

Reverse Structures in Accommodation Zone and Early Compartmentalization of Late Jurassic Extensional System, Laminaria High (Northwest Shelf, Australia)

Langhi, Laurent¹, Gilles D. Borel² (1) Lausanne University, Lausanne, Switzerland (2) Museum of Geology, Lausanne, Switzerland

The sediments dynamic and structural development associated with the Late Jurassic rifting phase represent the key factor on the accumulation of hydrocarbon in the Timor Sea. On the Laminaria High (Bonaparte Basin) the main Oxfordian-Kimmeridgian E-W fault systems form structural traps where several discoveries have been made. These E-W fault systems consist of a complex series of sub-parallel faults that connect via relay ramps or accommodation zones. One of these zones is associated with a transverse anticline resulting from the development of a positive flower structure. This secondary reverse structure, associated with significant impedance anomalies, has been revealed by the integration of 3-D seismic interpretation, attribute mapping and classification and classic structural analysis.

The formation of such a reverse structure in extensional setting is related to the evolution of the main associated E-W fault plan which grows by addition of secondary, en echelon, tip faults. Isopach analysis and displacement pattern suggest a zone of differential displacement occurring between the parent and a tip segment of the main associated E-W fault plan and inducing a local left-lateral strike-slip movement associated with transpressional uplifts.

This structure compartmentalizes the early development of the adjacent graben and then controls the distribution of the syn-rift Frigate Fm (Oxfordian-Kimmeridgian). It possibly affects the local migration of fluids as highlighted by amplitude anomalies associated with the domal anticlines and the reverse faults on the top of the Laminaria sandstone (Callovian-Oxfordian).