GO BEYOND

RESEARCH, ENGINEERING AND DEVELOPMENT ADVISORY COMMITTEE

SUBCOMMITTEE REPORT – AIRCRAFT SAFETY (SAS)

OCTOBER 16, 2024
CHRIS DYER, SAS CHAIR

SAS MEETING SEPTEMBER 17-18, 2024 AGENDA

DAY 1

FAA Budget Update	Blackwell/Kelly
Overview of SAS Spring 2024 F&Rs	Paglione/Orr
Industry Briefings	
SMS & QMS Integration Initiatives	Polland/Dyer
Artificial Intelligence/Machine Learning Application	Sultan/Polland
R&D Strategic Thrust Strategy Session Report	DeCleene
Researcher Briefs	
System Safety Management/Terminal Area Safety	McGuire/Shah
Flightdeck Maintenance/System Integration HF	Gibson/Jentsch/Baumgartner
Aeromedical Research/System Failures	Zinke/Happenny
UAS Research	Oehlschlager/Friedman-Berg
Digital System Safety	Summer/Mandalapu
Advanced Materials/Structural Safety	Weinstein/Stonaker/Oztekin

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DAY 2

Hydrogen Roadmap	Fotache
New Process Review	Orr
Domains	FAA/SAS
A/C Safety Assurance	
Environmental & Weather Mitigation	
Digital Systems Integration	
Human and Aeromedical Factors	
Aviation Performance and Planning	
Congressionally Directed FY24 Appropriation	
Automation Roadmap	DeCleene/Stuever
A/C Radio Altimeter Development	Steinle
Lab Tours (NASI – NIEC-POWER – Structures – VFAST)	FAA

SAS GENERAL OBSERVATIONS, FINDINGS & RECOMMENDATIONS

Three (3) General Observations

1. SMS/ QMS Integration and Artificial Intelligence/Machine Learning in Application
2. FAA Fatigue Working Group Aeromedical and Short Haul Fatigue Studies
3. FAA Research Planning and Program Management Process

One (1) Findings and Recommendations

1. Detection of Bleed Air Contaminants

SAS GENERAL OBSERVATIONS

SMS / QMC Integration at PC holders and AI/ML in Application

- The Subcommittee appreciates the opportunity to present these topics. We recognize the benefit of linkage of System Hazards to Process Risk Analysis Mitigation and the ability of AI/ML to enhance safety and certification processes in current and future products.

The Subcommittee appreciates the continuing research by the FAA Fatigue Working Group in various segments of the industry.

- Research in helicopter air ambulance operations presented at summer 2024 meeting was well received.
- FAA Short haul fatigue study in passenger operations is nearing completion. The Subcommittee would like a briefing on the status and findings of this study at the Spring 2025 REDAC SAS meeting.

Updated FAA research planning and program management process

- Good step forward toward a targeted and defensible research program that supports FAA safety priorities and is sensitive to industry / stakeholder concerns
- Due to transition of the process the SAS was unable to review proposed FY+3 focus areas
- SAS requests FY+3 information on the FAA's planned research program be presented at the upcoming Winter committee meeting to meet REDAC Review Guidance in transition

FINDING #1 - DETECTION OF BLEED AIR CONTAMINANTS

- At the Summer 2024 Committee meeting, the FAA provided a presentation of the research that addressed the FAA 2018 Reauthorization Section 326 (c) on cabin air quality, and that the research under this effort was complete.
- The Committee feels that this research is a very good step forward toward a comprehensive solution, but the research needs to continue.

RECOMMENDATION #1 - DETECTION OF BLEED AIR CONTAMINANTS

- SAS recommends that the FAA continue this research to determine if there is a direct correlation between exposure to cabin air, beyond engine bleed air, and reported illnesses in well maintained passenger aircraft.
- Conduct scientific studies to establish if a direct correlation exists between illness complaints and nano-particulates of engine oil, de-icing fluid, hydraulic fluid, or jet fuel chemical components that could be both hazardous and present
  - Intent to define duration, and concentrations of concern, other than events requiring maintenance
  - Establish if such chemical presences originate solely from aircraft systems or are also drawn in from outside (i.e., ramp or taxiing) to provide useful information to original equipment manufacturers (OEMs) in design systems.
- SAS also recommends that future research includes foundational principles for sensor design and operation, as requested by sensor OEMs, to help establish how these nanoparticles will be detected in flight on board an aircraft.
  - This should include both type and quantity of nanoparticles, to facilitate detection and identification of identified compounds to facilitate future iterations of the technology to include a form of proactive mitigation of an ongoing cabin air quality event onboard an aircraft.

NEXT SAS MEETING DATES

March 18-19, 2025

FAA HQ

July 29-30, 2025

FAA William J. Hughes Technical Center

Questions