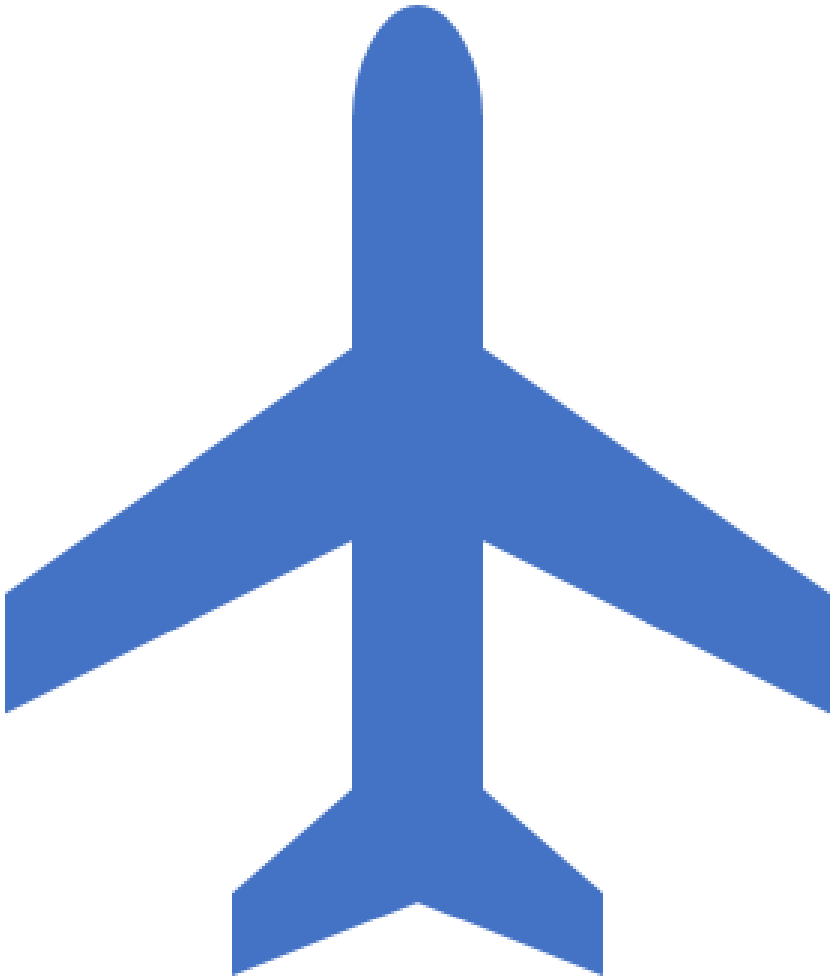
Research, Engineering and Development Advisory Committee

Subcommittee Report - Aircraft Safety (SAS)

Terry McVenes, SAS Chair

October 10, 2019



SAS Meeting August 19-20, 2019

- Review of FY19, FY20 budgets, and RE&D appropriations
- FY21 proposed budget
- R&D Landscapes
- FY19 Aircraft Safety Assurance Portfolio Accomplishments
- FY22 New Process for Strategic Guidance
- Software Assurance Challenges
- Update on UAS Research
- Response to the SAS F&R on Runway Friction
- National Artificial Intelligence R&D Strategic Plan
- Cybersecurity-safety Commercial Aviation Team
- RTCA and FAA Working Relationship

Finding #1– Funding of New and Emerging Safety Risks R&D

- Lengthy budget cycles significantly restrict the ability of the FAA to plan and conduct research in near real time to address emerging issues.
- Some issues have the potential to influence the current strategies around the NAS and could create a challenge to safety if the right levels of oversight are not provided.
- In all cases, the experts at the FAA are best equipped to make decisions with respect to the prioritization of research in the interest of safety.

Recommendation #1

A process should be established (ideally as part of the appropriation process) to set aside a portion of the RE&D budget for discretionary efforts to address out of cycle emerging issues that are agreed to have a potential impact on aircraft safety.

Finding #2-AVS Research Planning Process

- Briefing on the rebuilding of the AVS research proposal and prioritization process.
- The subcommittee was encouraged to see the effort to refine the process from the Agency's experience.
- Discussion on the FAA's aspiration of creating a balance between emerging issues and current issues.
- Subcommittee concern that strategic material developed with Industry and SME input contained in the Research Landscapes for the National Airspace System is not explicitly included as reference, or required guidance, in the development of research proposals. Nor is it explicitly built into the rubric for selecting research proposals in order to achieve the balance.

Recommendation #2

- As the research proposal and selection process is refined, guidance for the use of Research Landscapes and their associated Research Challenges, as reference for individuals proposing new research, and also that those Landscapes and Challenges are considered as part of the selection rubric.

- Guidance should establish a definition of emerging issues, in contrast to current issues, and the percentage of the RE&D budget that shall be allocated to emerging issues for the FY planning year.

Finding #3 - Additional Funding for Complex System R&D

- Certification of complex, non-deterministic systems is a significant emerging issue for several years now.
- Addressing this multifaceted, complicated challenge involves many different related aspects.
- Concern that some aspects which are being under-addressed involving such areas as the validation and verification of complex digital systems employing non-deterministic software elements to include autonomous systems, artificial intelligence, and machine learning.
- Also, under-addressed are design standards and best practices for safety critical non-deterministic systems.
- Autonomous flight is likely to have implications for all aspects of aviation and is likely to have near-term implications for systems which enable unmanned aircraft, urban air mobility type operations, and the use of single pilot operations in cargo aircraft.

Recommendation #3

The FY20 request for Digital System Safety includes a total of approximately $3M which is not currently supported by the House version. This is likely to be insufficient to address the complicated challenge in a timely fashion and the direct relationship to the scope of the Unmanned Aircraft System BLI. The FAA should dedicate a significant portion the anticipated congressional plus-ups in the area of unmanned systems to this essential topic. The FAA should continue to leverage, where appropriate, research investments at NASA and DOD.

The subcommittee would like a detailed update on FAA progress, plans, and relationships in this area at a future meeting.

SAS Meeting

Next Meeting:

RTCA Headquarters in Washington, DC on
February 25-26, 2020

Questions?