



REFINERY ENSURES SAFETY FOR FLUSHING EVENTS DURING TURNAROUNDS

Customer

A North America refinery

Application

Monitoring temperatures and pressures of the decontamination process by flushing units with chemicals, steam, and/or condensate during turnaround events.

Challenge

Turnarounds are a critical part of the long-term operations of refineries. To avoid prolonged shutdown times, several refinery workers and contractors are simultaneously working around tight schedules to complete numerous tasks planned for each turnaround.

Safety measures and scheduling cannot be compromised during these turnarounds. While the potential for hazardous exposure is present during a refinery's normal operation, they are dramatically increased when a turnaround is in progress. Due to the infrequency of operations, like cleaning and flushing, the risks for potential injuries are heightened. Turnarounds may also be costly based on the duration of decontamination, potential cleaning steps, and unpredictable decontamination quality outcomes, thus adversely impacting turnaround schedules. A refinery in North America wanted to improve upon the procedures that were used during the decontamination phase of the turnaround to improve the overall turnaround process.

All temporary piping, tubing, hoses, and instrumentation should be designed for the conditions at the time of decontamination, taking into consideration temperature, pressure, and material compatibility. The refinery would use local temperature and pressure gauges on the decontamination (decon) headers to monitor flushing events, thus requiring operator rounds to read the gauges. The existing transmitters on the units are installed for monitoring during normal operations and are designed for process conditions which are outside of the operating range during decontamination. As a result, decontamination conditions were not well monitored.

Results

- Safely lowered steam-out time, shutdown time, and time required to perform mechanical cleaning.
- Ease of installation and re-use of Emerson Wireless Instrumentation for multiple applications and plant units.
- Connectivity assurance with added repeaters.



Image 1. Reduce risks with Rosemount™ Wireless Technology while Lowering Steam-Out and Shutdown Costs

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Extreme care is especially required when decontaminating a catalytic reactor, because temperatures must be continuously monitored for a non-exotherm cleaning to look for signs of unintended reactions and during the degassing process, while pressure monitoring is required to look for incorrect piping line-ups or blockages. To further ensure unexpected exothermic reactions are avoided, pressure monitoring of the nitrogen blanket on the catalytic reactors is crucial for the duration of the turnaround until startup. Again, this continuous monitoring is not possible with local gauges and manual operator rounds.

For these reasons, the Turnaround Planners and Process and Safety Engineers at this refinery held early discussions with Emerson to discuss their monitoring needs to lower risks and improve the efficiency of decontamination procedures during turnarounds.

Solution

To lower risks by lessening the amount of people on-site to monitor local gauges, and to provide a cost-effective solution for continuous monitoring during the decontamination phase of a turnaround, a wireless solution was implemented. Emerson provided Rosemount Wireless Pressure Gauges with extended remote seals and Rosemount 648 Wireless Temperature Transmitters to monitor temperature and pressure points during decontamination. Therefore, operators were given the capability to continually monitor the process from inside the control room and look for signs of unintended or unexpected conditions. Emerson's wireless technology also allowed for ease of installation and re-use for multiple applications and process units. The Rosemount wireless devices met coverage needs and connectivity assurance with added repeaters. Although this refinery selected the Rosemount 648 temperature transmitters, the Rosemount 248 Wireless Temperature Transmitters are also a cost-effective and reliable wireless solution for temperature measurements. These new wireless temperature and pressure devices provided accurate monitoring to detect any issues during the decontamination process to ensure safety, while maintaining catalyst materials and overall equipment integrity.



Image 2. The refinery utilized Rosemount Wireless Pressure Gauges and Rosemount Wireless Temperature Transmitters for cost-effective pressure and temperature monitoring solutions.

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Resources

Refining Solutions

[Emerson.com/Refining](https://emerson.com/Refining)

Industrial Wireless Technology

[Emerson.com/Industrial-Wireless-Technology](https://emerson.com/Industrial-Wireless-Technology)

Shutdowns, Turnarounds & Outages

[Emerson.com/Lifecycle-Services/Shutdowns-Turnaround-Outages](https://emerson.com/Lifecycle-Services/Shutdowns-Turnaround-Outages)

Rosemount Pressure Measurement

[Emerson.com/PressureMeasurement](https://emerson.com/PressureMeasurement)

Rosemount Temperature Measurement

[Emerson.com/TemperatureMeasurement](https://emerson.com/TemperatureMeasurement)

For more information, visit

[Emerson.com](https://emerson.com)

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