

CPJ Seminar on LNG Handling Technologies for Petrovietnam

A Customized Program-Japan on Gas Processing for LNG was held for a group of participants from Petrovietnam, from November 12 to 22, 2012.

1. Background and Overview

JCCP organized a CPJ seminar for a group of selected engineers from Petrovietnam in response to a strong request from the company, as it pushes forward a plan to construct the country's first LNG receiving terminal by 2015.

The curriculum was designed based on prior



At Kobe Steel, Ltd.

consultation and mutual consent between Petrovietnam and JCCP regarding the detailed content of lectures. The group was comprised of 15 participants, including two LNG procurement and marketing officers and 13 engineers. Three were from the head office, six from Petrovietnam Gas Corporation (PVGAS), and two each from Petrovietnam Engineering Corporation (PVEngineering), Petrovietnam Oil Corporation (PVOil) and Binh Son Refining and Petrochemical Co., Ltd. (BSR).

2. Course Planning

To provide practical training as requested by Petrovietnam and allow as many visits as possible to LNG-related facilities, offsite training at six facilities was fitted into the program. They included the following: the Yokohama Head Office of Mitsubishi Heavy Industries, Ltd.; Yokohama Head Office of JGC Corporation; Kobe Steel, Ltd. Takasago Works; Kansai Electric Power Co., Inc., Himeji No. 1 Power Station; Osaka Gas Co., Ltd., Himeji Plant (LNG terminal and production and shipping terminal); and Kawasaki Heavy Industries Co., Ltd. Sakaide Works. At Sakaide Works, arrangements were made so that the participants could visit an LNG vessel before it goes into service.

At JCCP Headquarters, lectures were given by external lecturers who were highly popular in regular courses held in the past: Mr. Takayuki Nogami from JOGMEC and Mr. Tomoya Sato and Mr. Yoshihiro Yamaguchi from Chiyoda Corporation (LNG tank/LNG liquefaction technology).

3. Content

(1) Japan's Oil Industry

This lecture covered Japan's oil industry in general, including primary energy trends, the status of oil among all energies (share and importance of oil), the physical distribution of crude oil and products and their import to sales, oil distributors in Japan and their respective share, and the location and capacity of refineries operated by each distributor.

(2) LNG Tank Technologies / LNG Liquefaction Technologies

Lecturers: Mr. Tomoya Sato & Mr. Yoshihiro Yamaguchi, Chiyoda Corporation

Mr. Sato gave a lecture on LNG tank technologies in the morning, and Mr. Yamaguchi gave a lecture on

liquefaction technologies in the afternoon. The lecture on LNG tank technologies provided detailed information on design specifications and standards and the inner structure of each type of tank, and invited the participants to ask questions about various aspects of LNG tanks to reconfirm what they learned from practical training.

(3) Trends in the Global LNG Industry

Lecturer: Mr. Takayuki Nogami, JOGMEC

Mr. Nogami first lectured on the role and functions of JOGMEC and the present state and future outlook of the LNG industry. He captured the participants' interest and attention with his lecture, which he also provides at universities and on cable TV programs and constantly keeps updated. The participants seemed fascinated to learn about the future outlook of global LNG projects and about the demand-supply balance of LNG, and appreciated the ideal and rare opportunity to view the entire world from a broad perspective.

4. Offsite Training

(1) Mitsubishi Heavy Industries, Ltd., Yokohama Head Office

The participants first received an introduction of the company, followed by a lecture on LNG gas boilers, turbines, and power generators, and expressed particular interest in the introduction of case examples of boiler problems and the latest inspection methods for their prevention. At the Mitsubishi Minatomirai Industrial Museum, they studied a miniature model of the IGCC (integrated gasification combined-cycle) technology in the Environment/Energy Zone and learned about the company's advanced technologies with keen interest.

Additionally, the company's location in the Yokohama Minatomirai district offered the participants an excellent view and a taste of the excitement of Japan's modernistic model city.

(2) JGC Corporation, Yokohama Head Office

JGC Corporation gave an introduction of the company, followed by a lecture on the worldwide installation status of LNG plants; a second lecture on the physical properties of LNG and other basic matters, details of the LNG chain from the gas field to the liquefaction plant process, and the transportation and flow of LNG up to the receiving terminal; and a final lecture on the details of LNG receiving terminal facilities. Coming from a company that has vast

experience in designing LNG plants and made abundant achievements in implementing LNG projects particularly in the Middle East, information about the latest status of LNG plant construction and other broad aspects of LNG plants carried significant weight.

(3) Kobe Steel, Ltd., Takasago Works

The participants first received a lecture on various compressors, including the BOG (boil of gas) compressor that is one of Kobe Steel's specialties, followed by detailed descriptions of the structure of an LNG vaporizer and a brazed-aluminum heat exchanger called ALEX. They then had the opportunity to take a close look at each work process on the shop floor. The participants seemed to appreciate learning about the latest technologies related to LNG heat exchangers.

(4) The Kansai Electric Power Co., Inc., Himeji No. 1 Power Station

The participants visited the Himeji No. 1 Power Station, which is equipped with a combined-cycle gas turbine, to actually observe the equipment and facilities of an LNG-fired thermal power plant, the largest LNG consumer in Japan, and to study their operations and maintenance.

They seemed to appreciate the opportunity to carefully examine and receive detailed explanations of the high power-generating efficiency of the combined-cycle gas turbine technology.

(5) Osaka Gas Co., Ltd., Himeji Plant

Himeji Plant has the world's largest surface-type LNG tanks, and shares an LNG receiving pier with its neighbor, Kansai Electric Power Company's Himeji No. 1 Power Station. For this reason, two receiving pipelines extend from the pier to Kansai Electric and to Osaka Gas. An interesting lecture was given on the management and operation of LNG tanks and the supply of LNG to the market, and elicited many questions from the participants.

(6) Kawasaki Heavy Industries Co., Ltd., Sakaide Works

Kawasaki Heavy Industries is Japan's representative LNG vessel manufacturer and the world's leader



At Kawasaki Heavy Industries' Sakaide Shipyard

particularly in the field of older Moss-type tanks. The participants had the opportunity to tour the manufacturing site where aluminum alloy panels are assembled into parts of a specific size and forged into spherical tanks. The works was visited for the first time in a JCCP training program, and was highly appreciated by the participants, who also enjoyed touring an LNG ship immediately before casting off.

5. Observations

This CPJ seminar ended successfully without any particular mishaps, and the program achieved its intended results. All 15 members from Petrovietnam completed their entire training agenda with diligence and concentration.

The participants were a relatively young group averaging 33 years of age, and were strongly motivated to learn about LNG technologies, as Petrovietnam has plans to soon launch a new project. Petrovietnam requested the implementation of a training program with an eye toward the construction of the company's first LNG receiving terminal (Thi Vai: 100,000 KL capacity LNG tank; basic design of the receiving terminal to be undertaken by Tokyo Gas Engineering Co., Ltd.) slated to be completed in 2015. The seminar was thus implemented in support of this project. Its successful implementation with the participation of young engineers from Petrovietnam is expected to prove highly meaningful to the future of the energy industry in both Vietnam and Japan.

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