

Appendix B: Customer Feedback Case B

Background:

These test sensors are unique designs that are fragile, expensive and very difficult to replace.

As such, monitoring the stress state of the sensors is vital to ensure the sensors remains intact over the course of the test.

In this respect the live data viewer provided a critical function during the test: live monitoring of dynamic sensors loading to enable quantification of state. This capability allowed the high speed unsteady sensor data to be processed, analyzed and displayed in near real time, enabling immediate feedback between the sensor stress state and tunnel conditions. If the sensor stresses were too high, the tunnel conditions could be brought down in short order to prevent excess damage. By comparison, if processed in a "traditional" approach, it would take at least 60 seconds for this feedback to reach the tunnel operators. In that amount of time, thousands of damaging cycles are applied, leading to unacceptable risk to the sensors (and tunnel). While the test could have been run at reduced pressure, this would mean missing many planned conditions. The test could not have been run at its desired conditions without this capability.

Second, and more impressively, was provided a "data store" capability that allowed retroactive collection of high-speed data. When combined with the live viewer, the data store is especially powerful, allowing the capture of unexpected transient events, such as extremely rare unsteady measurement events (ie brief periods of worst-case simultaneous values). In an earlier data collection paradigm, these significant events would be lost forever or require good fortune in the timing of data capture. However, with these tools, capturing these events was routine and subsequent analysis provided insights/conclusions into the sensor performance and aerodynamic conditions that were not possible before. This capability is extremely valuable. I cannot conceive of running another Paraphrased [Expensive Sensor] test without it.