

STUDY SPECIFICATIONS

A study on site survey procedure for offshore methane hydrate production test

1. Title of Study

A study on site survey procedure for offshore methane hydrate production test (“Study”)

2. Objective of Study

Offshore production test of methane hydrate will be conducted in FY2012 in the eastern Nankai Trough area offshore Japan. The test will be conducted using system which is similar to the DST(Drill Stem Test) in oil and gas industry. The test system will be composed of the subsea drilling facilities including a drilling vessel, riser pipes and BOP (Blow-Out Preventer). Methane hydrate-bearing layers in production test area are unconsolidated sediment lie in 200-300m below seafloor and more than 700m water depth. Depressurization method will be applied with intensive drawdown (60-70%) as a production method.

To ensure the safe operation, site survey should be conducted. In addition, the survey results will be used to receive hazard insurance on the offshore production test. The site-survey before the test should be conducted matching to the test system mentioned above, and suitable for the geological, meteorological and oceanological conditions of the eastern Nankai Trough. Because the offshore production test for methane hydrate-bearing sediments has never been conducted in the world, investigation and summarization of the precedents of the site-survey on the conventional oil and gas development in deepwater should be conducted, and the specification and implementation plan of site-survey procedure for the offshore production test should be constructed.

3. Scope of work

In order to achieve the objective set out in paragraph 2 above, the contractor shall perform the research, and prepare and provide results to Methane Hydrate Research Project Team in Technology Research Center of JOGMEC (“JOGMEC-TRC-MH”) with a written report on the subjects described in paragraphs 3.(1)-3.(3) below.

(1)Investigation and summarizing of the precedents of the site-survey on the conventional oil and gas developments in deepwater

Investigation and summarization of the precedents of the site-survey on the conventional oil and gas developments in deepwater as a basic dataset to construct the specification and implementation

plan of site-survey methods for the offshore production test.

(2) Identification of the site-survey items for the offshore production test

Identify the site-survey items for the offshore production test including following;

(a) Seafloor condition survey

High-resolution seafloor condition surveys using deep-towed side scan sonar etc.

(b) Sub-surface acoustic survey

Sub- surface acoustic survey using high resolution sub-bottom profiler etc.

(c) Geotechnical and geomechanical surveys

In-situ CPT (Cone Penetration Tester) or the analysis of the coring samples for the stability of subsea facilities and wellbore

(d) Survey of current velocity and direction

Survey of current velocity and direction for analysis of riser-pipe dynamic behavior

(3) Construction of the site-survey procedure and plan for offshore production test

Propose the necessary survey items and procedures for offshore production test planned in FY2012 with accordance to the existing regulations and industrial standards. In addition, propose the schedule of site survey for the test, considering the availability of survey ship.

JOGMEC already has the dataset of high resolution 3D seismic exploration around the test area, so there is no need to implement seafloor geography survey using multi-narrow beam echo sounder and shallow hazard survey based on high resolution seismic exploration.

4. Deliverables, Duration of Study

Deliverables shall include and satisfy all of the following items:

(1) Three copies of Final Report shall be completed and delivered to JOGMEC-TRC-MH no later than 31st March, 2010.

(2) Three copies of Electronic Files (CD or DVD) of the Report shall be delivered to JOGMEC-TRC-MH no later than 31st March, 2010.

6. Methodology

The contractor shall carry out all work related to the Study with such care and skill as could reasonably be expected from a professional providing the same or similar services and in conformance with industry practices and standards. The work should be done under the close cooperation with the MH21 (the Research Consortium for Methane Hydrate Resources in Japan) researchers to exchange knowledge and improve understanding effectively through workshops or seminars. The presentation of the final report should

be held in a JOGMEC office in Japan.

7. Workplace

The workplace shall either be the contractor's workplace or a place designated by JOGMEC.

End of "Study Specification"