

Overview of R&D of Integrated Monitoring System at Methane Hydrate Production

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Research Group for Environment Impact which has been conducted by Engineering Advancement Association of Japan (ENAA) has been continuing R&D of Integrated Monitoring System at Methane Hydrate Production for the establishment of the element technology concerning environmental assessment.

The Integrated Monitoring System aims to measure the environmental influence factor that becomes an object in the environmental assessment done before it begins to produce MH continuously to produce, and to supply necessary data for environmental assessment on methane hydrate exploitation under the seabed in the deep sea of more than 1000 m depth in Japanese EEZ.

Japanese government (The Ministry of Economy, Trade and Industry) has had a national project, conducted by Research Consortium for Methane Hydrate Resources in Japan (MH-21), which has been promoting methane hydrate exploitation under the seabed in the deep sea of more than 1000 m depth in Japanese EEZ, based on Japan's Methane Hydrate Exploitation Program that was issued by Advisory Committee for Natural Methane Hydrate Exploitation Program in 2001.

In this thesis, it introduces the outline of the result of the R&D concerning the integrated monitor system as follows.

A) The measurement object was arranged based on the finding that had been obtained with R&D that had begun in 2001. It is an event with the possibility of influencing a peripheral environment besides in the peculiarity to the MH development in a word.

B) The area of the gas field for the MH production of one assumed about 10km. Because the setting of the environmental condition of the installation sea area is needed in the design of the Integrated Monitoring System, the sea area in Nankai-Trough that had been prospected in the past was selected and examined.

C) The event that should be observed in the Integrated Monitoring System is thought to be generated also in an existing oilfield and the gas field almost of that. But a feature event is feared to the MH development of the transformation of the leakage of the methane, the leakage of the resolution generation water, and the stratum etc. on the other hand. Therefore, a feature risk in MH development was examined.

D) The Requirements Specification of the Integrated Monitoring System was arranged. For instance, various situations are expected when of the methane leakage phenomenon, a small amount leaks slowly, and it leaks rapidly in large quantities. The detection at the early stage of the methane leakage can be expected to become possible by observing the change in the density of the methane. The measurement of the background density of the methane is thought that accumulating the in-depth data is necessary for understanding the change as more certain.

E) To satisfy the demanded function, the composition of the integrated monitor system was examined. For instance, the device is set up at suitable intervals like the grid about the density of the methane in seawater, and to measure it from the vicinity of bottom of the sea to an inside layer, the installation position of the sensor is decided. It observes continuously in the fixed point with this device, a three-dimensional mapping of the distribution of the density of the methane and the profile in the vicinity of bottom of the sea of the entire object sea area are made, and the change is observed. Accuracy good can be interpolated by executing a regular measurement by using AUV etc. about the area where the sensor interval is rough.

The development of a system and various sensors is scheduled to be advanced as project phase 1 final fiscal year aiming at the success in phase 2 including the oceanic production test in 2008.

Moreover, the system will be improved according to the progress of the R&D by other groups and subgroups in order to prepare enough for both ocean production test in phase 2 mentioned above and full production in the future.