

Sequence Stratigraphic Framework of Nemo Field, Onshore Niger Delta

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A sequence stratigraphic analysis was carried out on the sedimentary packages of Nemo Field situated in the distal part of the Northern depositional belt of the Niger Delta. This is aimed at identifying and classifying the depositional sequences as well as their associated facies. Well log data using well log shapes and parasequence stacking patterns and seismic sections based on reflection terminations, configuration types, shape, continuity of events, and amplitudes were employed.

Four depositional sequences TY1, TY2, TY3, and TY4 and their associated facies were identified. The sequences reveal the presence of three major system tracts namely the Lowstand Systems Tracts (LST), the Transgressive Systems Tracts (TST), and the Highstand Systems Tracts (HST). The depositional sequences are classified as Type 1 sequences. Seismic facies maps of the sequence boundaries identified indicate parallel, subparallel, hummocky, sigmoid, and chaotic configurations, variable amplitudes, and reflection continuities. These reflection configurations and the well log patterns indicate a regime of low and high energy environments.

Two different generalized seismic facies units interpreted as shelf and slope facies, with a series of upward coarsening deltaic and wave dominated shoreface successions capped by their finer sediments associated with the maximum flooding surfaces were identified. The different play types of the study area include the basin floor fan, the prograding wedge complex, and the sands of the HST, which display high potential for oil and gas accumulations.