Sequence Stratigraphy and Chronostratigraphy of the Malay Basin Unravels New Exploration Plays

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A series of biostratigraphically restrained seismic facies-based regional palaeogeography maps have been constructed for the Miocene and Oligocene of the Malay Basin, offshore Peninsula Malaysia during a regional evaluation study. These maps help to link many fields within a unified geological framework in a manner that allows for better prediction of reservoir/seal pairs, as well as identifying new plays.

Using a sequence-biostratigraphic approach, sequences have been differentiated independently from seismic by using foraminiferal abundance acmes to position maximum flooding surfaces, mangrove pollen acmes to locate transgressive systems tracts, and seasonal/cool climate palynological signals to locate lowstands in conjunction with gamma log trends. Biostratigraphically defined and seismically defined sequences showed close parallels, with both disciplines contributing equally to refining positions of sequence boundaries, and allowing a new biostratigraphically defined sequence-stratigraphic model to be developed for the basin. One particular biofacies type suggested an unusual type of peat swamp-dominated setting and clearly corresponded to the lowstand system tract. This combined sequence stratigraphic and seismic stratigraphic approach to locate sequences and their contained systems tracts is setting the “way ahead” for the future further elucidation of complex correlations in non-marine to shallow marine settings in this area. Examples will be shown.

To illustrate some of the findings of the study, examples of different seismic facies types along with new plays and play concepts will be presented. The new plays include lacustrine turbidites, incised valley fills, canyon deposits, synrift subcrops, possible fractured basement and possible carbonate plays overlying basement. Potential lacustrine turbidite plays occur downdip from mappable deltas within the J (basal Early Miocene) and K (Late Oligocene) Group units, some within half grabens.