

## **PETROLEUM PRODUCTION EFFICIENCY IN CARBONATE RESERVOIR**

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### **Abstract**

SUT budget, laboratories, and personnel supported this project with the assistant from DMR personnel for data and reservoir simulation. The objective of the research is to study and estimate the petroleum production efficiency in carbonate rock reservoir, especially for gas reservoir in the northeast of Thailand. In the past, the petroleum production efficiency estimation could not be performed accurately and sufficiently enough due to the data from the concessionaire is limited and confidential. Therefore, it is necessary to study the distribution of porosity and permeability in carbonate rock. The porosity and permeability data has been compiled from literature reviews such as concessionaire results, technical, and conference papers. More than 30 carbonate rock samples were collected from the fields to measure the porosity and permeability in SUT laboratory. The exploration in the NE area was evaluated at 10% risk, the FASPU program was run and resulted as the most likely potential reservoir gas in place at 255 Bcf. Three gas in place size models were simulated for economic evaluation aspect. The tank model reservoir program was developed to compare the reservoir simulation results. For the 255 Bcf gas in place model reservoir simulation, the gas production rate is started with 90 MMSCF/D and lasted for two years then declined about 16% per year until ended at the 20<sup>th</sup> year, with the final rate of 5 MMSCFD. The economic analysis of the production of this case was done and given 18 % rate of return with PIR of 1. The benefit of this study will improve the knowledge of reservoir simulation model including the ability to use the software for petroleum production efficiency approximation and probably promote the petroleum activities in the area.

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