

Real-Time Wireless Data Acquisition Enhances Exploration Well Test in Harsh Conditions Onshore Iraq

Chevron deployed Signature quartz gauges enabled by Muzic wireless telemetry to continuously transmit downhole measurements in a high-flow-rate well

CHALLENGE

Acquire downhole data quickly in an environment with high H₂S and CO₂ while ensuring measurement resolution and data accuracy to optimize the operator's high-rate well test.

SOLUTION

Use Signature* gauges enabled by Muzic* wireless telemetry to transmit real-time data during all testing stages; use the InterACT* global connectivity, collaboration, and information service to help modify the test program.

RESULTS

Performed successful testing of seven zones; met all test objectives while saving rig time with better-informed decision making.



Overcoming harsh downhole conditions during well testing

Chevron was interested in testing seven zones in its Sarta-2 well in the Kurdistan Region of Iraq. Chevron required the ability to wirelessly transmit real-time downhole pressure and temperature data continuously throughout the entire testing operation — from setting the packer to pulling out of hole. The well was drilled to a TD of 4,000 m with high H₂S and CO₂ levels. The seven drillstem tests (DSTs) targeted the Triassic and Jurassic formations.

Gauges paired with wireless telemetry deliver real-time data

Schlumberger proposed using Signature gauges to deliver high-resolution pressure and temperature measurements. This was further enhanced by Muzic wireless telemetry to integrate communication from downhole to surface. Four Signature gauges enabled by Muzic wireless telemetry were located below the IRDV* intelligent remote dual valve. Acoustic signals traveling along the DST string provided real-time data acquisition and enabled the operator to control downhole equipment from surface.

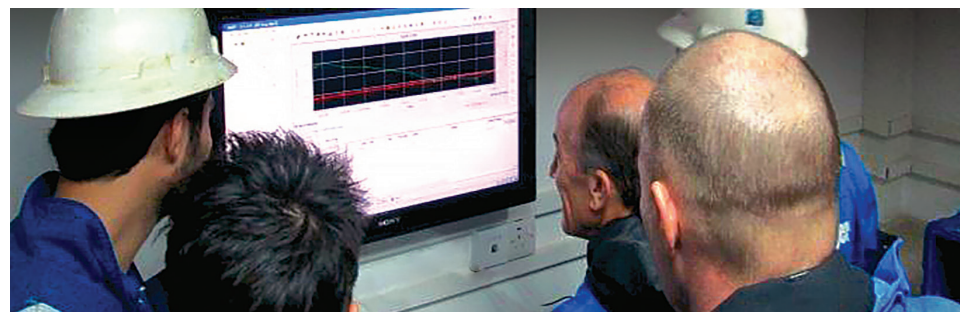
Operator verifies data quality and testing success

Throughout the entire testing operation, Signature gauges enabled by Muzic wireless telemetry provided real-time downhole pressure and temperature data and the InterACT system provided secure global access to real-time measurements. Using this solution, the operator was able to complete the following with success:

- confirm the dynamic underbalance effect
- perform real-time pressure transient analysis
- determine productivity index during flow periods
- measure reservoir pressure during postperforation and acid flow
- adjust mud weight for better well kill operations.

After testing, the real-time telemetry data were found to match data collected in memory mode. Timely access to this information enhanced safety and operational awareness by informing the operator of downhole conditions and events and eliminated the need to run cable in the well.

Chevron saved on rig-up costs (wireline equipment) by being able to make accurate decisions more quickly. The combination of Signature gauges enabled by Muzic wireless telemetry confirmed data quality and verified that the test objectives were met before completing the tests.



Real-time data acquisition performed by Signature gauges enabled by Muzic wireless telemetry gave Chevron the ability to make better-informed decisions faster.