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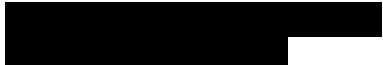
Massachusetts Institute of Technology

Aeronautics and Astronautics
Engineering Systems Division

October 2, 2013

The Honorable Michael P. Huerta
Administrator
Federal Aviation Administration

Dear Administrator Huerta:

Thank you for again taking the time to meet with the Research, Engineering and Development Advisory Committee (REDAC) at our recent meeting. These discussions help us understand your perspective on the issues, objectives and challenges for the agency's future.

I am enclosing the summary detail findings and recommendations from the Fall 2013 meetings of the standing REDAC Subcommittees (Aircraft Safety, NAS Operations, Environment and Energy, Airports, and Human Factors).

The committee would also like to share a few general thoughts for your consideration.

Enabling the Potential of "Big Data" in the FAA - The growth of operational data and advances in data analysis open up exciting new approaches to better understand and improve the safety and efficiency of the NAS. The FAA has taken initial steps in this direction with data driven programs such as ASIAS and ASDI but there is significantly more potential. Realizing the full potential of "Big Data" will require development of data access policies allowing the most open possible access to researchers and other users while providing appropriate data protections. The REDAC recommends that the FAA consider creative approaches to access policies such as multiple access levels to partitioned data structures. The most open level of data could be fully open to the public enabling crowdsourcing and open competitions for researchers/students to creatively analyze and visualize the data, enabling a level of effort in this data analysis greater than can be conducted in-house by the FAA alone.

Emerging Human-Automation Issues - The increasing reliance on automation in aircraft and ATC systems have created emerging vulnerabilities in the aviation system highlighted by recent events. This was an important area of research during the initial introduction of highly automated aircraft such as the A-320 and B-767/757 in the 1980s but the character of emerging issues is changing as both the complexity of the automation increases and the new generation of pilots has different backgrounds. The REDAC recommends increased priority for human-automation interaction research and that the FAA work with related activities at NASA and the DOD.

Validating NEXTGEN Con-Ops - The key to successful delivery of NEXTGEN benefits will be to validate the Con-Ops currently under Concept Maturity and Systems Development at a sufficiently detailed level that operational feasibility can be assured and risks can be identified and managed. This includes definition of candidate operational procedures, addressing human factors issues (often in Human in the Loop Simulations) and considering operational issues such as mixed equipage and off-nominal conditions.

Unmanned Air Systems Research – The REDAC is pleased that the FAA is making progress on UAS integration in the NAS with the reported completion of the UAS Roadmap and UAS Con-Ops. At this point the REDAC has not been able to view these documents so it is difficult for the committee to give specific and effective advice in this important area. The REDAC looks forward to the opportunity to review and respond to the UAS Roadmap.

Thank you for the opportunity to engage and contribute to the safety, efficiency and sustainability of aviation in the United States.

Sincerely,

R. John Hansman

Chair, FAA Research, Engineering and Development Advisory Committee

Enclosure