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Exploration at The Plate Margin: Trinidad Block 25(a)

Deepwater hydrocarbon exploration dominantly focuses on passive margin settings. In Trinidad, however, ongoing and future exploration is taking place at a plate boundary: the southeastern suture between the Caribbean and Atlantic/South American plates. Drilling results by BHP in shallow water Block 2(c) have demonstrated that significant hydrocarbons can be discovered in such a setting.

Most workers believe that the Caribbean plate is stationary with respect to the mantle, while the Atlantic/American plate is moving westwards at two centimetres per year, being subducted underneath the Caribbean plate to the northwest of Trinidad, generating the Barbados accretionary prism, and is currently sliding past the Caribbean plate within and adjacent to Trinidad itself. The extent to which this motion has been purely strike-slip, or has included a significant transpressional element, is a matter of some dispute.

A Shell-led partnership (Shell 55%, Agip 40%, Petrotrin 5%) acquired deepwater acreage along this margin in 1998 (Block 25 (a)). Early evaluation had suggested that shale diapirism has generated most of the highs in the Block, which were therefore seen as non-prospective for hydrocarbons. Thus first exploration efforts were concentrated on the intervening Plio-Pleistocene depotroughs. Recent re-evaluation of the NW portion of the Block suggests that WSW-ENE trending strike-slip movements, rather than diapirism, have been the dominant structure forming mechanism from Miocene times to the present, and that the main highs are cored with older Pliocene and possibly Oligo-Miocene strata. This paper will review the structural development of the Block, in the light of recent drilling activity.