REDAC Summer/Fall meeting in August 2022. Kylie Key spoke on the research they are working on regarding competency based maintenance training called "Human Factors Data to Inform FAA Decisions on the Adequacy of Policy, Guidance and Assumptions Related to Maintenance Training". Maggie Ma suggested inviting someone from Boeing training solutions to share their progress on adapting CBTA for maintainers and would like to share and exchange more information with Air France/KLM on this issue.

Barbara asked if anyone had any more questions. Requests to close the F&R.

F &R #2- Guidance for Operational Approval of New Applications for the Electronic Flight Bag.

Bill reviewed the Winter/Spring recommendation written on the EFB research which was really about simultaneous display and operational EFB guidance to handling multiple displays. The response was that the FAA didn't have any planned EFB operational guidance in the works at the moment.   The research is more general than EFBs, and includes projects such as: Information Management on the flight deck (FD) of highly automated aircraft, connect FD technologies and their anticipated HF issues and Pilot interactions with advance FD technology.   He opened up the floor for comment.

Colleen Donovan spoke on how they cut back on doing separate documents for each system and are now focusing on documents that cut across systems. Cathy Swider wanted to add that they are aware of the issue (information from the EFB going on the forward displays) and they are looking at it. Chris Reed wanted to clarify that this is about single screen access to multiple pieces of information that you might need to use simultaneously and how you do that. Dave McKenney spoke on how the EFBs were moving faster that the guidance and wants to know if they have fixed that issue or do they still need to do research to help the people approving these systems ensure that they are doing it in a safe manner. Kathy said it would be helpful if the airlines and others in the industry provided a list of specific areas and data that point to where the safety issues are. She asks that the subcommittee help narrow the focus by providing some type of input or data that would help identify the particular safety issues.

Barbara asked the subcommittee for their thoughts and the issue was further discussed. Chinita said the F&R was closed and the subcommittee would need to draft a new F&R to specifically identify safety areas. Chris wants to know, what type of decisions are they actually trying to impact with the work?

Barbara asks the subcommittee if they want to submit a new F &R. Dave wants to table the idea until tomorrow so they can review the information presented today and then try to figure out what the wording for the new F&R would be and what requests they have. Colleen thinks they are asking for a policy update more than a research update.

Bill opened up the discussion to general F & R issues.

Barbara asks the subcommittee if they want to pursue some of the topics that came out in general discussion such as; would head-worn devices and their integration into the flight deck impede safety and run the risk of runway incursions. A member asked if the subcommittee could get someone from AFS-110 to speak to these questions at tomorrow's meeting. Barbara noted the **action** to review what was happening.

The budget allocation was discussed next. The subcommittee can ask questions on the process of how the money is allocated and if the money provided is meeting the needs for the research.

Barbara asks if there are any other thoughts on F&Rs or actions. Chris Reed would like to suggest an **action** for it to become standard practice for the portfolio briefs to provide more details on who is doing what part of the research work. Victor clarified that they can only do that for current work in which the research performers are determined, but not for future work that has not yet been fully specified and awarded.

End of Day 1-4:04pm

General Review of Day 1 | All

Bill welcomed everyone to Day 2 of the REDAC and went over the agenda for the day.

FAA Budget Briefing | Presenter *Elizabeth Delarosby*

Elizabeth Delarosby provided an overview of the FAA R&D budget formulation slides.

The subcommittee discussed:
- NextGen Air/Ground Integration and the redistribution of funds over to the Flight Deck Maintenance System BLI (Core Flight Deck)
- If there are gaps that persist in the funding

Before the next presenter, Bill and Barbara asked the subcommittee about the wrap-up of yesterday. Barbara said she doesn't think they had any F&Rs from yesterday but asked the subcommittee if they thought more about it. Bill recalled the discussion on EFB and simultaneous information and if they have a recommendation or an action item out of that. Additionally, there was a continued discussion from yesterday of AR/VR impact on situation awareness that could affect runway incursions.

