

# JCCP NEWS

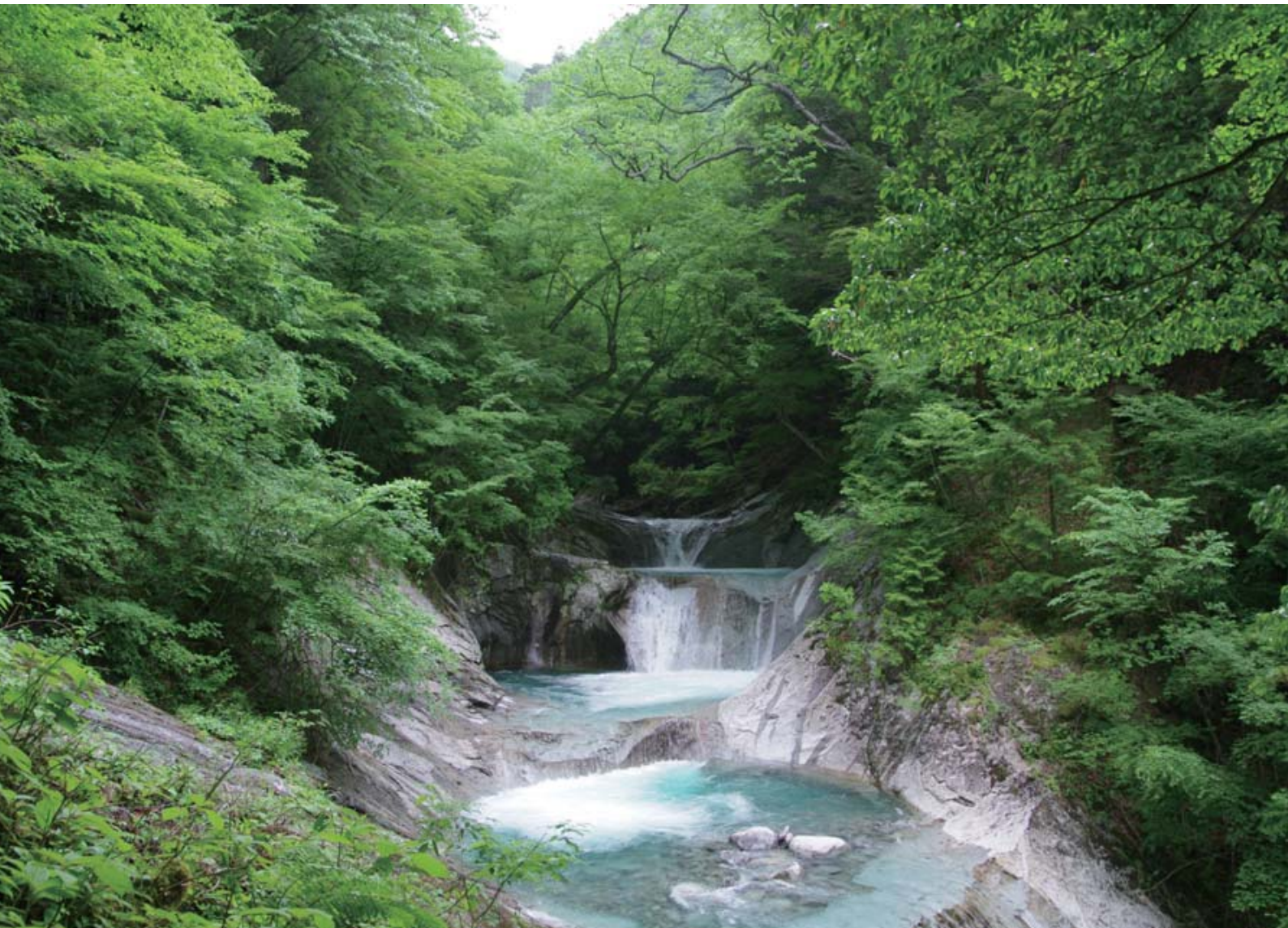
No. 113

2012 August

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## Topics

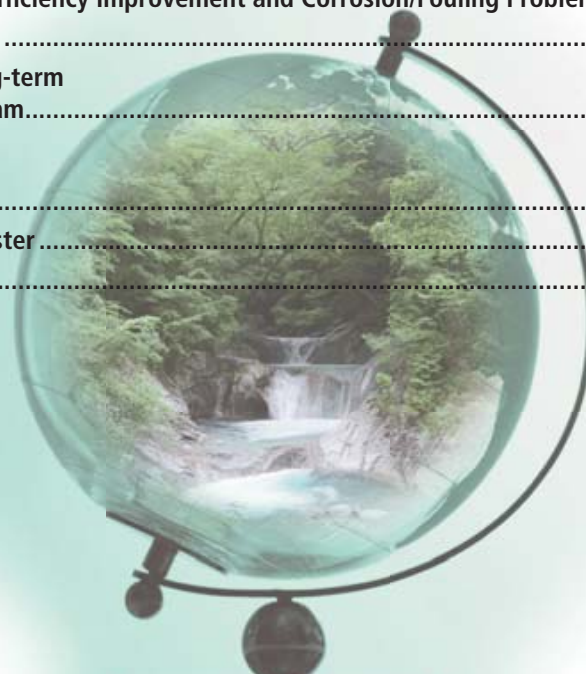
- Executive Meetings in Myanmar and Brunei
- Executive Meetings in Qatar and Libya
- Joint Conference with OAPEC
- Participation in Middle East Petrotech 2012 in Bahrain



# JCCP NEWS No. 113 August 2012

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Cover photo  
Taken by: Minoru Horike, Training Dept.  
Location: Nishizawa Keikoku  
[Nanatsugama-no-Godan-no-  
Taki waterfall]  
Date: June 24, 2012



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## *Message from the Outgoing JCCP President*

# **Mr. Yaichi Kimura**



As the outgoing President of JCCP, I would like to extend my deepest appreciation to everyone for a wonderful tenure.

The four years and three months since I became President of JCCP in April 2008 coincided with a period of great change in the oil industry as well as in JCCP. It was also a period filled with a multitude of events and occurrences.

During this period, JCCP celebrated its 30th anniversary and also became a general incorporated foundation as a result of a governmental reform of public corporations. I interpreted this change as the end of one phase and the beginning of another, where further development will be sought.

JCCP also achieved various other milestones during my tenure. We hosted the 30th international symposium and the 20th Joint GCC-Japan Environment Symposium, received the 20,000th participant to our courses, and launched the 250th technical cooperation project. I believe it is through such steady implementation of cooperation activities that JCCP has come to enjoy a stable reputation in oil-producing countries.

Not all were good experiences, however. We also suffered an unprecedented disaster in the Great East Japan Earthquake.

Having gone through a four-year transition period, JCCP is now raising the curtain on a new era. It must keep up with the daily changes that are occurring in Japan's and the world's oil industries and face new challenges while building on past achievements. Under Mr. Morikawa, the incoming President, I hope JCCP will continue to build even stronger ties than ever with oil-producing countries.

I am honored to have served as President of JCCP during this period of great change. It has been a most memorable four years. Once again, with deepest gratitude, I would like to thank everyone who has contributed their support and cooperation to the development of JCCP activities.

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## *Message from the Incoming President*

# **Mr. Keizo Morikawa**



It is with great honor that I accept this invaluable opportunity to serve as President of JCCP as recommended by the JCCP Board of Directors, and would like to briefly introduce myself in greeting.

The Japan Cooperation Center, Petroleum (JCCP) was established in November 1981 as an organization mandated with the responsibility of playing a central role in extending Japan's cooperation to the oil-refining sector in oil-producing countries. Based on the perspective that maintaining and developing friendly relationships with oil-producing countries is a national priority for stable oil supply, JCCP has hosted diverse training programs and technical cooperation projects to date. Over a period of more than a quarter of a century, JCCP has made a considerable contribution to the global oil industry by receiving more than 20,000 participants and sending numerous Japanese experts to oil-producing countries every year.

The Great East Japan Earthquake has brought renewed awareness of the importance and usefulness of oil, and has also increased the need to secure stable oil supplies. Given this situation, larger expectations than ever are placed on JCCP's role in strengthening relationships with oil-producing countries through transfers of Japan's advanced technologies.

As the next President of JCCP, I believe my responsibility is to further expand on JCCP's 30 years of achievements made under the leadership of past presidents, together with JCCP member companies and staff. It is a heavy responsibility, but I look forward to responding to expectations of JCCP and serving the global oil industry. Thank you in advance for your support and cooperation.

# Message from a JCCP Graduate

A JCCP graduate has offered a warm message of congratulations on occasion of our 30th anniversary, as introduced below.

.....



**Mr. Ali Obaid Al-Yabhouni**  
Chief Executive Officer, Abu Dhabi National Tanker Company,  
National Gas Shipping Company Ltd.,  
UAE Governor for OPEC

Participant of a regular course on Marketing and Physical Distribution (TR-8-97)  
offered in 1997

It is an honour to have been asked to contribute to the JCCP 30th anniversary publication.

I had the good fortune to attend a JCCP course in 1997, when I was working for Abu Dhabi National Oil Company (ADNOC) in the Marketing & Refining Directorate, Marketing Crude & Condensate for the Pacific Region.

The knowledge gained whilst on the course was invaluable during this early part of my career and provided me with management skills, which have remained with me. It was also an excellent opportunity to network and learn from the other international participants in the oil and gas industry.

As well as gaining an understanding of the Japanese method of conducting business, we also experienced Japanese culture and customs. This knowledge has been extremely useful during my many subsequent trips to Japan and especially beneficial since November 2007, when I assumed the position of General Manager, National Gas Shipping Company Ltd. (NGSCO), which is part of the ADNOC Group of Companies. NGSCO tankers carry LNG from ADGAS' liquefaction plant at Das Island in the Arabian Gulf to Japan.

The JCCP courses are an excellent initiative and, needless to say, I am very appreciative of having had the chance to attend one, all those years ago.

With regard to the future, I am positive that the JCCP program will continue to flourish. It offers participants a really unique opportunity to gain valuable insight, in addition to achieving personal growth and development. Such a stimulating and dynamic learning environment is rare and I am sure will always be greatly valued by all individual participants.

Personally, I still continue to draw upon the understanding and awareness I obtained during my own experience at JCCP. As such, I will always be an advocate of the program and hope that many others can benefit from such in-depth visionary courses.

Finally, I take this opportunity to congratulate JCCP on its 30th anniversary and wish the company continued success in the future.

# Executive Meetings

## Visits to Myanmar and Brunei

Mr. Masataka Sase, Executive Director of JCCP, visited Myanmar and Brunei from February 12 to 18, 2012 to hold policy dialogues with key figures in those countries. He was accompanied by Mitsuyoshi Saito, Executive Counselor, and Koichi Io, Deputy General Manager of the Operations Department.

### 1. Myanmar

#### (1) Purpose of the Visit

Myanmar has been making steady progress toward democratization since the first general election was held under the country's new constitution in 2010. Along with this progress, there has been a gradual easing of economic sanctions that had been imposed on the country by the international community, and the development of oil and gas resources has also been



*H.E. Mr. Than Htay, Minister of Energy (right), and Mr. Masataka Sase, Executive Director of JCCP (left)*



*At the Myanmar Ministry of Energy*



*Meeting with members of the Ministry of Energy*

opened to foreign investment. Furthermore, the country is seeking foreign technical support to build new refineries and to strengthen its domestic supply framework of oil products, as indispensable to its future growth. JCCP began receiving participants from Myanmar in 1982, but it has progressively strengthened its cooperation thereafter in response to the democratization movement in the country, and has received a total of 519 participants from Myanmar as of the end of fiscal 2011.

In view of the fact that Myanmar is now rapidly restoring ties with the international community, the JCCP delegation visited Myanmar to further strengthen JCCP's relationship with the country.

#### (2) Meeting with the Ministry of Energy

On February 14, the JCCP delegation visited H.E. Mr. Than Htay, Minister of Energy. Also present at the meeting were Mr. Htin Aung, Director General, Energy Planning Department, and the presidents of national companies in the oil industry under the governance of the Ministry of Energy.

Firstly, Mr. Sase expressed his honor to meet Minister Than Htay and the others who had lent their presence to the meeting, and explained the purpose of his visit, stressing his wish to exchange views toward



further expanding the relationship with Myanmar through the implementation of cooperation projects. Minister Than Htay reciprocated his appreciation of the JCCP delegation's visit, saying Japan's cooperation in Myanmar's independence is an integral part of his country's history, and its continued cooperation at a time of constraint that has lasted more than 20 years is truly appreciated. He also said that Myanmar workers who have received training at JCCP are making effective use of the knowledge they acquired and exhibiting the advantage of JCCP training programs, and that JCCP is like a close friend to Myanmar. In regard to these training programs, the Minister proposed the implementation of regular courses and long-term courses on oil-refining technologies based on Japan's advanced technological expertise, to further expand the cooperative relationship between JCCP and his country.

## 2. Brunei

### (1) Purpose of the Visit

Brunei is one of the largest exporters of LNG in Asia, and supplies roughly 8% of Japan's annual LNG demand of around 70 million tons (2010). However, JCCP training courses have unfortunately received only five participants from Brunei to date. Therefore, the JCCP delegation aimed to provide deeper understanding of JCCP activities to departments related to the oil downstream sector in the Brunei government and strengthen ties with the country through Brunei's increased participation in JCCP training courses.

### (2) Visit to the Department of Energy, Prime Minister's Office

On February 16, the JCCP delegation visited the Department of Energy under the Prime Minister's Office and met with several members of the department, including Ms. Nur Huraizah Haji Jamaludin, Head, Organization and Human Capacity, Energy Corporate Division; and Ms. Hajah Mariani Haji Abbas, Head, Downstream BSM/BMC, Energy Business Division.

Mr. Sase first expressed his appreciation for the opportunity to meet with members of the Brunei Department of Energy. He then noted that JCCP has entered its 30th year of operations last year since it was



*At the Department of Energy, Prime Minister's Office, Brunei*

founded in 1981, and has worked to develop the oil-refining sector for the common interest of oil-producing countries and Japan alike. He also expressed his wish to extend JCCP's cooperation activities to Brunei, as the country is one of Japan's most important energy suppliers, and thus explained his wish to exchange views regarding new frameworks of cooperation with Brunei. Following Mr. Sase's greeting, the JCCP members gave an overview of past achievements made by JCCP training activities as well as details of training programs and technical cooperation projects, and answered questions from the Brunei side to further clarify their understanding of JCCP. Finally, members on the Brunei side thanked the JCCP delegation for its detailed explanation of JCCP activities and schemes, saying they have gained a new outlook on cooperation with Japan.

## 3. Summary

In Myanmar, the JCCP delegation explained the current status of JCCP courses and received requests for training from members of the Ministry of Energy. Their words of appreciation for receiving Myanmar participants to regular courses since 1982 were also filled with a sense of expectation of future JCCP cooperation. In Brunei, the delegation's approach was the first step in promoting understanding of JCCP, and is expected to open windows of opportunity for further strengthening ties with the country in the future.

Lastly, JCCP would like to thank everyone in Myanmar and Brunei who helped arrange and warmly welcomed the delegation's visit.

*<by Koichi Ito, Operations Dept.>*

# Executive Meetings

## Visits to Qatar and Libya

Mr. Masataka Sase, Executive Director of JCCP, visited Qatar and Libya from May 12 to 18, 2012 to hold policy dialogues with key figures in the oil industry in those countries, accompanied by Jun Nishimura, Deputy General Manager, Technical Cooperation Dept.; Hisayoshi Tanda, General Manager, Planning & Coordination, Administration Dept.; and Koichi Io, Deputy Director, Operations Dept. in Qatar; and again by Koichi Io in Libya.

### 1. Qatar

#### (1) Purpose of the Visit

Qatar is the third-largest producer of natural gas in the world, following Russia and Iran, and supplies roughly 12% of Japan's total LNG imports. It has sent a total of 533 participants to JCCP training programs since 1981, and enjoys a good, stable relationship with JCCP. This fiscal year, JCCP is planning to hold the 21st Joint GCC-Japan Environment Symposium in Qatar.

The purpose of the recent visit was to pay a courtesy call on the directors of administration and human affairs at Qatar Petroleum (QP), and to seek Qatar's cooperation in the upcoming environment symposium.

#### (2) QP Administration Department

In the morning of May 13, the JCCP delegation paid a courtesy call on Mr. Ahmad Ali A. Al-Mawlawi, Director, Administration, and held a meeting also attended by Mr. Abdulla Omar Al-Dafaa, Manager, Human Resources; Mr. Davendra Mohan Wadhwa, Senior Planning Coordinator; and Dr. Abderrazak Bella Beci, Head, Program Development & Evaluation, Corporate Training.

At the beginning of the meeting, Mr. Sase noted that JCCP celebrated its 30th anniversary last year, and expressed his appreciation to QP, saying that JCCP training courses have received 533 participants from Qatar over the past 30 years, and that JCCP has been able to continue providing its services for so many years owing to QP's kind understanding and support. He also extended his heartfelt gratitude for the 4 million tons of LNG Qatar offered to Japan immediately after



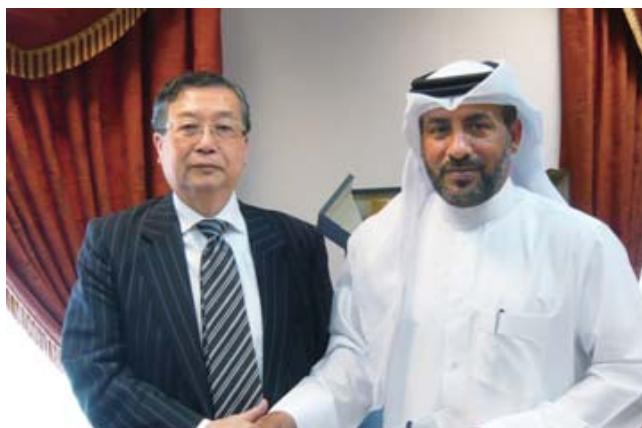
At QP: Mr. Ahmad Ali A. Al-Mawlawi, Director, Administration (fourth from right)

the Great East Japan Earthquake last year. He then closed his greeting by renewing JCCP's commitment to maximizing the mutual potentials of QP and JCCP to build a win-win relationship.

In response, Mr. Al-Mawlawi said Japan and Qatar have a long history of exchanges, and said he wishes to maintain the cooperative relationship with JCCP and continue to partake in training programs and technical cooperation projects. He also reaffirmed the friendly relationship between QP and JCCP, saying it is only natural for Qatar to extend a cooperative hand to its friend, Japan, in the face of difficulty.

#### (3) QP Corporate Health, Safety & Environment Department

Also in the morning of May 13, the delegation



At QP: Mr. Saad Ali Al-Kubaisi, Manager, Corporate Health, Safety & Environment Department



visited Mr. Saad Ali Al-Kubaisi, Manager, to personally seek QP's support in the upcoming Joint GCC-Japan Environment Symposium scheduled to be held this fiscal year in Qatar. Mr. Kubaisi said the symposium has been approved by the Minister of Energy and Industry, and thus promised even greater support than in the previous symposium.

#### (4) Japanese Embassy in Qatar

That afternoon, the delegation visited the Japanese Embassy in Qatar to pay a courtesy call on H.E. Mr. Kenjiro Moji, Ambassador. After thanking the Embassy for its support of JCCP activities, Mr. Sase informed the Ambassador about the joint implementation of the Joint GCC-Japan Environment Symposium this fiscal year in Qatar.

Ambassador Moji noted that Qatar is extremely friendly toward Japan, and mentioned the Qatari government's immediate offer of aid in the wake of the Great East Japan Earthquake last year. With this year marking the 40th anniversary of Qatar-Japan relations, he said the symposium would be an ideal opportunity to strengthen ties with Qatar, and expressed his personal wish to attend.



*At the Japanese Embassy in Qatar:  
H.E. Mr. Kenjiro Moji, Ambassador (right)*

## 2. Libya

### (1) Purpose of the Visit

Libya is a major oil-producing country that has 46.4 billion barrels of confirmed oil reserves, and that produced approximately 1.8 million bbl/day of oil before the civil war (2008). Prolonged economic sanctions

imposed by the international community made technical exchanges difficult, but the country shifted to a policy of international cooperation at the turn of the millennium, and JCCP began receiving participants from Libya from 2001. A total of 309 Libyan participants have participated in JCCP courses to date. There has been a temporary suspension of exchanges from February 2011 due to the outbreak of an internal conflict, but as the conflict came to an end at the end of the year and security has begun to be restored, the recent visit was made with the expectation of a resumption of exchange activities with Libya.

### (2) Visit to National Oil Corporation (NOC)

In the morning of May 16, the delegation visited the head office of NOC to pay a courtesy call on Dr. Nuri A. Berruien, Chairman of the Board. Mr. Amari M. Amari, Member of the Management Council of the Finance Affairs, and Mr. Mokhtar M. Abduldaem, Manager, Sustainable Development Department, were also present at the meeting.

