

Subcommittee on Human Factors 2018 Winter/Spring Meeting Summary

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FAA Research, Engineering and Development Advisory Committee
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Subcommittee on Human Factors Winter/Spring 2018

Meeting Objectives:

- Review proposed 2020 R&D portfolio based on strategic guidance
- Subcommittee provides recommendations on the proposed portfolio
- Define the HF emerging issues list
- Consider deep dives into significant areas

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Meeting Summary

The subcommittee met at the Honeywell Aerospace Deer Valley site in Phoenix, Arizona, February 27-28, 2018

- Reviewed 2020 FAA proposed or committed research portfolio
- Discussed impact of the planned budget reduction on critical priorities
- Developed HF emerging issues list and used it to identify FAA R&D gaps and mismatched priorities
- Identified areas the subcommittee may need to understand better with deep dive presentations:
 - Activities in adjacent industries (Uber, Amazon, Google)
 - European commission R&D areas and priorities
- Toured Honeywell R&D labs

Findings and Recommendations Winter/Spring 2018

Finding 1: Important areas for continued research and development

The subcommittee identified the following areas as significant, in either their emerging issues list or areas that require continued early stage research, and should remain high priority for funding.

- Certification criteria for advanced avionics technologies and vision systems
- Evaluation of fatigue mitigation in flight operations.
- Evaluation of training effectiveness
- Validation of pilot training and procedures for Next Gen integration
- Human factors guidelines for advanced instrument procedure design

Recommendations: Consistently fund these high priority areas despite the proposed budget reductions. If any areas are not funded, provide rationale for any reductions at the next meeting.

Consequences: Potential to negatively impact safety and operational efficiency if funding is reduced.

Findings and Recommendations Winter/Spring 2018

Finding 2: Research gaps that are not well represented in the current funded portfolio

The proposed FAA FY2020 Human Factors portfolio does not address HF issues for the following areas:

- Integration of UASs into the NAS
- Managing increased complexity in airspace operations
- Criteria for effective information management across certified and operationally approved devices
- Increased introduction of automation and autonomous systems/subsystems
- Transition to Trajectory Based Operations (TBO) and Performance Based Navigation

Recommendations: The FAA should review these HF areas for inclusion in the research portfolio as it is balanced against other competing needs. Provide rationale for decisions regarding these research areas if they are not supported.

Consequences: Proactive research in these areas is needed to achieve the goals of NextGen in a safe, timely and effective manner. Reduced funding would likely jeopardize NextGen implementation in unexpected ways.

Findings and Recommendations Winter/Spring 2018

Finding 3: Flight Crew Information Management

- Integration of operationally approved information with information contained in certified flight deck avionics systems is becoming more pervasive in the flight deck.
- Current FAA methods for approving and evaluating information presentation by using device or location to differentiate and communicate the accuracy and integrity of information are insufficient for evaluating the emerging ways information is being presented and integrated in the flight deck.

Recommendation: The FAA needs to develop standards and evaluation criteria to ensure information presented to the flight crew in various ways and across devices does not negatively impact flight crew understanding the accuracy, integrity, (i.e., trustworthiness), and timeliness of all information presented to them.

Consequences: Without appropriate evaluation criteria for integration of operationally approved information into certified systems, the FAA may inhibit industry innovation in bringing new features and functions to the flight deck or permit information integration that may lead to safety issues where the integrity or completeness of presented information may be misunderstood by the flight crew.

Human Factors Emerging Issues List

Urgent near term issues to be addressed within 5 years:

- Human Factors issues associated with implementation of UAS in the NAS
- Increasing complexity of the airspace
- Information management, especially operationally approved vs. certified
- Training and qualification methods and technologies
- Trajectory based operations

Important longer term issues to be addressed in the next 5-10 years:

- Increased automation and autonomy that enables operations with a reduced crew
- Development and deployment of new and novel interfaces
- Cybersecurity and safe integration of new technologies
- Data collection and analysis to enable big data analytics, data fusion, real-time assessments

Subcommittee on Human Factors Upcoming Meetings

- Summer/Fall 2018 August 28-29, Washington DC area, Host TBD
- Winter/Spring 2019 March 11-15, Seal Beach, Hosted by Boeing