

**SEISMIC DATA EVALUATION FOR TECTONO –
SEQUENCE STRATIGRAPHY, STRUCTURAL
INTERPRETATION AND ATTRIBUTE ANALYSIS OF
OFFSHORE INDUS BASIN, PAKISTAN**



By

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ABSTRACT

The Indus Basin offshore is a rift and passive margin basin of Pakistan and north-western India. Murray Ridge is in the west, Karachi offshore on the northern and eastern side whereas Carlsberg Ridge closes the southern margin of the Indus Fan. Using the well data from PakCan-01 and Indus Marine-1B along with published information, seven, age - wise horizons from Cretaceous to Pliocene are marked. Northeast – southwest trending fault pattern has been established in the Indus Fan, whereas, northwest – southeast trend of the faults have been observed along the Murray Ridge. To understand the geometry and geological history of the basin, time, depth and isopach maps have been produced for the respective horizons. Tertiary platform lies in the eastern part of the basin which has been developed over the Mesozoic sedimentary sequence. Central part of the basin has enriched sedimentation associated with the rifting and represents the phase of post-rifting. This particular area of the basin has extension fault blocks, normal faults, listric faults and associated rollover anticlines as the major structures that contain petroleum play prospects. Murray Ridge lies in the western part of the basin which is believed to be going under transform motion along with the Arabian plate. Rifting associated with breakup of India from Madagascar / Seychelles began during Late Cretaceous. On the basis of seismic data, episodic tectono-sequences have been established and correlation has been made. The area is characterized by pre- rift sequences, pre-collision/drift and collisional sequences. Normal faulting in the Miocene is attributed to the sinking and stretching of the basin which is controlled by the listric faulting. Miocene and Plio-Pliocene times are characterized by large-scale channel levee complexes covering the proximal part of the Indus Fan. The attributes analysis including RMS Amplitude, Instantaneous Frequency and Sweetness have been applied and tested on the selected set of seismic data and their effectiveness has been substantiated. Fault patterns were revealed more clearly by the application of variance attribute. Most of the reflection geometries were observed on the RMS amplitude. Attribute analysis and tectono sequence stratigraphy provided a base for the hydrocarbon potential of the area.

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