

Spring 2018 REDAC
Subcommittee: NAS Operations
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FINDING AND RECCOMENDATION

Commercial Space Transportation

General Observation

During the spring 2018 NAS Operations REDAC meeting, the subcommittee committee was briefed by the Office of Commercial Space Transportation (AST) on the FY2020 proposed portfolio for Budget Line A.11N Commercial Space Transportation (CST). AST regulates the civil, military, and commercial sectors of the space program to ensure the protection of the public, property and national security and to encourage, facilitate, and promote U.S. commercial space transportation.

This R&D portfolio addresses four research areas: (1) traffic management and spaceport operations, (2) space transportation vehicles, (3) human spaceflight, and (4) industry viability.

Within the first research area, the program places an emphasis on safety to the public through effective airspace integration and spaceport interoperability, which is accomplished through the use of models and predictive capabilities, mission planning tools, regulations, and safety analysis. The research area assumes an integration of space traffic into NAS operations through the use of trajectory-based operations (TBO) automation and procedures.

Finding: Today's commercial space traffic (CST) operation is based primarily on airspace segregation and has significant impact to airspace use by other NAS users. The feasibility applying future TBO automation applications as the primary way to integrate commercial space operations into the NAS is unknown and requires careful study the extension of TBO methods for CST requires an understanding of the ramification of space operations to all NAS users.

Recommendation: The NAS Operations subcommittee recommends that scheduling and causal factor analysis to all NAS operations be included to the research and development portfolio. Further given the number of space ports that are under the certification process and the forecast of demand for increased number of launches, analysis is needed before an assumption that TBO will mitigate CST on the NAS.

ATDP - Operations Concept Development and Infrastructure (BLI 1A01C)

General Observation

The NASOPS Subcommittee was briefed on the ATDP project at its March 2018 meeting. The subcommittee has, over the past, been extremely interested in FAA work in this area and has always been of the view that this work is critically important. The subcommittee believes that insufficient work in operational concept development and validation significantly increases the risk of operational problems after implementation. Since the budget for such work was moved from the NEXTGEN Office (ANG) to the ATO there has been an increase in concept development and validation focus on projects

closer to implementation. When this shift occurred, we were told that work on concept development in earlier stages of R&D would be done by ANG portfolio managers.

Finding: The ATDP presentation did not address how FAA decides which concepts will be studied with the limited ATDP budget. It was not clear what criteria are used to select and to prioritize concepts for concept development and validation.

Recommendation: The FAA should develop clear criteria for selecting and prioritizing concepts to be evaluated. They should identify potential implementation risks for concepts that are not selected for study or concepts that are subjected to only limited validation.

NextGen ATC/TechOps Human Factors

General Observation

At its spring 2018 meeting, the NAS Operations subcommittee appreciated the opportunity to review the FY2020 proposed portfolio for A11.i Air Traffic Control / Technical Operations Human Factors. This program addresses R&D needs in five focus areas: human factors standards; workforce optimization; improved safety; human factors in NAS technology integration; and human performance enhancement.

Maintaining an effective air traffic controller workforce is critical toward ensuring the continued safety of the NAS and enabling increased efficiencies capitalizing on NextGen investments and future concepts such as Trajectory Based Operations (TBO). The importance and challenge of workforce stewardship has also been raised recently in forums including the RTCA NextGen Advisory Committee.

The NAS Operations subcommittee notes that in addition to tactical air traffic control functions, strategic traffic flow management (TFM) is also a critical component of NAS efficiency. Without effective TFM, traffic flows may be mismatched against available capacity, leading to significant delays, congestion, and additional workload for tactical controllers. The skills needed to perform effective TFM are different than those typically required for tactical control, with the former tending to involve longer-term strategic collaborative decision-making under significant uncertainty and without immediate feedback on the outcome of the decisions that are made. The evolution toward TBO will necessarily shift the type of TFM information, procedures, collaborations, and decisions that are required, necessitating a corresponding evolution in TFM workforce training and skills.

Finding: The current A11.i portfolio and proposed R&D roadmap focuses solely on tactical air traffic control and technical operations personnel. The portfolio does not include any research requirements related to strategic TFM human factors issues. In contrast, the NAS Operations subcommittee finds that there are significant human factors R&D requirements specific to TFM involving human factors standards, workforce optimization, NAS technology integration, and human performance enhancement. Absent any R&D investment addressing these issues, the TFM workforce will continue to have significant challenges both in today's environment as well as when transitioning toward TBO, jeopardizing the expected benefits possible from new technologies and procedures.

