



COMPLETE TERMINAL SOLUTION WITH MICRO MOTION CORIOLIS FOR FAST STARTUP TO STOP FLARING LOSSES OF LPG



RESULTS

Restored truck loading capability with accelerated project delivery to halt flaring of LPG with losses over 1000 m³/day, saving \$500,000/day

Eliminated maintenance and increased accuracy by replacing PD metering skids with Coriolis technology

Increased safety with remote operator station for delivery batch control



Application

The customer, an independent gas company, is a joint operator of the Khor Mor field located in Kurdistan Region, Iraq. They previously standardized on PD metering with PLC-based control systems for Liquefied Petroleum Gas (LPG) terminal truck loading.



Challenge

This project was a fast-track rehabilitation project in Northern Iraq. The project was initiated to rebuild an LPG loading terminal that had suffered fire damage. The project urgently required rapid execution because the closure of the LPG loading facility was forcing 1000 m³ of merchantable LPG, valued at \$500,000, to be lost to flare every day. Four truck loading skids were needed to be installed and operational as quickly as possible in order to halt these losses.

There were many important requirements for the four truck loading skids that included:

- A safe and remote operator station for central control of the loading systems
- Maintenance-free operations
- High accuracy LPG loading measurement
- A complete system fully pre-tested to avoid issues during startup at the site in Iraq



Solution

The customer came to Emerson for help in addressing their challenges and chose to change the PD metering skid design to a complete Emerson solution based on measurement with Micro Motion Coriolis meters.

The complete Emerson solution consisted of:

- DeltaV Control / Terminal Automation System
- Micro Motion Coriolis meters
- DL8000 Preset controllers
- Daniel Digital Control Valves
- Virgo Block Valves
- EL-O-Matic Actuators
- Rosemount Pressure & Temperature Transmitters

The customer was able to quickly convert their design from PD meters to Coriolis technology, which increased accuracy and eliminated maintenance. Micro Motion Coriolis meters were an ideal choice for LPG flow measurement because the high volatility, high thermal expansion, and low lubricity of LPG cause issues for mechanical meters like PD meters.

High volatility increases the risk of vapor breakout that causes errors and can damage mechanical meters. Micro Motion meters are not damaged by vapor breakout and can even detect and indicate when vapor does appear in the LPG.

High thermal expansion makes temperature correction of the fluid volume prone to more error with PD meters. The customer was able to measure the LPG in both volume units and mass units simultaneously with the Micro Motion meters. This was valuable because the loading transactions are based on volume measurement units, and the mass balance of the facility is done in mass units. The overall measurement of the LPG was more accurate because the direct mass measurement of the Micro Motion meter is not affected by the changes in fluid volume and density that occur with changing temperature and pressure.

Fluids with low lubricity cause PD meters to wear very quickly, which causes ever increasing product slippage and product giveaway due to the resulting measurement error. Micro Motion Coriolis meters do not wear because there are no moving parts. The Coriolis meter calibration and Meter Factor remain stable and accurate over time with no need for maintenance or rebuilds.

The advanced diagnostics of the Micro Motion Coriolis meter, including Smart Meter Verification (SMV), gave the operators confidence in both the ongoing health of the meters and also the trouble-free operation of the overall loading process.

The DL8000 preset batch controller allowed the customer to conduct safe loading operations with no need for an operator to be located near the loading skids in the field. Seamless integration of the loading skids and the centralized control station was made possible with the DeltaV-based Terminal Automation Solution.

This solution accelerated the design and approval process through close engagement with the EPC contractor. With a coordinated project execution and expedited Emerson component deliveries, the skids were completed in a record 8 weeks.

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