

SwageSet Liner-Top Packer and WPHR Liner Hanger Incur Zero NPT While Running 9.875-in. Liner in HPHT, Offshore Well

Objectives

- Run and cement 9.875-in. liner at the total depth (TD) of 13,714 ft (4,180 m) in a 16-in., openhole section of an offshore well. This operation would involve passing through multiple formations—including a challenging high-pressure, high-temperature (HPHT) formation with pressure levels reaching 10,500 psi (72.4 MPa) and temperature levels reaching 302°F (150°C)—and a 36° inclination.

Our Approach

- Weatherford deployed the premium liner-hanger system because it provided the operator a means to run the liner safely through the critical formation without sacrificing well integrity. This system has the capability to pass through the 36° inclination and can withstand pressure levels up to 12,500 psi (86.2 MPa) and temperatures up to 400°F (204°C).
- The unique swage technology included in the premium system consists of ridge-shaped Aflas® elastomers bonded to an expandable metal ring. The resulting V0-validated, anti-extrusion seal that is created between the outside diameter (OD) of the liner and the inside diameter (ID) of the host casing isolated annular pressures and helped to maintain well integrity throughout the liner-running and cementing operation. Additionally, the elastomers resisted swabbing off when running in hole, reaming, and circulating at high flow rates during well cementing.
- The WPHR liner hanger enabled liner rotation to improve cement quality.
- This advanced liner-hanger technology enabled the entire operation—from running and setting the liner, to running and cementing the tieback to the surface—to be executed flawlessly.
- This operation marked the client's first successful installation of a 9.875-in. liner in this HPHT formation. HPHT formations are challenging not only for the operating conditions, but also because they are uncommon in the United Arab Emirates and not frequently encountered by operators in the region.

Value to Client

- Weatherford completed the operation without incurring any nonproductive time (NPT).
- Without swage technology, running a liner through this HPHT formation would have been extremely challenging and would have likely incurred NPT along with associated rig time and costs. This technology also mitigated risks of overall well failure.
- Running and cementing the tieback to the surface was inherently less risky than running casing to the surface. Running long sections of casing can result in an inadequate cement job, poor well integrity, and the casing becoming stuck. Additionally, running 9 5/8-in. casing to the surface would have increased the load on the wellhead.



The SwageSet liner-top packer (shown above) provides a V0-validated seal that isolates the annulus between the liner OD and the host casing ID. This helped to maintain well integrity while running and cementing liner in an HPHT formation.

CLIENT
TOTAL ABK

LOCATION
Abu Dhabi, United Arab Emirates

WELL TYPE
Offshore, exploration

HOLE SIZE AND ANGLE
16 in., 36°

TEMPERATURE
302°F (150°C)

PRESSURE
10,500 psi (72.4 MPa)

TOTAL DEPTH
13,714 ft (4,180 m)

PRODUCTS/SERVICES

- 9.625 x 13.375-in. SwageSet polished bore receptacle
- 9.625-in. tieback seal stem with 9.875-in., 62.8-lb/ft orifice collar
- 9.625 x 13.375-in. SwageSet liner-top packer
- 9.625 x 13.375-in. WPHR liner hanger
- 9.875-in., 62.8-lb/ft dual-valve float collar
- 9.875-in., 62.8-lb/ft dual-valve float shoe
- 9.625-in. subsurface top-release plug
- 5- to 5.875-in. top drill darts



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