Highlights from NASA’s Environmentally Responsible Aviation (ERA) Project

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National Aeronautics and Space Administration

Date: Wednesday, April 13, 2016
Time: 9:00 – 10:00 AM
Location: 358 Willard Bldg.

Coffee and donuts will be provided

Abstract:

Created in 2009 as part of NASA's Aeronautics Research Mission Directorate's Integrated Systems Research Program, the Environmentally Responsible Aviation (ERA) Project establishes the feasibility, benefits and technical risk of advanced commercial transport vehicle concepts and enabling technologies to reduce aviation’s impact on the environment. Current-generation aircraft already benefit from earlier NASA investments in aeronautical research, leading to improved fuel efficiencies, lowered noise levels and reduced harmful emissions. Although substantial progress has been made, much more can be achieved to improve future performance of the subsonic commercial transport sector. Forecasts call for the nation's air transportation system to expand significantly within the next two decades. Such an expansion could bring adverse environmental impacts. To neutralize or reduce these impacts is the goal of the ERA Project and its focused research. To enable improved environmental performance of advanced commercial transport configurations that might enter service by 2025, the ERA Project researched technologies while addressing operational hurdles that will simultaneously:

- Reduce aircraft drag by 8%
- Reduce aircraft weight by 10%
- Reduce engine specific fuel consumption by 15%
- Reduce oxides of nitrogen emissions of the engine by 75%
- Reduce aircraft noise by 1/8 compared with current standards

Most of the research is broadly applicable to many seat classes in the commercial fleet, and if adopted by the aircraft and engine companies, the technology suite will provide broad based
benefits by reducing community noise around airports and reducing the carbon footprint of aviation. Local air quality will also be improved due to reduced Landing/Take-off NOx emissions, even in the face of increasing numbers of operations at most airports. The speaker will highlight the success of the eight technology demonstrators just completed in the second phase of ERA and will describe the projected benefit at the fleet level if the technologies are incorporated into future commercial transport aircraft by 2025 and beyond.

Bio:

Dr. Collier is currently the Project Manager of the Environmentally Responsible Aviation Project within NASA’s Integrated System Research Program. In this capacity, he directs the planning and execution of NASA’s integrated system research project focused on the subsonic transport sector, working in partnership with Industry, FAA, AFRL and other government agencies. The technology development project is focused on research, development and integration of engine and airframe technologies that will enable dramatic improvements in noise, emissions, and performance characteristics of future subsonic aircraft operating in the air transportation system. Dr. Collier is a graduate of Virginia Tech (Aerospace Engineering, B.S., 1981, M.S., 1982, Ph.D., 1988) and the Massachusetts Institute of Technology (M.B.A., 1997) where he participated as a NASA Sloan Fellow. He serves on numerous committees for the Agency, including the AIAA Honors and Awards Committee, the AIAA International Program Committee, and the AFRL Fixed Wing Executive Council, and he was a contributor to the development of the National R & D Plan for Aeronautics. Dr. Collier is an Associate Fellow of the AIAA.