

Case study: West Africa

FASTrak HD service acquired formation fluid samples, pressures in large hole size, saved 24 hours of rig time

A major operator needed to acquire high-quality, single-phase samples from an offshore reservoir in West Africa. The operator needed to establish the fluid properties and pressure data from the reservoir where sampling had not previously been performed.

To address the operator's needs, Baker Hughes recommended the **FASTrak™ HD logging-while-drilling (LWD) fluid analysis, sampling, and testing service**.

The service combines three distinct functions:

- Accurate real-time formation pressure tests

- Real-time in-situ measurements of reservoir fluid properties
- Capture and retrieval of formation fluid samples

Extensive pre-job planning between the operating company and Baker Hughes resulted in a complete plan for a trial operation to verify the potential of using the 6¼-in. FASTrak HD tool in a large hole size for fluid sampling and pressure testing. Further **BHASYSPro™ finite element analysis** was used to confirm the integrity of the 6¼-in. FASTrak HD service in the 12¼-in. x 13½-in. hole.

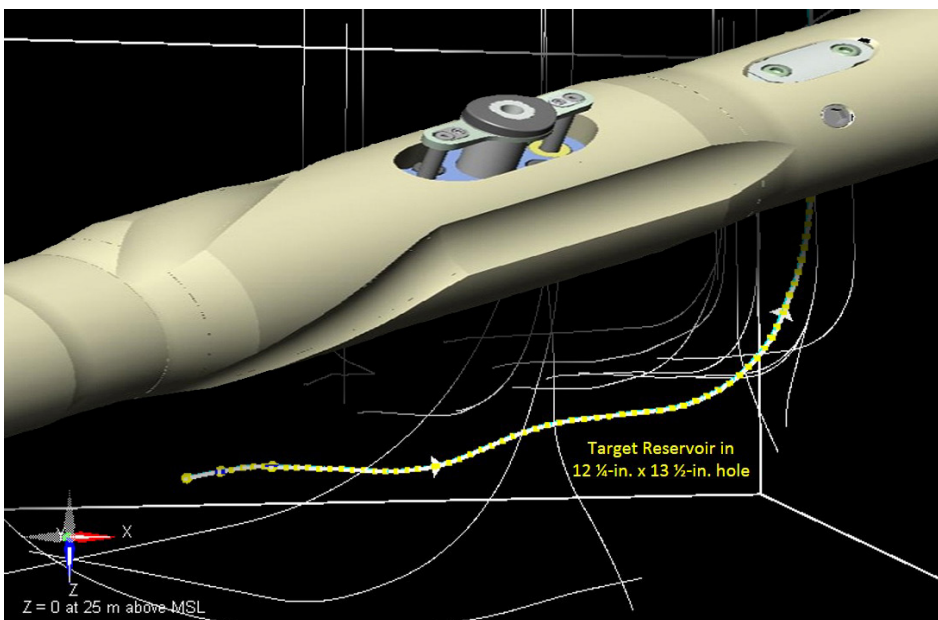
Deploying a 6¼-in. tool in a 12¼-in. hole size has the potential to create higher bending moments and typically higher

Challenges

- Obtain pressure tests and fluid samples in the 12¼-in. x 13½-in. borehole with the 6¼-in. FASTrak HD tool designed for 8-in. to 9½-in. diameter boreholes
- Safely deploy 6¼-in. FASTrak HD tool in the 8¼-in. or 9½-in. BHA without introducing harmful vibrations and other mechanical problems that could result in equipment failures
- Eliminate rig time and deployment risks associated with pipe-conveyed wireline sampling in a high-angle well

Results

- Performed successful large-hole sampling and pressure test in a single run while drilling in 12¼-in. x 13½-in. borehole
 - Acquired four fluid samples
 - Performed five formation pressure tests
 - Performed in-situ phase separation test
 - Achieved 100% sealing efficiency
- Saved the operator 24 hours of rig time by eliminating the need for pipe-conveyed run with wireline sampling tool
- Eliminated deployment risks of pipe-conveyed wireline testing and sampling the high-angle well



The 6¼-in. FASTrak HD LWD fluid analysis, sampling, and testing service was deployed in a drilling BHA and successfully acquired four formation samples in a high-angle, large hole reservoir section offshore Nigeria.

weight-on-bit and torque, which can create fatigue on the connection. A smaller size tool can introduce higher string vibrations, which can fatigue or damage the equipment or, in the worst case, result in a twist off.

To achieve the objectives, the BHA included:

- 6¼-in. FASTrak HD service
- 9½-in. **ZoneTrak™ deep-reading azimuthal resistivity LWD service**
- 9½-in. **OnTrak™ integrated measurement-while-drilling (MWD) and LWD service**
- 9½-in. **AutoTrak™ rotary steerable closed-loop drilling system**
- 9½-in. **GaugePro™ XPR expandable reamer**

Formation pressure testing and sampling were performed in the 12¼-in. x 13½-in. interval, which was drilled to a depth of 3,200 m (10,499 ft) MD with a final inclination of 73°. All tests were performed in the 12¼-in. pilot hole with the FASTrak HD pad oriented to low side prior to opening up to the 13½-in. hole size.

Several successful formation pressure tests were taken—with mobility ranging from 21.0 to 714.0 mD/cP—to identify the gradients. In addition to the pressure testing operation, the FASTrak HD service successfully captured four single-phase fluid samples and one phase separation test to determine bubble point.