Hydrogen Unit Uses FIELDVUE™ Diagnostics to Increase Uptime and Optimize Critical Loops

RESULTS

- Avoided pulling a critical NPS 36 tail-gas valve and reduced unit downtime to hours, not days
- Restarted a hydrogen unit two days ahead of schedule
- Improved the reliability of 30 critical control valves and reduced the unit's emission losses by 1%
- Extended time between maintenance outages to two years, instead of one

APPLICATION

Critical control valves in a high-purity hydrogen unit

CUSTOMER

Hydrogen unit in Texas, USA

CHALLENGE

A hydrogen unit, operating since 2003, was experiencing unplanned shutdowns of some critical loops. The plant and its large Steam Methane Reformer (SMR) provide high-purity hydrogen and steam to refineries along the Gulf Coast. They need to maintain this supply.

Spurious trips or shutdowns are always a problem, with management wanting a quick fix. The worst issue for the maintenance team, however, was the lack of information available to identify the root cause. Without data-driven results, they could not easily identify which devices were failing or what performance problems were occurring. Thus, they were reacting to failures rather than planning ahead to meet maintenance needs.

The facility appointed an Instrument & Controls engineer to improve the unit's reliability. He had two specific goals: improve uptime and facilitate repairs without a loss of supply to refinery customers. Many critical Fisher™ and non-Fisher valves already had FIELDVUE™ digital valve controllers linked to a DeltaV™ control system with ValveLink™ software and FOUNDATION™ fieldbus communications. The maintenance team, however, was not fully utilizing these tools. Emerson personnel visited the site to demonstrate diagnostic capabilities and to recommend ways to enhance predictive maintenance in the hydrogen unit.

"Using diagnostic tools such as FIELDVUE DVC6200f-PD instruments, we are able to see the mechanical aspects of control valve performance and plan maintenance. Access to better data makes our job easier and improves valve and unit reliability. We plan to expand our use of Emerson diagnostics technology at our other hydrogen units in North America."

Instrument & Controls Reliability Engineer
Hydrogen Unit in Texas, USA

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SOLUTION

During a site visit, Emerson sales and service experts helped hydrogen unit personnel understand their control issues. The team began by generating signature curves on valves in critical loops and monitoring their performance during process operations. By comparing actual performance to the application specifications, they discovered that modeled process conditions did not match the field conditions. Valves were being blamed for poor control, but they were not often at fault.

Pulling one of the critical valves—an NPS 36 butterfly in tail gas service—for repairs would have required shutting down the unit. The crew would need a crane, 6 to 8 hours of set up time, and 3 or 4 people to move and repair it. The cost would include an expediting fee.

Instead, the valve's FIELDVUE DVC6200f instrument with Performance Diagnostics identified the real cause of the problem. Running valve scans during an outage, the team discovered that the NPS 36 butterfly valve had a worn-out, non-Fisher actuator. The maintenance team planned a mini-shutdown and swapped out the actuator in half a day.

When used in combination with ValveLink software, FIELDVUE instruments enable custom-tuning of critical loops. They can be automated to run specific tests on control valves at user-specified intervals, without interrupting the process. With the detailed data they provide, operators can optimize loop performance, not just valve performance.

Since the reliability program began, this customer has standardized on FIELDVUE-PD instruments for all critical valves. They are using the DVC6200 family of instruments with both HART and FOUNDATION fieldbus communications. The reliability program with FIELDVUE diagnostics technology is being expanded to two dozen other hydrogen units across North America.

Performance Diagnostic tests available within the PD suite of any FIELDVUE instrument provide a snap shot of multiple valve-performance parameters such as travel, friction, or air supply. With PD, operators receive an early warning of any control or maintenance issues.

RESOURCES

Brochure: FIELDVUE DVC6200 Instruments
http://www.emerson.com/documents/automation/brochure-fisher-fieldvue-dvc6200-series-digital-valve-controller-en-125178.pdf

http://www.Facebook.com/FisherValves
http://www.YouTube.com/user/FisherControlValve
http://www.Twitter.com/FisherValves
http://www.LinkedIn.com/groups/Fisher-3941826

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