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Hydrocarbon Volume Optimization using Three Dimensional Modelling of Thin Bedded Heterolithic Reservoirs in Malay Basin

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Malay basin located at the east coast of Malaysia peninsula, one of the main petroleum systems in Malaysia. The thin bedded heterolithic reservoir plays a significant role containing oil and gas deposits throughout Malay basin. Three-Dimensional (3D) geological modelling for thin bedded heterolithic reservoir is used to demonstrate the high resolution 3D model that integrates thin bedded sand-shale petrophysical parameter analysis for volume estimation. High resolution 3D model is created from thin-bedded petrophysical log analysis to capture the properties in laminated sand. Results are compared to conventional 3D modelling using normal petrophysical log analysis. This approach includes modelling of the heterolithic reservoirs that captured the lamination of thin bedded sand-shale. The lithofacies, sand and shale volume are modelled together with other reservoir properties to provide flexibility between static and dynamic model updates.

The heterolithic lithofacies observed from the lamination of thin bedded sand-shale shown significant contribution to the total hydrocarbon volume and provided connectivity for better history matching. The approach using high-resolution 3D volume base modelling managed to preserve the thinly bedded petrophysical parameter from thin bed analysis. The 3D heterolithic reservoir model supported the shale volume (VShale) property derived lithofacies relationship which allows the sensitivity analysis, volume refinement and improves mobility within heterolithic reservoirs.

The high resolution 3D volume base model provides a better approach in 3D geological modelling for heterolithic reservoir and to unlock the reservoir potential. The model allows uncertainties analysis for closer uncertainty gap, gives more accurate hydrocarbon volume prediction and provide solution to complex history match.

Biography:

Stanley J. Kampit graduated with BSc (Hons) degree in Earth Science and Master in Petroleum Engineering. Currently, he is pursuing Doctorate degree at University of Technology Malaysia. Accomplished career of 22 years with international and regional experience in O&G industry. Previously worked with Schlumberger, Energy Quest, Petrofac, ROC Oil and currently with KUFPEC as Senior Geologist spearheading the exploration and development project towards enhancing subsurface reservoir characterization, development and exploration program. Vast experience working across different geographies and hands-on field operations as well as exploration and development projects in FDP, FFR, geological evaluation, reservoirs modelling, resource assessment and prospect maturation.