

FSM Based Interpretation of Complex Internal Carbonate Architectures, Facies and Karsts

D.A. ULI¹, Z. Z. T. HARITH², M.H.H. MOHAMMAD^{2*}, T. KANESAN², A. KOLUPAEV²,
LEE YIN YIN² & LIM SOOK FUN²

¹PETRONAS Carigali Sdn Bhd

²Beicip Technology Solutions

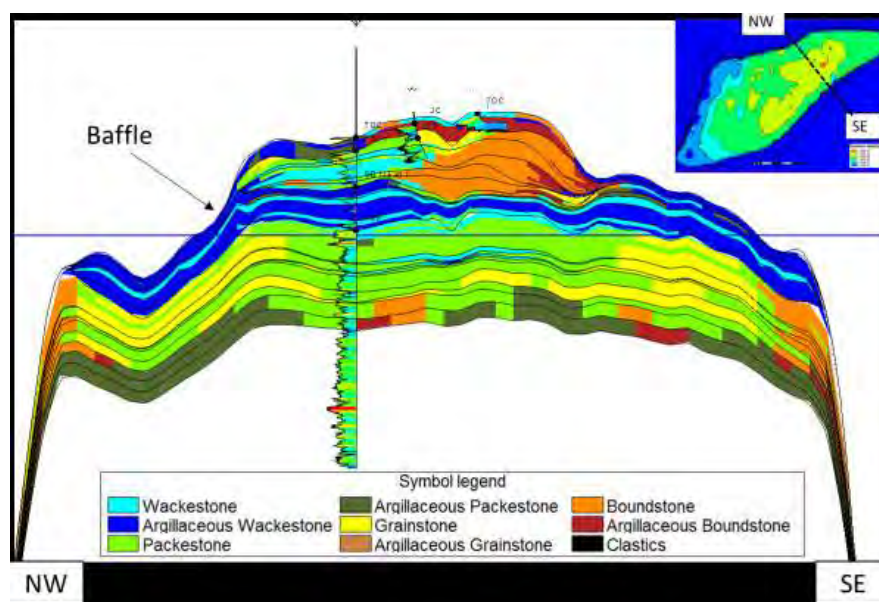
*Corresponding author: hanif.haziq@beicipsecsol.com

The paper discusses an innovative methodology of designing a carbonate reservoir model on a field in Central Luconia for planning further optimal field development and reservoir management & surveillance (RMS) using a Forward Stratigraphic Modelling (FSM) approach. Understanding of carbonate reservoir architecture is important for successful, stable hydrocarbon production and reservoir management plan. This understanding on early stages can help to prevent unpredictably low productivity & recovery, early water breakthrough and design field-customized RMS formulation.

The method used in the FSM approach is to first set the modelling input parameters which mostly represents the main depositional processes such as conditions of wave energy & direction, paleobathymetry, carbonate production rate, eustatic changes, amount of subsidence

etc. These input parameters are obtained from an integrated approach of analysis on all hard data available including understanding of modern analogues to create a conceptual model at time of deposition. Once these input parameters have been identified, the simulation is computed to provide a first-pass model which is validated with hard data. If present mismatch, the input parameters will be tweaked and another simulation is computed. The steps are repeated again until an acceptable match between the model results and the hard data is obtained.

Overall, the FSM model aided greatly in understanding the Internal Reservoir Architecture, Facies distribution and also Karst Interpretation in the field. All this assisted the Geomodeller in construction of a more robust Geological Model which also provides a better fluid flow prediction in the dynamic simulation.



FSM Facies for the entire modelled sequence