Refinery Reduced Maintenance Cost and Increased Hydrogen Throughput with Unique Vortex Technology

RESULTS

- Reduced maintenance cost by reducing maintenance cycle
- Increased throughput by avoiding unnecessary shutdown

With the CriticalProcess™ Vortex flowmeter solution, the refinery was able to reduce the maintenance frequency for a flow measurement down from quarterly to annually.

APPLICATION

Naphtha Hydrotreating

CUSTOMER

Refinery, China

CHALLENGE

Flow measurement of high temperature feed (370 °C or 698 °F) is critical in the naphtha hydrotreating process. The flow rate needs to be stable and the feed quality predictable. In this severe application, sensors occasionally fail resulting in the need to implement a quarterly preventative maintenance program. Moreover to eliminate unnecessary process interruption, redundant measurement systems were put in place.

Triple modular redundancy (TMR) with 2oo3 (two out of three) voting logic was implemented for the flow measurement control system in the naphtha feed line. In this system, they used both traditional vortex and orifice plate flow metering technologies. If one unit fails, it shuts down the unit process and possibly the entire plant.

A process shutdown causes lost revenue for every hour the feed line is out of service. It took about an hour to do maintenance work on each flow point in a single feed line for every preventive maintenance cycle for a total of sixteen hours. In addition, maintenance cost also increases with the frequent sensor replacement.

A Rosemount 8800 CriticalProcess™ Vortex flowmeters with the Severe Service Sensor for tough yet critical flow applications installed at the feedline.

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Process Management

SOLUTION

The refinery chose to install Rosemount 8800 CriticalProcess™ Vortex flowmeters with the Severe Service Sensor for this tough yet critical flow application. With the CPA option, the sensor can be serviced without disrupting the process allowing online maintenance without a need for bypass piping. Furthermore, the Severe Service Sensor uses corrosion resistant materials to increase robustness in more challenging applications. Rosemount was the only supplier able to meet the performance requirements of this difficult application.

With the CriticalProcess™ Vortex flowmeter solution, the refinery was able to reduce the maintenance frequency down from quarterly to annually per flow measurement point. This resulted to savings of a total of 12 man-hours for the whole process train allowing savings in maintenance cost. Hydrogen throughput also increased as process shutdown due to sensor replacement was reduced. In addition expensive bypass piping is not required to perform maintenance.

Rosemount 8800 CriticalProcess™ Vortex Flowmeter.

RESOURCES

Emerson Process Management Refining Industry

http://www2.emersonprocess.com/en-US/industries/refining/Pages/index.aspx

Rosemount Vortex Flowmeters

http://www2.emersonprocess.com/en-US/brands/rosemount/Flow/Vortex-Flowmeters/Pages/index.aspx

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