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Success Story

IMPROVED COMPRESSOR RESEARCH FACILITY READY TO MEET IHPTET AND VAATE GOALS



The Propulsion Directorate successfully integrated a new state-of-the-art High-Performance Data Acquisition System (HPDAS) in the directorate's Compressor Research Facility (CRF). The HPDAS provides a 75% increase in channel count measurement capability over the original 25-year-old system.



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Accomplishment

HPDAS meets the demands of the Integrated High Performance Turbine Engine Technology (IHPTET) program and expected requirements of the Versatile Affordable Advanced Turbine Engines (VAATE) technology program.

Background

The new data acquisition system allows direct connection of the sensors to the signal conditioners, eliminating the need for patch panels. This reduces set-up time and improves accuracy and reliability in comparison to the old system.

The footprint of the new system is only 10% that of the old system, making more than 300 sq ft available for special test equipment anticipated for future CRF testing. The old system was nearing the end of its life cycle and required an inordinate amount of maintenance. The new system reduces the maintenance burden by \$250K/year, which results in a payback of the new system's cost in only 3 years.

Previously, the directorate calibrated each channel using a dedicated standard, each of which was calibrated against a National Institute of Standards and Technology (NIST)-traceable standard. Calibrating all channels directly with one NIST-traceable standard eliminated the intermediate calibration step and the associated loss in accuracy as a result of that step.

The new system exhibits a consistent 100% availability, while the failure rate of the older system was 2-3%. The directorate will use the new system to effectively and accurately evaluate the advanced technology developed under the IHPTET and VAATE National Turbine Engine Technology programs.

The IHPTET program is a national collaborative effort among the Air Force, Navy, Army, the Defense Advanced Research Projects Agency, and industry to double aircraft propulsion capability by 2005. The VAATE program is focused on achieving a 10-times improvement in turbine engine affordability.

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-PR-09)