DEVELOPMENT OF NGH PELLET PRODUCTION PROCESS
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ABSTRACT
Mitsui Engineering & Shipbuilding Co., Ltd. (MES) has been developing gas ocean transportation chain by means of Natural Gas Hydrate (NGH) Pellet. The target capacity is 1 million tons per year of Natural Gas transportation (NGH 24,000 tons per day). The chain consists of NGH pellet production process, storage, carrier, and re-gasification process. NGH pellet production process has 5 processes; formation, dehydration, pelletizing, cooling and depressurizing.

With 5 sections, MES has been constructed the experimental plants for process development (Process Development Unit: PDU) and the R&D facility for scale-up of the process (Bench Scale Unit: BSU) and the demonstration plant for small industrial scale (Yanai Project Demonstration Plant: capacity is 5 ton of NGH per day which is referred to MES’s another paper).

MES has continued their experimental operation. During the operations, MES obtained and analyzed data. At the same time, MES has also experienced the difficulties. MES has recognized the problems for the commercial scale to break through are: high-speed formation, high-speed dehydration, high-speed pelletizing, low-energy depressurization and plugging troubles inside pipe.

Now MES has analyzed process control data, stream data and so on that is necessary for preparing process design package (PDP) of the next pilot plant for the capacity of 100 ton of NGH per day class. To be compact and high-speed NGH Pellet production, this PDP is for the verification purpose of 6,000 ton of NGH per day class of the commercial plant.

In this paper, an outline of MES’s Research and Development (R&D) on NGH pellet production process and the pilot plant, PDP and steps toward commercial plant are described.

Keywords: feasibility study, base case pilot plant, Process Design package, scale-up

INTRODUCTION
Mitsui Engineering & Shipbuilding Co., Ltd. (MES) has been investing in research for NGH supply chain as shown in Figure 1.[1]

MES also has been developing the technology, consisting of NGH production process, carrier, and re-gasification process since 2001, and as it constructed the experimental plant for process development (1st generation production process adopted: Process Development Unit: PDU)[2] and the research and development facility for scale-up of the process (2nd generation production process adopted: Bench Scale Unit: BSU) and continued their experimental operation.

Figure 1. Natural gas ocean transportation chain by means of NGH pellets

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