E&E Subcommittee Recommendations & FAA Responses

To: REDAC E&E Subcommittee

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Outline

- Meeting Dates
- Carry-over Recommendation from August 2015
- Recommendations from April 2016
- Action Item Status

Meeting Dates

- Feb 28-Mar 1, 2017 – Washington DC metro area

- Please fill out poll for July-August 2017 meeting dates

Response to 2015-08 REDAC Recommendation - 5

RECOMMENDATION	*RESPONSE*
As the aviation environmental tool suite effort matures from development to implementation and use in decision making, including standard setting and other policy making efforts, there may be opportunities to strengthen the R&D efforts on operational improvements within the Environment and Energy portfolio. These have been negatively impacted due to the F&E funding reductions in the past three years. The need to better understand the impact of aviation emissions on climate should also be considered in this Environment and Energy R&D portfolio planning. The subcommittee encourages the FAA to leverage efforts with ACRP studies like enhanced data gathering on noise and emissions impacts. The regular evaluation of the Environment and Energy R&D portfolio should be continued with consideration of "what does it take to be where we need to be in 2025 and beyond". To achieve these goals, additional collaborative technology development would be required.	The FAA appreciates the REDAC's positive evaluation of the balance of the Environment and Energy R&D Portfolio. Previous recommendations from the REDAC have been instrumental in adjusting the Environment and Energy R&D Portfolio to accommodate F&E funding reductions. The FAA agrees that as ongoing efforts are completed, opportunities need to be evaluated for both near term R&D needs and those that are a few years down the road. As an example, as work on particulate matter emissions shifts from measurements to analysis, additional funds could be available for other areas such as the examination of operational improvements and/or the consideration of the climate impacts of aviation emissions. The FAA will continue to examine previously completed ACRP studies to see if there are results that could be used within the Environment and Energy R&D portfolio, monitor ongoing ACRP studies to guide their direction, and to work with ACRP to develop new projects that could enhance data gathering on noise and emissions impacts. Finally, as a part of its next Summer Meeting, the FAA will request the REDAC Environment and Energy Subcommittee to consider what it would take to be where we need to be in 2025 and beyond.

Response to 2016-04 REDAC Recommendation - 1

RECOMMENDATION	RESPONSE
The ICAO CAEP/11 work program includes the development of an nvPM standard. The Subcommittee recognizes that this requires the development of a database based on engine test measurements. While some progress has been made significant work remains. The Subcommittee recommends that the FAA commit the necessary resources to generate this database and associated analyses tools. This is needed to develop the standard on time and maintain FAA's global leadership in ICAO discussions.	***The FAA concurs with the Committee's recommendation and is undertaking the following actions to address its recommendation(s).*** The FAA is focused on developing a global market based measure for international aviation CO2 emissions and an engine standard for particulate matter emissions. The FAA has done considerable work to support the global market based measure and has made considerable investments to develop an engine particulate matter test database. We will continue to prioritize the measurements that are needed to gather particulate matter emissions data. We are also updating our Aviation Environment Design Tool (AEDT2b) based on these measurement data such that the tool is ready to support the CAEP particulate matter standard analysis. The FAA agrees with the Subcommittee that resources need to be allocated to ICAO CAEP activities to ensure continued U.S. leadership. Robust funding is critical to ensure U.S. influence on the ICAO CAEP process and to develop our modeling capabilities and the generation of data to support ICAO CAEP decision-making.

Response to 2016-04 REDAC Recommendation - 2

RECOMMENDATION	RESPONSE
The Subcommittee recommends that the FAA continue to explore additional opportunities and, where feasible, develop a joint work plan to achieve even greater benefits from the collaboration.	***The FAA concurs with the Committee's recommendation and is undertaking the following actions to address its recommendation(s).*** The FAA has numerous collaborative efforts in alternative jet fuels, noise research, and particulate matter emissions measurements. As an example, the FAA has started collaboration with NASA to conduct particulate matter emission measurements that will help NASA advance the scientific knowledge of particulate matter emissions while helping the FAA develop a more robust database to assist the work in ICAO CAEP. The FAA will continue to keep the REDAC apprised of our progress on this front. The FAA agrees that continued collaboration is needed to leverage activities that are being performed within the FAA, in other agencies of the federal government, as well as by foreign governments. Collaboration is especially important given reduced federal funding for R&D.