Recommendation: The NAS Operations subcommittee recommends that TFM workforce human factors considerations be directly included in future R&D portfolio planning. Representatives from the TFM

stakeholder community should be included in the ATO R&D Requirements Roundtable and research requirements specific to the TFM workforce should be identified and included in the planning process. These requirements should consider both the current TFM environment as well as the planned evolution of systems including TFMS, TBFM, TFD and the transition to TBO.

ACTION ITEMS

The NAS Operations Subcommittee appreciates the updates provided by the FAA briefing teams in the following topics, and requests that these items be included in upcoming Subcommittee meetings:

New ATM Requirements

The subcommittee appreciates the additional detail that was recently provided regarding each research subtask under 1A09D New ATM Requirements. This information is useful to the subcommittee as it seeks to understand the balance between R&D efforts across the FAA.

The subcommittee asks that, at future meetings, the funding amount that has been allocated to each subtask is also provided along with the subtask descriptions. This will aid in gauging the relative level of effort between these subtasks. Finally, inasmuch as new entrants (in particular: urban air mobility concepts) will likely impact future ATM requirements, the committee requests additional information on how the 1A09D portfolio will support potential ATM changes driven by these disruptive concepts and technologies, and the implications to the FAA Research Engineering and Development portfolio, as well as the NARP.

Pathfinder

We request a refresh for the Subcommittee on this project (previously briefed in September 2017), to include budget, progress, plans, and implications to the broader needs of UAS in the NAS, UTM, and such emerging developments as Urban Air Mobility and related airspace management needs.

Cybersecurity

We request a refresh for the Subcommittee on this project (previously briefed in September 2017), to include budget, progress, plans, and summary of the public-private partnering aspect of the project.

Remote Tower Project

We request a refresh for the Subcommittee on this project (previously briefed in March 2017 or earlier), to include budget, progress, plans, and the implications of advancements such as space-based ADS-B as an augmentation of current surveillance solutions in the current testing plan.

Operations Concept Development and Infrastructure

The subcommittee would like to get an update on the concept development activities by ANG portfolio managers at its 2018 fall meeting. The subcommittee requests that these briefings detail how research in these three areas is mitigating risk associated with the operational integration of these concepts. The subcommittee also requests information about how funding within the budget line is divided between the three identified focus areas: (1) Improved TBFM/TFMS Data Integration, (2) Initial TBO Gap Analysis, and (3) Space Integration Enhancements.

INFORMATIONAL BRIEFING FOR NEXT MEETING

Cell signals for surveillance and use for UAS

The Subcommittee greatly appreciates the candid and forward-looking commentary shared at the meeting by Steve Bradford, regarding the possible implications of the emerging commercial broadband connectivity solutions for aviation, beyond Data Comm, including 4G LTE-Advanced and even 5G-enabled communication technologies. We are supportive of strategic thinking involving the FAA engaging with the emerging Urban Air Mobility (UAM) and UAS industries in their exploration of these technologies.

These emerging industries and their operations could serve as test beds for evaluation and proofs of concept of these new commercial data, voice, and video broadband connectivity technologies as to the implications to air traffic management and services, airport operations, and perhaps NAS infrastructure operations. The pace of development in the mobile connectivity technologies and industrial applications is creating the infrastructure for an “Aviation Internet of Things,” with significant possibilities for desirable cost and performance of data comm systems that are not possible with the legacy technologies. However, these technologies also must demonstrate satisfactory robustness in the face of cybersecurity challenges or GPS disruptions (they rely on precision timing solutions) for example. Global spectrum management policies that account for use of these connectivity solutions in mobile aeronautical applications could be a topic of importance in considering the FAA roles in supporting these advancements (e.g., what combinations of the available RF bands that enable large bi-directional spectrum be employed for airspace management and services, and if so, are existing public standards sufficient for proof of relevant system robustness, reliability, and resilience in safety of flight applications?)

Because the emerging connectivity solutions have such broad implications to many of the NextGen operating concepts, the NAS Ops Subcommittee plans to invite informational briefings on these topics, over the course of upcoming meetings. We will invite and encourage interested FAA personnel to participate in these future briefings. Our initial proposal will be to include the topic of Broadband Aviation Connectivity on the agenda for the Fall meeting.