NASOPS Findings and Recommendations

March 2015

General Observations

The Subcommittee is pleased to observe that the briefings it received on the FAA research program had a stronger focus on how research objectives are related to the delivery of benefits to the NAS. Two specific examples were noted by the Subcommittee: Data Visualization Analysis and Reporting System (DVARS) and NextGen Wake Turbulence / Wake Re-Categorization (Re-Cat).

DVARS provides a data processing capability that adds significant value to the analysis required for the development of 4D trajectory-based operations, in particular, for the verification and validation of trajectory models. The DVARS data architecture concept is well aligned with the global transition toward net-centric technologies. Because of this, the system provides a foundation for scalability for example, for "the rest of the airspace" (that is, for airspace and airports not currently provided with FAA surveillance). As the Subcommittee and the full REDAC has previously noted, the expansion of the quantity and quality of data from systems like DVARS exemplify the need for FAA to vigorously pursue an efficient governance process to make this data available to qualified users.

In recent years, the FAA has focused its wake turbulence research on the development and validation of new procedures and separation standards that have delivered substantial benefit to airspace users. The Subcommittee is pleased that the FAA has responded to its recommendation to continue the implementation of Re-Cat Phase I and notes that its plans for Phase II and III appear sound and well-focused on the delivery of operational benefits and international harmonization.

For several years, the REDAC has urged the FAA to develop a more strategic view of its R&D and use it to identify and prioritize research areas. In 2013, the Subcommittee observed some willingness on the part of FAA to do this as reflected in its stated commitment: "to develop a more strategic, forward looking process, so that there will be an integrated agency-wide view of R&D". During its August 2014 meeting, in response to the FAA's request, the Subcommittee devoted significant time to the identification of research opportunities and issues as a first step in this process. It is not clear to the Subcommittee, however, how or if the FAA will make use of this input or whether it will make significant progress toward its stated commitment. The Subcommittee continues to stand ready to assist.

Finding: 4D Trajectory Based Operations (4D TBO)

The FAA provided a briefing on its recently-published TBO Concept of Operations during the Subcommittee's March 2015 meeting. The Subcommittee notes that, from the perspective of NAS operations, the development and validation of 4D TBO in all NAS domains is of critical importance to delivering benefits to airspace users. There are a number of significant research questions that must be answered in order to achieve the benefits of 4D TBO, among them:

- What is the transition path from near-term NextGen capabilities to the 4D TBO operations envisioned in the Concept of Operations?

- What is the system design required to achieve resilience of operations, including failure detection and recovery?

- What is the allocation of responsibility between flight deck and ground personnel during nominal and off-nominal operations?

- What is the role of humans and automation on the ground and on the flight deck during nominal and off-nominal operations?

- How will 4D TBO operations be optimized to ensure fairness across airspace users while meeting user objectives?

- How will UAS and General Aviation airspace users be accommodated in 4D TBO operations?

Recommendation: 4D Trajectory Based Operations (4D TBO)

The Subcommittee recommends that the FAA expand upon its TBO Concept of Operations to define the transition path (at the conceptual level) and the associated research objectives as a first step toward defining a coherent research program to refine and validate the TBO concepts. The Subcommittee recommends that the FAA provide an update on this process during its August 2015 meeting so that it can provide recommendations for a strategic research agenda for TBO implementation in 2025 and beyond.