



APPLICATION SPOTLIGHT

Automated Data Collection & Process Optimization at
Expansive Oil Tank Farm



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APPLICATION:

As part of a massive overhaul in upgrading the infrastructure and processes of its oil production operations that included more than 400 wells over 9,000 acres of land north of Casper, WY, an oil exploration and production company looked to automate its manual data collection methodologies to support on-demand, real-time data management and eliminate process steps associated with determining net oil calculations during pre-production stages.

PRODUCT SUPPLIED:

- TRICOR Coriolis Flow Meter
- SignalFire Gateway Modbus Stick
- SignalFire Modbus (node) Stick
- SignalFire Multi I/O Stick System

CHALLENGE:

Manual monitoring of oil production operations could not address the growing demand for real-time, online data for mobile data management by SCADA and automation operators at the oil production company. As operators visually gauged a variety of sensors and meters that track the status of tanks, pumps, and other assets, creating status reports took time, delaying the tracking and trending of well operations that supported operational decisions. Besides, the WY weather and geography made driving tough and risky to the different buildings housing the sensors, sometimes requiring drivers to be escorted by snow plows to get to final destinations.

In addition to automating data collection methodologies, the oil production company wanted to eliminate process steps as well as the need for expensive equipment associated with determining the net oil volume in different tank batches.

SOLUTION:

A SignalFire Sensing System (SRFSS) automates data collection from sensors on tank DP, line pressure, building temperature, pump control as well as registries from TRICOR Coriolis Mass Flow Meters and wirelessly transmits output to a Gateway located at a control center. SCADA and automation managers now can access real-time data on different operating states in their offices on-demand.

The configuration of the SRFSS includes a SignalFire Multi Input/Output Modbus Stick with eight analog inputs, six digital inputs and an additional RS485 sensor reading for the Coriolis Mass Flow Meter. A mesh network supports radio transmission of readings over difficult terrain from Modbus (node) sticks - installed outside of each building on a ¾" NPT pole - to a Gateway located at the control center. In one building configuration, the SignalFire Modbus Stick successfully transmits sensor output over a hill obscuring a straight line of site to the control center located over a mile away.



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As the oil production company adds wells, the mesh network supports additional nodes (sticks), enabling coverage of hundreds of square acres. Because the nodes self-install into the network, no additional configuration is required.

TRICOR CORIOLIS MASS FLOW METERS REDUCE PROCESS STEPS

To determine the net volume of oil in different tank batches, TRICOR Coriolis Mass Flow Meters are used during pre-production to measure the watercut of crude oil as it flows from wells into storage tanks. Using these meters, operators can monitor how much oil each well is producing without the need for additional processes such as separating the oil/water for measurement. With the mass flow meters integrated to the SignalFire Remote Monitoring System, data regarding oil content from different wells are available on demand.

Based on the successful implementation of the TRICOR Mass Flow Meter and SignalFire Remote Sensing System in optimizing data collection and process operations, the oil production is commissioning their use throughout the WY tank farm.