

2D Multi-component Survey over Methane Hydrate Deposits in the Nankai Trough

Eiichi Asakawa[1]; Peter Ward[1]; Tatsuo Saeki[2]; Takao Inamori[2]; Naoyuki Shimoda[2]

[1] JGI, Inc.; [2] JOGMEC

A small 2D multi-component seismic survey was carried out using the new RSCS (Real-time Seismic Cable System) system in methane hydrate bearing zone in the Nankai Trough in order to delineate the S-wave characteristics of hydrates. The RSCS is an ocean bottom cable system employing a series of 3 component geophones connected with submarine optical cable. One deployment has 18 receivers with a spacing of 50m, which covers 850m line length. The 3 component data was acquired on the seafloor over two well locations and part of a conventional streamer 3D survey. The survey consisted of 3 receiver lines; the first line is intersecting over the well locations with 4 deployments of RSCS, the second and third one are crossing the first line on the each well location with 1 and 2 deployments, respectively. A sea-surface airgun system is used as source with a spacing of 25m.

The quality of the field data is excellent with high vector fidelity. The vertical component data was imaged using P-wave OBS pre-stack time migration, including VP migration velocity analysis. The resulting sections showed excellent agreement with the 3D survey migrated data volume.

The in-line horizontal component data was imaged using C-wave (PS converted wave) OBS pre-stack time migration, including VC migration velocity analysis and updates to the gamma ratios. The resulting C-wave sections showed amplitude anomalies at the BSR level. This fact indicates S-wave velocity anomaly and gives useful information to estimate the rock physics model of the methane hydrates in this area.