Mr. Sase briefly recounted the history of JCCP, mentioning its establishment in 1981 and its 30 years of providing training programs to oil-producing countries, and noting that it began receiving participants from Libya in 2001 and has received a total of 309 participants to date. He then expressed his wish to further deepen friendly ties with Libya in the future.

Dr. Berruien said that in order to further develop the oil industry, employee capacity building and coordination with the petrochemical industry are priority issues. Under this situation, NOC employees have participated in JCCP training and acquired opportunities to study oil



*At NOC:  
Dr. Nuri A. Berruien, Chairman of the Board (right)*

downstream technologies, and NOC is extremely grateful for JCCP cooperation especially in this regard.

The delegation next met with Mr. Hassan Hasanin, Training Department & Development Manager, and Eng. Ibrahim Mansour, Training Specialist, and discussed the immediate training program schedule.

### (3) Japanese Embassy in Libya

In the afternoon of May 16, the delegation visited the Japanese Embassy in Libya to meet with H.E. Ambassador Takashi Ashiki.



*At the Japanese Embassy in Libya:  
H.E. Takashi Ashiki, Ambassador (right)*

Mr. Sase reported on his meeting with Dr. Berruien of NOC, saying that it had helped deepen Dr. Berruien's understanding of JCCP activities, and reaffirming his commitment to make ongoing efforts to further strengthen JCCP's relationship with NOC. Ambassador Ashiki explained that the internal revolution has damaged the sewerage, roads, and other urban infrastructures, and that stabilizing oil supply is a priority issue for national reconstruction. He urged JCCP to continue receiving participants from NOC as its contribution to helping restore and develop Libya's oil industry.

### 3. Summary

In Qatar, the delegation was able to meet with Mr. Al-Mawlawi, Director, Administration at QP and promote better understanding of JCCP. In Libya, it met with Dr. Berruien, Chairman of the Board, and resumed relationships between the two organizations. These achievements helped renew JCCP's commitment to make further approaches to deepening ties with the two countries.

Lastly, JCCP would like to thank everyone in the two countries who warmly supported the delegation's visit.

*<by Koichi Ito, Operations Dept.>*



# Joint Conference with OAPEC

## 1. Overview

JCCP and the Organization of Arab Petroleum Exporting Countries (OAPEC) jointly held a conference on “Hydrocarbon Transportation Pipelines in Arab Countries” in Cairo, Egypt, from February 21 to 23, 2012.

The joint implementation of a conference in the oil downstream sector was one of the activities that were formally agreed upon between JCCP and OAPEC in March 9, 2011, and was held with the objective of establishing even closer ties of cooperation with Arab oil-producing countries.

## 2. Conference Details

### (1) Opening Ceremony

An opening ceremony kicked off the conference on the 21st, with speeches given by Mr. Hany Dahy, Chairman, Egyptian General Petroleum Corporation (EGPC); Mr. Abbas Naqi, Secretary General, OAPEC; H.E. Mr. Norihiro Okuda, Japanese Ambassador to Egypt; and Mr. Morihiro Yoshida, Managing Director, JCCP.

#### *Summary of Mr. Hany Dahy’s speech:*

Today, Egypt is actively inviting international tenders for the development and production of crude oil and gas, and is well aware of the importance of pipelines for the



(From the left) Mr. Hany Dahy, Chairman, EGPC; Mr. Morihiro Yoshida, Managing Director of JCCP; Mr. Abbas Naqi, Secretary General, OAPEC

production, transportation and marketing of these energy resources. Furthermore, as a “hub” in the Middle East and North African region, Egypt not only serves as a center for the transportation of oil and gas produced in Egypt to areas within the region, but is also a strategic point in the supply network of Middle East crude to Western markets via the Suez-Mediterranean (SUMED) Pipeline and Suez Canal.

EGPC welcomes JCCP’s participation in this OAPEC conference, and looks forward to its contribution through the sharing of Japan’s latest technologies, pipeline design technologies, and management technologies.

#### *Summary of Mr. Abbas Naqi’s speech:*

Significant developments have been made in pipelines that transport oil products and natural gas among the Arab countries, and SUMED’s crude oil pipeline and the gas supply pipeline between Egypt and Syria have become vital arteries for the global supply of energy. Through this three-day conference, we hope to study issues relating to the construction and the safe and efficient operations of such globally important crude oil and gas supply networks with the cooperation of JCCP and feed back the results to the field. We have strong expectations of continued cooperation from Japan and JCCP.



JCCP exhibition panels displayed in the entrance to the conference venue





(From the left) H.E. Ambassador Norihiro Okuda, Mr. Abbas Naqi, Secretary General, OAPEC



Mr. Al-Braik, a speaker from QP

*Summary of Ambassador Okuda’s speech:*

I believe this conference will expand the horizon of economic cooperation between Japan and the Arab and African countries. Japan may have suffered a devastating earthquake and tsunami disaster, but we are prepared to promote even stronger cooperation with the two regions to bring significant changes to the international community. As this conference itself is a specific result of Japan-Arab economic cooperation, I hope OAPEC and JCCP will continue to take the initiative in implementing cooperation in the region.

*Summary of Mr. Morihiro Yoshida’s speech:*

On behalf of JCCP, I would like to thank all our friends in the Arab countries for their heartfelt support and encouragement in the wake of the Great East Japan Earthquake and nuclear reactor crisis last year.

The disaster and nuclear reactor crisis provided a fresh reminder of the importance of safe supply of energy, and JCCP has also reaffirmed its commitment to establish close ties and mutual understanding with oil-producing countries. Based on this mandate we have, to date, invited more than 20,000 engineers and managers

from oil-producing countries to receive training in Japan, have sent over 5,000 Japanese technical experts to oil-producing countries, and have implemented a total of more than 250 technical cooperation projects.

We will continue these activities in the future, while also sponsoring conferences like this one and other survey activities, to further strengthen cooperation with oil-producing countries.

**(2) Presentations**

Technical sessions took place on the 21st and 22nd, divided into five tracks as shown below. They featured presentations by 21 speakers from Japan, Egypt, Saudi Arabia, Qatar, and other Arab countries.

- (1) Oil and Gas Transportation Pipelines in Arab Countries: Present & Future Perspective
- (2) Design and Construction of Onshore and Offshore Pipelines
- (3) Environmental Protection Measures, Leakage Monitoring and Safety Operation Concepts of Pipelines
- (4) Maintenance & Emergency Repair Technology
- (5) Pipeline Corrosion Control Techniques



Q&A session

Speakers on the Japanese side included Mr. Yuji Kimura from Kogakuin University, Mr. Katsumi Yamamoto from Waseda University, Mr. Hideki Matsumoto from Cosmo Engineering Co., Ltd., and Dr. Haruki Nishi from the National Research Institute of Fire and Disaster Management Agency. Their presentations on the cause analysis of accidents and safety and disaster prevention measures for pipelines, tanks and other oil facilities, in particular, captured the participants’ strong interest.

### (3) Inspection Tour

On the 23rd, the conference members visited SUMED's Ain Sukhna Terminal to inspect its tank yard and pump facilities. SUMED operates a 320-kilometer pipeline that connects Ain Sukhna Terminal on the Red Sea to Side Kerir Terminal on the Mediterranean Sea by passing the Suez Canal.

### 3. Summary

This was the first conference to be held jointly by OAPEC and JCCP, but despite its highly technical nature, it was attended by approximately 110 participants from 24 organizations in eight countries, and was successfully implemented both in terms of scale and content. Initially, it was scheduled to be held in late November 2011, but was postponed until February due to certain political situations. In coming up with the theme of "Hydrocarbon

Transportation Pipelines in Arab Countries," it was certainly no coincidence that countries involved in the so-called Arab Spring, such as Libya, Algeria and Egypt, are at the crossroads of the production and transportation of oil, gas and other hydrocarbon resources.

This first joint task by OAPEC and JCCP called attention to Japan's technologies and experience, and particularly drew praise from the participants for its responses in the aftermath of the Great East Japan Earthquake. In this respect, the conference was highly instrumental in increasing recognition of JCCP.

Lastly, JCCP would like to extend its sincerest appreciation to OAPEC for acting as joint organizer of the conference, and to the Egyptian Ministry of Oil, EGPC, and the Japanese Embassy in Egypt. Without their cooperation this conference could not have been successfully completed. Thank you very much.

*<by Sadao Wada, Technical Cooperation Dept.>*



# Participation in Middle East Petrotech 2012 in Bahrain

The 8th Middle East Refining and Petrochemicals Conference & Exhibition 2012 was held over a four-day period from May 20 to 23, 2012 in an international exhibition center in Bahrain.

## 1. Overview

Petrotech is a large-scale international convention that is held every two years in Bahrain to promote the development and exchange of technologies in the oil-refining and petrochemical industries. The organizing committee and sponsors of the event include state-run oil companies and petrochemical companies in the Middle East region (Saudi Aramco, BAPCO, ADNOC, QP, KPC, etc.) and Western oil and petrochemical companies (ExxonMobil, Dow Chemical, Foster Wheeler, etc.). Under this year's theme of "Creating Value: Technology, Investment & People," the conference part of the event featured four keynote presentations, eleven guest-of-honor speeches and a large number of presentations, and the exhibition part featured showcases by more than 80 companies in the oil industry. JCCP participated in the Petrotech exhibition for the fifth time this year, and sent Tetsuji Kubota, Senior Counselor, Training Dept.; Hisayoshi Tanda, General Manager, Planning & Coordination, Administration Dept.; and Masumi Kitahara, Manager, Public Relations, to staff the JCCP booth.



*Opening ceremony for the Petrotech exhibition*

## 2. Background and Objectives

JCCP participated in the past four Petrotech exhibitions to introduce JCCP activities to visitors from the oil industry in Middle East oil-producing countries. This time, in addition to introducing JCCP activities, the JCCP booth aimed to also introduce JCCP's 30-year history of technical cooperation in oil-producing countries, and to take advantage of the occasion to once again meet and exchange information with JCCP graduates and key figures in JCCP counterpart organizations.



*JCCP's booth*





*Ms. Huda Al-Ghpson, Executive Director, Employee Relations & Training, Saudi Aramco (center)*



*JCCP graduates (Saudi Aramco)*

### 3. Exhibition

The design concept of the JCCP booth, with some added improvements, was based on the idea used in the 20th World Petroleum Congress held last December, which met with great success.

Although JCCP graduates who were informed of JCCP's participation in the event took the time to visit the JCCP booth last year, we had only limited meeting space to enjoy conversation. With this in mind, this time around we prepared a space for meetings inside the booth.

This being JCCP's fifth participation, many JCCP graduates who knew that JCCP participates in the event every year paid a visit to the JCCP booth from Bahrain, Saudi Arabia, and other neighboring countries. Although an email notice was sent to all graduates in advance, many knew of JCCP's participation even without the notice, which was a clear indication that JCCP has become a fixture of sorts at the Petrotech event.

The visitors included people related to JCCP activities in diverse ways: JCCP counterpart coordinators, past participants, people scheduled to participate in a JCCP course the following week, university professors who attended a workshop sponsored by the Technical Cooperation Department, etc.

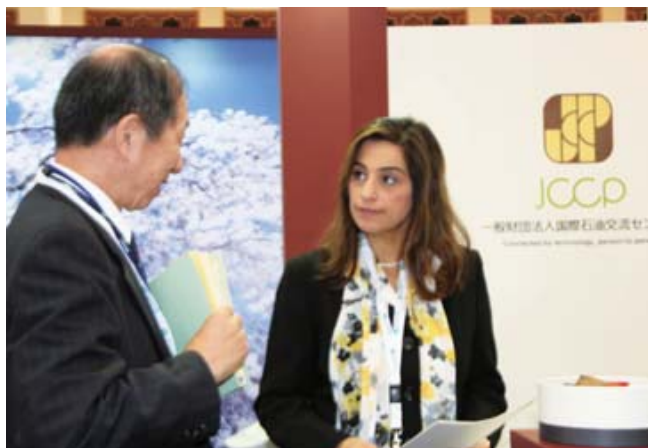
The event also provided an opportunity to get in touch once again with Mr. Bakheet Al Rashidi, Deputy Managing Director, KNPC, who was a guest speaker in a past JCCP international symposium and was acting as an executive member of the Petrotech organization committee; and with Ms. Huda Al-Ghpson, Executive Director, Employee Relations & Training, Saudi Aramco, and Ms. Salma Al Hajjaj, Director, Leadership

Development, KPC, who were present at Petrotech as guest speakers.

### 4. Keynote Presentations

The conference featured four keynote presentations under the theme, "Creating Value: Technology, Investment and People," and was chaired by Mr. Abdulaziz M. Al-Judaimi, Vice President, Chemicals, Saudi Aramco.

- (1) H.E. Dr. Abdul Hussain bin Ali Mirza, Minister of Energy, shared his view that the Middle East countries are globally important oil-producing countries, and in addition to their role as oil producers, they are also becoming oil consumers at a rapid pace. For this reason, oil-producing countries must also break away from their dependence on oil and introduce non-petroleum energies.
- (2) Mr. Mohamed H. Al-Mady, CEO, SABIC, spoke on a variety of issues. He said that the development of talented personnel is a priority issue, which should be addressed by creating a program that could systematically train the necessary human resources. In regard to business, he said it is necessary to take the standpoint of "asking customers to buy," and not of "supplying products to the market." In regard to technology, Mr. Al-Mady noted that shale gas being developed in the United States has dropped in cost to the level of natural gas in Saudi Arabia, and is posing a large threat to petrochemical companies in oil-producing countries. As a countermeasure, he



Ms. Salma Al Hajjaj, Director, Leadership Development, KPC



Mr. Al-Shirawi, General Manager (right),  
Mr. Larry Jaeger, Advisor (left),  
Oil and Gas Affairs, National Oil and Gas Authority, Bahrain

said Middle East countries must hereafter consider utilizing not only ethane but also a variety of other feedstock to develop the petrochemical industry.

- (3) Mr. Farouk AL-Zanki, CEO, KPC, spoke about Kuwait Refinery Vision 2030 and defined a number of major issues, including the integrated operation of three refineries, improvement of domestic consumption of heavy crude oil, and human resource development. He said that in the future, easy oil will need to be appropriated to exports, and heavy oil that is not suited for export will need to be domestically processed into oil products. He therefore emphasized the need to develop human resources with the necessary capacity to treat heavy oil.
- (4) Dr. Graeme Codrington, Futurist, Author, Keynote Presenter and Expert on the New World of Work, TomorrowToday, gave a presentation. He issued a warning, saying that “to stay competitive, we must

tackle the problems instead of solving today’s problem with yesterday’s technology.”

The presentations were peppered with phrases such as “cultural innovation,” “integrated wisdom,” and “developing creative culture” and shed light on the realization that even state-run companies must work hard to seek such values, and thus the development of human resources is a critical issue in conjunction with the advancement of technologies.

## 5. Summary

JCCP has participated in the Petrotech exhibition five times over the past 10 years, and has successfully introduced JCCP activities to a wide audience through repeated participation with a small booth measuring a mere 18m<sup>2</sup> in area. The event also provided an ideal opportunity to reunite with past JCCP participants, deepen mutual friendships, and update the roster of JCCP graduates, who are JCCP’s most precious asset.

As the theme indicated, the development of both technologies and human resources has come to be recognized as a major issue also in oil-producing countries. Meanwhile, JCCP has worked diligently to promote stable supplies of oil and cooperation with oil-producing countries through technical cooperation and personnel development activities for more than 30 years since its establishment. That JCCP’s efforts have come to match the needs of oil-producing countries today was clearly felt through JCCP’s participation in this year’s Petrotech event.



JCCP graduate (BAPCO)

<by Masumi Kitahara, Planning & Public Relations,  
Administration Dept.>

# For Improved Training Practicality (Part 2)

## —Training Using a New Simulator—

### 1. Introduction

In the previous issue of *JCCP NEWS*, we explained the objective of introducing training simulators to JCCP and provided an overview of upgrades that incorporate the latest technologies in the instrumentation field. A summary of the transition of JCCP training simulators is shown in Table 1. In this article, we introduce the points of improvement of a new simulator and an outline of training activities that maximize its characteristics.

### 2. Facilities of the New Simulator

The facilities of the new simulator and their characteristics are provided below, and their layout is shown in Fig. 1.

Each of the facilities embodies ideas that help improve simulator training at JCCP.

#### (1) Miniature plant (3 units)

- The miniature plant incorporates the necessary components of a training plant and clarifies the flow

of control processes. It is also equipped with the latest fieldbus, HART, wireless instrumentation and safety instrumented facilities in a layout that provides easy understanding of their functions.

#### (2) Operating station (6 units)

- The operating station is generally referred to as HMI (human-machine interface), and is the terminal from which the plant is operated.
- Each operating station is arranged so that it can be used to operate the miniature plant as desired via Ethernet data highway, and is designed to allow exercises by a multiple number of people.

#### (3) Controller (3 units)

- The controller is the “brain” behind operational control processes.
- In the new simulator, the controller is characterized by three types of structures that accommodate three types of communication systems (fieldbus, HART and the conventional system).  
\*HART: highway addressable remote transducer
- Facilities (2) and (3) above are generally called DCS (distributed control system).

Table 1: Transition of JCCP training simulator facilities

	Year	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	
(1) Training Simulator 1 (Yokogawa Electric)	1975 Release of CENTUM	XL		CS						CS 3000							CS 3000 R3		VP R4				VP R5.01		
DCS	1982 Introduction of dynamic simulators								DCS: CENTUM CS										Upgrade						
Miniature plant								Former space occupied by unit Nos. 1 & 2	Introduction																
(2) Training Simulator 2 (Yamatake Honeywell → Yamatake Corporation → Azbil Corporation)	1975 TDCS 2000																								
DCS	1982 Introduction of TDC2000																								
Miniature plant																									



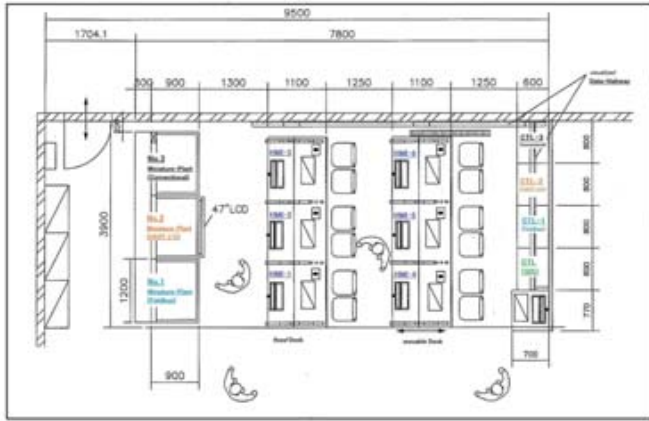


Fig. 1: Layout of the new simulator

#### (4) Subsystem

- To provide actual experience in advanced control, the simulator includes a server (computer) that is equipped with DCS engineering functions and various operational efficiency software as a subsystem.
- The subsystem is designed to exchange information and instructions with the DCS via Ethernet data highway.

#### (5) SIS (safety instrumented system) (1 unit)

- By outfitting the miniature plant with an instrument device that satisfies the SIL (safety integrity level) standard, control status can be confirmed by a system other than the DCS in emergency situations.
- As with DCS, SIS also incorporates process control and engineering functions for effective training.

#### (6) Other

- The new simulator is equipped with a large monitor and a modern operating disk to create the same environment as the latest control room, and communication channels that interconnect the facilities are visually arranged on a side wall to facilitate understanding of the flow of information.

### 3. Training Content

The following sections provide an overview of training activities that utilize the new simulator. Photo 1 shows scenes of simulator training sessions that provide a better image of these activities.

#### 3.1 Practical control practice utilizing the miniature plant

Participants gain hands-on experience in the basics of process control, including the meaning of control parameters and tuning methods, through actual operation of the miniature plant. This is an extremely important

session that marks the beginning of all training programs implemented by the JCCP instrumentation group, and constantly receives high marks from participants.

One of the benefits of the new simulator is that significant improvements have been made not only to the size and composition of the monitors but also to functionality, for better visibility and usability compared to the conventional simulator. In this session, participants acquire the basic theories of practical control, as well as experience the latest operating system.

#### 3.2 Process control practice utilizing the subsystem

Utilizing the subsystem, training is provided in the following themes.

- (1) DCS engineering practice
  - (i) Construction of a level control system
  - (ii) Construction of an emergency shutdown system
- (2) Practice using MPC (model predictive control) software
- (3) Practice using OSS (operational support system) software

Through actual DCS operations and operation of the miniature plant, participants experience DCS engineering functions and an advanced control system that is built using various operational efficiency software programs.

Software programs used in this session are compatible with any equipment. This means that the programs can run without problem even if the software maker and DCS maker differ.

#### 3.3 SIS Practice

In Japan, emergency shutdown systems that use the conventional relay method or DCS engineering functions

are the mainstream systems for emergency response. Meanwhile, in other countries, SIS that are approved as global standards independent of DCS are predominant as control systems for emergency shutdown devices and fire prevention and extinguishing equipment.

