EMBRY-RIDDLE Aeronautical University

FAA REDAC Subcommittee on Human Factors

Findings and Recommendations

Winter/Spring 2023

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April 12, 2023

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Subcommittee on Human Factors Winter/Spring Meeting 2023

March 28-29, 2023
Hybrid meeting

- Opening Remarks, Deputy Director Eric Neiderman
- Flight Deck Human Factors Research Portfolios:
  - NextGen Air/Ground Integration Human Factors Research Program
  - Flight Deck/Maintenance/System Integration Human Factors Research Program
- FAA Budget Update, Beth Delarosby
- ATC Human Factors Research Portfolios:
  - ATC Technical Operations Human Factors
  - ATC Enterprise
- Review FAA responses to S/F 2022 F&Rs

Invited Presentations:

- AVS Human Factors Research Roadmap
  Colleen Donovan
- Augmented/Virtual/Extended Reality
  Katrina Avers
- Human Factors AR/VR/ER Research updates
  Cliff Johnson
- ALPA Views on Emerging Technologies
  Captain Jack Barker
- InfoCentric NAS
  Steve Bradford
- FAA Advanced Air Mobility “Innovate 28”
  Bill Oehlschlager

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Finding: Advanced Vision Systems and Runway Safety

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.

Recommendation:
Advanced Vision Systems and Runway Safety

The Subcommittee recommends that the FAA research the effect of the use of Enhanced Vision Systems (EVS), Synthetic Vision Systems (SVS), and Augmented Reality Systems (AR) on pilot attention to visual ques needed for timely pilot response to runway safety information presented directly to the pilot.

Consequences: Continued research, development, and implementation of such vision technologies without assessing the impact of their use on pilot attention to important visual cues in the environment and warnings, may increase the risk of runway incursions or other runway safety hazards.

Observation: Proactive Integration of Human Factors

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The Human Factors Subcommittee was pleased to hear briefings on the FAA InfoCentric NAS and Advanced Air Mobility Innovate 28. The Subcommittee requested these briefings to gain insight into the future aviation vision concepts. The Subcommittee encourages the integration of human factors as the implementation plans in both areas are matured.

For the InfoCentric NAS concept briefing, several areas for further consideration were noted. These include: the impacts of digitization of data on human operators and implications for information display and management, the changing role of the FAA user controlling more highly automated aircraft, and the use of ML/AI to turn data into actionable information to be used by decision makers. Factors to consider are the display of information to users and transparency and trust in automation/autonomy, which will be critical in defining human interaction with various levels of automation.

It was understood from the Innovate 28 presentation that the effort was focused on near-term demonstration of emerging AAM technologies using current airspace and procedures. However, for the implementation of AAM beyond the 2028 boundary the subcommittee encourages understanding of the impact on the human operators of advanced automation, new flight rules, remotely piloted/autonomous aircraft, and new airspace constructs.

The Subcommittee encourages early and consistent integration of human factors into these efforts and encourages the FAA to continue to proactively identify emerging human factors research issues, so they can be submitted into the funding cycle as early as possible.

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. There are important human factors considerations that are relevant to that effort.

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 planned 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.

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Upcoming Meetings

Summer/Fall: August 29-30, 2023

Winter/Spring: March 5-6, 2024

Locations are TBD