Case study: Gulf of Mexico

XACT telemetry service saved two trips and 5 rig days during tubing conveyed perforating operations

A Gulf of Mexico operator had complex deepwater cased hole frac pack wells to complete in a maturing field. The reservoir at 30,000 feet measured depth (MD) had multiple sands with varying pressure regimes. For the past wells, they had perforated these sands in a single run, however significant rigtime was incurred in managing the wells due to uncertain dowhole pressures and overbalance conditions. The operator then switched to running the tubing conveyed perforating (TCP) operation on multiple runs with deburr runs in between to lower risk.

The operator contacted Baker Hughes to run the **XACT™ bi-directional acoustic telemetry service** on a subsequent well to evaluate performance and fine tune over balance conditions with real time downhole data prior to tripping out. Unlike mud pulse telemetry systems which are limited by wellbore flow conditions, the XACT service transmits digital data along the drill pipe via encoded sound waves so it can transmit data while tripping, running liners, or even during cementing.

The system captures key measurements including pressure, temperature, and torque at multiple locations along the wellbore. The XACT system was deployed with the deepest measuring node below a multicycle valve but above the TCP packer, and the repeater nodes along the workstring to provide realtime downhole pressure data during tripping, TCP firing and subsequent well monitoring operations. The XACT tubing pressure measurement mounted below the closed multicycle valve was in communications with the reservoir after perforation and was able to transmit data across the closed valve, providing a real time reservoir pressure measurement.

Over three TCP runs, realtime data was used to measure reservoir pressure, set down weights on the TCP packer and measure actual overbalance conditions to enable safe and efficient tripping. Based on the success of this initial well, the client adopted a new strategy for the next well.

Single TCP run saved multiple days

The XACT system had demonstrated it could provide real-time downhole data reliably with a system that was efficient to install and added no additional risk or complications to the operation. With reliable downhole data, the client adjusted their risk profile and moved from the base plan of two TCP and two deburr runs to perforating all sand intervals in a single run.

The XACT system provided continuous along string data pressure data throughout the operation that the client utilized to complete the TCP operation efficiently and safely. In addition downhole weights were used to measure setdown weights and to calibrate drage models for the subsequent frac pack operations.

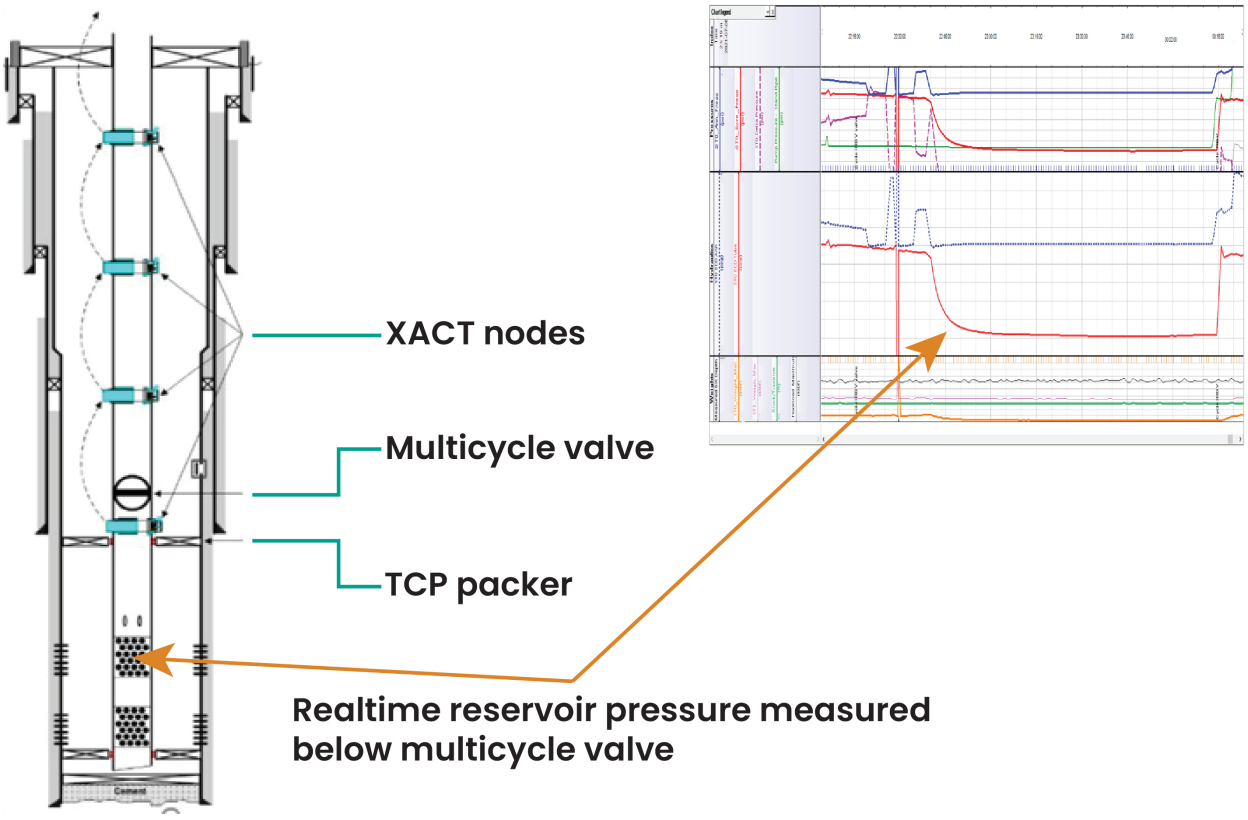
XACT telemetry services enabled the customer to change its operations plan and saved multiple rig days.

Challenges

- Multiple sands at significantly different pressures
- Base plan required multiple TCP and deburr runs due to uncertainty of downhole conditions

Results

- Deployed XACT system with no additional complexity to rig operations
- Eliminated additional TCP and deburr runs and their associated rig time and risk
- Delivered continuous pressure monitoring on tripping through real-time reservoir pressure data
- Provided real-time downhole weights at TCP packer throughout trip for torque and drag model refinement
- Offered high resolution memory data post run analysis to de-risk upcoming complex sand control operation



XACT tools positioned along the worksting and below a multicycle valve provide realtime downhole reservoir pressures during perforation operations.

Baker Hughes

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