The other follow-up item from Tuesday was the previous meeting's F&R on EFBs and simultaneous display of information. Barbara thought it remained unclear if the FAA's research projects identified in the F&R response will address the subcommittee's concern. Bill highlighted Kathy Abbott's request from yesterday, that it would be helpful if the subcommittee could provide some substantiation of the recommendation. A member asked if the responsible parties feel their research projects would provide the information needed to answer the questions the subcommittee already asked regarding operational approval. Is the answer within one or more of the 3 research projects or is a follow up F&R appropriate?

Info-Centric NAS-Technical Overview and Update on Information (info)-centric National Airspace System (NAS) | Presenter *Steve Bradford*

Steve Bradford gave an overview of the Info-Centric National Airspace System starting with a video.

The subcommittee discussed:
- How to get ahead of the curve on the rapidly developing capabilities to provide proper guidance for Human Factors issues
- The FAA taking a lead role vs Industry taking a lead role in research
- Partnering with communities of interest in the industry to do the research so they can work simultaneously to get more research done

Break

ATC Human Factors Research Portfolios (Part I) | Presenter *Karl Kaufmann, ATC Enterprise (NextGen) HF Portfolio Manager*

Karl Kaufmann briefed the subcommittee on the NextGen Enterprise ATC Human Factors F & E funded research. He began with an overview of the BLI before briefing the FY23 research accomplishments and ongoing and anticipated research in FY27+.

The subcommittee discussed:

- What is proposed for automation and what it means for Air Traffic Controllers
- ICN evolution from a Human Factors perspective
- HRLs (human readiness levels) relation to TRLs (technology readiness levels) and how that can seamlessly translate into the new environment
- Figuring out how to stay ahead of the curve and getting beyond the concept stage
- Collaborating with NASA on Trajectory Options sets
- Regional Decision Making (RDM) Phase II (TMU Collaboration work)
- "Desires" for automating, versus what *should* be automated

Lunch Break

ATC Human Factors Research Portfolios (Part II) | Presenter *Karl Kaufmann, Core ATC HF Portfolio Manager*

Karl Kaufmann briefed the subcommittee on the ATC Technical Operations Human Factors R&D funded research. He began with an overview of the BLI before briefing the FY23 research accomplishments and ongoing and anticipated research in FY27+.

The subcommittee discussed:

- The overall goal for the Air Traffic Control BLI in terms of automation impacts and AI/ML based systems
- Reframing the research to provide how to develop these technologies and integrate them into the system so they are effective to the users

FAA Advanced Air Mobility (AAM) "Innovate 28" Operationalizing an AAM Ecosystem |
Bill Oehlschlager, UAS R&D Portfolio Branch Manager

Bill Oehlschlager provided the overview of Advanced Air Mobility (AAM), Innovate 28, operationalizing an AAM Ecosystem.

The subcommittee discussed:

- If the key site activities will inform research plans
- Ensuring the Human Factors input is provided in a reasonable timeframe for proper planning
- Roles and responsibilities in the Provider of Services for UAM (PSUs) and the breakdown on that in the UAM ConOps 2.0 (planned release date May-June 2023)

- The timeline for key site decisions
- Sharing their future migration plans and presenting that to the subcommittee at a meeting in the future.
- If they will document a "lessons learned" on the key site selections

Phil would like an **Action** requesting a presentation in one of the next two meetings on Human Factors roles, responsibilities and considerations that went into UAM ConOps version 2.

Previous Meeting's F &R #3-Naturalistic Research for Air Traffic Controllers| HF Subcommittee

Bill summarized F&R #3 from the last meeting for Naturalistic Research for Air Traffic Controllers; which was about potentially performing a long term study on skill degradation at facilities.

