

Shell Ethylene Plant Increases Availability and Improves Efficiency Using Rosemount Dual Vortex Flowmeters on Steam Measurements

RESULTS

- Improved plant efficiency by 2%
- Reduced Maintenance Cost
- Increased plant availability



APPLICATION

The Shell Moerdijk ethylene plant mixes Light Distillate Feedstock (LDF) - such as naphtha or ethane - and steam to heat the mixture to temperatures sufficient to crack the LDF into basic feedstocks such as ethylene.

Dual steam flow measurements are required for advanced process control, and the plant safety instrumented system (SIS).

CUSTOMER

Shell Chemical Moerdijk Ethylene Plant - one of the largest ethylene plants in Europe

CHALLENGE

Shell Chemicals was looking for a more reliable steam flow measurement in order to improve operations and increase plant uptime. In addition they needed built in redundancy with an independent measurement for process control, and the safety system instrumented system. The installed DP flow based system was not providing the reliability they needed.

The ethylene production process operates at high temperatures and as part of the process carbon and coke deposits are created which get re-circulated with the process water and steam. The particles, when recycled in the steam, would constantly block the impulse lines of the installed DP flow based measurement system decreasing measurement reliability.

A monthly schedule of cleaning each flowmeter had been established to overcome this problem, to remove these deposits and ensure measurement reliability. As a result, the plant experienced high maintenance cost, and was unable to optimize their production performance. In addition, plant availability was reduced. All of these factors combined to reduce plant profitability.

Rosemount's non - clog design vortex meter reduces maintenance costs while improving plant efficiency.



A Rosemount 8800 Dual Vortex installed.

SOLUTION

Shell decided to first undertake a three month trial with a Rosemount 8800 dual vortex flowmeter on one of the furnace lines. The flowmeter provided a reliable measurement with no problems and no cleaning required. Following the success of the trial, all twenty furnaces were scheduled to be equipped with the Rosemount dual vortex flowmeters. Unlike other manufacturer's vortex flowmeters, the Rosemount dual vortex flowmeter has an all-welded body design with no crevices, process seals, or pockets where particles might collect and cause measurement error or failure. In addition, as a dual sensor unit, the 8800 provides two separate flow measurements, enabling one sensor to provide the process control signal, and the other to be used in the SIS loop.

The first eight furnaces have now been in operation for over 8 years. During this time none of the units needed to be removed for cleaning eliminating the monthly required maintenance cost and improving plant availability. With the improved measurement and ability to better control the process, a 2% improvement in plant efficiency has been realized. Finally, the dual sensor unit provided reduced installation cost by eliminating the need for two separate meters with the required upstream and downstream piping.

RESOURCES

Emerson Process Management Chemical Industry

<http://www2.emersonprocess.com/en-US/industries/Chemical/Pages/index.aspx>

Rosemount 8800 Series Vortex Flowmeter

<http://www2.emersonprocess.com/en-US/brands/rosemount/Flow/Vortex-Flowmeters/8800-Series/Pages/index.aspx>

“Rosemount dual vortex meters provide two flow measurements for process control and safety instrumented systems reducing installed cost.”



The Rosemount 8800 Dual Vortex

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