

Overview of well logging operations at the 1st offshore methane hydrate production test in the eastern Nankai Trough

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Objective

The objective of well logging operations at the 1st offshore methane hydrate production test is to evaluate the formation lithology and reservoir properties. We will construct an integrate reservoir model based on the well logging data for assessing an accurate prediction of production performances for the methane hydrate (MH) production test.

Well logging results

Our focused area around the offshore production test site comprised unconsolidated turbidite formations with a thickness of thin turbidite sand and mud layers according to the previous well logging data. These formations typically show significant washed out after the drilling and its effect of the quality of data is serious issues for the formation evaluation by well logging data.

The well logging results in the monitoring wells indicate that the significant washed out was found particularly in the intervals of thin bed turbidite formations above the reservoir interval and below the BSR(Bottom Simulating Reflectors). However, other intervals exhibit stable caliper logging data, which indicating there are no significant washed out effect even in the WL(Wireline Logging) data. This is probably due to the tight formation of the mud-rich and MH-rich intervals.

Conclusions and Future works

- a) Operation of both LWD(Logging While Drilling) and WL was successfully completed without any significant trouble.
- b) Borehole condition was bad due to the borehole washed out above the reservoir interval and below the BSR. This was mainly due to the unconsolidated turbidite formation with the thin thickness of sand and mud layers. In spite of the washed out effect, reservoir and seal intervals showed good quality of well logging results which correspond to significant tight formations of mud-rich and MH-rich sediments.
- c) In LWD operation, we used pulse neutron generator without radioactive sources. This operation was quite rare in the world and we could successfully obtain fairly good well logging data in the seal and reservoir intervals.
- d) In the drilling of the MH reservoirs in the offshore exploration, the borehole washed out is inevitable because it exists in the shallow marine unconsolidated sediments. Hence, several challenging and technical issues are significantly important for our future study.

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