The new simulator provides training in the following themes, to clarify the significance of SIS and specific methods.

#### (1) Practice using SIS devices

- SIS facilities are designed based on SILs defined in terms of the relative risk level of each process.
- The new simulator provides hands-on training using an actual SIS unit.

#### (2) Engineering practice for an emergency shutdown system using a virtual plant (furnace model)

- As with DCS, SIS also incorporates process control functions and engineering functions. Using these engineering functions and a virtual furnace system,

participants practice logic building for an emergency shutdown system.

#### 3.4 Other

As the new simulator is outfitted with wireless instruments and other advanced facilities in the instrumentation field, as well as such promising new software as AMS (alarm management system), it can be used to provide detailed explanation from experts, in the same manner as with DCS facilities.

### 4. Improvement of Training Environment

To provide effective simulator training, the following improvements need to be made to workability and working spaces.

In recent years, JCCP has been accepting a larger number of participants in response to an increasing number of applicants. As a result, in many cases a single simulator unit needed to be shared by a multiple number



Photo 1: Scenes of training sessions using the new simulator

of participants. Moreover, once the participants sat down in front of a simulator their activities were restricted, due to the limited space around the simulator. Given this situation, the working space around the new simulator was improved in the following manner.

### **(1) Working space improvement**

As shown in Fig. 1, the new simulator has two rows of HMI, one in front of the other, to ensure ample working space in accordance with each training content, as follows.

- Three HMI units each were arranged in two rows to ensure enough working space around each group of three HMI units that are needed to operate the miniature plant.
- In exercises that do not involve operations of the miniature plant, the working space was arranged to allow full utilization of the six HMI units by all participants, although it is a tight fit in some cases.
- At times when the HMI units are not used, such as when providing a lecture of the latest instrumentation facilities and controllers, which are the “brains” of the simulator, or when providing equipment maintenance training, the back row of HMI units can be moved to make more room.

### **(2) Introduction of a large monitor**

The new simulator is equipped with a large monitor at the front of the room for displaying training instructions and procedures. The same information is also displayed on the top monitor of each HMI unit to ensure smooth communication of information from the instructor to the participants.

## **5. Future Issues**

JCCP’s simulator training constantly earns high praise from participants. In order to accept a larger number of participants and continue to provide high-quality training, however, a new simulator was introduced, outfitted with the latest technologies and creative ideas. After actually putting the new simulator into practice, we feel we have achieved a successful upgrade.

Nevertheless, technological progress is constantly advancing at a rapid pace. Based on this awareness, JCCP will make committed efforts to keep watch over the advancement of technologies, capture participants’ interest and respond to their needs, and provide an environment for widely introducing Japan’s outstanding technologies to the world.

*<by Teruhiko Sasaki, Training Dept.>*





# Regular Course on Petroleum Marketing

## 1. Overview

JCCP has been providing this course for many years, but a number of changes have been made based on a review by the Regular Course Renewal Committee established within JCCP. The opinions of participating countries were deliberated and reflected as much as possible. That is, changes have been made to the program content so that it more faithfully reflects the basic principle that oil-exporting countries export crude oil and oil products, and Japan, as an oil-consuming country, imports, refines and delivers oil to domestic users. From this standpoint, the program was first modified to more closely benefit the future operations and management activities of managers in charge of marketing crude oil and oil products in state-run oil companies in oil-exporting countries. A new workshop on financial accounting and negotiation has been included in the program. Therefore, certain changes have been made to the lecture contents and location of site visits. These have been revised to provide the substantial background that is required when said managers take higher responsibilities. Furthermore, the program structure was designed to enable participants to easily grasp the larger picture, in consideration of the fact that many participants assume management positions in the marketing department from technical and other fields. Having prepared this foundation, the program was opened not only to marketing and physical distribution managers, but also to managers in departments who have a need to understand the above-mentioned activities to pursue their management duties.

A total of 18 participants, including three women, from nine countries attended the course. In terms of age, two were in their 20s, five in their 30s, ten in their 40s and one in his 50s. In terms of jobs, twelve were engaged in marketing and physical distribution, four in planning, finance and accounting, and two in refinery operations. The course ran for a period of 11 days, from January 10 to 20, 2012.

## 2. Course Content

### 2.1 Training at JCCP

#### (1) Japan's Oil Industry

While introducing the various fields of Japan's oil industry, we shared an understanding of the importance of oil-producing countries to Japan and the importance of the Japanese market to oil-producing countries. As the United States and the EU acquire half of their oil supplies via onshore pipelines, participation in this portion by other exporting countries is difficult. Since Japan does not have that kind of supply source, Japan is closely tied to the Middle East through sea transportation by VLCC. Nothing less than those, oil-producing countries other than the Middle East countries are also important to Japan as recourse in case of emergency. Many participants agreed to having come to realize the role and significance of JCCP activities.

#### (2) Workshop on Negotiation and Financial Accounting

This workshop aimed to provide practical knowledge of important skills in two completely different fields—negotiation and financial accounting—through two separate lectures combined with an exercise using the board game Monopoly. Monopoly is a business game that was created in the United States more than one hundred years ago. Players compete against each other as business owners and see who can acquire the greatest profit by finding hidden profit sources as the board



*Workshop on negotiation and financial accounting*

game progresses and selling, buying and exchanging properties through negotiation and bargaining with the other players. Depending on the participants' level of understanding, it can provide an extremely high level of training experience. With respect to negotiation, participants learn the new approach of "creating the pie to be distributed" by going beyond establishing a win-win relationship from the high point of view of a negotiation supervisor. With respect to financial accounting, which is indispensable to management yet presents a high barrier, intensive training was provided to allow participants to acquire the essential principles of accounting, from entering transactions in the book and creating financial statements. As far as small businesses go, participants gained the necessary foundation for understanding the financial statements of their company by acquiring the skills to prepare a balance sheet and profit-and-loss statement on their own. The workshop was designed so that participants can arrive at their study goal only by performing hands-on activities while communicating with other participants. They therefore engaged in discussion with a degree of concentration that even had them losing track of the time and forgetting to take any breaks.

### (3) World's Energy Situation

*(Lecturer: Prof. Mitsuyuki Maeda, Tokyo Institute of Technology)*

This lecture provided an understanding of world energy trends in relation to global environmental issues. Detailed explanations of energy situations were substantiated by abundant data on petroleum, LNG, nuclear power, coal, water and wind power. Trends in crude oil prices stemming from financial problems were also explained using specific examples and captivated the attention of participants from planning departments, as well as those who presently work in a regional office but aspire to work in the head office of their company.

## 2.2 Site Visit

### (1) JX Nippon Oil & Energy Corporation, Mizushima Refinery

At the Mizushima Refinery, the participants inspected the actual facilities of the refinery and engaged refinery staff members in active Q&A interchanges as they toured a large tank truck offloading facility, lube oil loading facility, and a crude oil receiving facility. Many of the questions were in reference to the land transport of oil



*Coastal tanker transporting oil from the refinery to a storage facility*

by tank truck. Other questions and opinions were about Japan's characteristic lack of a pipeline network and the fact it mainly depends on shipment by tanker, indicating the participants' strong interest in the rationalization of physical distribution.

### (2) JX Nippon Oil & Energy Staging Terminal Corporation, Kiire Terminal

On the day of the visit, a VLCC of 300,000DWT was in the process of unloading oil, and the participants were able to get a direct feel of the large scale of the crude oil loading/unloading facility and tanker. After receiving an overview of the terminal, they inspected the pier from the sea and received a description of the crude oil loading/unloading process. Then, in the control house, they received an explanation of the terminal's fully computerized and systematized operations, and in the tank yard, they stepped inside a large 160,000 kl tank that was under open inspection while listening to an explanation of open inspection procedures. The participants also inspected the latest vapor recovery device for crude oil tankers. In the afternoon, the members



*Inside a crude oil tank open for inspection*

of the terminal's operations group provided a lecture on the roles, functions and operational management of the terminal, and members of the environment and safety group gave a lecture on the terminal's environmental and safety management initiatives.

*(3) Uyeno Kosan Ltd., Kawasaki Tank Truck Base*

Uyeno Kosan is a company whose history goes back more than 100 years in the coastal shipping and tank truck transportation sectors. Instructors from each sector gave a lecture on the transportation of oil products and their safety activities. Many questions were asked, particularly from participants in charge of domestic sales of oil products. They expressed their view that the lecture provided a wealth of knowledge they could put to use immediately upon returning to their country, including methods of inventory management, determination of quantity and handling complaints from stakeholders.



*Tank truck base of a major oil transporter*

*(4) JX Nippon Oil & Energy Corporation, Head Office*

The head office of JX Nippon Oil & Energy Corporation provided a broad-based lecture on the size and operations of the company, trends in automotive fuel quality in Japan, environmental issues, and alternative fuels. A lecture on volatile hydrocarbon recovery technology was also given as an issue common with oil-exporting countries.

*(5) Showa Shell Sekiyu K.K., Head Office*

The head office of Showa Shell Sekiyu first gave an overview of its position within the global Shell Group, then provided a lecture on the R&D trends and status of demonstration tests of alternative fuels, such as biofuel, GTL and hydrogen fuel. In the afternoon, the participants toured a hydrogen station operated by the company.

### **3. Summary**

This course traced the oil flow in Japan, one of the biggest consumers. Starting from the import of crude oil and through refinery, we went over the transportation and marketing of oil products from a managerial viewpoint, with a focus on accident and fraud prevention rather than the details of actual operations. A constant stream of lively questions from the participants regarding solutions to issues mentioned in the lecture and the principles and concepts behind those solutions made for active daily discussions. The workshop, in particular, received high praise as an ideal opportunity to exchange views with participants from differing fields.

*<by Masayuki Jimbo, Training Dept.>*



# Regular Course on Inspection and Reliability Evaluation

## 1. Overview

This course aimed to introduce countermeasures to corrosion of refinery facilities (static equipment), inspection and diagnosis technologies and reliability evaluation methods, and was intended for inspection engineers, materials engineers and corrosion engineers who work with static refinery equipment. Specifically designed to provide knowledge and technologies needed to ensure reliability of refinery facilities and maintain safe and stable operations, it covered the latest inspection and diagnosis methods for principal refinery facilities, including towers and vessels, heat exchangers, furnaces, tanks, and pipes, and methods for evaluation of inspection results and countermeasures.

A total of 18 participants from 12 countries attended the course, including eight from the GCC countries. At an average age of 36, the group mainly comprised middle-level inspection and maintenance engineers. The course ran from January 17 to February 3, 2012.

## 2. Course Content

### 2.1 Overview

#### *(1) Course Objective*

The course aimed to provide knowledge and technologies regarding specific inspection, diagnosis and evaluation methods, and countermeasures to damage and repair methods, as measures for ensuring facility reliability and maintaining safe and stable refinery operations.

#### *(2) Program Content*

At JCCP Headquarters, JCCP lecturers gave a general overview of maintenance management and maintenance technologies in Japanese refineries, and external lecturers gave presentations on water management and anticorrosion management. Following the lectures, the participants engaged in group discussion to seek the true causes of equipment damage and explore appropriate countermeasures.

Two refineries provided offsite training in the

basic principles of maintenance and management methods, as well as in on-stream inspection (OSI) and periodic inspection methods and repair cases and plans based on inspection results. Additionally, two plant equipment and materials manufacturers (a pressure vessel manufacturing plant and a steel pipe and tube manufacturing plant) provided training on material characteristics and their manufacturing technologies and processes; a plant inspection company gave a lecture on the latest inspection technologies and provided hands-on inspection experience; and a maintenance company gave a lecture on equipment and tank maintenance, repair and material diagnosis technologies.

As a whole, the course covered a broad range of technologies in a well-balanced manner through both lectures and onsite training, with the goal of providing practical knowledge and technologies to engineers in charge of equipment inspection and maintenance in their respective countries.

### 2.2 Training at JCCP

#### *(1) Refinery Maintenance Management*

This lecture focused mainly on TPM (total productive maintenance) activities and autonomous maintenance activities by refinery operators. It also covered risk-based maintenance, taking a case study on corrosion damage as an example. Through exercises and discussion, participants studied how to evaluate risks and prepare cost-effective repair plans.

#### *(2) Material Problems of Static Equipment in Refineries*

This lecture provided knowledge of material characteristics that need to be understood when selecting refinery equipment materials, and methods for selecting materials based on an understanding of relevant regulations/codes and design conditions. It also introduced a case study of equipment damage in order to discuss the true causes of damage and measures for dealing with them.

Various inspection methods and their application were also introduced, including new methods for

inspection of pipes from the outside, self-propelled inspection methods, and methods for inspection of pipes from the inside, such as direct inspection by inspectors and the pig inspection method.

*(3) Management of Boiler Water and Cooling Water and Anticorrosion Management of Plants*  
(External lecturer: Mr. Takashi Suzuki, Suzuki Engineering Office)

Refineries use seawater and industrial water (river water, etc.) as cooling water and boiler feed water. As most countries commonly face issues regarding freshwater production, pretreatment of boiler feed water and cooling water management, albeit to varying degrees, the participants expressed strong interest in learning about water management, operational maintenance and anticorrosion management of plants, and particularly about the selection and management of inhibitors.

*(4) Oil Refinery Plant Troubles and Countermeasures*  
(External lecturer: Mr. Katsumi Yamamoto, Japan Society of Corrosion Engineering)

This lecture introduced case examples of damage to aging plants in the oil industry in Japan and abroad. A group exercise session was also held in which participants were divided into three groups to discuss and exchange knowledge and information about an actual damage case and present the results of their discussion to the other groups. This lecture received high marks from the participants for its active and meaningful content that effectively encouraged their input.

## 2.3 Offsite Training

*(1) Cosmo Oil Co., Ltd., Sakaide Refinery*

Employees of the Sakaide Refinery introduced case studies of actual damage to aged plants, such as corrosion and cracking, and discussed a method of deterioration diagnosis that was developed as a measure to assess the state of aged plants. The participants expressed strong interest in this topic, as oil-producing countries are expected to encounter the same types of issues in the near future.

The participants also deepened their understanding of maintenance management practices in Japan through a lecture on refinery maintenance plans, maintenance management methods and the maintenance management system employed by the Sakaide Refinery.

*(2) Kobe Steel, Ltd., Takasago Works*

At Kobe Steel's Takasago Works, a lecture was given on the production, inspection and quality control of reactors and other heavy-walled vessels, with particular focus on the development of new materials, analysis of thermal treatment and thermal stress, and new welding inspection methods.

The plant also provided practical training in the implementation status of welding, heat treatment and inspection processes, as well as in the production status of heavy-walled vessels using large processing machinery. As a whole, it allowed the participants to experience an aspect of manufacturing in Japan.

*(3) Sumitomo Metal Industries, Ltd., Steel Tube Works*

The staff at Sumitomo Metal Industries' Steel Tube Works gave a lecture on the steel pipe and tube production technology and technologies for damage inspection after pipes and tubes are placed in service. They also explained in detail the properties of stainless steel and the characteristic damage it sustains during use.

Additionally, a hands-on training session clarified how ordinary pipes are produced, inspected and shipped, and provided a good understanding of the ingenuity and the latest technologies that are involved in the production of pipes.



At Sumitomo Metal Industries' Steel Tube Works

*(4) Non-Destructive Inspection Co., Ltd., Head Office*

In addition to a lecture on the theory and methods of new non-destructive inspection technologies, a demonstration using a new inspection device and a simulated sample provided meaningful training that captured the participants' attention and interest.

The participants not only learned about the principles of Japan's outstanding inspection technologies that largely differ from what they normally experience in



At the head office of Non-Destructive Inspection Co., Ltd.



At Showa Yokkaichi Sekiyu's Yokkaichi Refinery

their respective organizations, but they also gained practical hands-on experience in an actual inspection procedure.

(5) *Showa Yokkaichi Sekiyu Co., Ltd., Yokkaichi Refinery*

At the Yokkaichi Refinery, a lecture was given on the utilization of maintenance management systems, with a focus on their prediction function, coverage and management. An example was also given of a system that also incorporates a risk-based reliability management function. In practical training, the participants seemed particularly impressed at seeing how advanced plants are rationally and closely interconnected in a compact group.

(6) *Shinko Plantech Co., Ltd., Head Office*

Employees at the head office of Shinko Plantech

introduced the maintenance, inspection and repair technologies for plant units and tanks, and provided practical training in materials testing and metallographic examination using an electron microscope, based on Q&A interchanges. This offsite training also provided a close look at the significant role of maintenance companies in the maintenance of Japanese refineries.

### 3. Summary

The participants were a well-balanced group of young to seasoned engineers, and included many high-quality refinery inspection engineers. They asked more questions than in any other course—and specific and advanced questions at that—to absorb all they can about Japan's technologies and experience that support refineries in Japan that were built as long as 50 years ago, thereby making for an active and lively course.

<by Hiromitsu Saito, Training Dept.>

Personnel Exchange

## Regular Course on DCS Fundamentals and Applications

A regular course on DCS fundamentals and applications was implemented over a period of 18 days, from April 9 to 26, 2012.

### 1. Background and Objective

DCS (distributed control system) was first

commercialized in 1975. JCCP began offering hands-on training using an actual DCS unit from immediately after its establishment, believing that utilization of DCS would prove useful in JCCP training programs.

Today, DCS is indispensable to equipment operations in many countries. However, there are also countries that continue to use pneumatic instruments in their operations.



Based on this understanding, this course introduced basic to applied DCS technologies and an outline of DCS projects, in addition to covering such recent topics as fieldbuses, wireless systems and alarm management.

## 2. Course Content

### 2.1 Training at JCCP

#### (1) *Functional Overview and Maintenance of DCS*

*(Lecturers: Mr. Riichirou Suzuki & Mr. Seiichi Nagura, Azbil Corporation)*

This session included a classroom lecture on DCS functions and a hands-on lecture using the DCS that was upgraded last year (Harmonas-DEO; Azbil Corporation). Following an overview of the history of DCS, the advantages and disadvantages of analog and digital systems, and DCS input/output and calculation functions, the lecturers explained the three different types of instruments connected to the DCS—fieldbus, HART and a conventional instrument—in an easy-to-understand manner using actual machines. Additionally, in discussing DCS maintenance, the lecturers undid the wiring of a certain station and intentionally set off its alarm to demonstrate how to identify the location of the alarm from the system message. It was an extremely practical lesson that captured the participants' strong interest.

#### (2) *Process Control Theory and Practice*

The lecture on basic control theories and practice using CAI is an integral part of JCCP's regular course on instrumentation. It defines the three control features that are needed to express process behavior and explains how controller parameters are determined from those features, through an understanding of basic theories and hands-on simulator training. After giving a video lecture to introduce theories related to setting parameters, the lecturer went over the essential points, then engaged the



At JCCP



In front of the simulator

participants in a CAI-based exercise. Following these lectures and exercise, the participants received hands-on training in control using actual machinery equipped with DCS and a miniature plant (water tank model). By setting the water tank level as the control variable, they studied simple level control, cascade control, feed-forward control and methods of tuning their respective controllers, as they examined the performance of each type of control. The first-hand experience in observing how control parameters can influence processes was especially appreciated by all participants.

#### (3) *DCS Alarm Management*

*(Lecturer: Mr. Yasuhiro Kutsuma, Azbil Corporation)*

Various efforts are being made to standardize alarm management at the global level, to prevent problems stemming from a flood of alarms. In consideration of this worldwide trend, JCCP has been offering a lecture on alarm management since three years ago. This particular lecture introduced the latest trends in alarm management, including proposals issued by the Engineering Equipment & Materials Users' Association (EEMUA), an organization instrumental in the movement for alarm standardization. The lecturer presented case studies on root cause analyses of alarms and the 10 worst alarm activities to discuss practical methods for reducing alarm events, and explained the various functions related to alarm management systems in an easy-to-understand manner using the simulator at JCCP that incorporates his company's DCS (Harmonas-DEO; Azbil Corporation).

#### (4) *Engineering Exercises*

Monitoring and control are the two main functions

of DCS. This program aimed to provide training in creating the necessary display for monitoring and the necessary control logic for control using two different DCS systems: Azbil Corporation's Harmonas-DEO and Yokogawa Electric's CENTUM-CS3000. Allowing participants to perform the same engineering exercises on two different DCS systems and compare the usability of the two systems was the most salient feature of this program. It proved to be a valuable experience to the participants, as there are few instrumentation engineers who have experience in DCS engineering.

#### *(5) Modernization of Instrumentation*

*(Lecturer: Mr. Takashi Sakamoto, JGC Corporation)*

This lecture presented a number of keywords that are drawing widespread attention in the instrumentation field in recent years, and placed particular focus on explaining fieldbuses, wireless systems, and alarm management. The lecturer then discussed how to implement projects for shifting analog instrumentation systems to DCS and for upgrading existing instrumentation systems, with reference to his personal experience in such projects. The participants made for a highly productive lecture by raising many good questions without any decline in their concentration, despite the course coming to an end the following day. One participant showed keen interest in learning about the economic potential of fieldbuses, while others expressed their wish to see a separate program organized for some of the topics mentioned in the lecture. Moreover, in a review meeting for the entire course held the following day, there were requests to allot more time to the lecture on modernization of instrumentation and fieldbuses. In response to this request, JCCP will consider augmenting this lecture with even more detailed presentations on the two subjects in future implementation of this course.

