UPDATE OF FINDINGS ON SERDP MILITARY AIRCRAFT EMISSIONS RESEARCH PROGRAMS

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The demands on air travel and aviation support for commerce and military activities have been increasing over the past couple of decades and are not expected to slow down in the future. Contribution of military aircraft emissions to overall atmospheric burden of particulate matter and gaseous pollutants remains one of the major uncertainties in air quality research and air resources management. Emissions data on military aircraft are scarce due, in part, to technical complexity of aircraft emissions sampling and measurement. Under the auspices of SERDP, our team has been conducting research to probe particulate and gas emissions since 2005 using an array of in-situ and remote-sensing technologies for fixed- and rotating-wing aircraft currently used by U.S. military. These include T56, T33, T700-GE-700, T700-GE-701, and T700-GE-701C engines. Field measurements of the emissions were conducted; from the data sets emissions indices of various pollutants were derived. Formation of ultrafine and nanoparticles in exhaust plumes was observed under ambient conditions. Accurate measurements of particulate composition and size distribution were determined to a large extent by sampling conditions; sensitivity in measurement results appears to be particularly dependent on those that exist at low engine power conditions when emissions of air toxics were also at its maximum. Research needs for better emissions measurement and sampling were identified. We will update the community on our findings for the research program.