

AN INTEGRATED GEOSCIENCE AND ENGINEERING EFFORTS LEADING TO INCREASED DEVELOPMENT PLANNING CONFIDENCE

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Successful field development planning requires effective mitigation of geological uncertainties through integration of available G&G data and this has been the case for Jambu Liang faulted anticline (Figure 1) which is currently operated by Petrofac Malaysia. Jambu Liang faulted anticline initiated by Cendor development in 2006 has been very prolific despite initially thought to be marginal. Following the success of Cendor, in 2008/2009 Petrofac resume the appraisal of fault blocks to the west and this appraisal campaign has lead to a potential new development of the West D fault block. For an effective development of the fault block, understanding reservoir characters and distribution especially in the prolific Group H reservoir which is geologically complex, is crucial. Amongst the challenges inherent in the block is how to effectively delineate reservoir quality and sand continuity especially at poor seismic quality areas where most seismic response has been attenuated by presence of shallow gas (Figure 2).

In 2008/2009, appraisal wells were diligently planned and drilled to test seismic bright spots and areas with attenuated reflectors. The wells encountered potentially developable sands and hydrocarbon amounts at the West D fault block within the attenuated areas. Well data acquired such as image logs and core has provided good calibration points at the poor seismic areas addressing issues such as structural uncertainties and depositional trends. Comparing and correlating stratigraphic events in cores and image logs from the wells enables the Group H reservoirs to be better characterized with a robust stratigraphic framework established across the fault blocks. Evidence via integrating well data and seismic (Figure 3) indicates that the fluvially influenced West D and tidally influenced Cendor could possibly belong within one depositional system. This interpretation suggests that the H reservoir may be continuous within the Jambu Liang structure; notwithstanding the geological interpretation for the geologically complex H sand continues to evolve and shall be enhanced from time to time.

It is envisaged that future development opportunities in PM304 will be tied-into the planned Cendor Phase 2 facilities in phases and achieve development economies of scale. West D is planned to be the next field for development post Cendor

Phase 2 based on the ongoing technical assessments stemming from the integrated subsurface geoscience, reservoir engineering and phase development strategy. The Cendor field has been on production since 2006 and experience gained from the field in addition to phase 2 development strategies shall be incorporated to mitigate the inherent subsurface risks and uncertainties throughout the Jambu Liang structure.

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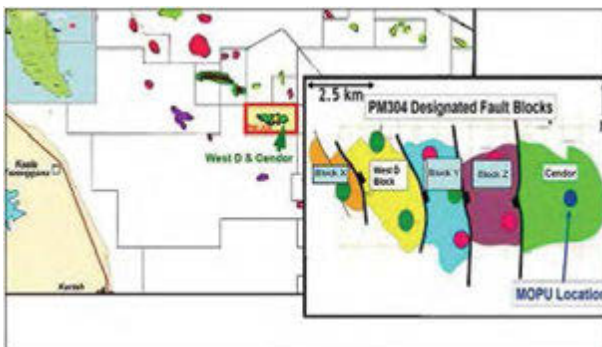


Figure 1: Field location.

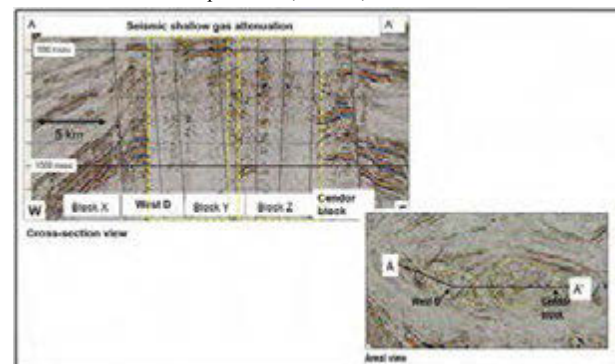


Figure 2: Seismic attenuation.

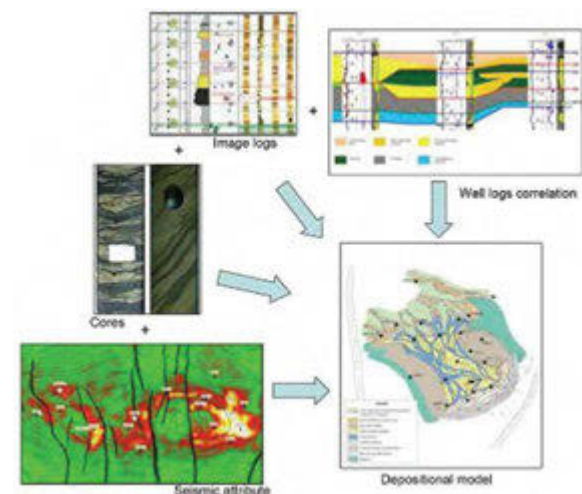


Figure 2: Integrated workflow.