## **2.2 Offsite Training**

### *(1) Yokogawa Electric Corporation, Mitaka Head Office*

Employees of Yokogawa Electric's Mitaka Head Office gave an overview of their company, followed by an introduction of their latest DCS (CENTUM VP). The lecture elicited a variety of questions from the participants, including methods of connection with other DCS systems, maintenance of PIMS (Plant Information Management System) databases, necessity of domain servers and, from an Iraqi participant, the nearest contact



*At the head office of Yokogawa Electric Corporation*

addresses. A lecture was also given on the latest safety instrumentation system (SIS) (ProSafe-RS) to provide detailed, hands-on knowledge about algorithms that increase SIL (safety integrity level) and reliability. In the demo room, Yokogawa Electric employees introduced the functions of an actual DCS, fieldbus and remote unit, and provided a good opportunity to learn about recent trends in DCS and its peripheral equipment. Lastly, the participants toured the company's response center, where technical support engineers are always on standby to respond promptly to field troubles, and learned about the center's measures against virus threats.

### *(2) Azbil Corporation, Fujisawa Techno Center & Shonan Plant*

Azbil Corporation provided training at its Fujisawa Techno Center and Shonan Plant. At Fujisawa Techno Center, the participants received a lecture on asset management, then divided into two groups to observe a demonstration of a control valve and AMS (asset management system) and another demonstration on DCS and related devices, including Azbil-brand local instruments. In the AMS demonstration, a system was introduced that automatically executes valve stroke tests, and had the participants eagerly asking questions about the system and its instruments after the demonstration. In the demonstration on DCS and related devices, there were many questions from the participants regarding not only DCS but also field equipment. In the afternoon, the participants visited the Shonan Plant and inspected the control valve production process. They seemed impressed by the clean and orderly manner in which steel pipes are processed, and listened intently to the detailed explanations about each work process.

### *(3) Emerson Japan, Ltd., Mizushima Solution Center*

As Emerson Japan boasts the world's leading wireless



At Emerson Japan's Mizushima Solution Center

systems and DCS systems, it provided a lecture on such systems and particularly on its latest DELTA-V DCS system. The explanation of wireless systems included highly technical information about theories and standards, but the participants maintained their attention and asked many detailed questions, such as about the service life of wireless batteries and methods for connecting wireless devices with DCS. The large number of such questions was a reflection of the widespread interest particularly in current wireless devices and systems. In the lecture on DELTA-V, an innovative function was introduced that eliminates the need for a marshalling cabinet (a cabinet for connecting field instrumentation wiring to the DCS). Despite the tight schedule, the lecture provided detailed explanations of wireless systems and DELTA-V in an extremely easy-to-understand manner.

#### (4) Idemitsu Kosan Co., Ltd., Tokuyama Refinery

At Idemitsu Kosan's Tokuyama Refinery, employees gave an overview of the refinery, introduced the company's computer systems and applications and operation support system, and provided a tour of the refinery's control room, where they introduced the organization and gave case examples of computer system utilization. The participants had questions regarding not only the system case examples, but also about departmental frameworks and operator training, and expressed strong interest in the refinery's system that regularly rotates board operators and field operators.

After the tour of the control room, the participants toured the training plant and learned about its training programs before returning to the administration building for a review session. In addition to a general interchange of questions and answers, the review session also provided an introduction of the refinery information management system at the participants' request.



At Idemitsu Kosan's Tokuyama Refinery

### 3. Summary

As instrumentation devices are evolving on a yearly basis, various measures are taken to ensure JCCP courses keep pace with evolving changes. With respect to this course, one of the two DCS models at JCCP was upgraded to a new model, and an environment was prepared to provide training using actual fieldbuses and wireless systems. These initiatives, we feel, have led to high-impact training. Furthermore, training content is reviewed annually to incorporate participants' feedback. For example, a post-training questionnaire revealed that many participants wish to receive a lecture on advanced control, so this need will be addressed when next implementing this program.

JCCP wishes to take this opportunity to thank all lecturers and staff members at offsite training facilities for surveying participants' requests and feedback. Thank you very much.

<by Kazuhiro Suzuki, Training Dept.>



# CPJ Seminar on Inspection and Reliability Evaluation for Iraq

A Customized Program-Japan (CPJ) on inspection and reliability evaluation was held for a group of maintenance and inspection engineers from oil and gas refining companies in Iraq from February 6 to 17, 2012, as requested by the Ministry of Oil-Iraq.

## 1. Overview

Today, the political and security situation in Iraq is improving and moving toward stabilization, and industrial recovery is also making steady progress. However, as Iraq's oil and gas refineries are especially indispensable to ensuring stable supplies of oil products, the functional recovery and restoration of oil and gas refining facilities is one of the country's most urgent issues.

To help address this need, JCCP implemented a CPJ on inspection and reliability evaluation for a group of engineers from companies affiliated with the Ministry of Oil-Iraq. The group was composed of 12 members, including three each from North Refineries Company and Midland Refineries Company, and two each from South Refineries Company, North Gas Company and South Gas Company. The course content was suitably arranged for the members, all of whom were engineers engaging in the inspection, maintenance and maintenance planning of rotary machinery, pipelines and static equipment (pressure vessels, towers and tanks, and heat exchangers).



Lecture scene

## 2. Training at JCCP

### 2.1 Petroleum Industry in Japan

This lecture first explained trends in energy demand in Japan, the ratio of oil within the primary energy composition, and trends in product demand, followed by the roles of distributors, major demand-side associations, and direct sellers in the logistics of crude oil and oil products, from their import by petroleum wholesalers to their refining and marketing. It then discussed Japan's oil industry in general, including the marketing share of petroleum wholesalers, the locations and refining capacities of refineries operated by oil companies in Japan, their rate of introduction of benzene reduction units and deep desulfurization units, and environmental countermeasures.

Though the participants work in a state-run oil company, they gained a thorough understanding of the necessity and significance of achieving sustainable development through management efficiency, environmental initiatives, and heavy oil countermeasures.

### 2.2 Safety and Reliability of Aging Plants

*(Lecturer: Dr. Katsumi Yamamoto, Japan Society of Corrosion Engineering)*

This lecture provided case examples of damage to aging plants in oil industries in Japan and abroad, based on the extensive knowledge and experience of the lecturer.

It went beyond simply providing an explanation of damage examples such as material corrosion and fractures, to discussing plant safety and reliability through an analysis of accidents that have occurred due to such damage. Among the examples of corrosion cases, the most convincing was that of external corrosion, which poses the difficulty of identifying cause and effect.

The participants also engaged in a group activity by dividing into three groups, and mutually discussed, exchanged knowledge and information, and gave a presentation based on an actual damage case. This active and productive participatory session garnered strong support from the participants.

## 2.3 Periodic Maintenance Management and Risk Management

This lecture discussed the reality of maintenance systems in Japan and described various types of maintenance tools, such as TPM (total productive maintenance), RCM (reliability centered maintenance), and RBI (risk based inspection). TPM activities, in particular, were explained as activities that involve the participation of an entire company, from top management to regular employees, based on the lecturer's personal TPM experience. Photos of TPM activities were also shown to facilitate understanding.

Additionally, the participants engaged in a decision-making exercise in which they used the "risk management method" to select the optimal method for repairing corrosion damage to the top of an atmospheric distillation tower from among a number of possible methods. This exercise in reaching a decision based on the risk management method provided highly practical training to the participants, as engineers frequently encounter issues in risk and cost balance that require them to make a difficult decision.

## 2.4 Plant Life Cycle Engineering

*(Lecturer: Mr. Eiichi Yamamoto, Eishintechno)*

Plant life cycle engineering (PLE) is attracting widespread interest as a means that takes life-cycle costing (LCC) into consideration from the design stages of a plant to ensure that optimal cost is spent throughout a plant's life cycle, from its construction and operation to its maintenance and repair, environmental measures, and disposal.

This is a worldwide trend that aims to achieve effective utilization of all physical and personal resources and realize earth-friendly manufacturing processes. As participants of this course regularly engage in plant maintenance activities, this lecture provided them with knowledge and information that are indispensable to their duties. The lecturer, Mr. Eiichi Yamamoto from Eishintechno, used his wealth of experience to provide a systematic and practical lecture that covered material dynamics, material selection, optimal inspection and repair methods for each type of material, and material trouble cases and countermeasures.

## 2.5 Maintenance Management of Static Equipment

This lecture provided knowledge of the latest non-destructive inspection technology as a key inspection

technology for the maintenance management of refinery facilities.

The advantages and disadvantages of various inspection methods were explained in an easy-to-understand manner using a comparison chart that included methods of non-destructive inspection from outside the pipe (self-propelled SLOFEC inspection, self-propelled multi-wave ultrasonic inspection, TOFD ultrasonic inspection, long-period ultrasonic inspection) and methods of inspection from inside the pipe (direct visual inspection of large-diameter pipes by an inspector, inspection using smart pigs).

It was explained that various factors need to be taken into consideration to select the optimal inspection method, such as inspection cost, the shutdown duration of facilities, and the possibility of undertaking repair work at the same time as the inspection. This discussion was particularly meaningful to participants who are in the position to formulate inspection and maintenance plans.

## 2.6 Boiler Water and Cooling Water Quality and Chemicals

*(Lecturer: Mr. Takashi Suzuki, Suzuki Engineering Office)*

Refineries use seawater and industrial water (river water, etc.) as cooling water and boiler water, and have a need to solve issues regarding freshwater production, pretreatment of boiler water and cooling water management, although to varying degrees depending on the country. For this reason, the participants showed strong interest in discussions about water quality management, operational management, anticorrosion management of devices, and particularly about the selection and management of inhibitors. The lecturer's rich experience and logical problem-solving approach made the lecture extremely convincing.

## 3. Offsite Training

### 3.1 The Japan Steel Works, Ltd., Muroran Plant

Muroran Plant offered a plant tour that only a world-leading manufacturing company can provide. It allowed participants to actually see and feel the heat of important manufacturing components of high-pressure vessels that require safety and reliability, such as high-pressure reactors and nuclear reactor vessels in the oil and nuclear power industry; and of high-quality forged products, such as the gas turbine axle (forging: 13,000-ton press,



*At The Japan Steel Works, Muroran Plant*

machine processing, welding of heavy-walled vessels, inner cladding).

In the lecture on technologies for repair of damage to high-pressure reactors that are actually used in the oil industry, participants learned that repair technologies greatly differ according to the location, type and degree of damage, and that some types of damage can be addressed by partial repair while other types of damage require a complete renewal of the entire area that includes the damage. The discussion of examples of actual repair cases and countermeasures for deterioration damage to heavy-walled reactors that are used under an intense operating environment in the hydrodesulfurization process proved to be especially meaningful to the participants who face such issues in their work.

### **3.2 JX Nippon Oil & Energy Corporation, Muroran Refinery**

As there is high demand for kerosene and fuel oil in Hokkaido, the Muroran Refinery works to provide a stable supply of these fuels by operating a unit that breaks down heavy oil into light oil. However, because the unit is in effect placed in continuous operation under extreme conditions, the refinery requires proper management capacity to maintain facility reliability at a high level. Toward this end, it is building and utilizing computer-aided systems that centrally manage such information as



*At JX Nippon Oil & Energy Corporation's Muroran Refinery*



*At The Japan Steel Works' Japanese sword workshop*

equipment ledgers, repair histories, design specifications, equipment diagrams, inspection records, and repair schedules for daily repair work, periodic repair work and tank repair work. This training program at Muroran Refinery provided a detailed understanding of such efforts to improve facility reliability in the refinery.

### **3.3 Idemitsu Kosan Co., Ltd., Chiba Refinery**

Voluntary maintenance activities by the operations department (operators), which constitute the basis of TPM activities, and specialized maintenance activities by the maintenance department are both necessary for proper maintenance. Only when these two activities function effectively can facility reliability be ensured.

Maintenance systems implemented in many Japanese refineries through external engineering companies were introduced in terms of their advantages and disadvantages based on abundant data. The participants showed strong interest particularly in management activities promoted by the operations department, such as the vibration management of rotary machinery, temperature management of bearings, lube oil management, and other voluntary inspection activities that are based on a sense of ownership, as well as in energy-saving activities based on finely tuned operational management.

## **4. Summary**

Just as in oil-producing countries, Japanese refineries also strive to ensure facility reliability by adopting Western maintenance management methods and independent management methods that are based on Western methods.

At present, Iraq is planning to rehabilitate oil refining units, build new refineries, reinforce existing refineries, and construct decomposing facilities as part



of its reconstruction efforts. At the same time, it faces another extremely important issue of developing plant inspection and maintenance engineers. In this respect, it can be said that this course has satisfied needs in Iraq to some extent.

By continuing to provide this type of seminar, JCCP hopes to deepen mutual understanding between Iraq and Japan and strengthen the two countries' relationship of mutual trust.

*<by Kenji Saito, Training Dept.>*



*At Idemitsu Kosan's Chiba Refinery*

Personnel  
Exchange

## CPO/CPJ Seminar on Technologies Related to Power Plant Efficiency for Vietnam

### 1. Background

In August 2011, Petrovietnam and JCCP exchanged a memorandum of understanding (MOU) and officially launched a JCCP special cooperation program for Vietnam. Under this special program, new customized programs were planned and prepared as requested by affiliates of Petrovietnam. The purpose of these programs was to provide cooperation to Petrovietnam in addressing technical issues and solutions to demands for electricity that are increasing at an annual rate

of almost 15% in the wake of the rapid development of the country's market economy since the Doi Moi policy and the accompanying expansion of residential electrification and industrialization. As the theme of the programs, priority was placed on technologies related to reliability and efficiency improvement of power plant facilities and equipment that comprise the heart of Petrovietnam's operational departments. A Customized Program-Overseas (CPO) and Customized Program-Japan (CPJ) were thus organized and implemented under that theme.



*Opening ceremony (group photo)*

As the first part of the seminar, a CPO was held in Ho Chi Minh City over a period of five days, from January 9 to 13, 2012. As the second part, a CPJ was held in Japan over a period of 11 days, from February 21 to March 2, 2012. This arrangement allowed JCCP to supplement the lectures provided in the first part with technical training provided at manufacturing and assembly plants in the second part, and thereby deepen and increase the participants' level of understanding. The programs were implemented as follows.

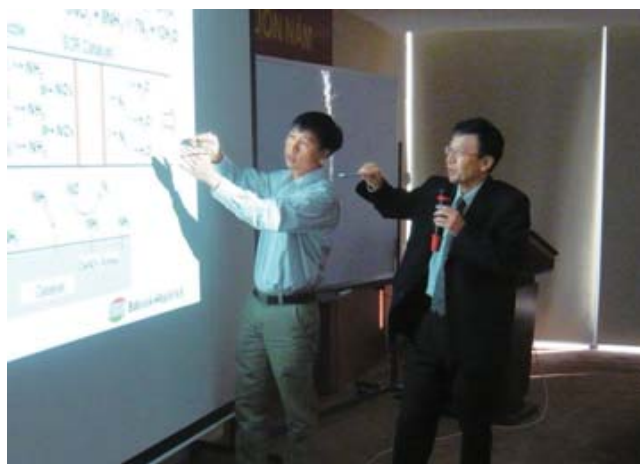
## 2. Part 1 (CPO)

The CPO seminar was implemented by the JCCP Training Department (Shintaro Miyawaki) with the cooperation of specialists in various relevant fields, including Mr. Teruaki Kashiwagi (Toa Oil Co., Ltd.), Dr. Koichi Kato (professional engineer; PhD), Mr. Yoshito Shibamura (Hitachi, Ltd.), Mr. Kazuhiro Takenaga (Babcock-Hitachi K.K.), and Mr. Shigeto Nishi (Hitachi Plant Technologies, Ltd.).

It was held in a conference room in a new intelligent building that was recently built in southern Ho Chi Minh City by the Petrovietnam Group, and was attended by a total of 37 members, including mechanical engineers and department managers from throughout the country.

The seminar began with an overview of the Petrovietnam Group today, by describing the state of progress of recent projects the Group is committed to undertaking as a whole (development of submarine gas and oil fields, construction of an oil refinery, power plant and bioethanol plant), along with its initiatives for globalization of the state-run conglomerate with an eye to global expansion.

Most of the participants were engineers with abundant practical experience who work in a state-run



*Active Q&A session*

company affiliated with Petrovietnam (Dung Quat Refinery, Nhon Trach Power Plant, Ca Mau Power Plant, etc.). The sincere manner in which they listened to the presentations of practical case examples and introduction of the latest technologies left an impression on the lecturers, who also noticed and appreciated the careful thoughts and considerations given to the seminar by the organizers on the Petrovietnam side.

Technical lectures were given by specialists in their respective fields, and covered 12 issues as requested by Petrovietnam. They were grouped into three sessions according to topic: a session on maintenance of steam turbines and other dynamic equipment (lectures 1 – 4); a session on an overview of power plants and new technologies (lectures 5 – 8); and a session on an overview of power generation boilers (lectures 9 – 12).

Lectures 1 and 2 (Miyawaki) explained the significance of reliability improvement of dynamic equipment, which forms the foundation of stable and efficient operations of the plant industry. The lectures also presented case examples of Kaizen, including an example of the contribution of dynamic equipment to improving performance and preventing the loss of energy. Lectures 3 and 4 (Mr. Shibamura) introduced maintenance technologies for large-scale steam turbines (including turbines with supercritical conditions) and the latest technologies for high turbine performance based on improvement of mechanical component materials. Lectures 5 and 6 (Mr. Kato) provided a wide-ranging discussion on improvement of power generation efficiency through recent advancements in power plant technologies, and on the development of environmentally friendly, future-oriented power plants. Lectures 7 and 8 (Mr. Nishi) introduced examples of



*At the entrance to the seminar venue*

repair technologies for compressors, blowers and other dynamic equipment used in power plants and of diagnosis technologies that are rapidly advancing in recent years, based on the lecturer's wealth of experience. Lectures 9 and 10 (Mr. Kashiwagi) described various facility improvement initiatives for maintenance management of power plant boilers based on actual case examples and accumulated technologies. The last two lectures, lectures 11 and 12 (Mr. Takenaga), introduced various case examples, including overseas cases, of the performance improvement of boilers, which are essentially the heart of thermal power plants, with a focus on practical issues, such as the optimization of energy-saving boilers and the new combined cycle technology. As these lectures were all highly relevant to the participants' daily activities, active Q&A interchanges ensued after each session and created a strong impression on the lecturers.

### 3. Part 2 (CPJ)

Part 2 of the seminar in Japan (CPJ) aimed to strengthen and substantiate the lectures provided by experts in Part 1 (CPO) that was held in Vietnam, and was organized to be implemented mainly at the facilities and plants of JCCP member companies from which experts were dispatched to Vietnam in Part 1. As the offsite training facilities were informed of the participants' specialty fields in advance, lectures were optimally prepared to suit the group. Moreover, the program was implemented in a much smoother manner than expected and contributed greatly to achieving one of the goals of the customized programs to increase the benefits of training through the mutually complementary Parts 1 and 2 of the seminar.

The participants of Part 2 were selected mainly from among working-level employees in charge of dynamic plant equipment at Petrovietnam, and comprised a young group in which 14 of the 15 members were in their 20s and 30s.

In terms of technical fields, most of the members were working-level mechanical engineers mainly from the Dung Quat Refinery and other operational departments at Petrovietnam (power plant operations and maintenance management). Because they were specifically selected for this seminar, the content was customized to perfectly match their needs, and the original objective of the seminar was smoothly attained.

Offsite training in practical technologies was provided at plants and facilities in Japan that boast leading

technologies in their respective fields, with a focus on six priority themes. They covered a wide range of content that included: technical explanations at the production site of actual plants; practical training and simulator exercise in mechanical operations and disassembly, processing and assembly methods; introduction and development status of the latest technologies; and diagnosis and repair technologies based on ample achievements and experience in manufacturing. Experts in these fields provided lectures and practical training in specific technical issues at facilities operated by JCCP member companies.

- (Theme 1) Selection and diagnosis technologies for vibration measuring instruments for rotary machinery (Shinkawa Sensor Technology, Inc., Hiroshima Works)
- (Theme 2) Latest technologies for dynamic boiler system equipment (Babcock-Hitachi K.K., Kure Works)
- (Theme 3) Maintenance management and diagnosis technologies for dynamic turbines (Hitachi, Ltd., Hitachi Works)
- (Theme 4) Diagnosis and repair technologies for rotary machinery and large gears (Hitachi Plant Technologies, Ltd., Tsuchiura Works)
- (Theme 5) Governor functions and reliability improvement technologies (Woods Corporation, Tomisato Plant)
- (Theme 6) Diagnosis and analysis technologies for bearing vibration (AIX Co., Ltd., Mr. Yoshimasa Sakaguchi)

The themes above were selected as elemental technologies indispensable to reliability improvement



*Vibration diagnosis exercise  
(Shinkawa Sensor Technology, Inc., Hiroshima Works)*





*Governor exercise  
(Woods Corporation, Tomisato Plant)*

of dynamic equipment that is essentially the heart of large-facility industries such as oil refineries and power plants, and also as priority issues that ensure stable and efficient operations in Petrovietnam's project companies. Additionally, the program was planned and designed to allow participants to acquire a broad knowledge of engines and turbines and various rotary machines, as well as to acquire practical skills and technologies through lectures and observation tours at the manufacturing plants of such machinery. Owing in part to the meticulous preparations made at each offsite facility, the seminar achieved its original goal, and the entire agenda of the seminar was completed as scheduled. This in itself could also be said to be a significant achievement of this seminar.



