Wave and Tide Influence in Neogene Paralic Hydrocarbon Potential Reservoirs in Sabah

ABSTRACT

Evaluating mixed-energy clastic paralic system requires detailed facies analysis, whichdetermined tide and wave regimes efficacy. This approach is applied to paralic successions in Neogene Sabah basin, utilizing well preserved outcrop data, guarded paleoenvironmental modeling. Series of field excursions revealed that the tidally-wave generated deposits formed significantly thick successions in the central region of Sabah interpreted as paralic depositional system. The overall sedimentary units consist of upwardcoarsening successions interpreted as prograding storm wave-, tidal-influenced deposits, indicating greater variability of coastal processes. Shoreline paleoenvironmental modelling suggests that a large-scale stratigraphic change from relatively tide-dominated to wave influenced facies successions reflects the development of wide embayments with early suppressed energy, the Tanjong Formation and the lower part of the Sandakan formation. These unitsare graded into mainly thick sequence of swaley-hummocky sandstones that erosionally overlain by subordinate tidallywave-dominated successions of planar cross beds. The overlying subset rock units are exposed in Sandakan Peninsula and Meliau basin display a change towards greater storm-wave energy and the development of storm-flood parasequences. Stratigraphic units of paralic systemin Sabah that possibly host potential hydrocarbon reservoirs are shaped by a wide range of depositional processes that reflect the distribution of sediment, the characteristics of the receptacle basin and the dynamics of depositional systems. This formed thick Neogene paralic sequence; with abundant evidences of fair-weather condition signatures in the thick flaser sandstone interbeds indicate significant tidal influence to depict probable hydrocarbon reservoir potential.