

US Refinery increases reliability by implementing Rosemount 8800 Quad Vortex Flow Meter in SIS application

RESULTS

- Increased reliability, rangeability and process availability over DP flow meters
- Eliminated plugging and freezing of impulse lines in extremely low temperatures
- Prevention of spurious trips due to 2oo3 voting



APPLICATION

At a major US refinery, a light gas oil Hydrotreating unit utilizes a feed stripper to remove dissolved O₂ from storage feed tanks. A Safety Instrumented System (SIS) was installed for personnel protection to reduce the risk of two phase back flow from the hydrotreating reactors (970 psig) through the feed drum back to the feed stripper (62 psig). An accurate flow measurement is required to operate the feed stripper in an efficient and safe manner.

While the DP flow meters experienced impulse line freezing, the Rosemount 8800 Quad Vortex performed reliably throughout the winter and prevented a false trip of the Hydrotreater unit.

CHALLENGE

The refinery required a flow metering solution for a 2oo3 (2 out of 3) voting system for the Hydrotreater Feed Stripper Bottoms Pump SIS System, along with a fourth flow meter for regulatory flow control. The solution needed to eliminate the main problems with existing DP flow meter installations, which included the plugging and freezing of associated impulse lines. These issues can lead to a false trip of the Hydrotreater.

SOLUTION

The refinery chose Vortex technology as a solution to eliminate their impulse line issues. They investigated using two dual Vortex flow meters, but this presented a problem due to the required straight pipe run. Emerson suggested using a Rosemount 8800 Quad Vortex Flow Meter that close-coupled two dual Vortex sensors with four independent measurements that also solved the straight pipe run issue. The Rosemount Quad Vortex also offered excellent rangeability with no need for zeroing and decreased operating expenses and maintenance over traditional DP flow meters.



The Quad Vortex was installed with the addition of an orifice and two DP flow meters to address SIS proven-in-use considerations. During the following winter, both DP flow meters experienced the freezing of sensing lines during the extremely cold temperatures. In contrast, the Rosemount 8800 Quad Vortex continued to function without issue throughout the entire winter, providing four independent outputs that prevented a false trip of the Hydrotreater unit. Because signals from the Quad Vortex were also being routed to Logic Solver with DP transmitters, a false trip of the unit, which could have cost several millions of dollars, was prevented.

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