

The Roxar subsea Wetgas meter

Results

- Continuous and accurate real-time measurements of gas, water and condensate flow rates at the wellhead.
- Improved flow assurance through the ability to take preventative action against hydrates, corrosion and scaling.
- Accurate measurement of wet gas flow for allocation purposes and reduced costs through comingled flow and subsea well tie-ins.

Challenges

With operators needing to ensure that their oil & gas reservoirs are operating at the very peak of their potential, the successful and economic flow of hydrocarbons from the reservoir to the refinery has never been more important.

At the same time, however, operators are facing increased threats to production particularly from unchecked water - particularly prevalent in deepwater wells and wet gas fields with high Gas Void Fraction (GVF).

Water and especially saline water in the gas flow can cause scaling, hydrates and corrosion in wells and pipelines, leading to the worst case scenario of wells being shut down. Furthermore, with the proliferation of subsea tiebacks - many of which are over 100 kilometers long - operators need to know about threats to production in real-time.

In addition, with many operators sharing facilities, different ownership structures, and the development of tiebacks from different licenses, accurate production allocation is vital for reconciling oil, gas and water measurements at the entry and exit points of the production network

Operators today need to measure the early onset of formation-water production in real time, enabling them to take preventative or remedial action, if necessary. They need to know how much water is being produced and they need to access accurate, real-time subsea measurement and allocation data.



The Solution

The Roxar subsea Wetgas meter provides real-time, accurate measurements of hydrocarbon flow rates and water production and is designed for installation in wells with GVF > 95 per cent volume. The compact design and low power consumption ensures flexibility and easy integration into the subsea system, while still providing dual redundancy. The meter is the culmination of 19 years of continuous investment and innovation into multiphase metering by Roxar (now Emerson).

The meter uses advanced microwave-based dielectric measurements to generate accurate gas and condensate flow rates based on standard delta pressure devices. Performance tests have shown the meter able to detect changes in the water production with sensitivity better than +0.0008% volume, while the absolute accuracy is +0.1% volume in high GVF (greater than 98%) cases.

By providing sensitive, accurate and reliable measurements of the water in the gas stream, operators can take preventative or remedial action, optimise production, prevent hydrate, scale and corrosion in the pipelines, and ensure a reliability of supply.

Applications & Customers

To date, Emerson's multiphase meters have been installed by 72 operators in 55 countries. The Roxar subsea Wetgas meter is today operating in some of the world's most challenging fields. These include:

- The Greater Gorgon field is one of the world's largest untapped natural gas fields. Here, the Roxar subsea Wetgas meter will operate in depths of between 200 and 1,300 meters, and will provide the operator, Chevron Australia, with real-time, accurate measurements of hydrocarbon flow rates and water production.
- The Ormen Lange field is the largest natural gas field on the Norwegian Continental Shelf with no offshore platforms. The early detection of water at the wellhead and in the pipelines by the Roxar subsea Wetgas meter ensures a stable supply of natural gas to the UK, where the field is meeting 20% of the UK's gas needs.
- The Roxar's Wet Gas Meters are accurately measuring all produced fluids on a well-by-well basis within the West Delta Deep Marine (WDDM) field, offshore Egypt, operated by Burullus. By providing early warnings of the water produced, the wet gas meters installed have helped Burullus and its partners save three wells from a water breakthrough. To date, 43 wet gas meters have been sold to the field with 30 already operational.

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