

Case study: Mexico

Integrated Well Services drills record HP/HT offshore exploratory well 33 days faster than plan, sets new metric

An operator needed to drill a delimiting offshore well through the largest length of a salt dome in the region to evaluate the potential reservoir and expand oil production. The high-pressure/high-temperature (HP/HT) well, a key component of the operator's overall field production, measured approximately 23,786 ft (7250 m) and carried with it the inherent challenges of salt creeping, saltwater influx, and unexpected well control events.

Initially, the operator contracted competitors, but every other company could not successfully navigate the complex field. Competitors constantly encountered operational issues, forcing multiple sidetrack operations, and exceeding the agreed-upon well plan. The operator knew similar wells—involving the running and cementing of 9½-in. casing through 10,334 ft (3150 m) of open hole and 8,858 ft (2700 m) of salt—could be completed faster and with fewer complications, and reached out to Baker Hughes for a viable solution.

Aligning the well plan

Drawing on a prior relationship, the operator and the Baker Hughes Integrated Well Services (IWS) team studied the challenges associated with the risk of stuck pipe, well control, and poor well integrity, and developed possible solutions to improve drilling performance. To guide the planning, the teams used the **RiskGuard™ analysis and risk management solution**, a methodology and

comprehensive program for drilling, logging, running, and cementing casings, and then selected the optimal Baker Hughes technologies according to the challenges of the well.

The teams studied formation geomechanics to determine the correct fluid density. The Baker Hughes Reservoir Technical Services team evaluated the technical and subsurface risks and created a mitigation plan for each stage of the operation, taking advantage of the latest technologies and fit-for-purpose processes and procedures.

Designing the solution

To quickly and reliably determine the top of the salt, Baker Hughes recommended the **ZoneTrak™ G near-bit gamma service**, which also can identify formation changes while drilling and allows proper selection of the casing setting depths.

With an eye to reducing the overall trips, the bottomhole assembly would be anchored by the rugged **Dynamus™ extended-life drill bits**, designed for long life in extreme conditions. The **AutoTrak™ eXact high build-up rate rotary steerable system with LWD** combined with the **CoPilot™ real-time drilling optimization service** would accelerate well delivery time while delivering excellent hole conditions prior to the casing run. The **EZCase™ casing bit system** and the high-capacity casing running tool would enable the casing to successfully reach the bottom. To ensure well integrity, the teams

Challenges

- Drill new well through large salt dome
- Drive operational and cost efficiency to best competitor's attempts
- Minimize health, safety and environmental (HSE) issues and NPT

Results

- Drilled and completed 23,786 ft (7250 m) of HP/HT well in record time
- Saved 33 days of rig time and rig costs, approximately \$2.4 million USD
- Eliminated 11½-in. casing and 5½-in. liner and associated costs
- Experienced no HSE issues, NPT, or major operations issues

agreed to perform the cement job in two phases.

Executing with predictable performance

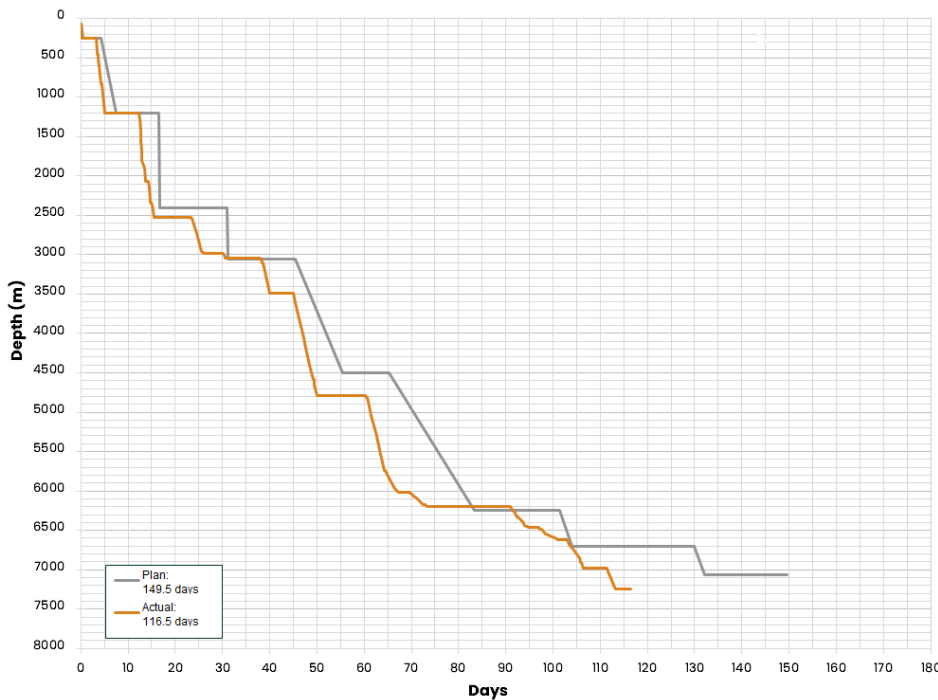
Field personnel from Baker Hughes and the operator executed the well plan. The integrated remote operations center with 24x7 surveillance and real-time alerts and recommendations provided support for the offshore operation and ensured continuity of the operation. The alerts and communications helped optimize the overall project across multiple product lines, including petrophysical, geomechanical, directional, bits, fluids, wireline, tubular, and cementing.

With all aspects of the operation in alignment, the well was drilled 33 days faster than the plan, an estimated \$2.4 million USD in direct savings. The Baker Hughes solution also came in 100 days faster than the competitor's offset well, making this operation the fastest in the entire field. The optimization of the casing configuration eliminated the need for an 11 $\frac{7}{8}$ -in. casing and 5 $\frac{1}{2}$ -in. liner, further reducing costs.

Significantly for the operator, the balanced approach of the Baker Hughes solution encountered no well control events and eliminated operational issues. The formation

evaluation data was acquired per the well plan, and there was effective hydraulic isolation on every casing string.

By aligning every aspect of the operation—internal and external stakeholders, remote operations, real-time monitoring strategy—the operator completed the well in record time with no major nonproductive time (NPT) events. The results of this flawless operation delivered predictable performance, and the operator is expected to assign the most complex wells to Baker Hughes.



The Baker Hughes IWS team successfully coordinated the drilling and completion of a challenging well, coming in 33 days earlier than the well plan, and substantially faster than the competitor's offset well.

