PAPER ID 11

Stratigraphic characteristics in shallow marine reservoirs by utilizing well and seismic attributes data, northern Malay Basin

TSARA KAMILAH[1,*], MAMAN HERMANA[1], LULUAN ALMANNA[1], RIDWAN SAIDI[2], SITI SORHANA SYAZWANI MOKHTAR[1]

[1] Universiti Teknologi PETRONAS, 32610, Seri Iskandar, Perak, Malaysia
[2] BPH Migas, Indonesia
* Corresponding author email address: tsara_17007113@utp.edu.my

Abstract: Shallow marine deposits are part of hydrocarbon reserves which have high heterogeneity rock properties. Understanding the distribution of shallow marine stratigraphy is an essential part of a successful exploration and production strategy. The integration core, well log, and seismic data are essential to determine the detail of facies distribution. This study aims to evaluate the reservoir depositional facies distribution based on sequence stratigraphy concept, seismic interpretation, and seismic attributes thus reducing the risk of oil exploration and improving the success rate. To ensure the objective is achieved, stratigraphy interpretation has been classified using integrating between geological and geophysical data. Based on the characteristic of logs, biostratigraphy and core data, five depositional environments have been interpreted in this study including in-distributary channel, delta plain (flood plain shale), crevasse splay, delta front shale (prodelta), and mouth bar. Whereas, the lithologies that influence the study area were gas sand, brine sand, shale, and coal. Integration of two seismic attributes from post- stack and prestack seismic data; Spectral Decomposition and SQs attributes were used to determine better facies distribution. Both seismic attributes showed the same characteristic that could optimize good facies characterization. Based on the log and SQs attributes, gas has been accumulated in the middle of the field which was a top anticline and showed high SQs values. The interval of the target area generally influenced by regression systems where on the lower formation was dominated by the transition depositional environment and changed to be dominant of delta plain. This was showed in the bellow interval that has occurred mouth bar and in the upper part, the mouth bar deposition was changed to be crevasse splay which has occurred in delta plain.

Keywords: Depositional environment, spectral decomposition, SQs attributes

Warta Geologi (Newsletter of the Geological Society of Malaysia), Vol. 47, No. 1, April 2021