

# Early Detection of Plugged Impulse Lines Improved Process Efficiency and Optimized Maintenance Schedules

## RESULTS

- Early detection of plugged lines reduced maintenance costs
- Increased process uptime
- Improved measurement quality

## APPLICATION

Pressure & Flow Applications in Gas-to-Liquids Plants

## CUSTOMER

Large Engineering & Contracting (E & C) Firm designing a new Gas-to-Liquids Plant

## CHALLENGE

Gas-to-Liquids (GTL) refers to the conversion of natural gas into liquid fuels such as methanol, diesel, gasoline and chemical feedstocks. Most GTL facilities under construction utilize the Fischer-Tropsch chemical reaction process which was developed in the 1920's but until recently was too costly to implement. In recent years, capital costs have been reduced and process efficiencies have been improved, making GTL commercially viable.

A by-product of the Fisher-Tropsch process is paraffin wax, which during pilot plant testing resulted in wax build up in instrument sensing lines for both pressure and differential pressure flow applications. The plugged impulse lines resulted in on-scale failures due to the loss of the measurement point, leading to an unplanned process shutdown that immediately required maintenance to unplug the line. Direct mounting practices of transmitters to avoid plugged impulse lines was not an option due to the high temperatures at which the process is run.

## SOLUTION

Since plugged impulse lines occurred in the pilot plant and the actual plant is a scale-up from that facility, the E & C knew that plugged impulse lines would be a major concern. They therefore specified the Rosemount 3051 transmitter with Advanced Foundation Fieldbus Diagnostics to help detect when plugged impulse lines would occur.

The Rosemount 3051 transmitter utilizes Statistical Process Monitoring (SPM) to continuously monitor the process variable. When SPM is activated in the process, it goes into "learn" mode or baseline normal process behaviors. SPM then tracks the mean and standard deviation of the process variable and monitors for abnormal situations, such as plugged impulse lines, and proactively alerts the operator of the event so that action can be taken.



*The advanced diagnostic capability allowed this GTL facility to proactively detect a plugged impulse line so they could send a maintenance before it caused an unscheduled shutdown.*



*The Rosemount 3051 Pressure Transmitter with Advanced FOUNDATION™ fieldbus Diagnostics*

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The advanced diagnostic capability allows this GTL facility to proactively detect a plugged impulse line so they can send a maintenance technician to unplug it. This not only increases their process quality by having accurate measurements, but also increases process uptime and allows them to optimize their maintenance schedules by knowing exactly when a line is plugged instead of purging when it is not needed.

In addition, measurement quality is improved because as the sensing lines become plugged, the transmitter detects it and alerts operators of the compromised measurement. Immediate action can be taken to unplug the lines and restore the measurement.

### RESOURCES

[http://www.emersonprocess.com/rosemount/products/pressure/m3051s\\_diagnostics.html](http://www.emersonprocess.com/rosemount/products/pressure/m3051s_diagnostics.html)

*Not only was process quality improved, but uptime was also increased and it allowed for the optimization of maintenance schedules by knowing exactly when a line is plugged instead of purging when it is not needed.*

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