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Features
August/September 2004

Demonstrator engine testing completed

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WRIGHT-PATTERSON AIR FORCE BASE, Ohio — The Integrated High Performance Turbine Engine Technology (IHPTET) program is building on a year marked with success.

Established in 1987 as a collaborative effort between the Defense Department, National Aeronautics and Space Administration, and industry, IHPTET's main goal was to double the propulsion system capability of turbine engines by 2005. Currently in its third phase of operation, IHPTET has achieved a 48 percent propulsion system capability increase and is continuing to raise this number.

"This was the most successful year of demonstrator testing in the 17-year history of the IHPTET program because we advanced the status of four IHPTET goals (the most ever in a single year) and (transferred) technology to major weapon systems," said Rich McNally, chief of the propulsion branch.

Introducing the line of success, the Pratt & Whitney advanced turbine engine gas generator XTC67/1 completed testing in April 2003. Testing of the General Electric/Allison Advanced Development Company (GE/AADC) XTC76/3B commenced in August 2003 and ended in October of that same year. "The XTC67/1 and the XTC76/3B are the highest temperature demonstrator core engines ever run," explained Mr. McNally. "Also, the core engines demonstrated a 48 percent increase in engine thrust-to-weight ratio, a 23 percent reduction in production cost, and a 19 percent reduction in maintenance cost."

On June 5, 2003, a baseline high cycle fatigue test was done on the AADC XTL17/SE1 engine. The test was a joint validation of new instrumentation and forced response modeling/simulation tools developed by both the United States and the United Kingdom.

Testing of AADC's XTL17/ASE1 core engine, equipped with a low spool generator, was successfully completed in October 2003. The XTL17/ASE1 is based on the Allison commercial AE3007 engine, the Global Hawk's propulsion system. The Global Hawk System Program Office has initiated activity to transition the low spool generator since the test demonstrated tripled electrical power capability.

The Honeywell XTC57/1 multipurpose core test was successfully completed in October 2003. The core engine was built for a future commercial turbofan engine and encompasses a high performance IHPTET compression system. According to McNally, this technology specifically supports Unmanned Air Vehicle propulsion and is an excellent example of how commercially developed core engines could be used to reduce the developmental cost of future military engines.

The Pratt & Whitney XTE67/SE1, based on the F119 engine for the F/A-22 Raptor, also completed testing within the last year. The highly successful XTE67/SE1 test achieved all of its goals. High cycle fatigue (HCF) technology from this test will transition to the F/A-22 F119 engine as well as the F-35 F135 Joint Strike Fighter engine.

The GE XTE77/SE1 recently completed testing designed to validate HCF technologies, demonstrate component performance and mechanical integrity, and validate the secondary flow system. Technology from this test will transition to the F-35 F136 Joint Strike Fighter engine.

The success of these tests is the direct result of a dedicated government and industry team whose efforts have proven to be efficient in advancing the turbine engine state-of-the-art. The IHPTET program will conclude in 2005, at which time the performance and durability of turbine engines will be greatly improved and cost will be reduced, providing capable, safe and efficient weapon systems to the warfighter. **@**