

Magnus[®] RSS Drills Large-Diameter Curve Section in an Offshore Application to Achieve All Well Objectives

Objectives

- Drill a 17 1/2-in. curve section in an offshore well with a push-the-bit rotary steerable system (RSS).
- Achieve an average on-bottom rate of penetration (ROP) of no less than 82 ft/hr (25 m/hr).
- Stay within 16 ft (5 m) of the planned well trajectory.

Our Approach

- After analyzing offset well data, the Weatherford drilling and evaluation team recommended an optimal bit for the customer to use with this type of RSS in this application.
- Using proprietary drilling engineering software, the team performed an extensive analysis on the drilling bottomhole assembly (BHA) that encompassed BHA stabilization, torque-and-drag analysis, hydraulics modeling, optimization of bit nozzle, bending stress moments, and risk assessments according to the formation.
- The selected BHA included the Magnus RSS 1100, HEL[™] hostile-environment-logging measurement-while-drilling (MWD) system, and MFR[™] multi-frequency resistivity sensor. The RSS and MWD combination was chosen to improve hole conditions while drilling, optimize drilling and casing, evaluate the casing point, and reach total depth (TD) as efficiently as possible.
- The Magnus RSS built up to a maximum inclination of 54.84° with a maximum dogleg severity (DLS) of 3.96°/100 ft (30 m).
- In full autopilot mode, the RSS maintained the tangent section with an average DLS of 0.25°/100 ft (30 m).
- A drilling engineering and optimization team at a Weatherford real-time operation center (RTOC) analyzed a total of 59.09 circulating hours of live data transmitted from the rig site via WITS.
- The Magnus RSS drilled for 5,346 ft (1,630 m) from 3,838 ft (1,170 m) to the section depth at 9,184 ft (2,800 m). It achieved an ROP of 90.46 ft/hr (27.58 m/hr).

Value to Customer

- Using the Magnus RSS enabled the customer to drill a large-diameter curve section and reach TD ahead of the planned schedule without any safety or operational issues.
- The RSS fulfilled the ROP objective by achieving 90.46 ft/hr (27.58 m/hr).
- Weatherford drilling technologies helped to maintain the planned well trajectory. The BHA was pulled out of hole efficiently and casing was run successfully to bottom without issues.



The Magnus RSS 1100 achieved a high average ROP, drilled 5,346 ft (3,838 m), and reached the section depth in an offshore well ahead of schedule.

LOCATION

Gulf of Mexico

WELL TYPE

Offshore, oil, deviated

FORMATION

Shale

HOLE SIZE AND ANGLE

17-1/2 in., 54°

CASING SIZE

9-5/8 in.

TEMPERATURE

172.4°F (78°C)

WATER DEPTH

77 ft (23.5 m)

DEPTH IN

3,838 ft (1,170 m)

TOTAL DEPTH

9,184 ft (2,800 m)

PRODUCTS/SERVICES

- Magnus RSS 1100
- HEL MWD system
- MFR sensor
- RTOC