The subcommittee discussed:
- Identifying suitable applications of this broad concept to study
- What research can be done in the near term and not missing the window of opportunity
- The support from the full REDAC for this kind of work (e.g., longitudinal studies)
- Skill degradation
- Manual flight operations work at MITRE
- Roles and responsibilities of Air Traffic Controllers remain the same but the duties change to accomplish those
- Next steps for this recommendation in order to make progress (focus efforts)

Bill asks the subcommittee what are the next steps for research on this recommendation? Stephanie from ATO, Safety and Technical Training, Human Performance, mentioned that AJI needed clarification on if the F&R was about skill degradation or more about using the naturalistic observations. The subcommittee discussed the timelines for getting useful data. AJI took the action to socialize the idea for a potential FAA research requirement.

Findings and Recommendations from this meeting:

Barbara went over the items discussed to determine if the subcommittee wanted to write an F & R on it. She asked if they wanted to write an F & R requesting information about the plan for human factors funding and how it might impact the research in the future. The question was asked whether there should be an Action to have them provide a report on that or an actual F & R. Barbara points out that an Action can be for a report or a briefing.

Barbara said she can make that an **Action**.

Emerging Technologies and how it might impact runway safety was discussed next. Chris DeSenti feels there is a gap in the assessment of the emerging technologies and runway safety. Dave McKenney asks for a briefing on the HF related issues with these types of systems used for runway incursions. The Safety Summit is mentioned and the thought that they should wait to see what is addressed there. Barbara feels that writing an F&R might give more power to the HF concerns at the Safety Summit. The question was asked if they were talking about the controller side or the flight deck side. Barbara said both and Dave added that he would like to add the Pilot side.

Barbara suggests that **Chris drafts the F&R** on Controller and FD emerging technologies. It will then be distributed so the other members can contribute to it. Barbara speaks on the bigger issue of the EFB and the issues with the technologies' impact on the demand on their situational awareness.

Barbara asks the subcommittee if they had any other F & R suggestions.

Phil Smith had a concern about how unspecific the Roles and Responsibilities are in the existing ConOps for UAM. He would like a briefing from them and would also like one from the NASA Automation Committee about the HF considerations that have gone into their new products. Cheryl said that NASA would be happy to provide that brief. Barbara points out that they can ask for 2 separate briefings at the same meeting. Bill said the FAA can brief on the ConOps. Cheryl asked for more specifics on what they were interested in getting the brief on. They can provide an overview of what NASA is working on regarding ConOps of developing architecture. Dave McKenney asks the subcommittee if they are actually looking for the ConOps or are they only looking for the HF aspects of developing the ConOps. He wants to know how HF will be addressed in the implementation. Phil says that NASA's presentation could address these questions.

Barbara asks Phil to draft the **Action** on that (the 2 briefs on ConOps with NASA) and then she will draft an **Action** for a follow up update on F & R #3 (Naturalistic Research for Air Traffic Controllers).

Barbara brought up the 3 proposed research projects that were given in response to the subcommittee's EFB question from the prior meeting and the broader issue of operationally approved devices; which is the workload and task management issues. The committee members further discussed operational approved devices and research needed to inform future guidance on this issue.

Dave McKenney volunteered to **draft the F & R** with the assistance of Chris Reed and Jack Barker.

Bill asked how this F & R will be different for the first EFB F & R. Dave reminded the subcommittee that the last F & R was about operational approval of EFBs, but FAA did not appear to show research that informed operational approval of such devices, related to simultaneous display needs. There was a discussion about the FAA request to substantiate this need at the next meeting, from airline operators.

Cheryl asked for more information on the Info-Centric NAS presentation, she wants to know the process for turning data into information that's usable and if they are using human factors considerations in that process. How are they making the overload of information more functional in the future? Barbara wants to know what would getting in front of these HF issues look like in implementation; should they be saying that the Human Factors issues have to be considered throughout the process of development? Cheryl asks if the subcommittee can ask for HF considerations when they develop their next level of detail for the Info Centric NAS. The subcommittee discussed the Human Readiness Level (HRL) document. Eddie Austrian provided some clarity on what the HRL document will entail. The HRL is directly tied to the AMS process.

Barbara asks the subcommittee if they should put in an observation for Info Centric NAS and AAM; that Human Factors is not in the forefront. Bill reminds the committee that this has been done in prior meetings. Dave doesn't think they have enough for an F & R for this. Cheryl would like a brief on what they are doing for the next subcommittee meeting. Dave suggests capturing thoughts on this now so they can revisit it later.

