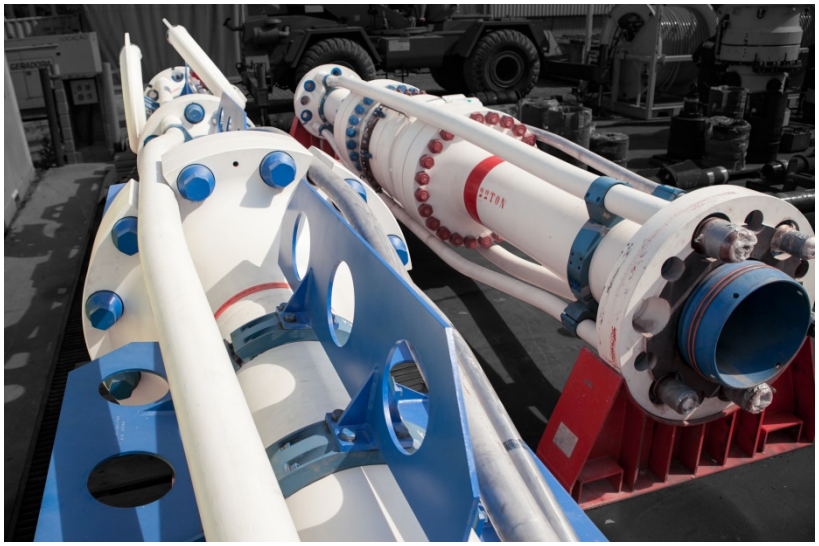
Managed Pressure Drilling Avoids Losses To Reach TD in Challenging Pre-Salt Formation



Weatherford prepared a deepwater MPD joint with auxiliary lines that enabled deployment below the tension ring and termination joint of the rig.

Objectives

- Drill a deepwater offshore appraisal well to a total depth (TD) of approximately 20,000 ft (6,100 m) in a challenging pre-salt area. The operator had encountered kicks and losses in two offset wells. In the first well, losses reached up to 200 bbl/hr (31.8 m^3/hr), and more than 15 days were spent counteracting them with no success. In the second well, losses reached 60 bbl/hr (9.5 m^3/hr), and the well was subsequently plugged and abandoned.
- Employ managed pressure drilling (MPD) techniques to maintain a constant bottomhole pressure (CBHP) within a narrow pore and fracture gradient window and avoid a kick and loss scenario.

Our Approach

- Weatherford deployed a deepwater MPD system, including the SeaShield® Model 7875 below-tension-ring (BTR) rotating control device (RCD) and the MPD automated control system, from a dynamically positioned drillship rig.
- The Weatherford team began drilling in the 12 1/4-in. hole section with a statically underbalanced drilling mud weight.
- After the reservoir pore pressure was measured in real time to define the actual drilling window, the MPD control system managed the bottomhole pressure by applying backpressure of 325 psi (2.2 MPa) from the surface, it measured the reservoir pore pressure in real time to define the actual drilling window.

LOCATION
Brazil

WELL TYPE
Deepwater, vertical, oil

RIG TYPE
Drillship

HOLE SIZE
12-1/4 in.

DEPTH
- Water: approximately 6,500 ft (2,000 m)
- Well: approximately 20,000 ft (6,100 m)

STANDPIPE PRESSURE
6,700 psi (46.2 MPa)

SURFACE BACKPRESSURE
325 psi (2.2 MPa)

PRODUCTS/SERVICES
- Managed pressure drilling
- MPD system
- SeaShield Model 7875 BTR RCD

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Our Approach (continued)

- The team reached TD at approximately 20,000 ft (6,100 m), which enabled access to continuous and connected reserves of light-to-medium crude oil.

Value to Customer

- The deepwater MPD system enabled the operator to drill to TD, which had not been possible in the offset wells, and to reach a reservoir with significant potential for production and profits.
- By performing the CBHP variant of MPD with the MPD automated control system and the SeaShield Model 7875 BTR RCD, the operator maintained the bottomhole pressure within the acceptable window to reach TD without losses.