

MPD Services and Victus™ Control System

Enable Drilling to Resume After 60 Days of NPT

Objectives

- Mitigate hazards caused by a high-pressure aquifer when drilling an 8 1/2-in. section to total depth (TD) in an offshore exploratory well with a narrow or nonexistent window.
- Minimize or eliminate nonproductive time (NPT) to avoid further cost overruns. Past drilling in the formation had resulted in 60 days of NPT and losing a hole section because of differential sticking.

Our Approach

- Weatherford recommended a managed pressure drilling (MPD) solution to control the annular bottomhole pressure (BHP) while drilling the 8 1/2-in. hole section of the well.
- Using the Victus intelligent control system and topside equipment (choke), the MPD team performed a dynamic pore pressure test and formation integrity test to determine the precise drilling window in the high-pressure aquifer. The tests confirmed a narrow 1-lb/gal (120 kg/m³) margin.
- The team began drilling, reduced the mud density below the pore pressure of the aquifer, and added surface backpressure (SBP) to keep the equivalent circulating density (ECD) constant.
- After drilling reached 3,000 ft (914 m) below the casing shoe, the pore pressure and fracture window decreased to a negative value.
- Using the MPD system and choke, the team implemented dynamic downhole pressure management to allow controlled flow of the aquifer at a rate of 20 bbl/hr (3.2 m³/hr) while drilling.
- The team loaded the mud system with stress cage material to strengthen the formation while drilling and gradually increase the ECD.
- Drilling finished at a depth of 14,162 ft (4,317 m)—462 ft (141 m) farther than originally planned—without NPT or safety incidents.

Value to Customer

- Weatherford MPD services and the Victus control system mitigated challenges related to a high-pressure aquifer and enabled drilling to continue after 60 days of NPT. Not only that, the services helped to reach a deeper target than expected.
- The incident-free MPD operation helped the operator to avoid further cost overrun.



Using MPD services and the Victus control system enabled the operator to make significant improvements in drilling performance and exceed the proposed section depth.

LOCATION

Egypt

WELL TYPE

Offshore, exploration, oil and gas

FIELD

South Ramadhan, Gulf of Suez

HOLE SIZE AND ANGLE

8-1/2 in., 35°

CASING SIZE

9-5/8 in., 47 lb/ft

TEMPERATURE

211 to 245°F (99 to 118°C)

MEASURED DEPTH

14,162 ft (4,317 m)

TRUE VERTICAL DEPTH

11,864 ft (3,616 m)

PRODUCTS/SERVICES

- Managed pressure drilling
- Victus intelligent control system
- Rotating control device Model 7875

