

Improved hydrocarbon prospectivity and new play concepts in inboard Block SB-301, Sabah

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Sabah Shell Petroleum Company (SSPC) acquired Block SB-301 in July 1997 and has since carried out an extensive regional evaluation to assess the hydrocarbon potential of the 'Inboard' area. Results to date have indicated a better hydrocarbon prospectivity than hitherto believed.

Hydrocarbon exploration activity in the Inboard area of Block SB-301 dates back as early as 1866 when a land well was drilled at "Raffles Anchorage", on the northern tip of Labuan Island. Since then a total of 22 land and 17 marine exploration wells have been drilled in the Block SB-301 Inboard area, resulting in five sub-commercial discoveries (SE Collins, Lokan, Raffles Anchorage, Klias and Tindak).

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The poor exploration success rate in the Inboard area has routinely been attributed to two main factors: the lack of hydrocarbon charge and a lack of seal. However, recent evaluations, involving well data review, satellite slick detection, sea bottom sampling and field work have shown that hydrocarbon charge is not a problem. Instead, hydrocarbon retention is believed to be the main risk. Previous exploration wells in the Inboard area targeted structural plays, with Stage IVA topsets as the primary objective. The wells were usually located on structural highs and ridges, which show complex deformation and therefore had a high risk for seal breach.

The hydrocarbon potential of the Block SB-301 Inboard area lies in the nine identified mini basins. These are relatively undeformed and contain a thick succession of Miocene siliciclastics. The hydrocarbon prospectivity of the mini basins remains largely unknown and untested.

Detailed interpretation of reprocessed and new 2D seismic lines in the Inboard area, together with results of a well review, has allowed the Inboard area to be systematically mapped. A number of new plays have been identified, and these are grouped into 3 age and objective related categories: Pre-DRU Plays, Inter-DRU-SRU Topset Plays and Inter-DRU-SRU Turbidite Plays. The major play types are further subdivided into 16 sub-play types based on the structural and stratigraphic configuration: Buried Hill/Reef, Pondered/Channelised Turbidites, Base of Slope/Slope Fans, DRU Subcrop, Basal Stage IVA Onlap, Transpressional Pop-up/Thrust, Truncation against Shale Injection, SRU Subcrop, Basin Margin Footwall Closure, Up-dip Shelf Edge Pinch-out, Shelf Edge Failure Truncation Trap, Crestal Footwall Closure, Inversion Induced Dip Closure, Wrench Induced Faulted Anticline, Distal Onlaps, Pondered Fan Systems, Channel-fill Deposits and Slump Induced Closure.

Selected examples of these plays will be presented.

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