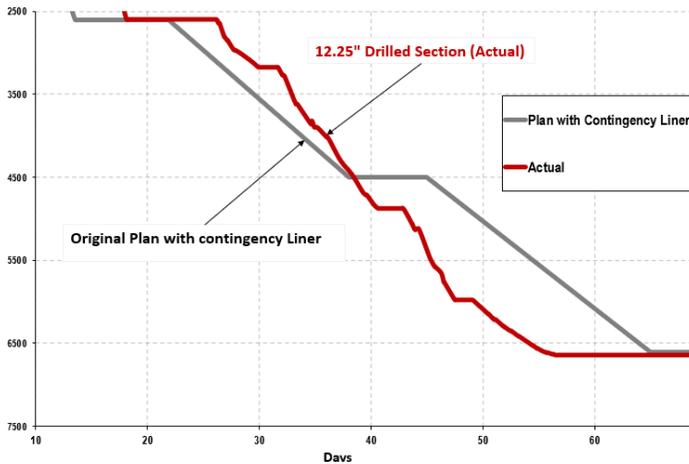


Magnus[®] RSS, LWD Technology Maintained Trajectory in Deep Onshore HPHT Well, Saved 11 Days of Rig Time, Approximately \$700,000 USD



The rugged design of Weatherford’s Magnus RSS delivers reliable, accurate, and fast operations as shown in this days vs depth comparison where the Weatherford solution increased ROP by 5% and saved 11 days of rig time.

Objectives

- Drill the 12 1/4-in. section vertically to 15,748 ft (4,800 m), kick off the well, build inclination to 25.40°, and then hold tangent to section total depth (TD) of 21,801 ft (6,645 m) measured depth (MD) in a middle Cretaceous formation.
- Overcome several challenges for this well section including fluid losses, influx, gasification, tight hole, vibrations, and stuck pipe.
- Evaluate data from logging while drilling (LWD) and pressure while drilling (PWD) to identify correlations and possible influxes and optimize well schematic, avoiding the 11 3/4-in. casing that usually isolates the transition zone to high pore pressure.

Our Approach

- Weatherford Drilling Engineering experts proposed the Magnus rotary steerable system (RSS), a push-the-bit RSS with an optimized drill bit with the specific cutting structure required to meet the ROP expectations.
- The Magnus RSS features optimized independent pad control to deliver the smoothest possible borehole and prevent excessive hole drag to ensure a successful casing set.
- To identify the casing point and bottomhole pressure/equivalent-circulating-density (ECD) monitoring, a high-temperature capable MFR sensor, a HEL system, and a BAP sensor were integrated into the BHA.

LOCATION

Mexico

WELL TYPE

J-type

FORMATION

Middle Cretaceous

HOLE SIZE AND ANGLE

12-1/4 in., 25.40°

CASING SIZE

9-5/8 in.

TEMPERATURE

316°F (158°C)

IN DEPTH

16,003 ft (4,878 m)

TOTAL DEPTH

21,801 ft (6,645 m)

PRODUCTS/SERVICES

- Magnus RSS
- MFR™ multi-frequency resistivity sensor
- HEL™ hostile-environment-logging measurement-while-drilling system
- BAP™ bore and annular pressure sensor
- HAGR™ high-temperature azimuthal gamma ray tool
- CENTRO™ well construction optimization platform
- 7875 DS Marine series rotating control device



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Our Approach (continued)

- The CENTRO platform ensured success by utilizing real-time wellbore data through the Weatherford real-time operations center (RTOC) to actively monitor and optimize drilling efficiency.
- Real-time ECD monitoring using the BAP sensor improved well control and identified loss circulation zone to avoid the 11 3/4-in. casing string.

Value to Customer

- After a competitor RSS was utilized in the upper hole section and was unable to maintain the well trajectory which resulted in 89 ft (30 m) of separation from the plan, Weatherford Drilling Services took over and drilled the section to TD in a single run with over 280 circulating hours and temperatures up to 316°F (158°C).
- With the Weatherford solution, the section was drilled to TD 1 day faster than planned and the contingency liner run was eliminated.
- In total, Weatherford's expertise and technology eliminated a complete liner string, saving 11.42 days of rig time and approximately \$700,000 USD in associated operating costs.

