

**Case study:** Gulf of Mexico, United States

# XACT service facilitated riserless integrity test, enabled slot recovery of previously abandoned well

A customer needed to re-evaluate a previously abandoned well in deepwater Gulf of Mexico. The slot had been abandoned at the 20-in. casing shoe due to an extremely narrow pore pressure fracture gradient window and the associated risks of weakening the integrity of adjacent wells. The area had a history of shallow hazards and shallow water flow conditions, causing significant problems in the past. To examine the feasibility of recovering the slot required undertaking a formation integrity test. The time and cost of purchasing a riser, installing a blowout preventer (BOP), and the relevant rig time made this choice uneconomical with conventional technology and current economic conditions.

To undertake the operation without installing a riser required real-time measurements below and above a packer, the ability to transmit data through a packer without hard wiring, and back to the surface in low and no flow conditions. Full through bore capability was also a requirement for wireline evaluation, as well as the potential to cement through the string, and the ability to mechanically activate circulation subs by dropping balls and bars.

The operator contacted Baker Hughes and decided to conduct a riser-less operation with the **XACT™ bi-directional acoustic telemetry service**. With the XACT service it's possible to eliminate the guesswork to get a clear, real-time understanding of the downhole environment—driving

efficiencies safely and predictably in a variety of well activities from spud to well abandonment.

Unlike mud pulse telemetry systems which are limited to wellbore flow conditions, the XACT service transmits digital data along the drill pipe via encoded sound waves. This means it can be used effectively during tripping, completion installation, liner running, and cementing.

## Eliminate guesswork from your operations

Integrated measurement and acoustic telemetry nodes were positioned above and below a packer. Internal pipe and annular pressures were used to conduct the below-the-packer formation integrity test, and to monitor the operation of the circulating subs and the activation of the packer. Real-time downhole weights and pressures were used to check the effectiveness and correct the setting of the packer. Acoustic signals sent through the wall of the regular rig drillpipe transmitted data back to the surface in real time, regardless of flow, formation, or depth.

## Make objective decisions

The XACT acoustic receiver, positioned on the quill of the top drive and on the circulating head (depending on the operation) decoded the information at the surface. The data was then sent wirelessly to a laptop on the rig floor.

After the data was successfully acquired, it was transmitted in real time throughout the operation,

## Challenges

- Evaluate abandoned well at 20-in. casing shoe
- Avoid cost for re-installing riser

## Results

- Completed riser-less formation integrity test
- Provided wireless transmission through regular drill pipe, across packer
- Recovered previously abandoned deepwater well

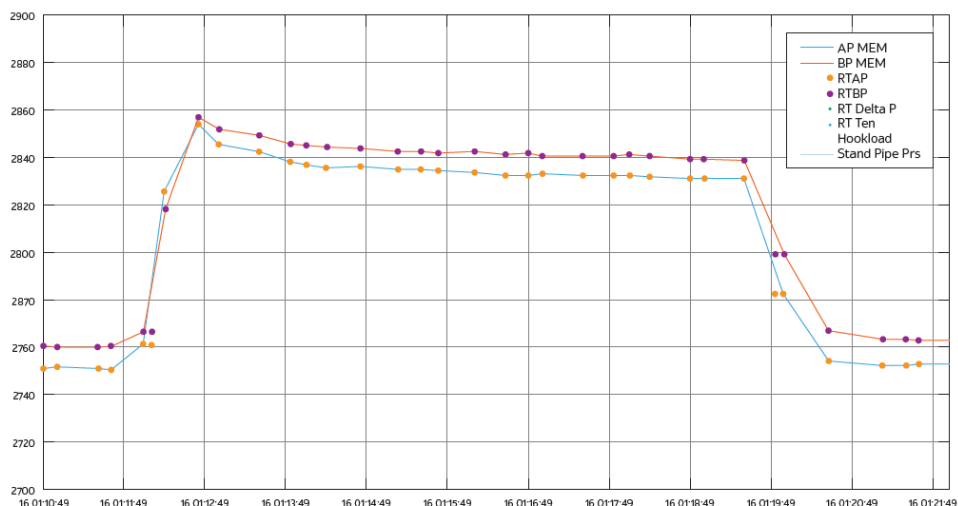
including tripping in and out of the hole. Continuous monitoring of downhole pressures allows hydrostatic barrier verification in situ, complying with all safety standards even while tripping in or out of the hole and enabling downhole pressure transmission even below closed BOPs. Because the system is “always on” and can provide data from along the drill string, it’s possible to optimize drilling dynamics, manage pressures, and push hole cleaning under low flow (or even no-flow) conditions.

The primary gauge of success of the operation was transmitting downhole data in real-time through a fully inflated downhole packer activated inside the 20-in. casing. The formation integrity test could then be monitored at the downhole conditions, completed

safely, and to the limits required for recovery of the slot without damaging the formation.

The customer successfully engineered and safely completed an operation that may never have been attempted without the expanded operating envelope provided by the XACT service.

Large cost savings were achieved in both the evaluation and efficiency of the operation. The XACT service achieved industry firsts, including wireless transmission through regular drillpipe and across a packer in real time with no modification required of downhole or surface equipment. Most importantly, however, was the value in knowing a previously abandoned well could now be recovered.



Real-time results transmitted from below the openhole packer during the riser-less formation integrity test. The real-time results are overlaid on the recorded mode results showing the validity of the measurement for use in these environments. The annular pressure is represented in blue and the internal pipe pressure in red.