Successful Exploration in a Deepwater Fold Belt: Examples from the Miocene Fan Systems of the Northwest Borneo Active Margin

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Over the past three years, a string of material oil discoveries have been made within the NW Borneo deepwater fold-thrust belt. These successes followed an initial 5-year exploration campaign that had begun with a number of stranded gas discoveries, finished with several dry holes, and showed little evidence of the significant oil charge we now know to exist. This paper examines the factors that brought this reversal in fortunes about, the technology that had the greatest impact, and the lessons that can be learned and applied to help drive exploration success in other frontier basin settings in the future.

One of the key factors that contributed to this "revolution in good fortune" was the decision to focus on regional integration of sometimes-disparate geoscience disciplines: geophysical acquisition and interpretation, regional charge modeling, reservoir palaeogeography, pressure prediction and trap analysis. Altogether these provide a far-greater predictive capability than the sum of their individual parts. Today integration is commonly lauded as a prerequisite for effective petroleum systems analysis from frontier exploration to brown-field development. But integration alone doesn't always guarantee success, nor does an understanding of the petroleum system. In this situation, the paradigm shift that contributed most to this success story was the courage to use the drill bit to challenge old dogmas and prove up new trapping concepts that, if successful, would provide a sizeable prize. One such dogma, for example, was that high-relief "blown traps" are simply future exploration failures. Today we know from recent discoveries that leaky traps are active pressure release valves with varying retention capacity, both temporally and spatially.