Barbara asks the subcommittee for a volunteer to **draft the observation** on the Info Centric NAS. Cheryl volunteers with the assistance of Maggie Ma.

WRAP UP of the DAY | All

Finding and Recommendation 1: Advanced Vision Systems and Runway Safety

Finding: The Subcommittee received several briefings outlining research on advancing information presentation to pilots that included: Enhanced Vision Systems (EVS), Synthetic Vision Systems (SVS), and Augmented Reality Systems (AR). The Subcommittee understands the FAA has conducted significant human factors research investing these technologies previously, however the active and planned research presented to the Subcommittee did not address whether bringing the pilot's attention into an EVS/SVS/AR information channel would diminish their attention to runway safety visual cues and warnings presented directly to the pilot. Or, conversely, if such information could be integrated into these technologies to supplement or enhance the pilot's situational awareness of runway safety information. Applications of these technologies continue to be focused on phases of flight where the risk of runway incursions exist, such as Takeoff Roll, Approach, and Landing. Runway incursion and safety warning systems continue to be developed but are not currently integrated with these other information systems.

Actions

Action 1 Advanced Air Mobility Briefings: The Human Factors Subcommittee received a briefing on expected advancements in work towards an effective Infocentric NAS. An important part of that was a focus on new entrants, including progress toward Advanced Air Mobility. The Subcommittee also received an AAM briefing ("Innovate 28"). There are important human factors considerations that are relevant to future AAM efforts.
To better understand how these are being addressed, the Human Factors Subcommittee requests two briefings at the Summer/Fall 2023 meeting:
1.   FAA to provide a briefing on the FAA CONOPS 2.0 for Advanced Air Mobility, which is expected to be released in late spring, 2023
2.   NASA to provide a briefing on their concepts, research and development for Advanced Air Mobility

Action 2 Connected Aircraft Briefing: The Human Factors Subcommittee received a response to S/F F&R 2, Guidance for Operational Approval of New Applications for the Electronic Flight Bag (EFB). The FAA response indicated new research projects would be starting in FY24 that might address the concerns expressed in the F&R that are tied to a program called Connected Aircraft. The Subcommittee requests a briefing on the connected aircraft concept, framework, and related research both inside and outside of ANG-C1. The Subcommittee wishes to understand the scope of the Connected Aircraft concepts and planned research to proactively help identify human factors research needs.

Next Human Factors REDAC Meeting- SUMMER/FALL August 29-30, 2023 and WINTER/SPRING March 5-6, 2024. Location: Metro DC is likely location for in person meetings. In person vs Remote/Hybrid will be discussed.

Meeting Adjourned-3:57pm ET

REDAC Human Factors Subcommittee Meeting
DAY 1 – Tuesday, March 28, 2023

Time (EDT)	Presenters	Agenda Item	Duration
10:00 – 10:30am	Eric Neiderman (FAA) Barbara Holder (ERAU) Bill Kaliardos (FAA)	Welcome / Opening Remarks	30 mins
10:30 – 11:00am	Victor Quach (FAA) Chuck Perala (FAA)	Flight Deck Human Factors Research Portfolios (Part I)	30 mins
11:00 – 11:10am	All Attendees	Session Break Meeting will resume at 11:10am	10 mins
11:10 – 12:00pm	Victor Quach (FAA) Chuck Perala (FAA)	Flight Deck Human Factors Research Portfolios (Part II)	50 mins
12:00 - 1:15pm	All Attendees	Lunch Break Meeting will resume at 1:15pm	75 mins
1:15 - 1:30pm	Colleen Donovan (FAA) Lisa Thomas (FAA)	AVS Human Factors Research Roadmap Update	15 mins
1:30 - 2:00pm	Katrina Avers (FAA) Cliff Johnson (FAA)	Augmented Reality (AR) / Virtual Reality (VR) Human Factors AR/VR Research Updates	30 mins
2:00 - 2:15pm	All Attendees	Break Meeting will resume at 2:15pm	15 mins
2:15 - 3:00pm	Captain Jack Barker (ALPA)	Air Line Pilots Association Human Factors Views on Emerging Technologies	45 mins
3:00 - 3:30pm	HF Subcommittee	Previous Meeting's Findings and Recommendations (F&R) #1 and #2 FAA Responses and discussions	30 mins
3:30 - 4:00pm	HF Subcommittee	Discussion & Action Items	30 mins

