AN OVERVIEW OF GEA TAPS COMBUSTION TECHNOLOGY AND ALTERNATE FUELS

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GE Aviation (GEA) has been actively involved in the development of low-emissions propulsion engine combustion systems since the early 1970s under company as well as government sponsorship in many initiatives including NASA Experimental Clean Combustor, E3, AST, UEET, Propulsion 21, and the U.S. Air Force and Navy supported TVC, an innovative high-performance low-emissions combustion concept which is covered in a SERDP presentation by Dr. Joseph Zelina. This presentation presents summary of the technology development and validation of TAPS, a Twin-Annular Premixing Swirl combustion system as applied to two engine classes, namely the CFM56 and GE90. The emissions characteristics of TAPS are compared with the most current technology (Low-Emission Combustor) LEC and pre-LEC combustors in certified commercial propulsion engines. The GEnx engine uses a TAPS technology based combustion system. Further TAPS technology enhancements continue for the LEAP56 propulsion system.

Interest in use of alternate fuels stems mainly from concerns about fuel availability, cost and potential impact of aviation on global warming. This presentation will cover GEA’s involvement in recent “drop-in” replacement fuels from various sources including Fischer-Tropsch liquid from coal, bio-fuels and an innovative highly efficient bio-oil conversion to Jet fuel, a DARPS sponsored project.