

GeoBalance™ Managed Pressure Drilling Service Cuts Drilling Time in Half

Location: Southern Mexico

Operator's Challenge

This multi-well project was a deep, depleted, fractured and compartmentalized reservoir with widely variable pore pressures. The objective was to design a flexible system to cover pressure gradients from 2 to 8.34 ppg, minimizing overbalance because of the narrow margin between pore and fracture pressures, and to reduce drilling problems of differential sticking and lost circulation.

Halliburton's Solution

The operator controlled bottomhole pressure (BHP) through precise selection of critical operating parameters such as injection flow rates, fluid properties and chemical injection control. Utilizing Sperry Drilling Services' GeoBalance™ Managed Pressure Drilling (MPD) service, the operator was able to measure, record and display important variables at the rigsite and transmit them to other locations, allowing remote monitoring and real-time adjustments to maintain the narrow target range for BHP.

Economic Value Created

Successful implementation of MPD in this case resulted in 1) process improvements from lessons learned while drilling challenging hole sections under changing conditions, and 2) increased rate of penetration (ROP) despite controlled drilling for hole cleaning. MPD times were approximately half those of offset conventional overbalanced drilling (OBD) wells. And when the MPD wells were brought on for production, cleanup times fell from 20 days to an average of three days.



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GeoBalance™ Underbalanced Drilling Service Minimizes Reservoir Damage and Increases Production

Location: East Asia

Operator's Challenge

A severe loss zone prevented several conventionally drilled onshore wells from hitting the reservoir. To handle this, an operator needed to minimize losses and reservoir damage while drilling to total depth (TD) and simultaneously evaluate the productivity of different intervals. This included characterizing properties from flow testing and determining production sustainability and stimulation needs.

Halliburton's Solution

The operator successfully employed Sperry's GeoBalance underbalanced drilling (UBD) service to drill into the reservoir without losses. This application also required high-end data acquisition, using pressure-while-drilling (PWD) sensor and additional downhole memory gauges for controlling BHP. In some wells, the operator used two types of gas meters to constantly monitor the gas rate. Data was transmitted via satellite to the service company's reservoir evaluation center where the asset team analyzed the information in real time, including conducting periodic flow tests and pressure build-ups in some wells.

Economic Value Created

Compared to conventional overbalanced drilling, UBD reduced nonproductive time by 75 percent by eliminating time needed to manage losses, kicks and stuck pipe as well as improving well control. In addition, GeoBalance UBD service reduced bit needs for the high compressive strength rock to just two or three bits, compared to six to eight bits typically required for OBD. Reservoir characterization from UBD service also identified at least one zone previously thought to be nonproductive. The use of GeoBalance UBD resulted in a ten-fold production increase compared to overbalanced wells, and a five-fold increase compared to stimulated wells.