Central OML 35 Hydrocarbon Habitat Study and Depositional Sequence Analysis

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The seven oil fields studied in the central OML 35 of the westerm Niger Delta have been systematically marked into major depositional sequences by the application of the seismic sequence stratigraphy concept. The identified cyclically deposited lithofacies and hydrocarbon distribution patterns ranging from deltaic to shallow marine depositional regime, with characteristic transgressive holomarine shales, lies within the dip - hanging wall closure, characterized by shifts in crestal axis with depth and the collapse crest structure.

Systems tract interpretation based on log shapes and biofacies data indicates the presence of Lowstand prograding complex (LPC), Transgressive systems tracts (TST) and the Highstand systems tracts (HST). Seismic stratigraphy and seismic facies analysis show seven major faults and a deep seated antithetic fault cutting across the parallel and sub parallel reflection units with gently divergent and slight progradational configurations. These facies units grades from variable amplitude, frequency and poor to fair reflection configuration of the Benin Formation, to the parallel-oblique and high reflection continuity within the Agbada Formation.

Sediment burial, thermal history and hydrocarbon maturation modeling of the well Galisoma-1 shows that the present day top of oil window (VRE = 0.6%) is reached at average depth of 13,123 ftah (4000m). The modeling confirmed the Galisoma area an oil field worthy of further exploration work, since the gas-oil ratio is less than 1000.