

Major Oil and Gas Company Improves Reservoir Management with Rosemount Vortex on Test Separator Gas Measurement

RESULTS

- Improved Reservoir and Production Management
- Reduced Health, Safety, and Environmental Risk
- Reduced Operations Cost



Lift costs were reduced with Rosemount Vortex on test separator gas measurement.

APPLICATION

Test separator gas measurement with approximately 1% liquid volume fraction

CUSTOMER

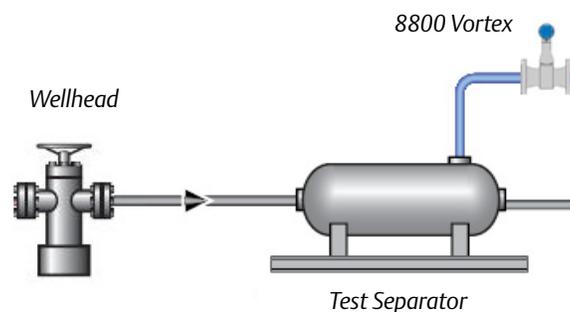
Large oil and Gas Company in South America

CHALLENGE

The gas oil ratio or GOR of an oil well is a critical measurement that needs to be monitored in order to maintain optimal well production. This oil and gas company needed to improve the measurement of gas production on their test separators. The natural gas at the top the test separator is sometimes wet and can carry small amounts of crude oil, which can lead to measurement error. In addition, each well being tested has unique flow characteristics that depend on the gas lift injection flow rate and reservoir properties. A flowmeter was needed that would be able to handle a large flow range and offer improved performance, without the necessity to change out the flowmeter size during each well test.

The current flowmeter used was a traditional DP orifice installation with chart recorder, which did not provide the measurement performance needed. The installation utilized impulse lines that increased the risk of leaks, and measurement inaccuracy was also a problem due to impulse line obstruction caused by the oil and condensate. The process piping also needed to be depressurized and orifice plate changed depending on the expected gas flow rates during each well test.

With the measurement uncertainty and issues with the traditional DP installation, this company risked not obtaining the correct GOR which is needed by reservoir engineers to understand the behavior of the



Wellhead and test separator installation diagram

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reservoir. The GOR is used to optimize the gas lift injection rates used to produce each well. Reduced production and over or under injection of gas can have a significant negative economic impact. In addition, maintenance cost increased due to plugged impulse line remediation and operations costs increased due to the time required to change out the orifice plates. Health, Safety, and Environmental (HSE) risk is also high to workers working with high pressure process piping.

SOLUTION

The oil and gas company ultimately decided to replace their orifice plate installations with Rosemount 8800 vortex flowmeters. The vortex meter eliminated many of the issues they were experiencing with the separator measurement. With 1% LVF (Liquid Volume Fraction), the amount of liquid carried by the gas did not affect the vortex meter as dramatically as the orifice plate installation and gave the company a +/- 5% accuracy they needed. Without any liquids present, the accuracy of the vortex flowmeter is 1% which was much better than the up to 10% error they would sometimes experience due to the many factors that would affect the DP installations such as wrong sized orifice plate being used for the anticipated flow rates, liquid accumulation in the piping, obstruction on the impulse lines, or bad readings at the chart recorder.

By minimizing the measurement error, this ensured that the wells remained optimized to maximize production and reduce lifting costs. In addition, by not having to depressurize the line and change orifice plates, operations cost was reduced as well as health and safety risks. The elimination of impulse piping and the potential leak points also lower environmental risks. Another benefit experienced was that vortex technology has a lower pressure drop that minimizes the risk of over pressure in the separator caused by sudden high flow rates coming from the well. Over pressure opens the relief valve on the separator, causing loss of production and a release of gas to the environment.

RESOURCES

Emerson Process Management Oil and Gas Industry

<http://www2.emersonprocess.com/en-US/industries/oil-gas/Pages/OilandGas.aspx>

Rosemount Vortex Flowmeters

<http://www2.emersonprocess.com/EN-US/BRANDS/ROSEMOUNT/FLOW/VORTEX-FLOWMETERS/Pages/index.aspx>

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*Safety was increased
and leak points
reduced with Rose-
mount Vortex.*



Rosemount 8800 Series Vortex
Flowmeter



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