Time (EDT)	Presenters	Agenda Item	Duration
4:00pm	All Attendees	Day 1 Wrap Up	-

DAY 2 – Wednesday, March 29, 2023

Time (EDT)	Presenters	Agenda Item	Duration
10:00 – 10:30am	Elizabeth Delarosby	FAA Budget Briefing	30 mins
10:30 – 11:00am	Steve Bradford (FAA)	Info-Centric NAS Technical Overview and Update on information (info)–centric National Airspace System (NAS)	30 mins
11:00 – 11:15am	All Attendees	Session Break Meeting will resume at 11:15am	15 mins
11:15 – 12:00pm	Karl Kaufmann (FAA)	ATC Human Factors Research Portfolios (Part I)	45 mins
12:00 - 1:15pm	All Attendees	Lunch Break- Meeting will resume at 1:15pm	75 mins
1:15 - 1:30pm	Karl Kaufmann (FAA)	ATC Human Factors Research Portfolios (Part II)	15 mins
1:30 - 2:00pm	Bill Oehlschlager (FAA)	FAA Advanced Air Mobility (AAM) "Innovate 28"	30 mins
2:00 - 2:30pm	HF Subcommittee	Previous Meeting's Finding and Recommendation (F&R) #3	30 mins
2:30 – 2:45pm	All Attendees	Break- Meeting will resume at 2:45pm	15 mins
2:45-4:00	HF Subcommittee	Final Discussion and New Findings	75 mins
4:00pm	All Attendees	Adjourn	-

HF = Human Factors
F&R = Finding and Recommendation by REDAC
RED/RE&D = Research, Engineering, and Development
AVS = FAA Office of Aviation Safety
UAS = Unmanned Aircraft Systems
AAM = Advanced Air Mobility

Attendee List

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DAY 1 – Tuesday

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Name	Organization
Kevin Siragusa	Fort Hill Group (CTR)
Bill Kaliardos	FAA
Marlo E Allen	JMA Solutions (CTR)
Kurt Reesman	Auburn University
LaTesha J Holloman	Booze Allen Hamilton (CTR)
Randy Bone	MITRE CAASD
Chuck Perala	FAA
David McKenney	MITRE CAASD
Lauren J. Thomas	FAA
Kelene Fercho	FAA
Russ Tokarski	FAA
Phil Bassett	Cavan
Eric Neiderman	FAA
Rany Azzi	FAA
Jim Kuchar	MIT Lincoln Lab
Sparko Andrea	Volpe
Steve Lang	Cavan
Doug Rodzon	FAA
Jorge Fernandez	FAA
Kolie Lombard	FAA
Rich Golden	FAA
William Cape	FAA
Divya Chandra	Volpe
Jessica Cruit	University of Central Florida (UCF)
Wes Olson	MIT Lincoln Lab
Sonia Dodd	Honeywell
Kenneth Allendoerfer	FAA
Kathy Abbott	FAA
Ben Willems	FAA
Chris Reed	JetBlue
Kevin Comstock	ALPA
Christopher DeSenti	MITRE CAASD
Tracy Lennertz	Volpe
Maggie Ma	Boeing
Dr. Heidi Kim	FAA
Kenneth Allendoerfer	FAA

