



Drilling and Evaluation Solution Saved \$3.4 million

Baker Hughes drilled longest-ever 12 1/4-in. section in deepwater West Africa

Benefits

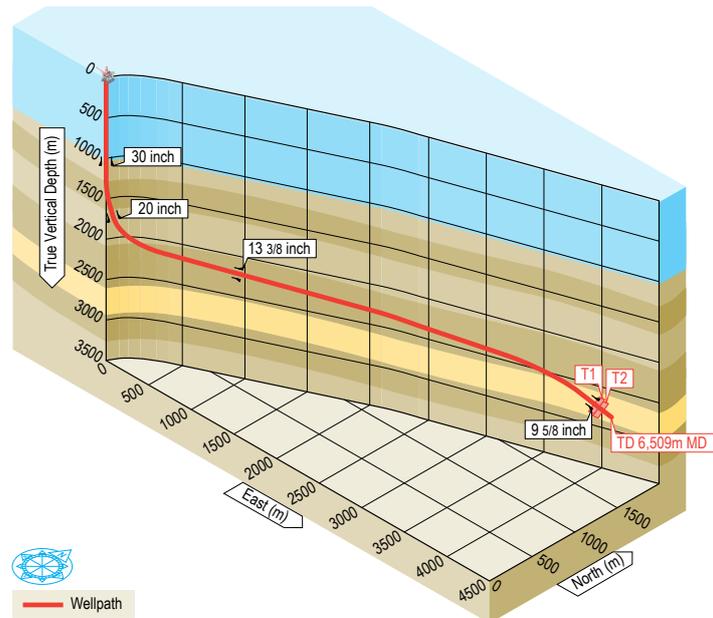
- Successfully accessed distant reservoir target
- Saved estimated \$3.4 million
- Reduced HS&E exposure

Well background and challenges

- Deepwater West Africa
- Target location only 5,577 ft (1,700 m) below seabed but 14,764 ft (4,500 m) laterally from wellhead
- Require reliable steering in weak rock with excellent hole quality
- Comprehensive LWD formation evaluation data

Baker Hughes solution and results

- Comprehensive planning and integrated drilling and evaluation solution including:
 - AutoTrak™ rotary steerable system, Hughes Christensen™ drill bits, Navi-Drill™ motor, GyroTrak™ gyro MWD
 - TesTrak™ LWD formation pressure testing, SoundTrak™ LWD acoustic, LithoTrak™ LWD porosity, PresTEQ™ pressure management service



Wellpath

The AutoTrak rotary steerable system has been used to drill some of the deepest, extended-reach wells around the world.

This development well in deepwater West Africa was drilled in 3,281 ft (1,000 m) water depth to intersect multiple stacked reservoir targets positioned 5,577 ft (1,700 m) below the seabed. The primary challenge was that the targets were located 14,764 ft (4,500 m) laterally from the surface location—a truly challenging extended-reach well in a high-cost drilling environment.

In order to drill this well profile, Baker Hughes carefully planned with the customer to strategically address all wellbore and formation evaluation concerns. It was determined that an integrated drilling and evaluation solution would be necessary to handle this extended-reach project.

The operation started with a kick-off at a shallow depth in weak sediments and build almost to horizontal in 17 1/2-in. hole before

drilling the 12 1/4-in. hole section to targets. Using the Navi-Drill motor with GyroTrak gyro MWD, the surface conductor was jet-in, set and the 26-in. hole kicked-off and drilled to total depth (TD) in one run. Completing this in a single BHA run saved an estimated \$500,000 in operating expenses.

The 17 1/2-in. hole section was then drilled in another single BHA run to TD using AutoTrak rotary steerable system. The section was smoothly steered at 4°/98 ft (30 m) to 85° inclination in a weak formation and the tangent was accurately maintained to section TD.

Formation pressures were also acquired while drilling this section using the TesTrak LWD system. Drilling the section in rotary mode rather than with a steerable motor in the friable formations saved another

\$500,000. Slick, 13³/₈-in. casing operations as a direct result of the excellent hole quality saved another \$160,000.

The next hole section was a 12¹/₄-in. pilot hole underreamed to 13¹/₂-in. while drilling. This section was accurately maintained at 85° inclination before dropping the angle to intersect each target using AutoTrak rotary steerable system. Baker Hughes drilling optimization services were supplied to manage and monitor equivalent circulating density throughout the operation

Comprehensive formation evaluation information were acquired while drilling and included OnTrak resistivity and gamma, LithoTrak neutron porosity, SoundTrak acoustic and TesTrak LWD formation pressure testing while drilling services.

This section was again drilled to TD in a single run and was the longest ever 12¹/₄-in. hole section to be drilled in West Africa. Drilling this in a single run saved an estimated \$1,250,000. Eliminating wireline logging saved an additional \$1,500,000.

With several stages of operations, and the subsequent savings tallied, Baker Hughes delivered an estimated total savings of over \$3.4 million through its integrated drilling and evaluation solutions. In addition to the cost benefit; the exceptional shoe-to-shoe drilling and evaluation performance, smooth hole quality, and reduced pipe handling, all contributed to reduced HS&E exposure.