ABSTRACT

Recently, a joint project that started in 2006 as a demonstration project of Natural Gas Hydrate (NGH) overland transportation was completed in Japan by Mitsui Engineering & Shipbuilding (MES) and The Chugoku Electric Power (CEP), supported by New Energy and Industrial Technology Development Organization (NEDO). NGH is expected to be one of new media to store and transport natural gas by taking an advantage of its unique characteristic of meta-stability under atmospheric pressure and around 253K. NGH demo production plant with production capacity of 5 tons of NGH pellets per day with a loading facility was constructed in Yanai LNG Power Station of CEP where vaporized LNG was used as raw material for NGH production. Produced NGH in pellet shape around 20 millimeter in diameter per unit were transported by special-designed NGH container trucks to two users re-gasification sites located approximately 100km away from Yanai, one is a 280kW gas engine power generation, the other is city gas testing site simulating a housing complex. Though the demo production capacity was too small for commercialization, MES and CEP verified the entire NGH overland transportation chain from production, transportation, storage and re-gasification in addition to NGH technical viability in such a scale. Also, in course of this project, MES acquired process design data and know-hows, which are necessary for preparing process design of the next pilot plant with the capacity of 100 tons of NGH per day class, which is meant for verification purpose of 6000 tons of NGH per day class commercial plant. In this paper, an outline of the overland demo project and the results of operations are shared. Further, the present status and roadmap toward commercialization are explained.

Keyword: overland transportation, NGH pellets, re-gasification, city gas

INTRODUCTION

Mitsui Engineering & Shipbuilding Co., Ltd. (MES) has been continuously investing in development of NGH supply chain technological segments: production, carrier, storage and re-gasification to establish the entire supply chain, targeting to monetize stranded natural gas reserves around the world as its final goal of commercialization. In other words, MES is aiming at monetization of stranded small to medium gas fields by establishing economical marine transportation of natural gas by means of NGH. NGH does not require cryogenic conditions like LNG when produced, transported and stored. Therefore, for example, although NGH supply chain needs more carriers than that of LNG due to its smaller density of natural gas in the same volume, which inevitably results in higher cost in...