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### Model development for fractured crystalline rock reservoir, Rang Dong Field, Offshore Vietnam

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**Abstract:** The Rang Dong oil field is located in the Cuu Long basin, offshore Vietnam. The field was discovered by Japan Vietnam Petroleum Company Ltd. in 1994. The field has naturally fractured basement reservoir, which is producing with 14 producers and 7 injectors as of now. One of the production bottlenecks of the Rang Dong field is gas and water break through. High bubble point pressure oil provides secondary gas cap drive system to the reservoir. But control of the liberated gas production by coning is difficult. Deeper completions to avoid gas break through often result in water break through, although there is no significant pressure support from aquifer. Currently, water injection is applied to the field to control reservoir energy and gas cap development. With this situation, development of reliable model to predict field performance is a key technical requirement to manage the field. This paper describes evolution of the reservoir modeling. Generally, characterization of fractured crystalline rock reservoir is more difficult than sedimentary rock reservoir. After some lessons learnt, new approaches such as 3D seismic reprocessing, highly deviated-horizontal wells, extended well testing were applied to fully evaluate the reservoir. These new approaches made a lot of improvement to understanding of the fracture system and resulting simulation models. Integration of different disciplinary data introduced key concepts such as discrete fractures, productive network and dynamic data matching. The fracture data gathered so far were re-evaluated in the view of connectivity to the productive network. The simulation model consists of discrete mega-fracture framework and associated relatively continuous lower order fractures. The model is calibrated with

both static and dynamic data, using such data as seismic, log and well test. This model describes pore space distributions and their connectivity in single porosity system and can re-produce the history of break through and predict the reservoir performances with some practical accuracy in natural depletion condition.

**Key words:** [fractured basement reservoir](#), [fracture network model](#), [discrete fracture](#), [integrated interpretation](#)

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