L&T Technology Services

WIND TUNNEL DATA ACQUISITION

THE CHALLENGES

A world leader in fans, blowers, and ventilation equipment was seeking to update and automate a test system which validates and certifies air flow of industrial fans and blowers. Their current system relied on legacy computer hardware, boxed instrumentation equipment, and manually logged primary instruments such as mercury barometers & manometers. This would cause differences in logged measurement data depending on who was operating the test, along with the potential for miswritten data. Certification is critical to the company so a new test and measurement system was required.

THE SOLUTION

L&T Technology Services' approach to the solution leveraged our experience engineering reliable testing solutions using quality measurement tools from National Instruments, with whom we are an Alliance Partner. The solution created an easy-to-use, flexible, and easy to maintain/upgrade system capable of capturing accurate data regarding the performance of the devices under test. Further, L&T provided unique value by ensuring that solutions allowed for simple management of the data generated by the testing process. This allowed for the generation of clear, actionable reports that gave the engineers and technicians the precise information that they needed.

LTTS engineers installed high precision pressure transducers and RTDs throughout the facility for ambient conditions monitoring. The wind tunnel measurement section was also outfitted with high precision pressure transducers and RTD's with the signals transmitted back to the measurement controller using high quality shielded twisted pair cabling.

The custom measurement control application that was created to capture the data, graphically monitor current test results against benchmarks, perform calculations to adjust for ambient conditions and altitude above sea level and also create reports automatically. The measurement controller was Ethernet based allowing the data to be shared within the client's testing team.

BENEFITS DELIVERED

L&T Technology Services worked closely with the client's engineers to develop a measurement system that streamlined the testing process, eliminated instrument interpretation error by operators, and automated report generation. The customer has significantly reduced the number of man hours required to complete tests while increasing accuracy.

TEST AND AUTOMATION SERVICES

Mechanical & Electro-Mechanical System

- Mechanical System Engineering & Design
- Mathematical Model Development
- Test Stand Development
- Actuator Requirements / Specifications

Engineering Application Development

- LabVIEW, MATLAB, Simulink, Stateflow
- Excel (VBA), Java, C++, Python
- HTML, PHP, .NET

Data Acquisition

- Data Acquisition / Data Analysis
  - eDAQ, National Instruments, Arduino, LabJack
  - Vector CANcase
- Instrument Test
- Test Stand Development

Control System Development

- Automation
- Signal Processing

Power Systems

- Engine Performance Analysis & Simulation
- Emissions Simulation
- Test Cell Design

Multiple Applications

- Heavy Equipment
- Agriculture
- Electronics
- Automotive
- Consumer Products
- Industrial Processes

Simulation / Analysis Process Streamlining

- MATLAB scripting to automatically process large batches of data
- Integrate modular MATLAB and Python GUI applications for complete Windows based automation and optimization of complex simulations in a single unified user environment.

Web Based Interfaces to Databases

- Project Tracking
- Part Information
- Inventory and Asset tracking

Mechanical Design CAD Scripting Bench Software Validation

Compact measurement and control solutions that allow software engineers the ability to quickly validate the affects of code changes on the target ECM's right at their desktop or workstation.

- Connectivity to multiple communication buses
- Stand Alone processor options
- Analog, PWM, and Digital signals
- Powered by NI VeriStand / Test Stand for fast configuration
- FPGA capability for high speed complex solutions
- Automated Test Sequences for repeatability

Software Issue Prevention & Root Cause Analysis

- Model based control for true Model-, Software-, and Hardware-in-the-Loop Solutions
- Turnkey systems with capability of integration of external components
- Software regression testing/results linked to bug tracking & reliability software
- Fault insertion and load-based testing of circuits

L&T Technology Services

ENGINEERING **THE CHANGE**