CPJ on the Latest Power Turbine and Boiler Technologies for Vietnam

1. Background

The recent customized program in Vietnam came to be implemented against a background of circumstances in which the efficiency improvement and increase in power supply capacity of Petrovietnam's power plants have become issues of particularly high priority among the company's various operations, as also mentioned in the previous issue of *JCCP NEWS* (No. 117, January 2014).

Based on this understanding, JCCP planned and organized a two-part program, with the first part comprised of a Customized Program-Overseas (CPO) in Ho Chi Minh City held by a Japanese expert, and the second part comprised of a Customized Program-Japan (CPJ) held with the cooperation of representative plants and businesses in relevant technical fields in Japan. The program was implemented as scheduled, according to plan.

2. Overview

The second part of the program was designed as an 11-day seminar, and was held from October 1 to 11, 2013. The offices and plants of leading Japanese companies in their respective technical fields cooperated in providing offsite training, and included Shin Nippon Machinery Co., Ltd. (Kure City), Woods Corporation Headquarters and Plant (Kobe City), Osaka Gas Co., Ltd. Senboku Power Station, Torishima Pump Mfg. Co., Ltd. Head Office and Plant (Osaka Pref.) and Mitsubishi Heavy Industries, Ltd. Kanazawa Plant (Yokohama City), all of which are located in a large-scale industrial park representative of Japan or in neighboring districts.

As stated earlier, the main theme of the course focused on increasing efficiency and preventing loss in Petrovietnam's power plants, facilities and equipment, and on enhancing plant reliability. As the theme pertained closely to actual operations, the group of participants (15 members) was selected mainly from among facility and machine engineers in virtually all offices and refineries affiliated with Petrovietnam, and included 10 engineers from Petrovietnam's power plant department.

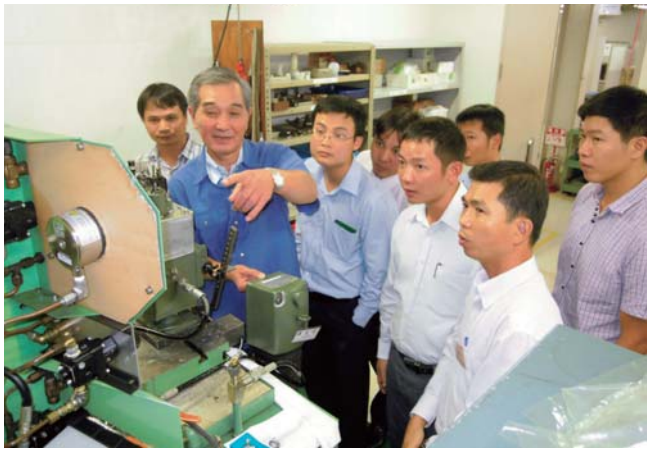
Opening ceremony (group photo)

(1) Governor functions and reliability improvement technology

Woods Corporation, Head Office and Plant

Woods Corporation is an exclusive technical service provider of Woodward Governor, a company that boasts a worldwide business base. A content-rich lecture was provided that reflected the fact that governors are an important control mechanism (and speed-regulating function that can be regarded as the brain) for power turbines. In response to the participants' many questions, precise knowledge and explanations were provided by a specialist in the field.

Using a governor to regulate the speed of power tools is an indispensable technology to rotary machine engineers. By receiving a lecture on operating theories



Training at Woods Corporation

followed by practical training that included actual disassembly and assembly operations, the participants were able to acquire hands-on knowledge of the control mechanisms of various governors.

(2) Rotary equipment inspection and diagnosis technologies

Shin Nippon Machinery Co., Ltd.

Among the company's wide lineup of production machines, steam turbines are one of its primary products, and are exported to the Dung Quat Refinery in Vietnam and to countries around the world. The participants were thus fascinated to be able to observe up close the steady production process of actual machines using advanced technologies, as they traveled through the vast site of the plant located along the coast of the Seto Inland Sea. Furthermore, as power machines that are familiar to the participants were among the machines that were brought to the plant for repair, the participants asked a host of questions and boosted the interactive mood of the program.

