

Resources assessment of methane hydrates in offshore surround Japan

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Japan Oil, Gas and Metals National Corporation (hereinafter, JOGMEC), as a member of research group for resources assessment of Research Consortium for Methane Hydrate Resources in Japan (MH21), is conducting resources assessment of methane hydrates (hereinafter, MHs) in offshore surround Japan.

The seismic interpretation of migrated profiles of two/three dimensions-seismic surveys acquired by geophysical vessel Shigen that JOGMEC owns, are carried out. MHs are being extracted to search the Bottom Simulating Reflector (herein after, BSR) and assumed sand intervals, which is characterized high-amplitude reflected waves. In addition, based on the knowledge of the MHs are correlated to high-velocity, the comparison between extracted MHs and the high velocity anomalies in the velocity-analysis-profiles run in two-dimensions-seismic-survey lines, or the three-dimensions-seismic-survey area carrying out high-density-velocity analysis. This introduced example is an example of seismic interpretation in the data of three dimensions-seismic-survey area, which have not drilled.

The characteristic in this area shows fold structure, which undulates severalfold. In addition, the gaps of the reflected waves can interpret faults, which does not show the large displacement, are seen. Clear velocity contrast to assume BSR and the high-velocity anomaly above BSR are confirmed in the high-density-velocity-analysis profiles.

Multiple reflector of assumed sand facies is estimated by the results of seismic interpretation in the migrated profiles of three dimensions seismic survey, and each flow shows different sedimentation environment and geological age. In addition, heterogeneity of lithology (different grain size and sand/ mud ratio) is suggested by the variety of amplitude and velocity distribution in the high-density-velocity-analysis profile. In the high-density-velocity-analysis profile, characteristic high velocity anomalies in the sand facies above BSR are visible, but these are estimated MHs because those anomalies are shown in the sand facies above BSR.

As above, even the area has not been drilled, the existence of MHs can be estimated from seismic interpretation of the migrated profile of the seismic survey, and the velocity distribution of the high-density-velocity-analysis profile. And it is expected that these results become useful information for the plan of the future drilling programme. This introduction is the example of the three dimensions seismic survey area; hence, it is a useful information for a programme of three-dimensions-seismic-survey plan by performing similar interpretation in two-dimensions-seismic-survey lines.

Keywords: Methane hydrate, 3-D seismic reflection survey, High density velocity analysis