*At the Tsuchiura Works of Hitachi Plant Technologies, Ltd.*

## 4. Summary

As mentioned above, JCCP launched a special cooperation program for Vietnam in fiscal 2011 and, under this program, planned and formulated a program in line with a request from Petrovietnam, following a prompt assessment of its needs. Power plants were selected as the theme of a seminar for the first time in JCCP's long, 30-plus-year history, and the program was customized thanks to the cooperation of related companies and organizations. The seminar was ultimately implemented in two separate parts that mutually complemented each other to increase training effectiveness, but there were a number of unexpected difficulties along the way. For example, seminar venues scattered throughout the longitudinally long country were reviewed and integrated into one (two seminar venues were brought to Ho Chi Minh City), and the lecturers' schedules needed to be re-adjusted due to the changes in venue. Meanwhile, however, the planning of the program content made significant progress, through preliminary discussions and coordination with the Petrovietnam counterpart regarding content details and themes, with input also from experts and the added benefit of cooperation from JCCP member companies that were key to realizing the technical aspects of the new program. Ultimately, offsite training venues and themes were efficiently narrowed down, and the concerns and issues encountered at each stage of planning were sequentially resolved, thus allowing the seminar to be implemented as planned.

JCCP intends to offer an increasing number of such CPO-CPJ combination programs like this one in the future, with expectations that they will open the path and lead to future development of even more practical courses in JCCP's personnel exchange program. Such programs are also expected to provide proper direction to planning training programs that are even more beneficial and timely to major oil-producing countries that are selected for JCCP's special cooperation program.

*<by Shintaro Miyawaki, Training Dept.>*

# CPO Seminar on World's Energy Situation Held at TASWEEQ

A Customized Program-Overseas (CPO) on the world's energy situation was held from February 4 to 11, 2012, intended for marketing managers at Qatar International Petroleum Marketing Company Ltd. (TASWEEQ).

## 1. Background

A JCCP delegation visited Qatar's TASWEEQ for the first time in February 2010 under the Training Cooperation Program (TC) scheme. The delegation gave an overview of JCCP regular courses and customized programs (CPO & CPJ) at that time, and the TASWEEQ side expressed stronger interest in receiving a customized program in Qatar than in Japan, because the majority of the company's employees are foreign workers. Subsequently, the delegation visited TASWEEQ again last June to present a specific training proposal toward realizing the customized program, which was recently implemented.



*Greeting by a representative on the TASWEEQ side*

## 2. Overview

Based on TASWEEQ's motto to employ and develop world-class human resources, the main theme selected for the seminar was "World's Energy Situation."

TASWEEQ is a state-run oil company that governs the international oil products marketing sector in

Qatar and mainly operates in Japan and other parts of Asia. Taking this into consideration, the program was composed of the following three lectures concerning Japan's and the world's energy situations.

The first was a lecture on "The Oil Industry and Oil Marketing Situation in Japan" by Kazuo Kojima (Lecturer, JCCP Training Department); the second was on "The World's Energy Situation and Future Outlook" by Mr. Mitsuyuki Maeda (Researcher, Tokyo Institute of Technology); and the third was on "Renewable Energies (alternative energies)" by Mr. Yasuhiko Nagata (Senior Economist, The Institute of Energy Economics, Japan).

## 3. Content

To satisfy TASWEEQ's wish to allow as many employees as possible to attend the seminar, a two-day seminar was implemented twice over four days.

The first day featured lectures on "The World's Energy Situation and Future Outlook" and "The Oil Industry and Oil Marketing Situation in Japan."

The former provided an understanding of (i) the environment and factors surrounding the global oil industry; (ii) demand-supply trends and regional trends in primary energies such as oil, coal, and natural gas; and (iii) trends in crude oil prices, in relation to the demand-supply balance, the European financial crisis, and other such issues. Questions and opinions from the participants were mostly in regard to the mechanism, trends and forecast of the financial crisis that occurred in the wake of the Lehman Shock triggered by the collapse of the subprime loan market. Discussions about trends in the prices of crude oil and gas, which have direct bearing on daily business, also elicited active questions and opinions from the participants.

The latter lecture on "The Oil Industry and Oil Marketing Situation in Japan" mainly introduced the history of deregulation in the oil industry and the reality of excessive competition in recent years since after liberalization of the industry. More specifically, it explained the backdrop and characteristics of the



Lecture by Mr. Maeda  
(Tokyo Institute of Technology)



Lecture by Mr. Nagata  
(The Institute of Energy Economics, Japan)

oil crisis, the historical background and reality of oil stockpiling, and the importance of stable oil supply. There was particularly strong interest in the stockpiling of oil, perhaps because two GCC countries have already commenced strategic stockpiling in Japan. The lecture also discussed such issues as the structurally decreasing trend in demand for oil brought about by a low birthrate, longevity and declining population, global warming countermeasures, and initiatives for promotion of renewable energy sources.

The second day featured lectures on “The World’s Energy Situation and Future Outlook” (Part 2) and “The Reality and Outlook of Renewable and Alternative Energies.”

The former lecture on “The World’s Energy Situation and Future Outlook” (Part 2) explained (i) the outlook of the world’s crude oil reserves and production volume; (ii) changes and trends in global-scale climate change; and (iii) the current state of the Fukushima nuclear crisis caused by the Great East Japan Earthquake. It elicited many questions related to trends in oil prices, including

the production and development of non-conventional oils such as oil sands and shale oil, CO<sub>2</sub> emissions and the future outlook of Japan’s nuclear situation.

The latter lecture on “The Reality and Outlook of Renewable and Alternative Energies” discussed solar power (heat) and other such energy sources as wind, bio and geothermal power as sources of power generation that are most suited to the Middle East region. The participants had many questions particularly in regard to geothermal generation, perhaps because of their unfamiliarity with this method of power generation. The lecture also explained the shift toward renewable energies and nuclear power, which have already been introduced and promoted in the GCC countries. Participants with knowledge about solar energy actively exchanged information and views with the lecturer.

The same program was implemented once again, for a different audience.

#### 4. Summary

In response to a request from TASWEEQ, the seminar was unconventionally designed as a two-day seminar and implemented twice over four days. As intended by the organizers, the seminar was attended by a large audience of approximately 60 people, composed of Qatari nationals as well as multinational employees from Africa, Europe and Asia. The wide diversity represented TASWEEQ’s global composition as an international company that is active across the globe.

In an evaluation questionnaire about the seminar, most of the participants indicated their strong interest in JCCP training by expressing their wish to participate in a training program in Japan in the near future. As



Lecture by Kojima (JCCP)





*Participants and lecturers after completion of the seminar*

stated in the company motto, TASWEEQ aims to employ world-class employees, and it was clearly evident that, as an international company, it wishes to have as many of its employees as possible acquire global knowledge and information through this seminar.

While TASWEEQ is a young company that was established only four years ago, it has exhibited remarkable growth. However, with respect to human resources, the company still needs to develop personnel who are capable of performing on the world stage, just like other Middle East countries.

Lastly, JCCP thanks everyone who provided support and cooperation in bringing the seminar to successful completion. Thank you very much.

*<by Kazuo Kojima, Training Dept.>*

**Personnel  
Exchange**

## **CPO Seminar on Carbon Management Held Jointly with the Omani Ministry of Oil and Gas**



*Participants and lecturers of the carbon management seminar*

### **1. Background**

A Customized Program-Overseas (CPO) on carbon management in the oil industry was held jointly with the Omani Ministry of Oil and Gas (MOG) from April 21 to 23, 2012, in Muscat.

As Oman is one of Japan's key crude oil suppliers, JCCP has consistently promoted its participation in training programs and technical cooperation projects.

Last year, a conference on training activities was held for the first time with MOG as part of JCCP's initiative to renew its training courses and design programs to more closely satisfy changing needs in oil-producing countries and to cultivate new counterparts. As a result of the conference, the ministry formally requested the joint implementation of a seminar on carbon management with JCCP.

MOG, in cooperation with the Ministry of Environment

and Climatic Affairs (MECA), invited the participation of oil companies in Oman, and meticulously prepared for lecturers and presentation themes with the JCCP side, to design a seminar that closely matches participants' needs. JCCP has previously implemented training programs with state-run oil companies affiliated with the Ministry of Oil and Gas, but this was the first time to organize a seminar directly with the ministry.

In recent years, domestic energy consumption is increasing in oil-producing countries and bringing about a heightened interest in carbon management technologies, such as for the reduction of greenhouse gas emissions, efficient utilization of energy, and effective utilization and underground storage of CO<sub>2</sub>. In Oman as well, MECA and MOG are promoting carbon management activities, and oil industry sectors under their supervision have launched various relevant activities. There is also growing interest in establishing cooperation with Japan in carbon financing, which is important for project development.

Meanwhile, Japanese companies, with their advanced technologies for efficient energy utilization, effective utilization of CO<sub>2</sub>, and underground storage of carbon, have expressed strong interest in introducing and applying these technologies to oil-producing countries. Thus, this seminar on carbon management was implemented as a JCCP program, with the attendance of executives of MOG.

## 2. Content

Complying with the ministry's advice, the seminar was implemented in two parts, with a general open session held on the first day for a wide range of participants from the oil industry, and in-depth technical



*Dr. Said Khamis Al Siyabi, Director General, MOG, giving an opening speech*



*Members of the seminar:  
Dr. Al Siyabi, Director General, MOG  
(front row, third from left);  
Mr. Yamanaka, Counsellor, Embassy of Japan  
(front row, third from right);  
Mr. Al Ajmi, Director General, MECA  
(front row, second from right)*

discussions held on the second and third days.

On the first day, Dr. Said Khamis Al Siyabi, Director General, MOG, and Mr. Shinichi Yamanaka, Counsellor, Embassy of Japan, respectively gave an opening speech to an audience from major oil-related organizations in Oman. The second and third days of the seminar were attended by approximately 25 participants, including Mr. Sultan Mohammed Al Hilali, Director of Oil, and Mr. Ameen Nasser Hilal Al Mouti, Director of Gas, both from the ministry. The attendance of the important figures indicated the Omani side's high level of interest in this seminar. At the same time, because the seminar program was prepared with MOG as JCCP's counterpart, participants from throughout major oil companies in Oman were able to attend and contribute to making the seminar highly successful.

The seminar content was designed with the main objective of developing capacities to formulate new projects, and provided training in a broad range of issues relating to climate change policies, technologies, and financing. Lecturers on the Japanese side included JCCP lecturers (Shintaro Miyawaki, Tetsuo Arie) and specialists from Mitsubishi Heavy Industries, Ltd. (Mr. Masaki Iijima), Chiyoda Corporation (Mr. Toshihiko Miyagawa), and Mitsubishi UFJ Morgan Stanley Securities Co., Ltd. (Mr. Vladislav Arnaudov).

### (1) Day 1

On the first day, Dr. Said Khamis Al Siyabi and Mr. Shinichi Yamanaka gave an opening speech on the significance of carbon management, the theme of

the seminar, and the seminar's timely implementation toward strengthening future cooperation between Oman and Japan. The lectures were given in presentation style, as follows.

#### <Session 1: Carbon Management Policies>

The Japanese side lectured on the following issues: trends in international conferences on climate change frameworks, potentials for formulation of new projects in the oil industry, prospects for bilateral cooperation with Japan (Mr. Arnaudov), and carbon management in Japan's oil industry and future trends (Arii). On the Omani side, Dr. Ashok Sharma from MECA discussed climate change policies, implementation plans and project development in Oman.

The session drew many questions from the floor, and provided deep understanding of new frameworks and Japan's initiatives regarding the formulation of new projects.

#### <Session 2: Overview of Low-carbon Technologies>

Mr. Iijima and Mr. Miyagawa lectured on advanced technologies and global project trends in carbon management toward building a low-carbon society. More specifically, the session as a whole provided a general overview of Japan's advanced technologies, technical achievements and future technical trends, as well as promoted greater understanding of future project development potentials in Oman and Japan's advanced technologies.

For the first time in this session, a presentation was given of case examples of solar energy utilization in oil facilities. This presentation by Dr. Syham Bentouati from Petroleum Development Oman (PDO) garnered strong interest from the audience.

At the end of the session, all speakers gathered on stage



Q&A session (Mr. Miyagawa, Mr. Arnaudov, Mr. Iijima)

and took part in a forum-style Q&A/discussion session, which was favorably received by all participants.

#### (2) Day 2

The second and third days of the seminar took the form of a workshop for interactive discussions in a seminar room. The workshop sessions proceeded smoothly with Mr. Hamood H. Al Sawafi, Acting Director, HSE, MOG, acting as moderator.

#### <Session 3: Carbon Management in the Oil Industry>

This session introduced examples of potential projects for implementation in Oman's oil industry. More specifically, it lectured on energy efficiency, renewable energy sources, carbon sequestration, and effective utilization of flare gas, with reference to project examples in other oil-producing countries.

#### <Session 4: Carbon Management Technologies>

This session lectured on CO<sub>2</sub> separation and sequestration technologies and international project trends. As it was an area of particularly high interest among the Omani participants, many specific questions were raised in regard to future trends, and made for an active interchange of questions and answers.

#### (3) Day 3

#### <Session 5: Carbon Finance (Case Studies)>

#### <Session 6: New Project Development Exercise>

Taking specific projects implemented in other oil-producing countries as examples, Session 5 presented case studies of such issues as energy conservation, flare gas reduction, CO<sub>2</sub> underground storage and renewable energies. Additionally, by studying how to develop new projects in specific terms in Session 6, the participants



Small-group workshop (Arii)



in effect prepared to develop new projects in Oman. The sessions provided highly pragmatic training, which led to proposals for cooperation projects and specific feasibility studies between Oman and Japan, as well as discussions about the future possibility of other cooperation schemes between the two countries.

### 3. Summary

The seminar incorporated a number of new initiatives as discussed below, with the following results.

#### *(1) First-ever joint implementation with MOG*

JCCP has conventionally implemented individual training programs with state-run oil companies affiliated with MOG, but this time, the seminar was implemented with the ministry itself as the counterpart. Since the ministry oversees the entire oil industry, this arrangement allowed a wide range of participants from oil companies affiliated with the ministry to attend and contribute to making the seminar highly successful. Particularly with respect to environmental issues, which are common to many sectors of the oil industry in oil-producing countries, having the ministry act as the counterpart of the seminar proved more effective than co-sponsoring a seminar with a single organization. JCCP will therefore give broad consideration to selecting seminar counterparts in future implementation of customized seminars in oil-producing countries.

#### *(2) Preliminary meetings on the content of the customized seminar*

As this was the first joint implementation of a seminar with MOG, JCCP and the ministry held preliminary meetings to make careful preparations. This made it possible to implement an effective seminar that matched needs in the partner country in regard to the selection of lecturers, lecture content, scope of participants, and other such aspects of the seminar. In fact, the program accorded with the ministry's interest so closely that there

were director-class members of the ministry present throughout all seminar sessions.

JCCP is convinced that careful preparations should be made in collaboration with the counterpart to enhance the training quality of future customized programs.

#### *(3) Training for new cooperation project development*

By placing emphasis on building capacities for new project development, this seminar provided the participants, who attended the seminar from ministry-affiliated companies throughout the country, an opportunity to closely examine their own activities. It also provided an opportunity to examine the possibility of developing new projects in discussion with Japanese companies.

GCC oil-producing countries have specifically requested a seminar related to the environment once again this fiscal year. JCCP hopes to continue promoting effective training programs that satisfy expectations of oil-producing countries by making careful preparations in cooperation with the counterpart country to more closely respond to its needs.

*<by Tetsuo Arai, Training Dept.>*



*Presentation of the JCCP seminar completion certificate (Mr. Hamood H. Al Sawafi, Acting Director, HSE, MOG; and Miyawaki)*

# Report on the Training Cooperation Program

## —Myanmar & Vietnam—

A three-member JCCP delegation visited Myanmar and Vietnam from May 8 to 16, 2012, to strengthen relationships with major oil-producing countries outside of the Middle East region and thereby contribute to diversifying future energy supplies in Japan. The delegation consisted of Akio Yamanaka, General Manager, Operations Dept.; Takeyoshi Haishima, Deputy General Manager, Technical Cooperation Dept. (visited Myanmar only); and Takaaki Yuasa, Training Dept.

Myanmar is speculated as having a wealth of resources. Given the gradual stabilization of the country's political situation since the end of last year owing to the pro-democracy movement, the Executive Director of JCCP made a courtesy call on the Myanmar Minister of Energy this past February and proposed the implementation of customized training programs (Customized Program-Japan (CPJ)/Customized Program-Overseas (CPO)). As a follow-up to this meeting, the delegation visited the Energy Planning Department in the Myanmar Ministry of Energy to discuss specific details of the proposal.

The delegation also visited Vietnam, which was designated as one of JCCP's priority training program counterparts last year. To further strengthen the cooperative relationship with Vietnam, the delegation visited the head office of Vietnam National Petroleum Corporation (Petrolimex), a state-run oil marketing company based in Hanoi, and the head office of Petrovietnam, a state-run oil company that takes charge of both upstream and downstream operations in the oil industry, to discuss and confirm specific details of the customized programs.

### 1. Myanmar

#### (1) Energy Planning Department, Ministry of Energy

The delegation visited the Ministry of Energy in the new capital of Nay Pyi Taw, located approximately 350 km north of the former capital of Yangon. There they met with Mr. Htin Aung, Director General, and nine other executive officers and discussed the customized programs that are slated to be implemented this fiscal year. Following the delegation's explanation of

JCCP's training programs, the content of CPJ and CPO seminars, and the sharing of expenses, the Myanmar side suggested two themes for a customized program—(i) Operation Management: Refinery & Process, and (ii) Maintenance Management—with priority preferably placed on operation management. They also said they are considering a training program in Japan, since a CPJ seminar that provides hands-on training at actual oil facilities in Japan would be more effective than a CPO centered on lectures.

The Energy Planning Department stated that it would deliver the proposal to the minister and subsequently contact JCCP regarding the minister's decision.



*Meeting with the Energy Planning Department of the Ministry of Energy*

#### (2) Thanlyin Refinery

The delegation visited Thanlyin Refinery in Yangon and met with Mr. Ne Lin, General Manager, and other executive officers. After explaining what was discussed at



*Refinery executives and Mr. Ne Lin, General Manager of Thanlyin Refinery (fourth from left)*



*Akio Yamanaka giving a greeting to JCCP graduates at Thanlyin Refinery*

the Ministry of Energy, they toured the refinery facilities and the training center located within the refinery site. More than 20 JCCP graduates, including the general manager, himself a JCCP graduate, enthusiastically welcomed the delegation and expressed their strong expectations of future JCCP cooperation.

## 2. Vietnam

### (1) Petrolimex, Head Office

Members of Petrolimex and JCCP discussed the implementation of CPJ and CPO seminars this fiscal year during the JCCP Program Seminar that was held this past March. The recent delegation therefore visited the Petrolimex head office to work out the details, including a final confirmation of the content and dates for implementation of a CPJ on petroleum marketing and physical distribution. After the meeting, the delegation met with Mr. Tran Van Thinh, the former Deputy General Director who was promoted to Member of BOM-General Director in this year's personnel reorganization.



*At the Petrolimex head office:  
Mr. Tran Van Thinh, Member of BOM-General Director (center)*

### (2) Petrovietnam, Head Office

The following matters were discussed at the Petrovietnam head office.

- A final confirmation was made of this year's implementation of a customized program on maintenance management for power stations owned and operated by Petrovietnam, which was discussed during a TCJ held this past March, and the Petrovietnam side was asked to issue an official letter of request for implementation of the program.
- The CPO on maintenance of equipment & instrumentation was decided to be separated into a program for refineries and a program for power plants, due to the large number of participants.
- The requested CPJ and CPO seminars on LNG handling technologies were decided to be implemented with a main focus on LNG management by import terminals (tanks, vaporizers, piping technologies).

The specific dates of implementation and content details were agreed to be decided at a later date.



*At Petrovietnam:  
Mr. Le Binh, Deputy Director (left)*

## 3. Summary

Upon arriving in Yangon, members of the JCCP delegation noted that the city's most conspicuous difference with Hanoi and Ho Chi Minh cities in Vietnam was the relative lack of motorcycles and the abundance of used buses, trucks and passenger vehicles. According to the delegation's interpreter Mr. Thet Pyinn, the general public is prohibited from riding motorcycles into Yangon, as a measure to avoid traffic congestion in the city.

