Controls on the Stratigraphic Architecture of Fluvial Sandstone Reservoirs, Gulf of Thailand

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Abstract

Many of the important Gulf of Thailand reservoirs are fluvial sandstones within the Early to Late Miocene. The fluvial sandstones vary considerably with respect to channel size, orientation and sinuosity, making accurate reservoir characterization difficult as many of them are below seismic resolution. The stratigraphic architecture of the Miocene to Pleistocene succession in the Gulf of Thailand was investigated by integrating seismic geomorphology, well logs and biostratigraphic data.

The Oligocene to Early Miocene depocenter was controlled by synrift faulting and was adjacent to the large basin bounding faults. Oligocene lacustrine sediments are overlain by an Early Miocene fluvial succession with sinuous, broad (average width 2 km) NW-SE channel belts in the basin center. Channel belts became straighter and narrower (0.65 km) and changed orientation to NE-SW in the middle Miocene when the main depocenter shifted eastward after the main phase of rifting ceased. Flared channel geometry observed on seismic images supports biostratigraphic data that indicates marine influence in the middle Miocene, with the incursion coming from the northeast. Wide (1 km), NW-SE sinuous channels again dominate in the post-rift succession that comprises the top middle Miocene through Pleistocene. The general temporal variations indicate that tectonics was the main control on channel morphology until late early Miocene, whereas, in the middle Miocene short-lived marine incursions were observed locally.