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Deep reservoir potential of the North Malay Basin

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Exploration in the North Malay Basin began in the late sixties. By late seventies, a few gas fields have been discovered. The producing reservoirs are restricted within the Groups D and E. Group F generally contains overpressure shales. Only a few wells

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have penetrated the deeper Group H & I. Based on these well data, it is generally thought that the Group D and E sands are the main reservoirs and all appraisal wells only targeted the Group D and E reservoirs. These data are inconclusive because sediment thickness and facies variation both laterally and vertically have not been taken into account. By studying the seismic facies based on recently acquired high quality regional lines and calibrating with the well data, we were able to predict the depositional environments and hence the lithofacies. The Group F sequence generally contains weak, discontinuous reflectors, indicating the predominance of shales in a neritic setting. The Group H & I sequences generally comprise a band of strong, continuous events representing sands, shales and coals in a lower coastal plain environment. Amplitude anomalies in the form of 'gas sag' are also observed within the Group H & I. These observations are also supported by pressure data which suggests an abnormal trend in Group F but returning to normal trend in Group H & I. Coupled with the fact that the 'geopressure threshold' has increased with the improvement in drilling technology, the deeper reservoirs posed new objectives in the North Malay Basin.

In late 1995, the deep reservoir potential was tested by the drilling of a well which targeted the Group H & I horizons in a prospect which contains previously tested, gas bearing shallow reservoirs in the Group D. The well successfully penetrated the overpressure zone in Group F and found new reservoirs in the Group H & I. These 'sweet spots' were tested to contain substantial amount of gas and condensate. The pressure trend in this well has shown that the abnormal pressure trend is encountered in the Group F but it went back to normal trend again in Group H & I where the main reservoirs are situated, as predicted. The results of this well indicate that there is indeed a deep reservoir potential in the North Malay Basin, thereby opening up a new play in the process. Many of these 'sweet spots' below the overpressured interval are yet to be found and tested.