

Integrated Interpretation of Two Closely-Spaced Cores, Gbaran Field, Nigeria - Impacts Upon Sedimentary Modelling

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The Gbaran field D7000 reservoir has been cored in two wells situated 2.5 km apart. The field is located 110 km West of Port Harcourt.

An integrated approach incorporating bio-seismic-sequence stratigraphy and conventional core sedimentology provided the best platform for optimising the information inherent in the rocks. Sequence stratigraphic interpretation suggests that the D7000 reservoir sands are part of a thick highstand system tract succession deposited during the Middle Miocene Burdigalian 2 global sequence (after Gradstein et al., 2004). The seismic facies are generally parallel continuous as expected of typical highstand, presumed possible shoreface deposits.

The two cores display an overall progradational shoreface HST depositional sequence. Lower shoreface sands at the base consist of intercalations of fine to medium grained, parallel to cross-stratified sandstones, silts and heterolithics with shaly intervals. This was followed by deposition of upper shoreface, tidal channel and tidal flats deposits overlain by a carbonated cemented 12-15ft transgressive lag and open marine mudstones..

Petrographic analysis of ten selected thin-sections indicates mainly quartz arenites, with quartz cementation and authigenic clay formation and patches of calcareous cementation as diagenetic features.

This approach highlighted some heterogeneity within the reservoir intervals which would have previously been modelled as homogenous. The result is a genetically related subdivision of reservoir packages supported by multiple data constraining the depositional environment and paleogeographic reconstruction.

Improved correlation, and understanding of variance in heterolith distribution, palaeoazimuthal coastline orientation are some of the improvements as a result of integrated methods involved.