Project Finding Program for Development of a Refinery Maintenance System in Saudi Arabia

During the 1970s and 1980s, Japanese companies engaged in the construction of numerous oil refinery facilities in the Middle East region. After supporting many years of operations, however, the maintenance of these refineries has become a focus of concern among national oil companies in Middle East oil-producing countries. As JCCP has commenced a technical cooperation project on maintenance of oil refinery facilities in Kuwait and has received high praise for it, possibilities for its lateral expansion were sought.

With the aim of expanding its implementation of technical cooperation projects, JCCP approached Saudi Aramco and discussed preparations for launching a technical cooperation project on the maintenance of refineries and oil refinery facilities. Following these preparations, JCCP commenced the "Project Finding Program for Development of a Refinery Maintenance System in Saudi Arabia" as part of the FY2013 project finding program.

To enhance efficiency, JCCP is implementing the program in consultation with Saudi Aramco's Inspection and Corrosion Best Practice Committee, as well as with Aramco Asia Japan K.K.

The program features risk-based inspection (RBI) technology. In RBI, the risk of plants and plant equipment is analyzed in blocks, and inspection and repairs are performed in accordance with the analysis. This inspection method has begun to be used by the plants of major oil companies, and is also being adopted by petrochemical and power plants. Given the worldwide dissemination of the technology, it has been introduced to general refinery facilities at Saudi Aramco as well.

As RBI is based on examples of statistical analysis and accident cases, it is not applicable to LNG and LPG facilities, at which accidents very rarely occur. Additionally, LNG and LPG facilities are not legally subject to overhaul inspection in many countries, so it is common practice around the world not to conduct overhaul inspection even after 20 to 30 years of operation after construction.

However, from the perspective of facility management, it is unsafe not to subject tanks to overhaul inspection. Therefore, the introduction of an inspection method to take the place of overhaul inspections was sought. Meanwhile, Japanese companies have developed an RBI system for LNG and LPG tanks and related facilities, and have begun to introduce the system in Japan.

After consulting with the Inspection and Corrosion Best Practice Committee about introduction of the RBI technology, arrangements were begun for its introduction to propane and butane tanks at the LPG shipping terminal in Juaymah.

In fiscal 2013, a kick-off meeting was held with engineers from Saudi Aramco's Juaymah LPG Terminal in May, followed by subsequent meetings in July and September. JCCP took the occasion to explain the main features of the RBI technology, in addition to clarifying the objective and providing an overview of the planned project.

At the LPG terminal, propane and butane tanks are subject to overhaul inspection every ten years, as the structure of the tanks differ from those in Japan, but an

Discussion at the Jeddah Refinery

Discussion at the Juaymah LPG Terminal

efficient inspection method was sought to ensure safe operation of tanks that have been used for more than 30 years. Saudi Aramco engineers thus showed strong interest in applying the RBI technology to LPG tanks, as proposed by JCCP.

As a result of repeated consultation with engineers from the Juaymah LPG Terminal, JCCP received a request not only for the application of RBI to LPG tanks, but also for technologies to inspect corrosion under insulation (CUI), a problem plaguing LPG shipping pipelines.

The schedule hereafter includes the implementation of the title program beginning in fiscal 2014 as a joint undertaking between Saudi Aramco and JCCP, and the signing of an agreement on implementation of the actual project with Saudi Aramco.

At a recent meeting with Saudi Aramco, a graduate of a JCCP regular course, who was among the members of the meeting, helped lead the discussion on promoting the technical cooperation project. Taking a cue from this, JCCP plans to organically combine its training program and technical cooperation program for greater promotion of both operations.

<by Yukio Nobayashi, Technical Cooperation Dept.>