Carbonates: A potential exploration target in the Malay Basin

KOH TUCK WAI, Petronas Carigali Sdn.Bhd., Kuala Lumpur

Sotong B-1, a discovery well drilled in 1973 in the Sotong Field (at the southern edge of the Malay Basin) penetrated 292 m (958 ft) of carbonates at the lowermost strata (2761 to 3053 m). The entire carbonate sequence is tight with no hydrocarbon shown. CONOCO, then the operator, considered the top of the carbonates as the top of a pre-Tertiary economic basement. In contrast, the author believes that the age is mid-Tertiary (Oligocene/Miocene) and that the top of the carbonate sequence coincides with a regional unconformity (probable Oligocene-Miocene age) which is clearly evident on seismic record. Three depositional facies can be recognised by means of detailed core-logging and petrographic studies: (1) a crystallized coral packstone facies, (2) a siliceous wackestone/packstone facies, and (3) a recrystallized coral boundstone facies. Source rock studies on the thin interbeds of shales showed the presence of low TOCs, inertinitic and vitrinitic kerogen and a maturity level corresponding to a mean of 0.82% vitrinite reflectance (peak oil generating phase). The hard, brittle and tight carbonates are expected to have extensive fracture porosity and excellent permeability. Dolomitization is rare within the sequence. Seismic data indicate that the carbonate complex may be of several square kilometres in areal extent and may be extensively faulted. As Miocene age carbonates generally have very good hydrocarbon potential in Southeast Asia, the appraisal of this type of carbonate prospect is highly recommended.

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