James Ness	FAA
Chad Healy	Reliable Robotics
Kevin Williams	FAA
Tara (Holmes) Gibson	FAA
Barbara Holder	Embry-Riddle Aeronautical University
Don Kauffman	Honeywell
Jackie Jensen	Wisk
Vicki Ahlstrom	FAA
Fabrice Kunzi	Wisk
Caprice Brown	FAA
Andrea Stevenson	FAA
Victor Quach	FAA
Mark Orr	FAA
Lisa Thomas	FAA
Rebecca Morrison	RTCA
Todd Lewis	FAA
Patrick Kong	FAA
Mark Hale	FAA Contractor Support
Eddie Austrian	Fort Hill Group (CTR)
Rob Bastholm	SAIC
Karl Kaufmann	FAA
Dan Brock	FAA
Monique Moore	FAA
Stephanie Kreseen	FAA
Florian Jentsch	University of Central Florida (UCF)
David Newton	FAA
Cathy Swider	FAA
Todd Truitt	FAA
Katrina Avers	FAA
Cliff Johnson	FAA
Nichola Lubold	Honeywell
Alex Konkel	FAA
Colleen Donovan	FAA
Sabreena Azam	FAA
Lowell Foster	Wisk
Heidi Kim	FAA
James Birdsong	Auburn University
Jon Schleifer	FAA
Kylie N Key	FAA
Tara Gibson	FAA
Elly Smith	MITRE CAASD
Jack Barker	ALPA
Laura Wood	FAA
Angel Millan	Boeing

Carla Hackworth	FAA

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<tr><td colspan="2" align="center">DAY 2 – Wednesday</td></tr>
<tr><td align="center">Name</td><td align="center">Organization</td></tr>
<tr><td align="center">Kevin Siragusa</td><td align="center">Fort Hill Group (CTR)</td></tr>
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<tr><td align="center">Kevin Williams</td><td align="center">FAA</td></tr>
<tr><td align="center">David McKenney</td><td align="center">MITRE CAASD</td></tr>
<tr><td align="center">Jorge Fernandez</td><td align="center">FAA</td></tr>
<tr><td align="center">Monique Moore</td><td align="center">FAA</td></tr>
<tr><td align="center">Christopher DeSenti</td><td align="center">MITRE CAASD</td></tr>
<tr><td align="center">Rich Golden</td><td align="center">FAA</td></tr>
<tr><td align="center">Jerry Crutchfield</td><td align="center">FAA</td></tr>
<tr><td align="center">Cheryl Quinn</td><td align="center">NASA</td></tr>
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<tr><td align="center">William Cape</td><td align="center">FAA</td></tr>
<tr><td align="center">Russ Tokarski</td><td align="center">FAA</td></tr>
<tr><td align="center">Sabreena Azam</td><td align="center">FAA</td></tr>
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<tr><td align="center">Adam Hendrickson</td><td align="center">FAA</td></tr>
<tr><td align="center">Maggie Ma</td><td align="center">Boeing</td></tr>
<tr><td align="center">Dan Brock</td><td align="center">FAA</td></tr>
<tr><td align="center">Caprice Brown</td><td align="center">FAA</td></tr>
<tr><td align="center">Steve Lang</td><td align="center">Cavan</td></tr>
<tr><td align="center">Mark Hale</td><td align="center">FAA</td></tr>
<tr><td align="center">Angel Millan</td><td align="center">Boeing</td></tr>
<tr><td align="center">Tara Gibson</td><td align="center">FAA</td></tr>
</table>

Eddie Austrian	Fort Hill Group (CTR)
Stephanie Kreseen	FAA
Elly Smith	MITRE CAASD
Victor Quach	FAA
Laura Wood	FAA
Francisco Capristan	FAA
Nick Lento	FAA
Divya Chandra	Volpe
Karl Kaufmann	FAA
Erin Sunshine	FAA
Wes Olson	MIT Lincoln Lab
Stafford Duncan	FAA
Adam Rhodes	FAA
Kenneth Allendoerfer	FAA
Pam Munro	FAA
Todd Lewis	FAA
Vicki Ahlstrom	FAA
Tara (Holmes) Gibson	FAA
Kelene Fercho	FAA
Rebecca Morrison	RTCA
Lisa Thomas	FAA