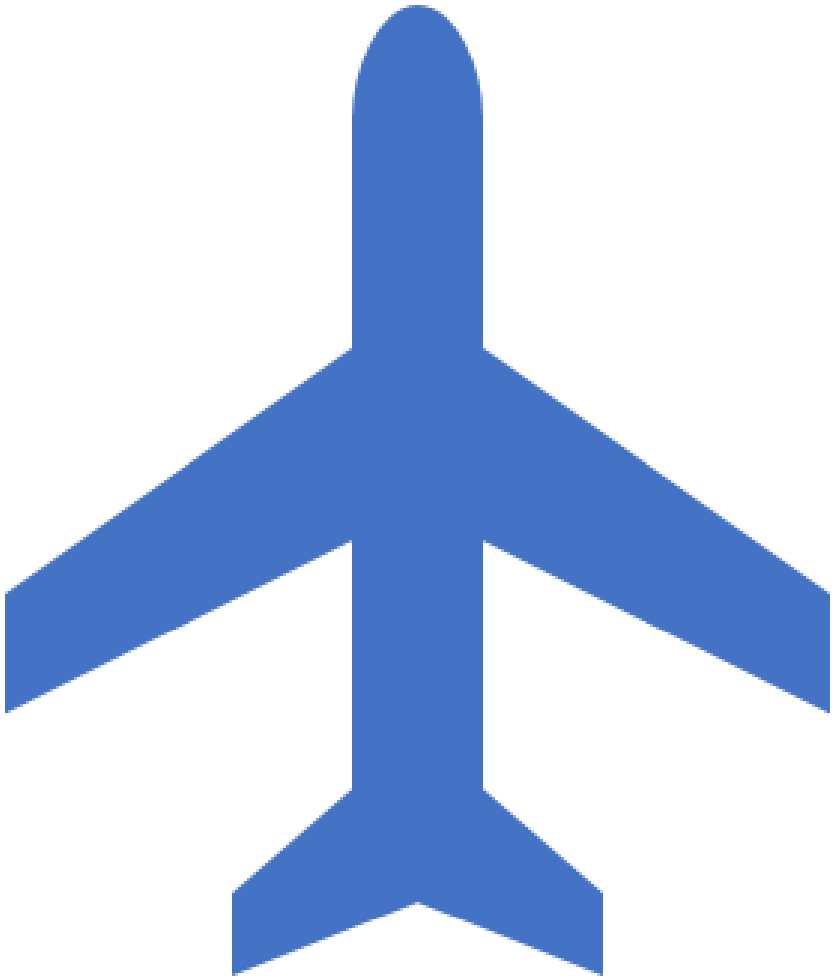
Research, Engineering and Development Advisory Committee

Subcommittee Report - Aircraft Safety (SAS)

Terry McVenes, SAS Chair

October 7, 2020



SAS Meeting August 11-12, 2020

- R&D Landscapes – Jamie Figueroa
- Budget Update – Beth Delarosby
- FY2020 Portfolio & Accomplishments – Mike Paglione/Mark Orr
  - Aircraft Safety Assurance Portfolio
  - Environmental & Weather Impact Mitigation (Aircraft Icing)
  - Human Performance & Aeromedical Factors
  - Aviation Performance & Planning Portfolio
- Covid-19 Impact on R&D Programs – CAMI
- In-Time Aviation Safety Management System (IASMS) – Akbar Sultan (NASA)
- Commercial Space Research Briefing – Ken Davidian
- UAS Research – Bill Oehlschlager
- General Aviation 2030 – Katrina Avers

General Observation

- Many R&D efforts supporting on-going developments in industry
- FAA collaboration with industry will be important
  - Common set of requirements and how used as means of compliance
- Worldwide acceptance
- FAA must build on R&D efforts for solid regulatory framework
  - Critical for innovation
  - Bring new entrants into aviation ecosystem

Finding #1– FAA R&D Efforts During COVID-19

- Tremendous progress being made on FAA's R&D program
- Long Term – continue focus on R&D will be imperative
- Impact to FAA human-subjects research
  - Concerns for potential budgetary & program disruption
- Outcomes of 737MAX re-certification
  - May lead to new priorities on the R&D program

Recommendation # 1

As the FAA continues its R&D work program, the REDAC SAS further encourages the continued focus on those funded programs. The REDAC SAS requests regular updates to any R&D programs that may be negatively impacted by the COVID-19 crisis, including re-planning of milestones and areas.

Recommendation # 2

As progress is made on the recertification of the 737MAX, at the appropriated time the REDAC SAS requests a briefing on what lessons have been learned and the impact they are having on the FAA's R&D portfolio and any changes to its priorities.

Finding #2- Fatigue Risk Management R&D Portfolio

- SAS impressed with dedication of researchers – including addition of rotary-wing operations
- No appearance of any planned research aimed at assessing FRMP/FRMS in long-haul commercial operations
- Budgetary information shows several research requirements are unfunded in FY2022
- FAA methodology of annual re-prioritation of research:
  - Contrary to good science
  - Unethical in human use circles due to exposure to research risk

Recommendation #1

The Subcommittee requests additional information on the FAA's fatigue-related projects to enable a better understanding of funded research objectives and deliverables. The SAS is requesting an update at the Spring 2021 meeting on the progress and continued funding of this research.

Recommendation #2

The Subcommittee requests further clarification of the funding profiles and prioritization of fatigue-related research in the FAA. Additionally, the Subcommittee recommends for the FAA to restore full multi-year funding for the two research projects discussed above, which follow up on the effectiveness and utility of the FRMS/FRMP and allow the FAA to identify shortfalls and potential enhancements to the current flight time/duty time regulations.

Finding #3- Aircrew Stress Biomarker Research

- Objective markers for degraded aircrew performance are urgently needed
- Ground-breaking research into gene expression and genetic-based biological indicators at CAMI is unique and aims to deliver tools that can identify pre-accident aircrew stress states
- These techniques, when validated, can serve as fitness-for-work assessments, giving safety and management personnel tools for real-time risk assessment decision-making.

Recommendation #1

The Subcommittee requests that the FAA consider the potential short- and long-term benefits of objective genetic-based biomarkers for aircrew stress and impaired performance and evaluate possible stable funding strategies to support this important and unique forward-looking research program.

Finding #4- Ice Crystal Icing

- Project currently funded through FY2020
  - Exception: Task 4 – Develop and test a large-scale model rotating rig to investigate engine geometric scaling effects
- Further research will aid rulemaking efforts
- Additional funding is needed for:
  - Consultants on flight campaigns
  - Additional testing for modeling for ice accretion behind the fan

Recommendation #1

The FAA should consider further funding for ice crystal icing research for Fiscal years 2021 and 2022 and beyond as this problem has not been adequately addressed in certification and rulemaking. The FAA should consider additional research in the following fields:

- Aerosol testing to determine how the water droplet adheres to the pollutant.
- New engine entrants and components (e.g. wide chord fans, composites, etc.)

SAS Meeting

Next Meeting:

February 23-24, 2021

Questions?