The application of 3D Coherency analysis for stratigraphic and structural interpretation at Larut Field

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Larut Field is located offshore Terengganu, approximately 270 km North-Northeast of Kemaman Supply Base in PM5 contract area.

The Larut Field traps hydrocarbons in the four combination high-side/low-side fault dependent closures. The Main Larut was tested with two wells, the East with three wells, the North with one well and a sidetrack, and the West was tested with one well.

Groups H, I and J sandstones form hydrocarbon-bearing reservoirs that are generally channelized. 3-D Coherency enhances the interpretation of this complexly faulted and channelized field.

In late December 1996, about 8,000 km of full-fold 3-D seismic data were sent to 'Coherence Technology Company' in Houston, USA for Coherency Processing. The data were processed with a three dimensional multitrace coherence algorithm. The number of the parameter set is the half space vertical aperture, which is a 6 msec aperture for 2 msec dataset.

The 3D Coherency data was loaded onto GEOQUEST interactive workstation and the fluvial and tidal channels of the group I and J were mapped by "Horizon Slice" technique. Data enhancement was achieved by adding or comparing various combinations of horizon slices.

Areas of faults can then be identified by its poor similarity measure. Subtle changes in the seismic wavelet showing the extent and the internal details of stratigraphic features can also be resolved using this technique. On a good coherence slice, fault traces will be visible as black lineations.

Coherency analysis is an innovative process that brings a renewed excitement to seismic interpretation by providing accurate maps of the spatial change in the seismic waveform which can be readily related to geologic features and depositional environment. It extracts a vast amount of information from the normal 3-D seismic data volume which may otherwise be overlooked.