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ORAL PRESENTATION

Reservoir Characterization of the Middle Miocene Isolated Ca Voi Xanh Carbonate Platform

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The Ca Voi Xanh (CVX) field is located offshore Vietnam in the Song Hong Basin. Tertiary carbonates of Middle Miocene (Langhian and Serravallian) age form an isolated carbonate platform along the Triton Horst structural high. Shallow water corals and large benthic foraminifera (LBF) are the main constituents of the older Langhian carbonates, whereas the overlying Serravallian carbonates are dominated by deeper water coralline red algae (rhodolith) and LBFs.

The Langhian carbonates can be described by one lithofacies: coral-LBF grainstone / rudstone. Depending on the presence of mud in the samples, two lithofacies types are characteristic for the Serravallian: LBF-rhodolith packstone to mud-lean packstone and rhodolith-LBF grainstone to mud-lean packstone.

Two well-developed exposure surfaces can be identified on top of the Langhian (*Ser1_SB*) and on top of the Serravallian (*Tor1_SB*). Serravallian carbonates show an overall shallowing-upward trend from more horizontally-oriented rhodoliths (encrusted and bored pavements / hardgrounds) at the lower part of the section to large, roundish, irregular rhodoliths towards the upper part of the section. Petrographic thin section, stable isotope (oxygen and carbon), and fluid inclusion analyses confirm a freshwater (vadose and phreatic) diagenetic overprint of the carbonates below the exposure surfaces (sequence boundaries).

Sequence stratigraphic interpretation is based on detailed sedimentolological core description tied to well-log character. A sequence stratigraphic framework was established for the Serravallian carbonates, displaying three third-order depositional sequences (Ser1, Ser2, and Ser3).

A reproducible reservoir rock type (RRT) scheme was developed for the described carbonates, using a combination of depositional environment, diagenetic overprint, and reservoir parameters (porosity and permeability). The Serravallian RRTs are separated into dominantly packstone (RRT1) and dominantly grainstone textures (RRT2 - RRT6). The grainstone RRTs show varying degrees of cementation (RRT2 and RRT3), dolomitization (RRT4), and dissolution (RRT5 and RRT6). The Langhian is characterized by two RRTs, depending on the degree of cementation (RRT3L) and dissolution (RRT5L).

The vertical and lateral distribution of RRTs, supported by seismically derived paleo-reconstruction of the carbonate platform, adequately describes the reservoir. Sequence stratigraphy-keyed RRTs were used as input to the geological (static) model, providing a more detailed reservoir description to the dynamic model.