

Power Plant Avoids Costly Unit Trip Charges With Control Valve Diagnostics

RESULTS:

- Identify gas turbine “trip” cause to reduce OEM’s turbine hardware warranty back-charges.
- Realized savings of \$140,000 cost per event from turbine OEM.
- Reduced system downtime and improved maintenance reliability.

APPLICATION

Steam injection control valves within a combined cycle generation facility using four gas turbines in a 1-on-1 configuration with associated HRSG and steam turbines.

CUSTOMER

1200 megawatt combined cycle power plant owned by a Midwest independent power producer.

CHALLENGE

By contract, the turbine OEM warranties turbine components in guidance to allowable unit starts and run hours. Turbine “trips” result in costly penalties toward the contracted allowable “wear-and-tear” of warranted turbine components.

The function of the CTG steam injection system is to boost the combustion turbine output during base load operation. Steam injection into the combustion turbine also lowers the overall plant heat rate, and works by injecting superheated steam into each of the combustors, upstream of the combustion zone.

The process increases overall mass flow through the turbine, resulting in increased power generation and provides a cooling effect on the combustion process, thereby reducing the fire temperature. By decreasing fire temperature, NOx emissions are reduced and more fuel can be introduced into the combustion zone.

Continued on back side.



Fisher® Vee-ball™ Valves with FIELDVUE digital valve controllers enable diagnostics of critical valves to avoid false alarms and costly downtime.

The Fisher® Vee-Ball™ is a segmented ball valve which features a patented contoured segmented V-notch ball for throttling or on-off operation for many different applications in the process industries; shown here with the Fisher FIELDVUE DVC6200 digital valve controller.



UTILITY POWER GENERATION

Continued from front side.

Fisher® VeeBall™ control valves are very important to this process as these valves, if not reacting quickly enough, will “trip” the unit.

An upgrade of turbine control software was installed on Units 1 & 3 during a recent outage. Shortly after these upgrades, the customer experienced issues with the steam injection process. The unit would trip once steam injection was initiated.

The OEM attributed the trips to the Fisher Vee-Ball control valves, insisting that the valves were in poor shape and told the customer that the control valves on Units 1 & 3 needed immediate replacement. Novaspect was contacted and asked to verify whether the valves were in fact the problem.

With two days notice, the experts from Fisher’s Lifecycle Services came in to perform a complete Advanced Diagnostic scan on both valves in question. Fisher also scanned a known good valve for additional comparison to the control valves in question.

The results proved the Fisher control valves were in excellent working condition and the requested replacement was unnecessary.

Benefits & Measurable Results

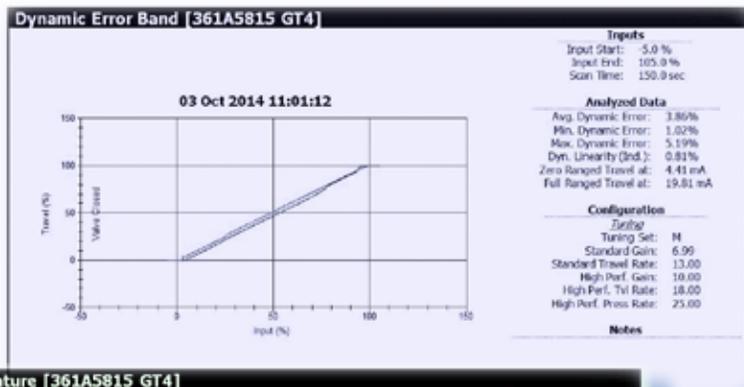
The evidence pointed to significant financial benefits: The power plant had ten system trips isolated to Units 1 & 3, equating to a cost to the customer of \$140,000 per trip. The test proved that the fault was with the turbine software upgrade, thus the customer was not responsible for the trips. In addition to the wasted downtime and lost production of the ten trips, the customer also lost over 50,000 pounds of natural gas during the events.

Reliability Adds Up

“Your [Novaspect] team always comes through. By having this leverage and proving the control valves were in properly working order, we avoid the “trip” penalties which will save us up to a million on the warranty.” — **Plant Operations Manager**



At the Fisher testing facility, a technician uses advanced diagnostic equipment to certify the condition of Vee-Ball control valves fitted with FIELDVUE digital valve controllers.



Sample test result screens from the Advanced Diagnostics scans on the Fisher Vee-Ball control valves.

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