

Real-Time CT Tool Saves 22 Hours of Rig Time During Production Testing Operations, Ecuador

ACTive PTC tool expedites well evaluation and eliminates the need for a workover rig

CHALLENGE

Improve well production evaluation cost and rig time by eliminating the downhole uncertainty associated with traditional methods, which use hydraulic jet pumping and memory gauges.

SOLUTION

- Deploy ACTive PTC* CT real-time pressure, temperature, and casing collar locator tool to monitor downhole reservoir parameters while using nitrogen as an artificial lift method and a tension mechanical packer to shut in the well to perform a pressure buildup test for pressure transient analysis.
- Monitor downhole forces during packer functioning using the ACTive TC* CT real-time tension and compression tool.

RESULTS

- Used real-time downhole data to eliminate uncertainty of reservoir parameters during well evaluation.
- Completed well production evaluation and pressure buildup test in only 17 hours without a workover rig.
- Identified crossflow behind the casing, saving the operator at least two additional days of rig costs to perform several casing integrity tests using a workover rig.

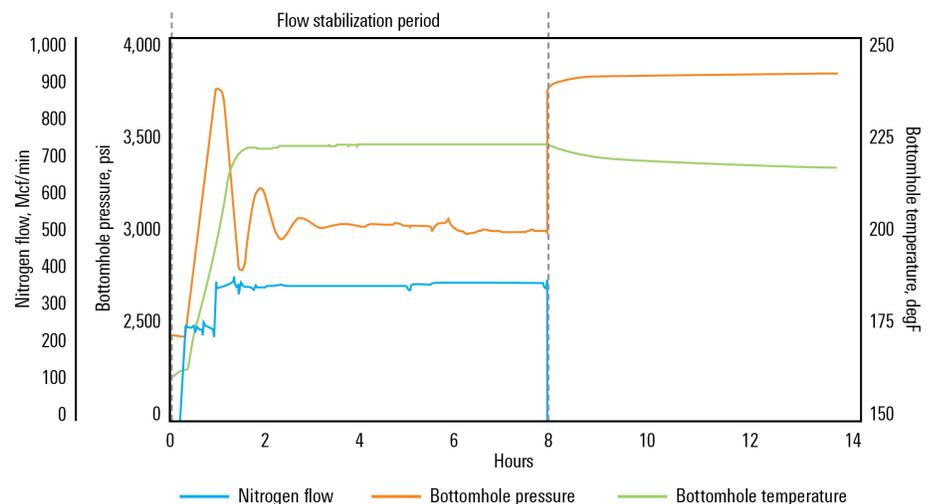


Downhole memory gauges did not allow real-time well production evaluation

An operator in Ecuador needed to acquire real-time data during well production evaluations in an onshore subhydrostatic well. Conventional operations for well production evaluation register the reservoir's response using downhole memory gauges, and the data recorded can be read only when they are retrieved at surface—after the evaluation has been completed. This conventional method failed to notify the operator when problems were encountered, which wasted resources, delayed decision making, and acquired potentially unreliable data.

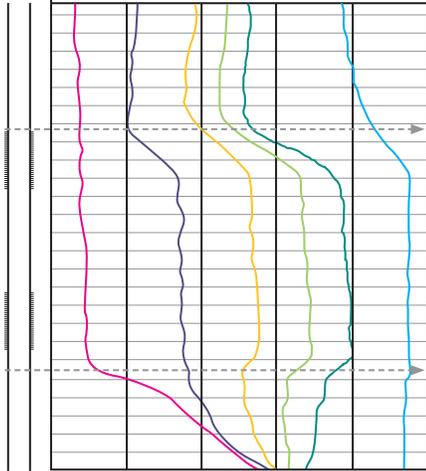
High downhole pressure prompted buildup test and further analysis

The well production evaluation registered an abnormally high downhole pressure. The well was producing 2,050 bbl/d with 100% basic sediment and water, and the ACTive PTC tool's downhole sensors were reading a 2,984-psi [20.6-MPa] downhole flowing pressure. This pressure did not match the estimated reservoir pressure of the zone of interest, which was 1,900 psi [13.1 MPa]. After eight hours of flowing the well, the operator decided to perform a pressure buildup test to further analyze the well. The pressure buildup was registered with the ACTive PTC tool downhole sensors, showing a reservoir pressure of 4,000 psi [27.6 MPa], confirming that the well production was from another formation. Using the fiber optics inside the CT string, distributed temperature sensing (DTS) profiling was performed and identified crossflow between two zones behind the well casing. A remedial cement job was scheduled to resolve the problem.



The real-time downhole pressure shows well flow stabilization and pressure buildup for pressure transient analysis while the well production evaluation is performed.

Reference temperature		
185	degF	225
Brine injection temperature		
185	degF	225
Warmback temperature after 1 h		
185	degF	225
Warmback temperature after 2 h		
185	degF	225
Warmback temperature after 3 h		
185	degF	225
Warmback temperature after 4 h		
185	degF	225



The distributed temperature sensing well profile showed communication to the lower formation confirming crossflow into lower zones below the second perforated interval.

Crossflow behind casing identified in a matter of hours instead of days

With the conventional method, the operator would have had to evaluate the well for several days while the reservoir pressure dropped and water cut stabilized and would not have been able to confirm the source of the water. Using real-time data at surface, the operator identified the crossflow behind the casing and completed the buildup test and well production evaluation in only 17 hours, saving several days of rig time.