

Reservoir Characterization and geological modeling for methane hydrate-bearing sediments around the 1st Offshore Product

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The eastern Nankai trough is considered as an attractive potential resource of methane hydrates (MHs) and the first offshore production test was performed around the Atsumi-oki in 2013. The objective of this study is to conduct MHs reservoir characterization of methane hydrate (MH)-bearing turbidite sediments around the test site.

The depositional environment of MH-bearing sediments around the production test site is a deep submarine-fan turbidite system (e.g., Takano et al., 2009). To evaluate MH dissociation and gas production performance, we require precise geological models that describe facies variations of turbidite sediments and their corresponding petrophysical properties. In this study, we performed MHs reservoir characterization integrated from well log, core and 3D seismic data, and the 3D geological models were constructed based on geostatistical approach.

In accordance with the geological modeling workflow, (1) layering and gridding along the geological horizon and facies variations (framework modeling) and (2) defining internal properties (property modeling) were performed for the reservoir. Property modeling includes calculation of the distribution of facies and petrophysical properties such as hydrate saturation, porosity, and permeability, which are required as input to the reservoir flow simulation for predicting gas production performance.

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