

Operator Explores New Oil and Gas Discovery Offshore Nigeria with At-Bit LWD Solutions

AZIMUTHAL FOCUSED “AT-BIT” RESISTIVITY SERVICE HELPS IDENTIFY CORING POINT WITH ACCURACY

NIGERIA

CHALLENGES

- » Identify any possible reservoir sand
- » Determine if the reservoir was hydrocarbon-bearing or wet
- » Conduct an exploratory drilling campaign not to exceed 5m tolerance in the target reservoir to maximize core interval

SOLUTION

The engineered technology solution included:

- » AFR™ Azimuthal “At Bit” Focused Resistivity – to transmit high-resolution LWD borehole images and ensure precise geostopping at the core point
- » Modified BHA with comprehensive sensors, such as near-bit gamma ray, neutron-density, sonic, and testing for formation evaluation while drilling

RESULTS

- » Obtained accurate drilling data 2m into the reservoir
- » Confirmed the presence of hydrocarbon at top of the target reservoir

OVERVIEW

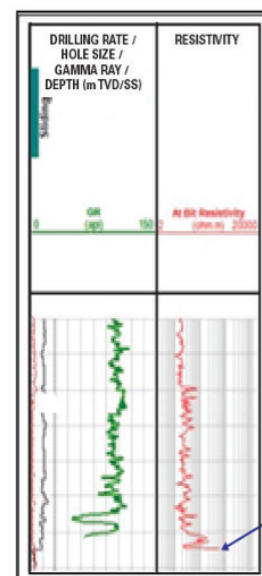
An operator in Nigeria uncovered a new significant oil and gas discovery in an oil mining lease (OML) located offshore eastern Niger Delta. The asset was successfully drilled from surface to well target depth (TD), with a customized suite of logging-while-drilling and measuring-while drilling (LWD/MWD) solutions that included formation testing, neutron-density, and sonic in an oil-based mud system.

CHALLENGES

The well challenges required a new strategy. The operator needed to first identify the possibility of reservoir sand and determine if the reservoir was hydrocarbon-bearing or wet. They had to precisely drill with only a 5m tolerance in the target reservoir and geostop at the right depth to maximize the coring interval.

SOLUTION

Halliburton offered a comprehensive bottomhole assembly (BHA) to help reach the well objective. The at-bit AFR azimuthal focused resistivity service was key to accurately completing the 8½-in. hole section of the well, along with data obtained from the FTWD GeoTap® formation pressure testing service and the gamma ray, sonic, and neutron/density services in an oil-base mud system.



“At-bit resistivity has proven to be a very reliable measurement in real time when quick decisions, such as geostopping, need to be made (for coring depth and section TD) given that a resistivity contrast indicates the presence of hydrocarbon.”

~ Customer representative

RESULTS

The real-time, at-bit resistivity measurements enabled geostopping successfully 2m into the reservoir optimizing the coring interval. As a result, the operator was able to confirm the presence of hydrocarbon at the top of the target reservoir (2182m MD).

The new discovery has added to Nigeria's cumulative oil and gas reserves, laying the foundation for future development and production investments to further grow the country's oil and gas output.

AN EXPLORATION SUCCESS

The operator has since reported that the new discovery well encountered 38 meters of net oil pay and 15 meters of net gas pay, while its sidetrack encountered 73 meters of net oil pay, in well-developed and excellent-quality reservoirs.

CONCLUSION

This implemented solution provides valuable inputs for upcoming exploration wells, where the deepest objective rests on top of an over-pressured zone. At-bit resistivity measurements enable the client to access the presence of hydrocarbon in the reservoir by drilling only a few meters without the risk of entering the over-pressured zone.

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