

Managed Pressure Drilling Performed Regulator-Approved Dynamic Pore Pressure Test in Deepwater Exploration Well, Redefined Future Well Design

Objectives

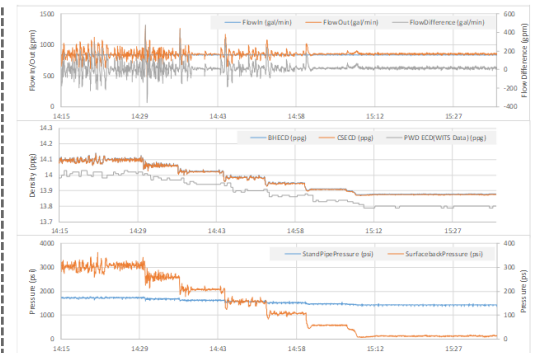
- Determine the pore pressure across a depleted formation
- Assess downhole formation pressures in real time
- Apply lessons learned in further planning for other wells in the same field

Our Approach

- While drilling in a depleted field, the operator was not confident of the pore pressure when crossing the depleted formation. During the preliminary consultations with the operator, Weatherford engineers learned about the uncertainties within certain parts of the formation and recommended a dynamic pore pressure test to map the downhole formation with actual data.
- After the initial evaluation of the well data, engineers determined the project was feasible using managed pressure drilling (MPD) techniques.
- While preparing the MPD modeling for the planned sections, some of the models represented how the dynamic pore pressure test would appear in real time.
- One challenge remained: the local regulator agency, the BSEE, had not approved a dynamic pore pressure test within the Gulf of Mexico. The sticking point was the intentional reduction of the pressure to “test” possible pore pressure lines.
- During the operational phase of the well, engineers from both the operator and Weatherford discussed options on how to proceed. They arrived at a mock trial run during the normally planned MPD “in-casing test,” or “fingerprinting,” of the system to know what to expect when the test would be performed in real time and in the open hole.
- After the operator received approval to proceed, the actual test lasted approximately one hour.

Value to Customer

- Upon showing a successful dynamic pore pressure test, the operator reduced the mud weight, and the effective bottomhole pressure was also reduced to match the low value showed on the pressure while drilling (PWD).
- Using the lessons learned on this test, the operator changed the permitting process on the next well within the same field.
- Based off this data, the operator was able to drill with a lighter mud weight and pressure, redefining future well construction designs, with less uncertainty and cost savings.



MPD parameters recorded during the dynamic pore pressure verification test period.

LOCATION

Gulf of Mexico, USA

HOLE SIZE AND ANGLE

12-1/4 in., 10 to 12°

CASING SIZE

14 in.

DEPTH

26,855 ft (8,185 m)

PRODUCTS/SERVICES

- Victus™ intelligent MPD software
- 7875 BTR-S rotating control device (RCD)
- Capital sales junk catcher
- 3-in. chokes
- Upstream flow meter
- 3 x 3-in. trim MPD choke manifold
- 24/7 MPD engineering support service

