CASE STUDY • OIL AND GAS

EMERSON'S ROSEMOUNT MAGNETIC FLOW METER SOLUTION ENABLES REMOTE SALTWATER INVENTORY BALANCING

Application

Saltwater disposal companies charge their customers to remove produced water by truck or pipeline. This particular customer operates exclusively with pipelines, and has measurement points at inputs from producer facilities, inputs into their facilities, and outlets to downhole disposals. Measurement quantities need to match across pipeline inlets and outlets in order to ensure proper payment is received and that there are no leak points. Additionally, real-time measurement in pipelines helps them control where water needs to be moved.

Customer

WaterBridge, a Houston-based Midstream Water Management company with most of their assets west of Midland Odessa in the southern Delaware basin.

Challenge

WaterBridge needs to achieve accurate, low maintenance measurement at all transfer points to ensure proper compensation. Given the remote locations of meters, significant costs are incurred in solar-powered setups. Because this is such a dirty application, buildup is also a big issue and coating is often a challenge in getting an accurate measurement. Additionally, magnetic flow meters are often damaged during installation at the company due to over-torqueing that causes shearing of the liners.

While producers desire to exclusively send water through these pipelines, occasionally upsets occur which result in gas, oil, and solids being sent down the pipelines instead of produced water. Traditionally, producers have implemented turbine meters in these lines, which show very high flow rates during periods of gaseous flow, and continue totalizing under these conditions. This gas can cause liquid piplines to have a pressure build-up, eventually shutting down the facility and feeding pipelines.

Results

- Transitioning to Emerson's Rosemount™ low-powered magnetic flow meters provides significant cost savings
- Diagnostic information is now used to quickly address measurement discrepancies
- Meter liners are no longer damaged during installation
- Cost savings are achieved by utilizing the Emerson FB1200 flow computer with pressure transmitter (PT) wet-end assembly

> *"By transitioning to a solution implementing Rosemount's low-powered magnetic flow meters with the addition of Emerson's FB1200 flow computer, WaterBridge has seen a savings of $6,300 per meter location."*

Measurement Supervisor
WaterBridge

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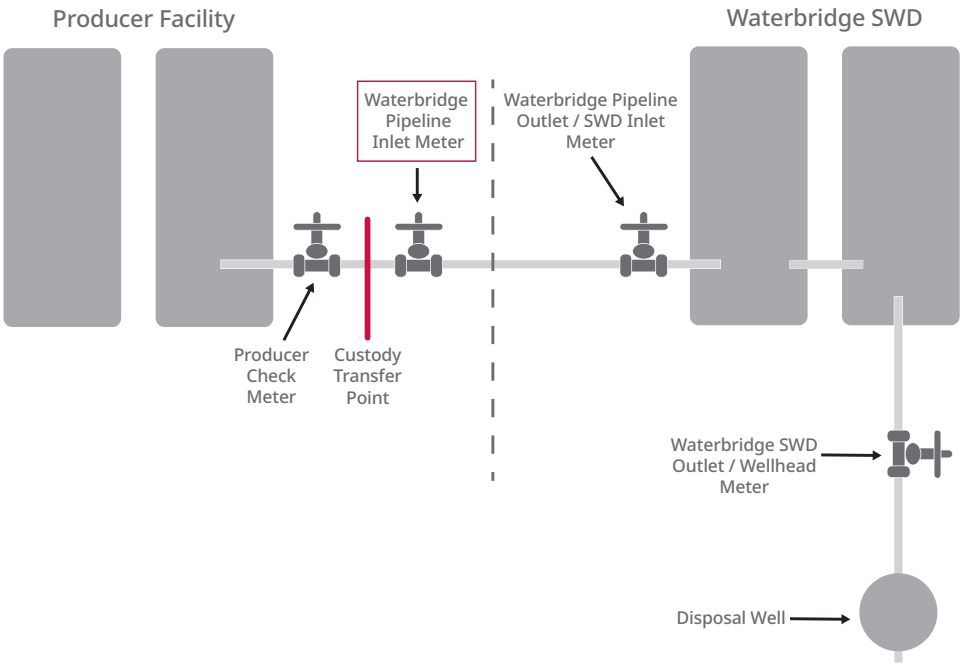
Turbine meters also require routine maintenance schedules based on either timing or volume quantities. This is costly and either not done frequently enough or done when there is no need. Because WaterBridge uses magnetic flow meters, this often creates incorrect compensation expectations between the two flow technologies. WaterBridge was looking to overcome these challenges to ensure low cost, accurate meter performance and proper compensation.



Saltwater disposal operation showing flow measurement transfer points

Solution

WaterBridge has transitioned all magnetic flow meters to the low-powered option, driving significant cost savings with a reduction in solar panels and batteries. They have also incorporated diagnostics enabled by Emerson's Rosemount Magnetic Flow Meter Transmitters. The grounding/wiring fault detection gives them confidence in the grounding and wiring of the meter during and after installation. Additionally, WaterBridge is collecting analytical data via their SCADA system. This allows them to monitor the coating detection diagnostic, determine when non-conductive material is building up, and put cleaning schedules in place.

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Empty pipe detection is also possible with the diagnostics, allowing WaterBridge to inform producers when entrained gases and oil are present in pipelines. Spikes in empty pipe values, in conjunction with flow rates dropping to zero, inform WaterBridge when customers are inadvertently sending gas. By incorporating Smart Meter Verification™ and continuously monitoring meter health, WaterBridge can have confidence in their measurement.

To avoid damaging liners during installation, WaterBridge developed proper installation instructions and provided training to employees and contractors. Additionally, their standard practice moving forward is to purchase lining protectors for all new magnetic flow meters, further reducing the risk of damaging the liners. Finally, the company has saved on automation costs by transitioning to the Emerson FB1200 flow computer with PT wet cell as their data collection point instead of a separate pressure transmitter and temperature transmitter with data converter/radio that has no data retention capabilities.

Installed Rosemount 8705 Magnetic Flow Meter (left) paired with the Emerson FB1200 Multi-Run Explosion-Proof Flow Computer for Gas and Liquids (right).

The flow computer measures pressure, temperature and the flow meter variables, and outputs Ethernet protocol.

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