Petrophysical Rock Typing to Enhanced Permeability Prediction and Reservoir Descriptions

Wanida Sritongthae[1]

[1]PTT Exploration and Production PLC., Bangkok, Thailand (wanidas@pttep.com)

Abstract

One of the existing challenges for geoscientists and reservoir engineers is to improve an understanding of reservoir descriptions (i.e. fluid flow capacity). This is to define the best representative reservoir properties in a reservoir simulation model. Poorly described reservoir characteristics can lead to a significant impact in reservoir performance predictions and its future production behaviors. The field case studies are 1) Field A of the Jurassic sandstone of a fluvio-deltaic environment that has undergone multiple stages of diagenesis 2) Field B of the Miocene fluvial-lacustrine thinned-bed sand shale reservoirs.

FZI rock typing technique provides an understanding of factors that controlled reservoir quality and fluid flow characteristics. Rock type prediction using the statistical MRGC model with conventional log provides a good matched with the core data. However, predicted rock type becomes less accurate when bed thickness is less than the well log vertical resolution, and mismatching often occurs at the shoulder bed boundaries. Furthermore, the appropriated sets of reservoir properties (permeability, relative permeability, capillary pressure and irreducible water saturation) are well defined for each rock type. This will help to improve reservoir simulation studies for performance prediction and future field development decisions.