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Prospect Analysis and Hydrocarbon Reservoir Volume Estimation in an Exploration Field, Shallow Offshore Depobelt, Western Niger Delta, Nigeria

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Abstract

The daunting challenge in the exploration and production of oil and gas in the face of continual rise in the world's energy consumption has long been how to economically recover bypassed reserves within existing assets. This research is focused on the analysis of prospects and volumetric estimation of the hydrocarbon reservoirs delineated within an exploratory field using 3D seismic data and suites of wireline logs. The prospectivity of the delineated reservoir was carried out using seismo-structural interpretation and formation evaluation towards the assessment of the prolific hydrocarbon occurrence within the field. The reservoirs have porosity (0.29–0.32) for H1, (0.20–0.31) for H2 and (0.30–0.40) for H3 and the average computed hydrocarbon saturation of (0.31–0.62) for H1, (0.16–0.52) for H2 and (0.64–0.73) for H3, hydrocarbon pore volume (HCPV) of 28,706.95, 33,081.2 and 45,731.49 barrels for H1, H2 and H3, respectively, while the estimated stock tank oil initially-in-place (STOIIP) range (136.8–140.73) MMSTB for H1, (36.77–489.64) MMSTB for H2 and (166.62–308.14) MMSTB for H3. The observed porosity and hydrocarbon saturation for the delineated reservoirs as well as the estimated hydrocarbon pore volume and storage total oil in place indicate that the reservoirs are highly prolific. The study has therefore contributed to the understanding of hydrocarbon resource potential within the study area.

Keywords

Hydrocarbon resource evaluation Play analysis Reservoir characterization Formation evaluation Prospect mapping Niger Delta

Notes

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