

SUBCOMMITTEE ON AIRCRAFT SAFETY (SAS)

2018 SPRING MEETING SUMMARY

FAA Research, Engineering & Development Advisory
Committee (REDAC)

April 11, 2018

SPRING 2018 SAS MEETING OBJECTIVES

- Input on guidance to the research portfolio
- Continue to explore previously identified emerging issues and trends impacting needed safety research
 - UAS, General Aviation safety, Additive Manufacturing, Fatigue Management, Electric Propulsion
 - Learning from Industry: Boeing, NASA / National Academy of Sciences, PEGASUS, GAMA
- Evaluate the reduction in FAA RED funding to the extent possible

SAS APPROACH

- Continue to build upon work of prior SAS meetings
- Keep previously identified Emerging and Future concerns in the forefront to assist in identifying research gaps
- Meet the advisory needs of the AVS Management Team
- Incorporate CSTA and outside industry / FAA expert participation whenever possible
- Deep Dives into significant items – as defined by:
 - Significant research dollars committed
 - REDAC priority items
 - Committee concern items (Emerging issues)
- Continuous improvement of the research review process

AGENDA DEVELOPMENT GUIDE

- Deep Dive into 2019 funding situation (REDAC request)
- Update on UAS research (SAS and REDAC request)
 - Integration and research plan status
- General Aviation Safety (Emerging Issue and REDAC request)
 - General Aviation safety and Emerging Challenges
 - PEGASUS CoE
- Additive Manufacturing status (Emerging Issue)
- In-Time Aviation Safety Management (Emerging Issue / National Academy of Sciences)
- Support AVS requirements (SAS and AVS Request)
 - Conversation with the AVS leadership team
- Continued education on industry observations / directional checks
 - Industry technology briefings (Validation of Analytical Models to Demonstrate Compliance)

FINDINGS AND RECOMMENDATIONS

Impact of proposed 2019 budget cuts on safety related research

Findings

Reasonable evaluation of the FAA's planned research program for 2019

More information necessary for the SAS to adequately assess the proposed funding approach

Appears there has been a greater emphasis placed on continuing existing research versus investing in the future

Recommendations

Reassess planned research and consider cancelling ongoing work in favor of funding research in emerging areas

Provide the SAS with additional information necessary to provide a more informed assessment

FINDINGS AND RECOMMENDATIONS

Impact of proposed 2019 budget cuts on safety related research

General comments

Much of the deferred research is in-house labor and projects. The cuts will result in the loss of experienced unique individuals who will be, in some cases, impossible to replace.

CAMI and Technical Center experts are often international leaders in their field, and their loss will leave a void potentially affecting international policy and the national interest.

Much of the deferred research capability is unique to the FAA, meaning that there is no alternative source for the expertise in the private sector or government.

\$10M is planned to be spent on Cyber within the Office of the Secretary. As this had been identified as an emerging issue by the SAS it would be worthwhile for the sub-committee to understand any of this funding that is intended for research to address safety related threats.

UAS UPDATE

Summary

- Briefed on status of Integrated Research Plan although have not seen plan in detail yet. It was expected that it may be released prior to full REDAC
- Continued lack of clarity on the overall UAS plan makes it difficult to assess if the planned RE&D spend is sufficient in the context of the overall plan.
- Briefed on status of 2017-2018 research activities
- Similar to Fall 2017 the committee understands that the plan is beginning to identify gaps in required research and funding
- Committee sense is progress is being made and we look forward to a more detail review of the plan in the future

ADDITIVE MANUFACTURING UPDATE

Summary

- Briefed on additive manufacturing challenges, FAA's research role and longer term research plan
- Acknowledged that the Additive Manufacturing research plan is nearly completed and will be shared with SAS in the future
- Good clarity was shown in terms of understanding the research requirements and integration of tasks including required policy changes or updates
- Details of several ongoing research tasks were reviewed
- Committee sense is progress is being made and we look forward to a more detail review of the plan in the future

ELECTRIC / HYBRID ELECTRIC UPDATE

Summary

- Briefed on a “Path to Electric and Hybrid / Electric Engine Regulation”
- SAS expects much more conversation around electric aircraft systems.
- FAA involvement in several industry committees is noteworthy
- Level of aircraft / system integration increasing with aircraft powered by electric or hybrid-electric propulsion systems including propulsion systems providing primary flight controls in e-VTOL configurations.
- System complexity increasing (ref 2014 SAS emerging issues) requiring alternate V&V and certification compliance methods.
- FAA may wish to consider proactively developing a national plan or roadmap describing the research required in the area of electric aircraft systems safety

GENERAL COMMENTS

AVS Leadership Discussion

Committee interaction with AVS leadership helpful to inform focus areas for SAS – especially on emerging and future issues

Noted that the innovation centers in the new organization are an enabler especially in the context of future product development

SAS continues to consider the role of General Aviation in aviation safety and the impact of the convergence of distributed electric propulsion and autonomy technologies.

