ABSTRACTS OF PAPERS

RESERVOIR GEOLOGICAL MODELLING OF MIOCENE SHALLOW MARINE SANDS IN ST. JOSEPH FIELD, OFFSHORE SABAH

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The St. Joseph Field is situated along a major wrench-fault zone in offshore Sabah (the Bunbury-St. Joseph-Bambazon 'Ridge') which divides the field into several structural compartments. The most prospective area is the structurally-simple northwest flank (ca. 6 km long and 1 km wide) which dips uniformly to the NW (at ca. 15–20 degree) in a basinwards direction away from the crestal wrench fault zone. The main hydrocarbon-bearing interval comprises a ca. 1350 ft long oil column, which is contained within highly heterogeneous sequences of Late Miocene (Stage 1VC) shallow marine sandstones and shales.

The main geological uncertainties of the northwest flank concern lateral variation in sand development, shale layer continuity and reservoir quality. They have a major impact on reservoir recovery mechanism, pressure maintenance schemes and, hence, on field development strategy. A reservoir geological model was developed, therefore, which incorporates sedimentological studies, well log facies analysis, reservoir mapping and detailed seismic interpretation (utilizing a full reservoir core and 3D seismic data).

These studies demonstrate that depositional processes and tectonic setting had a major impact in controlling the thickness, quality and distribution of these sandstone reservoirs, of which the following were particularly significant: (1) storm-dominated shelf sand depositional system, (2) rapid vertical and lateral switches in sand supply, (3) a tectonically unstable, narrow (ca. 5–15 km wide) shelf, and (4) shelf-edge slump scars.