

Eni/Allied Energy Worldwide Longest Horizontal Well Drilled and Completed in Openhole Gravel Pack Employing Advanced LWD Measurements

**M. Rossi¹, S. Carbonara¹, M. Subhani¹, J. Otiocha², Vikas Jain³, D. Molokhov³, P. Occhipinti³,
O. Babayeju³, and G. Santoso³**

¹Eni Nigerian Agip Exploration Ltd, Lagos, Nigeria.

²Allied Energy, Lagos, Nigeria.

³Schlumberger, Lagos, Nigeria.

In this paper, we present how usage of advanced LWD helped to achieve the objective of successful development drilling, setting the longest Eni horizontal well ever completed with Openhole Gravel Pack, and putting the field in production just 3 years from its first appraisal well.

Oyo-5 was drilled by Eni's affiliates Nigerian Agip exploration and Allied Energy to develop Oyo Field located in OML 120, 75kms from Nigerian coast in about 400m water depth and characterized by turbidite channel deposits in a complex system of sand distribution. The well trajectory was defined by seismic amplitude facies reconnaissance and the program consisted of a 12" ¼ pilot hole leg to validate planned landing point and final horizontal 8" ½ drain hole leg (612m) in productive interval of Oyo channel sands.

LWD Suite of GR-Resistivity-Density-Neutron was used for petrophysical evaluation and Advanced Formation-Pressure-While-Drilling tool allowed to acquire pressure data for reservoir management. Advanced Integrated-LWD Petrophysical data, real-time density images, Sigma and Spectroscopy measurements were used in 8.5" horizontal section for well trajectory optimization. Use of Directional-Bed-Boundary-Imaging tool along with real-time near wellbore density images in collaborative well placement environment enabled drilling 612m of horizontal drain section achieving an outstanding 74% of N/G ratio. All sections were drilled with Rotary Steerable System and Continuous Circulating Device to ensure hole quality and trajectory control with minimum reaction time. Ultrasonic and density calipers were utilized for cement and hole volume calculations.

Logging-While-Drilling (LWD) technologies and services have come a long way since their introduction for reconnaissance of formation using real-time data. Nowadays advanced LWD offers information for superior formation evaluation and ability to make real-time decisions to drill, place and evaluate wells.