High resolution Biostratigraphy for enhanced reservoir correlation in the Bergading field

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Detailed correlation of reservoir sands is critical to field development and reservoir management. High-resolution biostratigraphy can provide this correlation by supplementing regional biostratigraphic markers with local bioevents, recognised from thin shales within reservoir intervals. This high-resolution data set could reduce risks in the drilling appraisal and development wells.

Regional biostratigraphic markers are generally have a resolution of tens of meter or more. Though they permit regional correlation and mapping, they are too broad for correlation at the reservoir scale. Most reservoir objectives occur between these biostratigraphic tops. Therefore, a high resolution technique is necessary.

An example of such application is in Tertiary reservoirs of the Bergading Field, Malay Basin where three regional and 59 semi-regional bioevents are used to enhance reservoir correlation. They comprise 43 palynological events i.e. mangrove and palynofacies events, and 16 marine events. These palynological events are believed to be caused primarily by changes in climate and relative sea level, while the marine events are caused by physical and chemical fluctuations in the sea-water mass through time. Palynomorphs, foraminifera and nannofossils imprint these changes onto the accumulating sediments and yield reproducible signals that can be interpreted and correlated across the field. Recognising and documenting these bioevents are the principles behind high resolution biostratigraphy. When integrated with wireline logs and seismic, such signals produce a more refined correlation and subdivision of sediment packages at the reservoir scale.