Nay Pyi Taw, an artificial planned city located five hours from Yangon, is slated to host the Southeast Asia Games next year, and a slew of new hotels and sports



facilities have gone up one after the other, giving the impression of an extremely well developed city. In Nay Pyi Taw, the delegation met with JCCP graduates at the Ministry of Energy, as well as received a warm welcome at all other destinations they visited. This is a result of years of JCCP activities and a testament to the friendly relationship between Myanmar and Japan.

Refinery facilities and analysis instruments in Myanmar, some of which are more than 30 years old, clearly need to be modernized. This understanding renewed JCCP's commitment to providing ongoing support and cooperation to Myanmar through its training activities.

The meeting with Petrolimex and Petrovietnam in the second half of the tour allowed the delegation to confirm the dates and content of scheduled CPJ and CPO seminars, and directly gain a strong sense of their expectations for JCCP support and cooperation through training courses.

The recent visits to Myanmar and Vietnam were highly meaningful, and were fully able to achieve their initial objectives, specifically owing to the generous cooperation and support of all relevant people who contributed to realizing the visits. We wish to take this opportunity to thank you all very much.

<by Takaaki Yuasa, Training Dept.>

Personnel  
Exchange

## FY2011 JCCP Program Seminar



*Seminar participants and JCCP staff*

The FY2011 JCCP Program Seminar was held over a seven-day period, from February 29 to March 6, 2012, as part of JCCP's personnel training program. Managers of human resource development departments in oil companies in oil-producing countries who act as JCCP counterparts were invited to Japan to personally experience the training that JCCP regular course participants receive in Japan, and to individually discuss and exchange views about JCCP activities with JCCP staff for future implementation of training programs.

### 1. Participants

This year's program seminar was not open to as wide a range of participants as in past years for several reasons, including: participation from the Middle East countries could not be expected due to the Great East Japan Earthquake; and scheduling the program seminar was difficult due to the concentrated number of regular courses slated for implementation in the second half of the year. Instead, the seminar was restricted to

participants from Brazil and Timor-Leste, two new emerging countries in terms of JCCP activities, and to participants from Iraq and Vietnam, countries which have been designated as counterparts for JCCP's special cooperation program. Accordingly, the following six managers of HRD departments from the above-mentioned four countries attended the seminar.

**Brazil:**

Petrobras (Brazilian state-run oil company)  
Mr. Gustavo Tamara, International Coordinator/  
Human Resource, Petrobras University

**Timor-Leste:**

Autoridade Nacional do Petróleo (National agency  
of petroleum)  
Mr. Edgar Da Costa, Training & HR Manager

**Iraq:**

Training & Development Dept., Ministry of Oil  
Mr. Iqdam M. R. Hashim Al-Shadeedi, Director  
General  
Mr. Jasim Mohammed Hameed, Manager of  
Technical Division

**Vietnam:**

Petrovietnam (state-run oil company)  
Mr. Nguyen Le Binh, Deputy General Manager,  
Training & HRD Division  
Petrolimex (state-run oil company)  
Mr. Tran Trung Kien, HR Expert, Human  
Resources Dept.

## 2. Seminar Content

### (1) JCCP Regular Course Experience

To provide a general idea of the content and flow of a typical regular course, the seminar gave the participants an opportunity to experience the same orientation session, opening ceremony and administrative guidance as are given in an actual regular course.

### (2) Lectures and Offsite Training in Japanese-style Refinery Management

A lecture on "Japanese-style Management," a subject of strong interest among HRD managers, was provided as an example of how lectures are given in a typical regular course. Then, as an example of offsite training, the lecture was supplemented by practical training at the Chiba Refinery and Technical Training Center of Idemitsu Kosan Co., Ltd., where an introduction was given of their TPM activities and training systems. The

participants had numerous questions, not only about the hands-on experience, but also even about the content of the training, which seemed to capture their interest.

### (3) Information Exchange on Human Resource Development Programs in Participants' Companies

The participants gave a 20-minute presentation per company on the reality of human resource development in their respective companies and what they expect of JCCP. The presentations effectively showed that there are organizations that have an established human resource development program and those that have yet to develop such a program, and that the central theme of human resource development varies according to organization and ranges from leadership to skills of individual employees. All in all, the presentations provided information that would prove useful in planning future training courses. The participants also deepened their understanding of human resource development, and asked questions that allowed them to compare programs in their own companies with those of other companies.



*Lecture on Japanese-style management*



*At Idemitsu Kosan's Technical Training Center*



*Presentation session*



*Individual discussion*

With regard to general requests for JCCP, the participants sought the following: acceptance of a larger number of participants to each course, participation in activities other than training activities, stronger emphasis on customized programs, and enhancement of courses on Japanese-style management.

#### **(4) Explanation and Individual Meetings on Future Training Plans**

Following activities (1), (2) and (3) above, individual meetings were held with participants from each company to give an overview of regular courses and customized programs slated to be implemented next fiscal year, and to obtain specific requests from them. These meetings also allowed JCCP to more personally reach a common understanding with each company. As a result, further discussions were agreed to be held hereafter toward the implementation of 13 customized programs.

### **3. Summary**

As discussed above, the FY2011 JCCP Program Seminar was implemented in a manner that differed from previous program seminars, by narrowing down the participants to specific countries. Because their degree of engagement in JCCP training activities varied by company, sufficient time was allotted in the second half of the seminar to hold individual discussions with each company. With respect to companies that already have a deep engagement with JCCP activities, due consideration was given to drawing forth and addressing even more detailed training needs. These efforts consequently yielded fruitful results, deepening mutual understanding with each participating company and achieving agreements to implement a large number of customized programs.

Lastly, we wish to take this opportunity to thank everyone for sparing their precious time to cooperate in implementing this program seminar.

*<by Akio Yamanaka, Operations Dept.>*



## CPJ-Iraq Courses Completed

### **CPJ-21-11 Practical Refinery Plant Operation September 15 – November 8, 2011**

**Lecturer: Takaaki Yuasa**

**Content:** Outline of the Petroleum Industry in Japan; Basic Rules for Operators; Preventing Fire and Fire-fighting; GO-HDS Unit; Start-up & Shut-down Procedures; Introduction of DCS and Measuring Instrument

**No. of participants:** 16



### **CPJ-23-11 Refinery Management December 1 – December 15, 2011**

**Lecturer: Tetsuo Arie**

**Content:** Outline of the Petroleum Industry in Japan; Environmental Management in Refineries; Energy Conservation & Profit Improvement in Refineries; Refinery Management and Human Resources Management & Development System; Safety Management; Management for Refinery Products Manufacturing; Worldwide Updated Fuel Specifications; Quality Management & Efficient Activities in the Refinery; Maintenance Management; R&D Strategy; Japanese Refinery Upgrading Technology

**No. of participants:** 20



### **CPJ-24-11 Lube Oil Technology January 19 – February 2, 2012**

**Lecturer: Teruhiko Sasaki**

**Content:** Fuel Technology – Quality & Specification of Fuel Products; Overview of Base Oil Production Technology; Engine Oil Performance; Lube Oil & Grease Blending & Shipping System; Lube Oil Quality Control & R&D; Lube Oil Manufacturing Units; Oil Performance and Test Method for Lubricant Oil

**No. of participants:** 15



## JCCP Regular Courses Completed

### TR-20-11 Quality Management of Refinery Products February 7 – February 24, 2012

Lecturer: Takaaki Yuasa

Content: Quality Management; Quality Control in Japan; Environmental Strategy of Japanese Oil Companies; QC in the Refinery; ISO-9000; Clean Fuel in Japan; Product Planning by LP Model

Site visits: Yokogawa Electric Corporation; DKK TOA Corporation; Idemitsu Kosan Co., Ltd. (Tokuyama Refinery); Shimadzu Corporation; JX Nippon Oil & Energy Corporation (Negishi Refinery); Tanaka Scientific Limited

Countries: Iraq, Kuwait, Myanmar, Pakistan, Sudan, Thailand, Venezuela, Vietnam



<8 countries / 12 participants>

### TR-21-11 Advanced Process Control on DCS February 7 – February 24, 2012

Lecturer: Teruhiko Sasaki

Content: Basic Process Control Theories with Practice Using Computer Simulator and Miniature Plant with Applied DCS; Practice of Advanced Process Control Theories and Operation Support System Using DCS; Application for Shutdown Sequence System on DCS and Practice of Safety Instrument System; Latest DCS Related Technologies

Site visits: Yokogawa Electric Corporation (Mitaka Headquarters); JX Nippon Oil & Energy Corporation (Mizushima Refinery); Seibu Oil Co., Ltd. (Yamaguchi Refinery)

Countries: Iraq, Kazakhstan, Nigeria, Pakistan, Philippines, Saudi Arabia, Sudan, Thailand, Venezuela, Vietnam, Yemen



<11 countries / 15 participants>

### TR-1-12 Petroleum Marketing April 9 – April 26, 2012

Lecturer: Masayuki Jimbo

Content: Petroleum Industry in Japan; Refinery Shipping System for Petroleum Products; On-site Observation of Facilities; Endless Price War in the Retail Market; Oil Flow to Mass Consumers; Latest Service Station Facilities; Integrated Refueling System; Facilities and Safety Refueling Operation; Distribution of Petroleum Products; Facilities and Safety Measures; New Automobile Fuel; Business Expansion to Non-oil Fields; Management by Rational Thinking Process; Workshop on "Advanced Negotiation"; Workshop on "Financial Accounting"; Workshop on "Supply Management"; Workshop on "Oil Derivatives"

Site visits: Idemitsu Kosan Co., Ltd. (Aichi Refinery); Fujitani Inc. (depot, service stations); San-ai Oil Co., Ltd. (Haneda Airport Branch); Tatsuno Corporation (Yokohama Factory); JX Nippon Oil & Energy Corporation (Head Office); JX Nippon Procurement Corporation (Head Office)

Countries: Brazil, Indonesia, Kazakhstan, Kuwait, Libya, Myanmar, Nigeria, Qatar, Saudi Arabia, Sudan, Thailand, Timor-Leste, UAE, Vietnam



<14 countries / 20 participants>

**TR-2-12 Upgrading Processes of Heavy Oil**  
**April 9 – April 26, 2012**

Lecturer: Takaaki Yuasa

Content: Outline of Upgrading of Heavy Oil; Hydrotreating and Hydrocracking Catalysts; Thermal Cracking Process; IGCC Technology and Selection of Heavy Oil Upgrading Process; FCC & Resid-FCC Process Technology; Hydrotreating and Hydrodesulfurization Process Technology; FCC Catalyst Reaction Theory; Thermal Cracking (Delayed Coker) Unit and FCC Unit; Operation and Troubleshooting and Decreasing Effect in Heavy Oil Production; Developed HDS & FCC Catalyst and Its Theory; Process and Characteristics of RFCC and VRHDS Units; Evaluation Technology and Its Results for HDS Catalyst & FCC Catalyst; Process Simulator Practice in FCC Startup; Linear Programming and Production Planning for Refinery

Site visits: JGC Catalysts & Chemicals Ltd. (Kitakyushu Operation Center); JX Nippon Oil & Energy Corporation (Negishi Refinery)

Countries: Indonesia, Iraq, Kuwait, Libya, Myanmar, Nigeria, Pakistan, Qatar, Sudan, Venezuela, Vietnam



<11 countries / 16 participants>

**TR-3-12 DCS Fundamentals and Applications**  
**April 9 – April 26, 2012**

Lecturer: Kazuhiro Suzuki

Content: Petroleum Industry in Japan; Outline of Distributed Control System (DCS); Latest DCS and Instrumentation; Process Control Theory; Hands-on Training in Process Control; Engineering Practice in DCS; Outline of Alarm Management; Modernization of Instrumentation

Site visits: Yokogawa Electric Corporation (Mitaka Headquarters); Azbil Corporation (Fujisawa Techno Center & Shonan Factory); Emerson Japan, Ltd. (Mizushima Solutions Center); Idemitsu Kosan Co., Ltd. (Tokuyama Refinery)

Countries: Indonesia, Iraq, Kazakhstan, Kuwait, Libya, Malaysia, Nigeria, Pakistan, Qatar, Sudan, Thailand, Vietnam



<12 countries / 17 participants>

**TR-4-12 Essential Petroleum Technologies in the Future**  
**May 8 – May 25, 2012**

Lecturer: Bunsuke Kariya

Content: Petroleum Industry in Japan; World Energy Situation and New Energy; Profitability Improvement Simulation of JCCP Refinery; Hydrogen Transportation by Organic Compound; Life Cycle Assessment of Biofuel; Biofuel Production from Wood and Bio Refinery; Hydrogen Infrastructure; Fuel Cell Vehicle; Future Energy Vision of Each Country

Site visits: Cosmo Oil Co., Ltd. (Central Research Laboratory); Fuji Oil Co., Ltd. (Sodegaura Refinery); Japan Petroleum Energy Center (Advanced Technology and Research Institute); Kyushu University; Fukuoka Hydrogen Town; Kitakyushu Hydrogen Town; Meitetsu Bus Company; Chubu International Airport Hydrogen Station

Countries: Indonesia, Kazakhstan, Kuwait, Libya, Myanmar, Nigeria, Pakistan, Saudi Arabia, Thailand, Vietnam



<10 countries / 15 participants>



**TR-5-12 Petroleum Distribution**  
**May 29 – June 15, 2012**

**Lecturer: Kazuo Kojima**

**Content:** Petroleum Industry in Japan & Petroleum Marketing and Distribution; Management by Rational Thinking Process; Transportation System & Safety Driving at a Transportation Company; Manufacturing Process of Petrol Dispensing Equipment at a Petrol Dispensing Pump Manufacturer; Efficiency and Safety of Petroleum Product Distribution Process at Jet Fuel Supplier; Shipping System for Petroleum Products at an Oil Company; Production & Maintenance Process of Pipelines at a Steel Company; Functions of an Oil Stockpiling Base at an Oil Storage Terminal Company; Role of Procurement at a Procurement Company and Workshop on "Supply Management"; Latest Situation & Future Outlook of Energy in the World



<13 countries / 16 participants>

**Site visits:** Uyeno Kosan, Ltd. (Kawasaki Training Center); Tatsuno Corporation (Yokohama Factory); San-ai Oil Co., Ltd. (Haneda Airport Branch); Cosmo Oil Co., Ltd. (Sakai Refinery); JFE Steel Corporation (West Works); JX Nippon Oil & Energy Staging Terminal Corporation (Kiire Base); JX Nippon Procurement Corporation (Head Office)

**Countries:** Bahrain, Brazil, Indonesia, Iraq, Kuwait, Libya, Myanmar, Nigeria, Pakistan, Qatar, Thailand, Uzbekistan, Vietnam

**TR-6-12 Maintenance Management**  
**May 29 – June 15, 2012**

**Lecturer: Hiromitsu Saito**

**Content:** Petroleum Industry in Japan; Maintenance Management in a Japanese Refinery; Maintenance Activities in a Japanese Refinery; Manufacture and Inspection Technologies for Turbines and Boilers; Manufacture Technology and Material Characteristics of Stainless Steel Tubes and Pipes; Maintenance and Repair Technologies for Refining Equipment; Reliability Management in the Refinery; Trouble Experiences and Countermeasures; Safety and Reliability of Aged Plants; Plant Life Cycle Engineering; Project Management Activities in a Japanese Refinery and Maintenance Management by TPM



<13 countries / 17 participants>

**Site visits:** Mitsubishi Heavy Industries, Ltd. (Nagasaki Shipyard & Machinery Works); Sumitomo Metal Industries, Ltd. (Steel Tube Works); Shinko Plantech Co., Ltd. (Head Office); Toa Oil Co., Ltd. (Keihin Refinery); JGC Corporation (Yokohama Headquarters)

**Countries:** Colombia, Indonesia, Iraq, Kuwait, Malaysia, Myanmar, Nigeria, Pakistan, Sudan, Thailand, Uzbekistan, Venezuela, Vietnam

**TR-7-12 Refinery Management**  
**May 30 – June 13, 2012**

**Lecturer: Tetsuji Kubota**

**Content:** Overview of the Oil Industry in Japan; Project Management/EPC Business/Engineering IT; An Example of Maintenance Management; Carbon Management; Safety Management; Environmental Management; Production Planning Management; Human Resource Management; Rational Thinking Management; Case Study



<12 countries / 16 participants>

**Site visits:** JGC Corporation (Yokohama World Operation Center); JX Nippon Oil & Energy Corporation (Mizushima Refinery)

**Countries:** Colombia, Indonesia, Iraq, Kuwait, Myanmar, Nigeria, Pakistan, Qatar, Sudan, Uzbekistan, Vietnam, Yemen

# Completion Ceremony for a Pilot-scale PV System in a Refinery Facility in UAE

JCCP, with the participation of Showa Shell Sekiyu K.K. on the Japanese side and Abu Dhabi Oil Refining Company (TAKREER) as their counterpart in UAE, launched the “Study and Application of the Possible PV System Introduction in Petroleum Company Related Facilities in UAE” in fiscal 2011, and subsequently held a ceremony to commemorate the completion of the photovoltaic system on May 22. The project received many words of encouragement from the audience, which included H.E. Mr. Tatsuo Watanabe, Ambassador of Japan to UAE.



*Ribbon-cutting scene*

## 1. Background and Technical Development Overview

Abu Dhabi is one of the emirates of UAE. According to the Abu Dhabi Water and Electricity Authority, domestic electricity demand is expected to increase two-fold in the next five years and 2.6-fold in the next 10 years, with the energy industry accountable for one-third of the total increase in demand. Meanwhile, the country has set a target of using renewable energy sources to supply 7% of domestic energy consumption by 2020, and is rapidly pushing forward its plan to introduce renewable energies. Under this situation, the introduction of a PV system that would produce electricity from renewable energy sources would make a large contribution toward achievement of the country's national target.

From fiscal 2009 to 2010, a feasibility study was conducted on the introduction of a PV system to oil refining facilities in UAE. The study found that TAKREER, which maintains a Green Refinery Concept, is extremely proactive toward introducing a PV system to its refinery facility.

Thus, a project was launched in fiscal 2011 with the cooperation of the Showa Shell Sekiyu Group as a participating member on the Japanese side. Showa Shell Sekiyu was selected, as it has experience in startup operations, and also manufactures solar panels and undertakes the installation and operations of PV systems. The project began by conducting a study on the utilization

of a PV system in TAKREER's refinery and ancillary facilities and presenting a proposal to TAKREER. After repeated discussions, it was agreed that photovoltaic systems that would produce a combined total of 36.4kW would be installed on a trial basis in four locations in TAKREER's Central Environment Protection Facility (BeAAT; literally meaning “environment” in Arabic), including the roof. The system was completed at the end of December 2011 and subjected to demonstration in January 2012.

PV systems generally do not require a rotary device or other such drive equipment, and so they can be operated at low maintenance cost even in locations subject to fine sandstorms, such as a desert. Additionally, the Showa Shell Sekiyu Group's CIS thin-film solar cell modules are expected to provide greater investment efficiency compared to crystalline Si solar cells, because they exhibit better temperature characteristics and relatively minimize the drop in conversion efficiency even when exposed to high temperatures. However, in order to examine the performance characteristics of the CIS photovoltaic system in Abu Dhabi, it was obviously necessary to actually install the system in the country, operate it for a certain duration under local geographical and climatic conditions, and acquire performance data. Thus, the necessary facilities were installed for examination purposes, and are currently operating

steadily to generate electricity.

The demonstration test of the trial facility installed in BeAAT will be continued for the present, while at the same time proposals will be discussed for installation of a second PV system in a refinery in Abu Dhabi in fiscal 2013.

## 2. Completion Ceremony

A completion ceremony was held to commemorate the installation of the above-described PV system in BeAAT. It took place at the facility, and was attended by a large audience, including such important figures as Mr. Jasem Ali Al Sayegh, CEO of TAKREER, and H.E. Mr. Tatsuo Watanabe, Ambassador of Japan to UAE. JCCP was represented by Mr. Morihiro Yoshida, Managing Director; Mr. Shoichiro Yagi, General Manager, Middle East Office; and Kenji Ikushima, Manager, Technical Cooperation Dept.

The ceremony was a grand affair graced by more than 10 Japanese and UAE flags put up throughout BeAAT. Following an opening speech by Mr. Al Sayegh, other dignitaries delivered speeches of congratulation, and a ribbon-cutting and commemorative photo shoot were held in front of the PV system. Then, an overview was given of the system and its power generation status so far.

In his speech, Mr. Al Sayegh stressed that the project would greatly advance TAKREER's Green Refinery Concept, and expressed his compliments and appreciation for the project. Ambassador Watanabe also praised JCCP for the technology transfer that would make a significant contribution to strengthening the friendly relationship between UAE and Japan, while Mr. Yoshida thanked TAKREER for the smooth promotion of the project and asked for their support in its continuation.

News of the completion ceremony appeared in the May 25 issue of multiple newspapers in Japan.