The lecture was based on extensive examples of the company's products and machines. They included many examples of facilities that boast an extensive delivery record to Vietnam and other oil-producing countries in Asia that are recently experiencing remarkable growth in their market economy, and captured the enthusiastic attention of the participants. A lecture was also given on various repair technologies from an officer in charge of technical services, with reference to a number of specific examples.

(3) Power plant pump reliability improvement technology

Torishima Pump Mfg. Co., Ltd., Head Office and Plant

At Torishima Pump Mfg., a representative facility and equipment manufacturer that manufactures and supplies power plant pumps to overseas customers, a specialist in a relevant field gave a presentation on the reliability improvement of high-performance pumps, which is one of the most versatile fields for mechanical engineers, based on the company's wealth of experience.

Information about pumps was provided in an easy-to-understand manner based on familiar topics, such as the fact that electricity to drive pumps accounts for approximately 15% of Japan's total electricity consumption (1,150TWh), and therefore that total electricity consumption by pumps equals four to five times the amount of electricity produced by Fukushima

At Torishima Pump Mfg. Co., Ltd.

Daiichi Nuclear Power Station. In relation to this information, case examples of the implementation of energy-saving technologies through high-efficiency power plant pumps attracted particularly strong attention of all the practical training themes selected appropriately from among the large variety of elemental technologies.

As is well known, an especially conspicuous trend that has been observed in Vietnam in recent years is the construction of new power plants in response to a rapid increase in electricity consumption. Thus, a particularly heated Q&A took place in regard to practical technologies that would allow newly constructed plants to deliver even greater power generating efficiency than conventional plants.

(4) Practical technologies for natural gas-fired power plants

Osaka Gas Co., Ltd., Senboku Power Plant

This was the first time Senboku Power Plant was visited by a group of training participants from Petrovietnam. Boasting the latest combined cycle system among all other natural gas-fired power plants in Japan, it delivers a power generation efficiency (57%) that is on par with Petrovietnam's newest power plant. The participants asked many questions about the similarities and differences with the power plants where they work (Ca Mau, Nhon Trach), and expressed particularly focused interest in comparing cooling water systems. In Osaka Gas's power plant, cooling water is circulated by operating two cooling towers, whereas at the Nhon Trach power plant, water is drawn from an abundant river and used in a once-through cooling system.

(5) Latest combined-cycle generation technologies

Mitsubishi Heavy Industries, Ltd.

Mitsubishi Heavy Industries gave a lecture on its

abundant experience and accumulation of technologies as a representative manufacturer and worldwide supplier of steam turbines and steam generating boilers, the principal engines of power plants. Manifesting the company's abundant experience, the lecture provided a summary of a broad range of topics, including inspection technologies in general and repair examples related to various facilities and equipment that make up high-performance boilers and steam supply systems, which support the foundation of high-performance power generation systems.

In a tour of a production plant, where the processing and assembly of various facilities and devices of steam generating boilers for steam turbines were in progress, the participants asked many questions about the production methods and status of inspection at the finishing stage of such facilities, which also play important roles in power plants where they work.

Additionally, an introduction was given of the company's initiatives for strengthening its overseas technical service framework in an effort to enhance facility and equipment reliability, which is key to the maintenance and management of facilities and equipment for overseas customers. Such concrete explanations that directly pertain to actual operations were especially appreciated by the participants.

3. Summary

The course was implemented during a period of good weather. Even for the Vietnamese participants who are not used to the cold, the weather was comfortable enough for them to maintain their health, and the entire course program was completed as scheduled.

At Mitsubishi Heavy Industries, Ltd.

In consideration of the fact that the course schedule coincided with the period when the largest number of JCCP regular courses are simultaneously implemented during the year, steps were taken to avoid any conflicts in the reservation of lecture rooms. As a result, no unexpected occurrences arose from the congested schedule, and the course was fortunately completed without incident.

Having completed the course successfully, JCCP has renewed its commitment to continue planning and implementing timely customized courses to accurately respond to needs in oil-producing countries and further develop its personnel exchange program.

<by Shintaro Miyawaki, Training Dept.>