Response to 2016-04 REDAC Recommendation - 3

RECOMMENDATION	RESPONSE
The Subcommittee is highly pleased with the progress here and recommends that the FAA continue their commitment to this program which produces high value especially with the greater than 1:1 cost share by industry.	***The FAA concurs with the Committee's recommendation.*** During the process of setting up CLEEN II, the FAA carefully considered the make-up of the CLEEN II portfolio with a goal to achieve such a balance. The FAA appreciates the Subcommittee's view that the CLEEN II portfolio is well balanced among noise and emissions reduction technologies and alternative jet fuel development. The FAA also appreciates the Subcommittee's support of the CLEEN Program as it remains one of our top priorities.

Response to 2016-04 REDAC Recommendation - 4

RECOMMENDATION	RESPONSE
The Subcommittee recommends that the FAA start plans to assess and understand the noise impact of UAS. This would include the development of environmental impact assessment tools starting with evaluating the applicability of AEDT2b. We are also encouraging the FAA to explore opportunities to make noise measurement that will provide both an indication of the future challenge and a better understanding to make assessment models more relevant and practical.	***The FAA concurs with the Committee's recommendation and is undertaking the following actions to address its recommendation(s).*** The Office of Environment and Energy (AEE) and the Office of Unmanned Aircraft Systems (AUS) are working closely within the ASSURE Center of Excellence to acquire noise measurement data for UAS. We are also leveraging opportunities with NASA and DOD to access UAS noise data. In addition to the ASSURE measurement campaign, AEE is developing a plan to address the potential environmental impacts of UAS to ensure that FAA is able to assess environmental impacts considered under the National Environmental Policy Act (NEPA), develop noise certification procedures including potential risk-based noise standards for UAS, and develop environmental analysis capabilities that are unique to UAS. These efforts could require additional noise measurements and analysis to cover a growing range of vehicle types and could potentially include the creation of noise models. The potential noise concerns regarding UAS are not well understood at this time. The FAA agrees that there is a need to be proactive regarding UAS noise given the increased sensitivity to noise produced by civil aircraft. The FAA anticipates that the noise levels of individual UAS, along with their mission, will play a part in determining the community reaction to this new aircraft type.

Actions Completed/Underway – from Previous Meetings

- Present historical data on noise exposure – go back at least 10-15 years.
- Create ASCENT fact sheet for sharing with community.
- Leverage the road mapping efforts at NASA and FAA to update the White House National R&D Plan.
- Report out on research being done by the FAA to develop technology that enables integration of relayed information (e.g., weather, 4D trajectories, etc.) with cockpit information. This will enable higher levels of onboard automation and the ability to further reduce the environmental impacts from aviation.
- Carefully consider NARP milestones on noise metrics
- Add a NARP milestone on supersonic aircraft
- Ensure verbiage for PM standard is engine exhaust PM standard
- Revise E&E brochure to capture significant population exposure in 1970s and today
- Leverage “right-to-left” thinking in developing roadmaps wherein we start by thinking about the endpoint (goal) that is desired and decide how to get there.
- Provide additional details on data hand-offs among tools within the CAEP standard setting process.

Actions Completed/Underway – from Previous Meetings

- Monetize the air quality and climate benefits of having an alternative jet fuel with reduced sulfur and naphthalene content.
- Share the ASCENT NFO with the REDAC E&E Subcommittee (on an annual bas
- Examine ways to improve usability of AEDT. This could include the introduction of “flags” within AEDT that turn on/off functionality.
- Organize a review of tool development / analysis efforts at the summer meeting
- Share noise roadmap at next meeting including aspects regarding UAS noise