*<by Kenji Ikushima, Technical Cooperation Dept.>*



*Members of the ceremony in front of the PV system*



# Signing Ceremony in Kuwait for the Study on the Treatment and Effective Usage of Oilfield Produced Water and Technical Collaboration for Corrosion Assessment and Mitigation Technology

On May 15, 2012, JCCP and its counterpart Kuwait Institute for Scientific Research (KISR) held a signing ceremony at the KISR head office for Memorandums of Agreement (MOAs) for implementation of two projects: Feasibility Study for Treatment and Effective Usage of High Salinity Oilfield Produced Water; and Technical Collaboration Project for Newly Planned Corrosion Assessment and Mitigation Technology Program. The former will be implemented with the participation of Arabian Oil Co., Ltd., and the latter with the participation of the Japan Society of Corrosion Engineering.

In the presence of H.E. Mr. Yasuyoshi Komizo, Ambassador of Japan to Kuwait, and Mr. Yoshinori Yamashita, First Secretary, H.E. Dr. Naji M. Al-Mutairi, Director General of KISR, and Mr. Morihiro Yoshida, Managing Director of JCCP, signed the two MOAs. Also present were Mr. Nobuyuki Samizo, Senior Managing Director of Arabian Oil, and Dr. Shigeo Tsujikawa, Professor Emeritus at the University of Tokyo, representing the Japan Society of Corrosion Engineering.

With Dr. Al-Mutairi personally presiding over the ceremony, Dr. Al-Mutairi, Mr. Yoshida, Ambassador

Komizo, Mr. Samizo and Dr. Tsujikawa gave congratulatory speeches in that order prior to the signing of the MOAs. In his speech, Dr. Al-Mutairi noted that the treatment of associated water is a priority issue as water is a precious resource to Kuwait, and also that corrosion accidents are depriving the country of 3% of its GDP. He said JCCP is an important partner, and expressed his deep appreciation for its cooperation in the two said projects. Dr. Al-Mutairi and Mr. Yoshida then signed the two MOAs and brought the ceremony to a close.

Because it was a joint ceremony for two projects, it attracted numerous members of the press, including two TV cameras, indicating their strong interest in the projects. After the ceremony, Ambassador Komizo and Dr. Al-Mutairi also conducted an interview on Kuwait TV.

After a break, the ceremony venue was used to give a presentation on the two projects. Dr. Al-Mutairi had a technical question about the treatment of oilfield produced water, and in regard to the corrosion issue, he said the presentation helped clarify the details of the project. Later that night, KISR hosted a dinner party in a restaurant in Kuwait City. The invitation was also



*Signing of the MOA*



*Ambassador Komizo giving an interview*

extended to Japanese members who attended the signing ceremony, as an indication of KISR's high level of expectation of the two projects.

An overview of the two projects is provided below.

## 1. Feasibility Study for Treatment and Effective Usage of High Salinity Oilfield Produced Water

### (1) Background

Kuwait produced 2.4 million bbl/d of crude oil as of 2011, but has announced a plan to increase production to 4 million bbl/d by 2020. However, this increase in production would be accompanied not only by an already increasing amount of oilfield produced water not only from existing oil fields, but also from new oil fields. Oilfield produced water is the largest by-product of crude oil production, and costs for its treatment and disposal are generally high. This is a major issue for oil development companies.

Oilfield produced water in Kuwait has a salinity of 9 to 23%, which is extremely high, considering that the world average is around 15%. The process of

desalinating such water for use as industrial water or irrigation water would therefore produce a large amount of salt along with water and pose difficulties regarding its disposal.

Meanwhile, Japan has technologies that allow it to produce caustic soda (sodium hydroxide) and chlorine by mixing the salt it procures from foreign countries (industrial salt) with pure water to make highly concentrated salt water and applying the chlor-alkali (electrolysis) process. These products are utilized in various sectors of the manufacturing industry.

The focus of this project was therefore placed on developing new technologies for treating Kuwait's high-salinity oilfield produced water through the chlor-alkali process and using its salt content to produce caustic soda (sodium hydroxide) and chlorine by electrolysis.

### (2) Planned activities

Fig. 1 shows an overview of the project. An efficient and economical method for treatment of oilfield produced water will be examined by initially analyzing the properties of the water produced during crude oil excavation in Kuwait and conducting a test of the chlor-

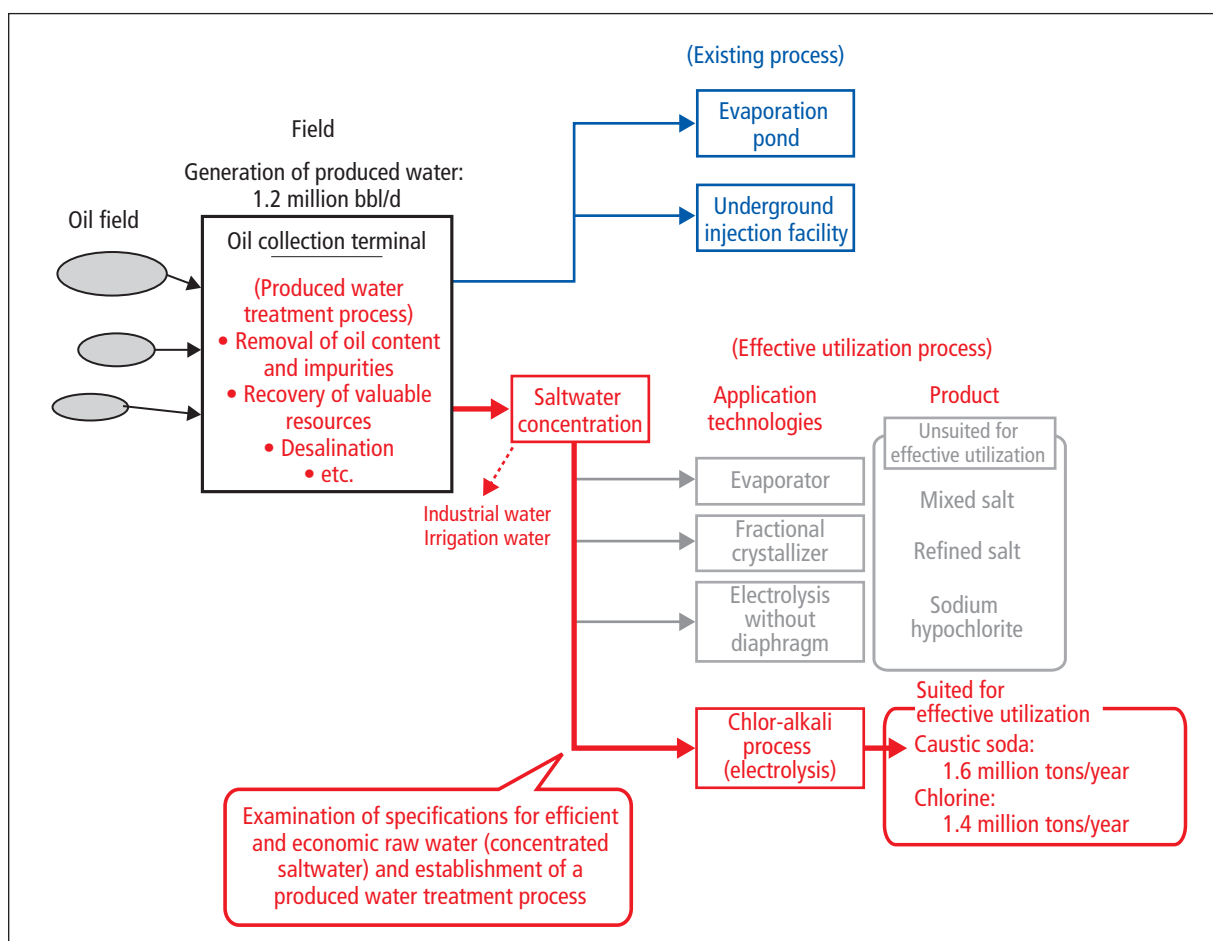


Fig. 1 Industrial utilization of crude oil-produced water

alkali process (electrolysis). Then, based on tests for confirmation of the quality of caustic soda and chlorine produced through electrolyzation of the salt content, a process will be designed that combines the optimal water treatment method with electrolysis, and a market survey and economic evaluation will be conducted.

## 2. Technical Collaboration Project for Newly Planned Corrosion Assessment and Mitigation Technology Program

### (1) Background

In Kuwait, accidents and damage attributed to deterioration and corrosion of plant materials occur

frequently even today. Survey results indicate that losses from such accidents correspond to as much as 3% of the country's GDP.

Cases of damage attributed to corrosion have been acknowledged from early on as a major problem that undermines the safety and security of oil plants. To address this problem, KISR established the Corrosion Assessment & Mitigation Technology Program in 2011, composed of an executive department consisting of four doctors, one master of science, six bachelors of science, and two technicians.

KISR receives requests for surveys of corrosion causes from Kuwait National Petroleum Company (KNPC) and Kuwait Oil Company (KOC), but faces difficulty in

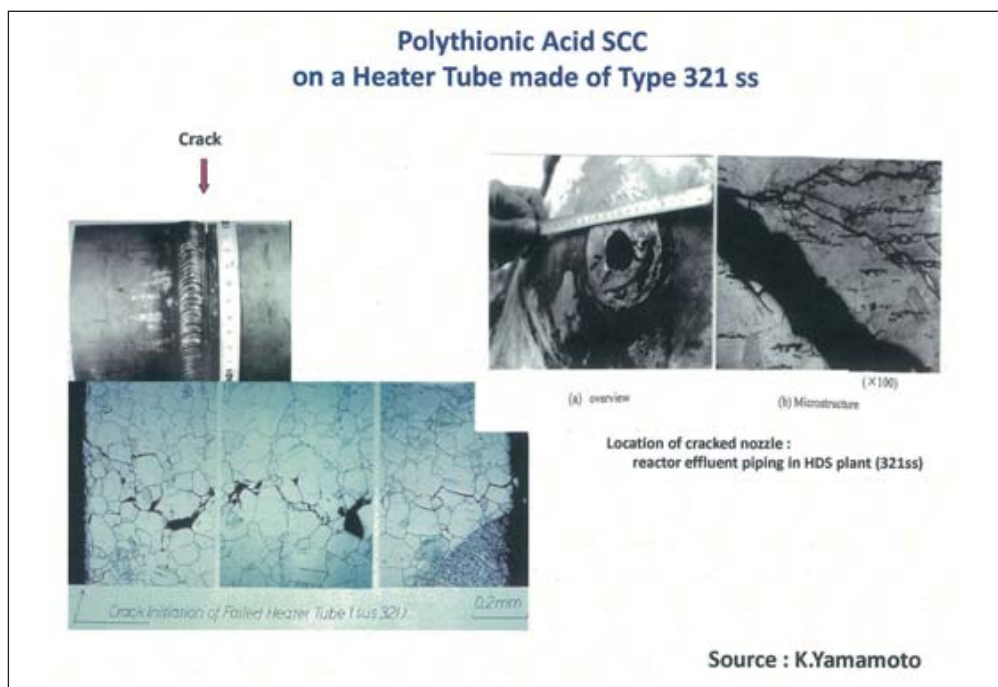


Fig. 2 Corrosion example



Opening statement by H.E. Dr. Najji M. Al-Mutairi, Director General of KISR (left)



Sealing the MOA with a handshake



addressing some requests due to its researchers' lack of field experience. Under this situation, Dr. Hamdy Shalaby, the manager of the program, asked for technical assistance from Japan, as Japan has abundant experience and achievements in this field. In response, JCCP sent experts from the Japan Society of Corrosion Engineering to KISR and ultimately agreed to launch this project based on discussions with persons concerned at KISR and KNPC.

## (2) Planned activities

The project will look into the following seven themes.

- 1) Synergistic effects of hydrogen sulfide and chloride on stress corrosion cracking of stabilized austenitic stainless steels
- 2) Effect of excess chlorine on corrosion of carbon steel in cooling water service
- 3) Corrosion behavior of high-performance heat exchanger alloys in severe process conditions
- 4) Failure investigations
- 5) Application limits of carbon steel in sea water
- 6) Application of electrochemical noise technique for refinery corrosion monitoring
- 7) Application of RBI (Risk Based Inspection)

Prior to implementation of the project, researchers and engineers on the Japanese side, who are experts in the respective themes, will visit KISR to examine and establish details of each theme. They will engage Kuwaiti researchers and engineers in discussion by presenting specific cases of corrosion as shown in Fig. 2 to facilitate their understanding.

For themes that require laboratory review, evaluation test methods will be examined, test equipment will be selected and installed, samples will be procured, and preliminary tests will be established. The test equipment will be procured in Japan and introduced to KISR after inviting KISR engineers to Japan and teaching them how to operate, analyze and perform maintenance of the equipment.

Additionally, the Japanese side will keep in close contact with KNPC and KOC engineers through KISR to confirm their needs regarding each theme and to review the overall roadmap of the project as necessary.

We hope these projects that will be jointly implemented by Kuwait and Japan will be brought to a successful conclusion and will contribute to the further development of the friendly ties between our two countries.

*<by Hiroaki Hara, Technical Cooperation Dept.>*



# Project on Mild Hydro-cracking of LCO & Evaluation of Gas Oil HDS Catalysts in Saudi Arabia

JCCP and King Fahd University of Petroleum and Minerals (KFUPM) in Saudi Arabia implemented the Project on Mild Hydro-cracking of LCO & Evaluation of Gas Oil HDS Catalysts over a three-year period, from fiscal 2009 to 2011, as follows.

## 1. Background

The project aimed to achieve two objectives. One was to develop an evaluation technology for catalysts that are used to produce ultra-low-sulfur diesel fuel with a sulfur content of less than 10 ppm from Saudi Arabian heavy crude oil, as an effective utilization of the crude oil. In Japan, ultra-low-sulfur diesel fuel has been produced from relatively light crude oils since more than 10 years ago. However, in addition to a high sulfur content, heavy crude oil was also expected to contain substances that are difficult to remove by hydro-desulfurization (HDS). Therefore, also included in this first objective was the transfer of analysis technology for identifying compounds contained in light gas oil fractions.

The other objective was to lay the basic groundwork for development of mild hydro-cracking technology as a means for the effective utilization of the surplus of light cycle oil (LCO) that is expected to be generated in a fluid catalytic cracking unit (FCC). Since LCO has a high

content of polycyclic aromatics, mixing it with diesel fuel might degrade the exhaust gas of diesel vehicles. Based on this understanding, the project explored catalysts that could be used in a mild hydro-cracking process to convert polycyclic aromatics into xylene to be used as a petrochemical feedstock.

With the participation of a Japanese university in a JCCP technical cooperation project for the first time ever, this project in effect became a joint study effort between a Saudi Arabian university and a Japanese university.

## 2. Overview

1. Implementation period: April 1, 2009 – March 31, 2012 (three years)
2. Overseas counterpart: KFUPM
3. Participating companies: JX Nippon Research Institute, Ltd.; Kyushu University
4. Activities: The following activities were implemented to provide technical cooperation for the development of basic technologies for catalyst evaluation and compositional analysis of feed oil and oil products at KFUPM.
  - (a) Introduction of a micro-testing unit to be used for hydro-desulfurization tests and hydro-cracking tests
  - (b) Provision of support for catalyst evaluation



Practical training (I) for invited researchers



Practical training (II) for invited researchers



*Operational training on the GC-AED*



*Micro-reactor*

technology through operational training of the micro-testing unit and guidance for analysis of data acquired from the unit

- (c) Introduction of a gas chromatograph with atomic emission detector (GC-AED) and a high-performance liquid chromatograph (HP-LC) to allow for close identification of the composition of light gas oil fractions; and analysis of feed oil for the micro-testing unit and the oil produced in the unit, through the combination of GC-AED and HP-LC and technical guidance on an analysis method proposed by Kyushu University

The micro-testing unit was delivered and installed in KFUPM in fiscal 2009, and the GC-AED and HP-LC, in fiscal 2010. Details of the technical guidance provided were as follows.

- (a) The micro-testing unit was manufactured in Japan, and KFUPM researchers were invited to Japan to learn about the unit and receive operational guidance in advance of introducing it to KFUPM.
- (b) After introduction of the micro-testing unit to KFUPM, researchers from JX Nippon Research Institute and Kyushu University were sent to KFUPM to provide guidance in conducting a catalyst evaluation test using an actual sample.

- (c) The GC-AED and HP-LC were introduced to KFUPM for analyzing the actual feed oil for the micro-testing unit and the oil produced in the unit.

### 3. Observations

Through this project, a general concept began to take shape at the laboratory level of a catalyst that could be used to produce ultra-low-sulfur diesel fuel from Saudi Arabian heavy crude oil. Additionally, although various types of light cycle oils exist according to the operational conditions of the FCC unit, a mild hydro-cracking method for polycyclic aromatics was discovered through repeated tests.

The KFUPM side presented part of the results of this project at the 20th annual Saudi-Japan symposium on catalysts, which was held on December 5 and 6, 2010 under the joint sponsorship of KFUPM, JCCP and the Japan Petroleum Institute (JPI). Furthermore, a paper was submitted to an academic journal during the project period, and even today after completion of the project, KFUPM and Kyushu University are preparing other papers for submission to academic publications. It is hoped that these cooperative activities between the two universities will further deepen the friendly relationship between Saudi Arabia and Japan.

*<by Hiroaki Hara, Technical Cooperation Dept.>*



# Study on Hydrogen Pilot Unit Demonstration (HyPUD) for Integration to H2 Station in Saudi Arabia

Over a period of two years, from fiscal 2010 to 2011, JCCP and Saudi Arabian Oil Company (Saudi Aramco) implemented a joint technical cooperation project called “Study on Hydrogen Pilot Unit Demonstration (HyPUD) for Integration to H2 Station.”

## 1. Background

Saudi Aramco, in anticipation of the possible widespread use of hydrogen to fuel automobiles in the future, is directing efforts to the development of a hydrogen station capable of producing hydrogen fuel from oil and dispensing the fuel to fuel cell vehicles (FCV). It is also pursuing the development of a reforming catalyst for producing hydrogen.

Meanwhile in Japan, a national project is already under way for a demonstration test of an onsite hydrogen station that uses city gas, LPG, naphtha, kerosene and methanol as feedstock, and efforts are being made toward the diffusion of FCVs in fiscal 2015.

Against this backdrop, in fiscal 2009, Saudi Aramco’s R&D Center requested JCCP’s cooperation in the research and development of a hydrogen station capable of producing hydrogen from oil and dispensing the fuel to FCVs. Acknowledging Japan’s advanced technologies and particularly wishing to introduce Japan’s onsite hydrogen station to Saudi Arabia, Saudi Aramco strongly requested support for the construction of a pilot demonstration plant and the development and evaluation of relevant catalysts.

In response to Saudi Aramco’s request, JCCP launched the technical cooperation project on “Study on Hydrogen Pilot Unit Demonstration (HyPUD) for Integration to H2 Station” as follows.

## 2. Overview

- (1) Implementation period: April 1, 2010 – March 31, 2012 (two years)
- (2) Overseas counterpart: Saudi Arabian Oil Company (Saudi Aramco)



*With project members in front of Saudi Aramco’s R&D Center office building*

- (3) Participating companies: Mitsubishi Kakoki Kaisha, Ltd.; JGC Corporation; JGC Gulf International Co., Ltd.

### (4) Activities:

- 1) In fiscal 2010, a project finding study was conducted, which included a FEED (front-end engineering design) study as the first step toward construction of the pilot-scale hydrogen unit and studies of technical issues and preliminary cost estimation. The study was also made in regard to reforming catalysts that would be used in the actual hydrogen unit.
- 2) In fiscal 2011, the FEED study was continued as a joint technical cooperation project, and case studies of cost reduction were studied to provide the necessary information that would allow Saudi Aramco to make a final decision on whether it wishes to embark on the construction of the pilot plant.

## 3. Summary

At the beginning of this year, Saudi Aramco decided not to go through with the construction of the hydrogen station pilot plant at this time, and the project was therefore brought to a close at the end of fiscal 2011.