Received briefing on GA 2030 vision by FAA/Pegasus COE

Identified future action to ensure GA items scheduled into research plan

Technology status briefings

Common themes continue (PWA, GAMA, MITRE, Boeing, Honeywell)

Will continue to use these industry briefings to ensure our emerging and future issues are still relevant

SUPPLEMENTAL DATA

BUDGET COMMENTS BY BLI AREA

FINDINGS AND RECOMMENDATIONS

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A.11.e – Continued Airworthiness

Comments

Proposed deferred activities include “Determine the safety of new electric aircraft”.

Industry pace is accelerating in this area

REDAC, in recognition of this industry trends, has specifically tasked the SAS to stay abreast of electric aircraft technology including dispatch requirements, energy state management and battery protection schemes.

The SAS is concerned that the FAA may not keep pace with these developments and fall behind in their ability to support certification and regulatory efforts with these new aircraft.

FINDINGS AND RECOMMENDATIONS

Impact of proposed 2019 budget cuts on safety related research

A11.h – System Safety Management / Terminal Area Safety

Comments

Deferred items in this area related to Safety Oversight Management System and Integrated Domain Safety Risk Evaluation Tool are closely related, and in support of, the SAS emerging issue of Real Time System –Wide Safety Assurance

NASA also performing extensive work in this area as a strategic thrust

There may be further collaboration opportunities between the FAA and NASA which will allow this important subject to proceed.

FINDINGS AND RECOMMENDATIONS

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A.11.I – Unmanned Aircraft Systems Research

Comments

2019 budget identifies that \$73M will be spent on UAS across Operations (\$51M), Facilities (\$18M), R&D (\$3.3M) and Grant in Aid for airports (\$1M) with incremental funds from Coe / ASSURE cost share

Continued lack of clarity on the overall UAS plan makes it difficult to assess if the RE&D spend is meaningful in the context of the overall plan.

It now seems likely that the research activity will be overcome by the pace of “industry” development in the UAS space.

Research plan should be assessed in the broader context to assure that the research is timely and that the funds will add value to the overall effort.

FINDINGS AND RECOMMENDATIONS

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A.11.J – Aeromedical Research

Comments

SAS is concerned that the FAA will not be able to fund safety-related operator state monitoring research in the short- and long-term, leaving certification and regulatory issues lagging development in the commercial and government sectors.

The projected reductions in spend and staffing at CAMI appear to be disproportionate and significant. This is worthy of additional discussion within the FAA. Cuts of the magnitude proposed could result in the complete loss of capabilities that do not exist elsewhere.

FINDINGS AND RECOMMENDATIONS

Impact of proposed 2019 budget cuts on safety related research

A.11.J – Aeromedical Research

Comments

SAS notes that several topics related to this ‘emerging issue’ are “cancelled” in FY19 because of funding cuts; for example, a) Impact of BASICMED regulation on safety; 2) Gene expression research; and 3) Novel pharmacology research.

To ensure defensible practices, FAA medical certification policies must keep pace with developments in science.

The SAS is concerned that without funded aeromedical research in these areas, medical standards will fall far behind current medical practice, exposing the Agency to legal challenge and inflicting outdated medical standards on pilots.

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A11.n – Commercial Space Transportation

Comments

Commercial space safety was defined in 2014 as an emerging issue.

There are deferred safety topics related to developing safety models to reduce overly conservative airspace restrictions for commercial aviation and developing and demonstrating innovative analysis to automatically declare aircraft hazard areas for launch/re-entry.

This subject is impacting commercial aviation airspace today and with the planned growth to include many more space launch locations the impact is likely to grow.

Also deferred is research into radiation hazards, which will leave unanswered questions about exposure limits for commercial space travelers.

SAS believes this issue must be addressed in FAA planning

FALL 2014 - SAS EMERGING ISSUES

Reminder

Real time system-wide safety assurance

Dependability of increasingly complex systems

Certification of advanced materials and structural technologies

High density energy storage, management, and use

FALL 2014 - SAS FUTURE OPPORTUNITIES

Reminder

- Commercial space integration with the National space system
- General aviation's role in safety systems development
- Effects of breakthrough medical technologies on FAA medical certification standards
- Identification and funding of strategic research and development