

**Federal Aviation Administration  
REDAC HF Subcommittee Summer/Fall 2019  
Findings and Recommendations  
August 27-28, 2019**

**Finding and Recommendation 1: System Integration Research**

**Finding:** Within the four HF BLIs the research objectives and execution generally considers the perspectives of the flight crew and the air traffic controllers separately. Separation of air and ground domains is primarily due to the FAA's budgeting structure within RE&D. Although it may be challenging to study air and ground domains (flight crew and air traffic controllers) in an integrated manner, studying the domains separately will likely result in different products for each domain (flight crew / flight deck versus air traffic controllers). Therefore, where appropriate, studies should assess the impacts on both domains to ensure adequate integration of air and ground and their impacts on both domains in the context of each other to create valid deliverables in terms of tools, processes, recommendations and guidance.

**Recommendation:** Identify opportunities where research would benefit from integrated studies and identify how such integrated studies can be accomplished within the constraints of the current funding structure and available resources. Report out at next HF REDAC meeting the results of this and include any issues or barriers with executing this recommendation.

**Consequences:** A consequence of not carrying out integrated studies is concepts may inappropriately allocate tasks or procedures to one domain causing unnecessary workload and errors on the other domain. This has a high potential to result in rework when the concepts get implemented due to inadequate integration across the domains.

**Finding and Recommendation 2: Strategic inputs to the research prioritization process**

**Finding:** ANG-C1 has been doing an excellent job of addressing several important human factors issues of importance to the missions of ATO, AVS Tech Ops, NextGen and the FAA more generally. However, it appears that the current research prioritization process is dominated by reactive, shorter term pressures. While these shorter-term focus areas are important, there is a need to better integrate broader strategic considerations into the planning and prioritization process for determining the human factors research portfolio.

**Recommendation:** Clearly define a research proposal and prioritization process to include strategic guidance regarding the development and integration of emerging new capabilities, current issues, and operational concepts so these issues can be addressed proactively. The strategic perspective needs to be driven by input from ATO, AVS, Tech Ops and NextGen as well as Industry to ensure the certification, regulatory and operational needs of the Agency are considered relative to emerging capabilities and operational concepts balanced with current needs. Guidance should be established to define how the consideration of emerging issues fits into an overall process for determining how to best allocate research efforts to an appropriate mix of research needs.

**Consequences:** Focusing on shorter-term inputs to the research prioritization process alone will not enable the agency to integrate broader strategic considerations into the planning and prioritization process and consequently miss important emerging issues.

### **Finding and Recommendation 3: Urban Air Mobility (UAM) research gap**

**Finding:** As part of its emerging issues list, the Human Factors subcommittee has noted new entrants and operations associated with emerging markets, such as urban air mobility (UAM), are expected to be realized within the next 5-10 years. Given this timeframe, the subcommittee previously recommended research on human factors issues involving the certification of new vehicles, integration of operations into the airspace, and safe introduction of increasingly autonomous systems need to be addressed within the next five years. The subcommittee noted the research presented at the August 2019 meeting did not include any work in these areas and nor did it appear any such research is planned through FY22.

**Recommendation:** The subcommittee recommends the FAA invest in human factors research associated with increasingly automated operations (such as UAM) as soon as possible. FY22 research guidance provided by both ANG and AVS should specifically identify the need to address UAM human factors issues. This research should include human-machine systems integration, pilot/operator training and certification, and airspace interoperability between traditional and UAM operations, as appropriate to the organization.

**Consequences:** The FAA will be unprepared to provide guidance and approvals for UAM OEMs, operators, and operations targeting an EIS date prior to 2025.

### **Action 1: UAS Human Factors Research**

The Human Factors Subcommittee was briefed previously on a high-level FAA UAS research plan. However, at the Summer/Fall 2019 meeting the Subcommittee became concerned that visibility into the progress of UAS research is reduced. The Subcommittee requests an update on the progress of the FAA UAS Research plan, and specifically on how the plan is being translated into research requirements related to human factors and their associated research requirements.

### **Action 2: Research Landscape**

The landscape presented to the subcommittee at the Summer/Fall 2019 meeting has shown some progress however, based on discussions during the meeting, the subcommittee is concerned the Landscape has not been fully vetted or approved within the agency. The subcommittee requests the FAA report at the Winter/Spring meeting on the following:

- How will the Landscape balance current issues and drivers with emerging issues and drivers?
- What data are being collected and analyzed to define high priority current and emerging issues and drivers?
- How will the Landscape be used to across the agency? How will it inform the R&D needs and portfolio prioritization?
- How does the Landscape and the NARP relate to and inform each other?