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MULTIPHASE PRODUCTION TESTING WITHOUT PHASE SEPARATION

By Schlumberger

At ADIPEC 2015, Schlumberger is showcasing its new Diligens Spectra* mobile multiphase production testing unit, designed to address the specific challenges of efficient land production testing activities. The company is exhibiting a newly-built unit on its booth, which is already scheduled for active service as soon as the event ends.

Fitted on a trailer, the lightweight modular, fit-for-purpose, mobile unit features the Diligens* mobile production testing concept and Vx Spectra* surface multiphase flowmeter technology, both of which have been proven in diverse environments around the world. The combination of state-of-the-art reliable technologies and Schlumberger high-quality global services expertise is primarily aimed at periodic well production metering, but also provides the flexibility to be integrated into more specialised customised solutions, increasing efficiency and reducing the total cost of production testing operations.

The new service builds on the success of the Diligens SEP*, which uses truck-mounted separator units in a compact and modular design. Schlumberger has built a workforce of experts with global experience in flowback, cleanup, and production testing operations, and able to handle the harshest of flowing conditions.

The Diligens Spectra service avoids the need for phase separation through the use of Vx Spectra multiphase flowmeter technology, which is able to deliver reliable production data for accurate production profiling. Reliable access to flow rate measurements provides operators with the allocation data necessary to efficiently manage and optimise their production.

The mobile testing units feature dual Venturi systems to provide metering capabilities over a wide range of flow rates and produced fluids. Compared to many alternative systems, the dual-Venturi configuration improves the turndown ratio of the unit from 10:1 to 50:1 without compromising operational efficiency, enabling a large number of wells to be tested per day. Vx* multiphase metering technology provides

excellent dynamic response to fluctuating flows, requiring no stabilisation time. In addition, it is not affected by complex flow regimes, such as slug flow, foam, emulsion, or heavy-oils.

Data from Diligens Spectra units can be made available in real-time via the InterACT* global connectivity, collaboration, and information service, allowing stakeholders in multiple locations to participate in the entire decision-making process. The unit is compliant to applicable industry standards for safety and data accuracy to serve any phase of surface well testing operations.

The family of fit-for-purpose mobile well testing solutions has been designed to dramatically reduce the logistics and rig-up and rig-down times associated with each test delivering safer and more efficient operations. Vx multiphase metering technology has been used around the world in a wide variety of flow regimes, and has proven its resilience in handling challenging environments including high levels of H₂S, CO₂, high-pressure high-temperature (HPHT), solids, and heavy oil. Sour oil and gas fields can present particular operational and HSE challenges. In a high H₂S environment, ensuring that a production system remains within its design parameters, and managing corrosion and effluent disposal, requires accurate monitoring of H₂S content in the produced fluids.

Fraction data acquired by the Vx technology

enables the measurement and monitoring of H₂S content in the flow without the need for physical sampling. In previous multiphase flow-rate measurement, the phase's fractions were differentiated based on the ability of oil, water and gas to absorb gamma rays at two different energy levels.

Vx Spectra technology integrates additional measurements from multiple energy levels that result in a large resolution between the attenuation of sulfur, hydrocarbon and water components. This makes it possible to determine the mass fractions of H₂S as an additional output. Comparisons with laboratory tests have demonstrated that the measurements have been within 0.5% of reference data. The in-line H₂S measurement technology has been widely used in areas including the Middle East, Russia, and Caspian Region.

Vx Spectra was launched at ADIPEC 2013 following widespread market acceptance of Vx multiphase metering technology in production flow testing. Schlumberger has established an engineering, manufacturing, and sustaining center in Singapore dedicated to supporting its multiphase measurement services.

For more information, visit:
www.slb.com/diligens

*Mark of Schlumberger



IMAGE COURTESY OF SCHLUMBERGER

Diligens Spectra mobile multiphase production testing units encompass Vx single-point, high-frequency flow rate measurement, bringing accuracy, agility and efficiency to periodic well testing operations.