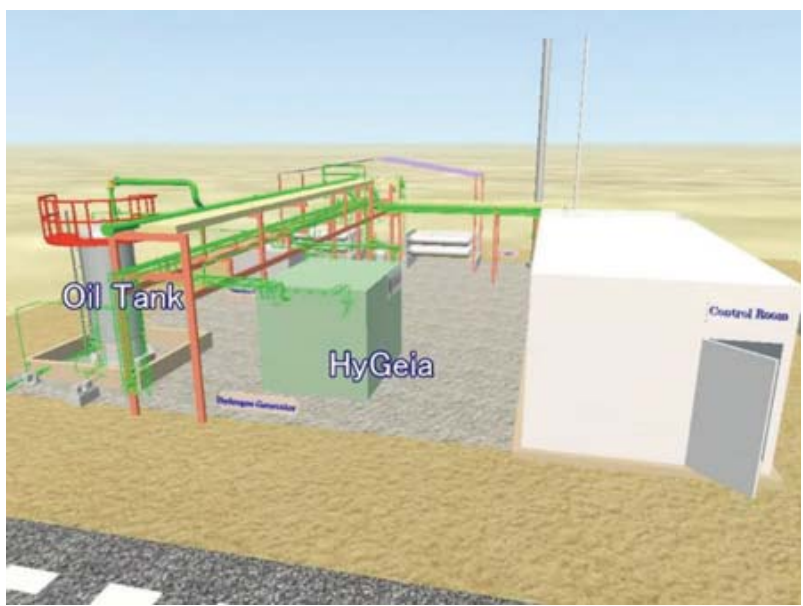
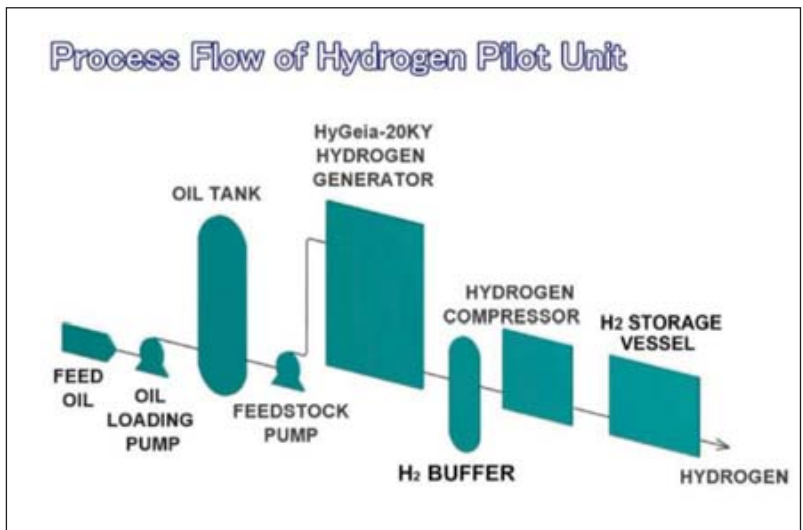
Nevertheless, the project played a significant role

in introducing Japan's advanced technologies in the relevant field to Saudi Aramco, as well as in garnering praise from Saudi Aramco in regard to the excellent quality of the detailed considerations and results of the FEED study conducted by the Japanese side, and in

strengthening the relationship of trust between Saudi Aramco and JCCP.

We hope to continue to deepen the relationship between our two countries through the implementation of similar technical cooperation projects.

*<by Toshifumi Amemiya, Technical Cooperation Dept.>*



# Application Study of Sulfur Concrete Technology in UAE

JCCP and United Arab Emirates University (UAEU), with the participation of JX Nippon Oil & Energy Corporation and Penta-Ocean Construction Co., Ltd. on the Japanese side, implemented a project on “Application Study of Sulfur Concrete Technology in UAE” from fiscal 2008 to 2011 and achieved good demonstration test results.

## 1. Background

The global demand-supply balance of sulfur continues to lean heavily toward the supply side. From the perspective of environmental countermeasures, surplus sulfur is expected to further increase along with today’s strong trend toward desulfurization of fuel oil. In anticipation of this surplus, Japan has embarked on technical development for the effective utilization of sulfur that is produced in refineries, and has succeeded in demonstrating a technology for producing modified sulfur solids. The solids exhibit high performance with respect to strength and chemical resistance (salt resistance, acid resistance, base resistance), and are expected to be used for development of marine structures and wastewater treatment.

Japan depends on UAE, the counterpart country for this project, to supply approximately 21% of its domestic crude oil demand, which corresponds to an annual import of roughly 770,000 barrels (2010). Thus, from the perspective of Japan’s energy policies, UAE is one of the most important suppliers of crude oil to Japan. Meanwhile, in UAE, where oil refining and natural gas production are the country’s key industries, there are increasing needs to develop sulfur applications in response to the expected future surplus of sulfur. Under this situation, UAE proposed to launch a joint study on developing new sulfur applications using Japan’s sulfur solidification technology. UAEU has agreed to play a central role in the study, while the Marine Environment Research Center (MERC) of the Ministry of Environment and Water and Abu Dhabi Sewerage Service Company (ADSSC) have offered their cooperation, such as in providing a demonstration test site and monitoring the demonstration.

In response to the UAE framework, JCCP surveyed and examined the applicability to UAE of the modified sulfur solidification technology by conducting a demonstration test on the utilization of modified sulfur solids in creating artificial fish reefs as a possible

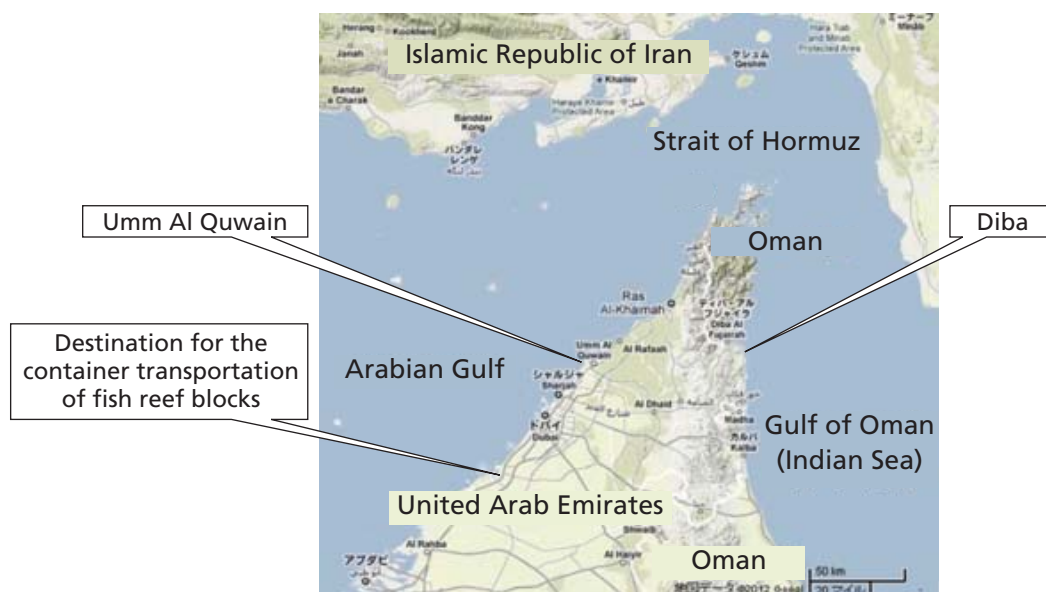


Fig. 1 Installation locations of the artificial fish reef



marine application and in developing a city sewerage system as a wastewater treatment application. Through these efforts, this project helped to establish new uses for sulfur in UAE and to create new demand for sulfur treatment measures in the oil industry, as well as laid the groundwork for the creation of a new industry based on UAE-Japan cooperation.

## 2. Overview

Modified sulfur solids that have been developed in Japan are commercialized in Japan after being subjected to a stringent demonstration test, but in UAE, where various conditions differ, it was necessary to re-examine the results of a demonstration test conducted there. Modified sulfur solid structures were therefore installed in test sites to monitor and confirm any changes and effects in their characteristic strength and chemical resistance when used as a marine structure (artificial fish reef) and as a wastewater treatment facility (city sewerage system). Here, we mainly introduce its utilization as a fish reef, as an example of a marine structure.

As the marine environment differs between the west side of UAE, which faces the Arabian Gulf, and the east side, which faces the outer sea, a fish reef was decided to be installed off the coast of both the east and west sides of the country. The fish reef blocks were test-produced, transported, installed and monitored, to examine the effectiveness of modified sulfur solids as a fish reef based on their durability as marine structures and on the state of growth of algae and fish.

The artificial fish reef was proposed as a means for effectively utilizing large amounts of sulfur solids, and approximately 200 sulfur solid blocks were randomly

piled to create the reef and installed in the Arabian Gulf and the Gulf of Oman. Immediately after their installation, schools of fish and the attachment of various organisms were verified. The favorable results of the demonstration test indicated that the sulfur solids are harmless to living organisms. Moreover, in both locations, there was a steady and catchable distribution of a species of highly marketable grouper fish called hammour.

### 2.1 Artificial Fish Reef Project

The project aimed to create an artificial fish reef that would attract the hammour, a valuable species of the grouper fish that live among rocky reefs, and was planned in line with the “Guidelines for Artificial Fish Reef Fishing Ground Development Project” issued by Japan’s Fisheries Agency. Fig. 1 shows the locations where the artificial fish reefs were installed in the Arabian Gulf and the Gulf of Oman. On the Arabian Gulf side, it was installed off the coast of Umm Al Quwain, in a ridge-like area at the bottom of a flat and sandy shoal. On the Gulf of Oman side, it was installed off the coast of Diba, near a large rock called Diba Rock where the seabed is flat and sandy.

### 2.2 Monitoring

After installation of the artificial fish reefs, they were monitored to confirm their installation status, the appearance of any schools of fish, and the development of living organisms. In Umm Al Quwain, hardly any schools of fish were detected in areas other than where the artificial fish reef was installed. In other words, they were verified only in areas near the reef. In Diba, schools of fish were found distributed in a manner surrounding the artificial fish reef. They were also verified in the area between Diba Rock and the artificial fish reef, which suggested an ecological similarity between the two.

## 3. Results

As discussed above, the artificial fish reef was proposed as a means for the effective utilization of sulfur, and was installed in the Arabian Gulf (Umm Al Quwain) and the Gulf of Oman (Diba). As a result, numerous organisms attached themselves to the surface of the reefs, and dense schools of fish were found swimming inside and outside them.

Both Umm Al Quwain and Diba are prosperous coastal fishery towns, but the installation of solid sulfur blocks in these waters would offer even greater benefits



Fig. 2 A school of a species of horse mackerel

by providing a fishing ground that promises a relatively stable catch in an area closer than the fishing harbor. This would also help local fishermen lead stable lives. However, since the artificial fish reefs installed in this project were small in scale, larger reefs would need to be installed in multiple locations if the project is to be implemented as a commercial business in the future.

A survey of fish catches also indicated that the artificial fish reefs are beneficial, and a survey of the species of fish caught in and around the artificial fish reefs showed that the reefs provide an effective breeding and farming ground for diverse species of fish. Judging by these outcomes, this project has produced meaningful demonstration test results.

*<by Masatoshi Yokotsuka, Technical Cooperation Dept.>*

Technical  
Cooperation

# Project on Kuwait Heavy Crude Oil Upgrading – Feasibility of Thermal Cracking

JCCP and Kuwait Institute for Scientific Research (KISR) implemented a project on “Kuwait Heavy Crude Oil Upgrading – Feasibility of Thermal Cracking” over a period of three years, from fiscal 2009 to 2011, as follows.

## 1. Background

Large amounts of high-sulfur heavy crude oil exist in Kuwait. Even if blended with other light crude oils, there is no avoiding the heavy trend of crude oil exports, because the ratio of heavy crude oil is increasing. As the country is well aware, there is strong need for various examinations and considerations to lighten and reduce the sulfur content of heavy crude oil using an upgrading facility.

Meanwhile, Japanese engineering and oil refining companies have their own heavy oil upgrading technologies, and are in an optimal position to effectively apply their technologies and experience to upgrading Kuwait’s high-sulfur heavy crude oils.

Against this backdrop, this project was launched to formulate a business model for lightening and reducing the sulfur content of Kuwait’s high-sulfur heavy crude oils using Japan’s upgrading technologies and to examine the feasibility of its practical application to business.

## 2. Overview

- 1) Implementation period: April 1, 2009 – March 31, 2012 (three years)
- 2) Overseas counterpart: KISR
- 3) Participating companies: Arabian Oil Company, Ltd.
- 4) Activities: This project was implemented in three phases, as follows.
  - (1) Phase 1 (Process screening and examination of economic efficiency based on estimated cost)  
The following activities were implemented in fiscal 2009: establishment of a study base and basic design conditions; process optimization studies; establishment of project scope; verification of crude oil properties and product qualities through laboratory tests; market survey; and evaluation of estimated economic efficiency.
  - (2) Phase 2 (Detailed feasibility study, improvement of cost estimation precision, business plan formulation)  
The following activities were implemented in fiscal 2010: verification of the qualities of synthetic crude oils and implementation of a stabilization test; detailed conceptual process design; project cost estimates; economic efficiency evaluation of the project; and business plan formulation.

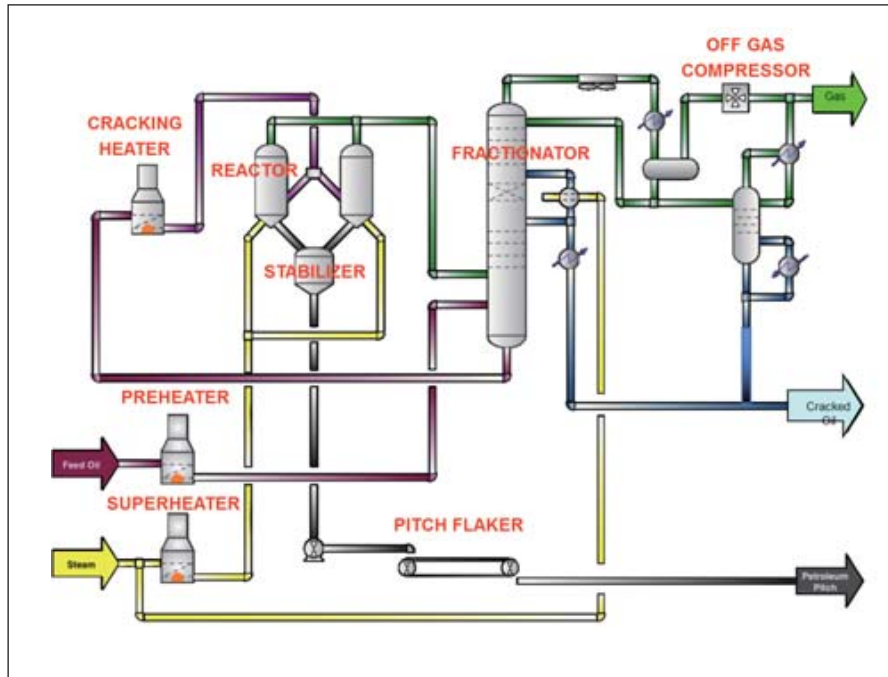


Fig. 1 Schematic diagram of the Eureka Process

(3) Phase 3 (Environmental impact assessment, establishment and application of heavy crude oils and reformed oil evaluation technologies; preparations toward business development)

In fiscal 2011, the following activities were implemented: examination of the introduction of the Eureka Process to the Shuaiba Refinery; heavy oil thermal cracking test and establishment of analytical evaluation technologies; thermal cracking tests of other heavy oils in Kuwait and evaluation of their compatibility; updating of the conceptual design and results of the economic efficiency examination; evolving and continuous approaches to Kuwait's oil sector; and

construction of a business model.

The Eureka Process forms the basis of the heavy oil cracking technology in this project. Fig. 1 shows an overview of its concept. It is a thermal cracking process developed in Japan and licensed by Chiyoda Corporation and Fuji Oil Company, Ltd., and has served Fuji Oil's Sodegaura Refinery for more than 30 years. Compared to the delayed coker unit, which is another thermal cracking process, Eureka delivers a higher yield of cracked oil and provides cracked residue as a melted pitch. It is expected to be particularly advantageous when combined with a gasification process for treatment of cracked residue. With the cooperation of the Eureka Process licensor, this project evaluated an upgrader that



Eureka plant



Workshop



uses the Eureka Process and examined its advantage over other processes.

### 3. Workshop

In fiscal 2010, a workshop was held at KISR as a forum for the presentation of interim project results. It attracted an audience of more than 50 from such organizations as Kuwait Petroleum Corporation (KPC), Kuwait Oil Company (KOC), Kuwait National Petroleum Company (KNPC), Organization of Arab Petroleum Exporting Countries (OAPEC), and Kuwait University. Mr. Ronald Dickenson, President of SFA Pacific, Inc. gave a keynote speech from an impartial standpoint on heavy crude oil treatment. Judging by the active exchange of questions from the oil sector about the interim results, it can be said that Kuwait's initial objective of disseminating the project to the oil sector has been achieved. The thoroughness of the workshop's operation and preparation were also an indication of the KISR side's strong interest in the project.

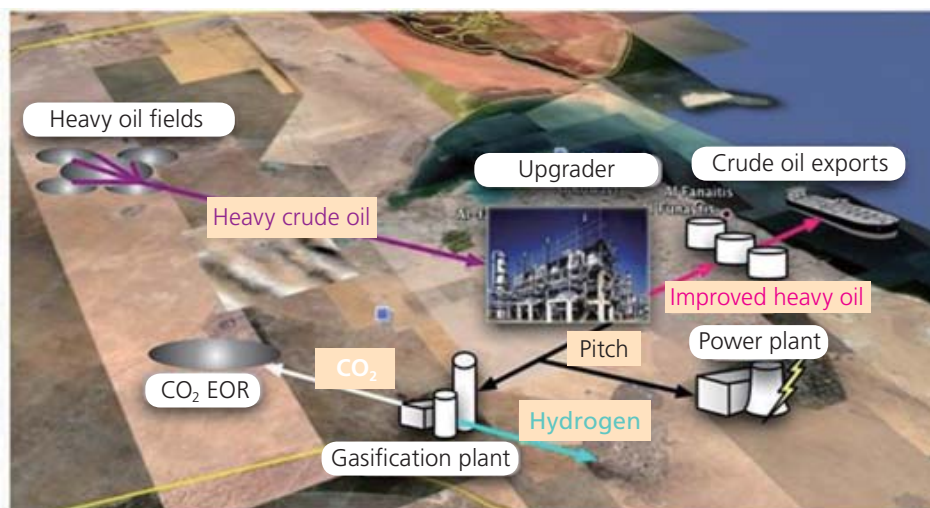
### 4. Observations

In this project, case studies were conducted of three types of upgraders: a large upgrader for mixed heavy crude oils, a large upgrader for a type of heavy crude oils, and a small field upgrader for installation in heavy crude oil production sites.

Arabian Oil Company, Ltd. will continue to propose the installation of the small field upgrader to KOC, because by sequentially installing such upgraders as required based on Kuwait's oil field development plan, the project could be kept relatively small in scale, and would be easy to initiate. In regard to the large upgraders, gasification cannot be avoided for the efficient treatment of cracked residue (pitch), but the demonstration of gasification technology for Eureka pitch could pose an obstacle to their introduction in Kuwait. In consideration of these points, combined efforts need to be made with KPC to create an optimal upgrader plan for Kuwait, along with the establishment of a business model.

JCCP hopes this project will be instrumental in further deepening Japan's relationship with Kuwait.

*<by Hiroaki Hara, Technical Cooperation Dept.>*



Project image

# Technical Support on Energy Efficiency Improvement and Corrosion/Fouling Problem at QP Refinery

Over a period of two years, from fiscal 2010 to 2011, JCCP and Qatar Petroleum (QP)'s Mesaieed Refinery implemented a joint project on "Technical Support on Energy Efficiency Improvement and Corrosion/Fouling Problem at QP Refinery," as follows.

## 1. Background

In line with an increasing global awareness of environmental issues in recent years, QP has launched a Health, Safety & Environment Management Program and commenced full-fledged initiatives for environmental conservation with the target of reducing greenhouse gas emissions and waste materials and increasing energy efficiency. As part of this initiative, QP's Mesaieed Refinery requested technical support from Japan on improvement of energy efficiency and corrosion/fouling problems based on Japan's abundant experience and accumulated technologies in the fields of environmental countermeasures, energy efficiency and conservation technology. This project was thus implemented as follows.

## 2. Overview

- 1) Implementation period: April 1, 2010 – March 31, 2012 (two years)
- 2) Overseas counterpart: Qatar Petroleum

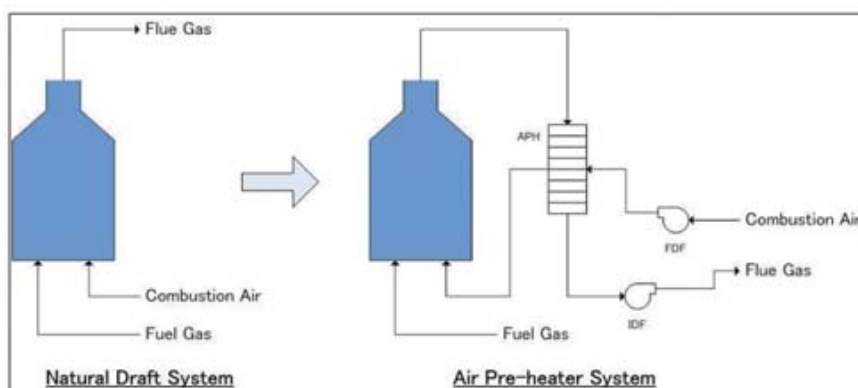


Fig. 1 Concept of the air preheater system

- 3) Participating company: Cosmo Engineering Co., Ltd.
- 4) Activities: This project was implemented in the following two phases.

### (1) Phase 1 (FY2010)

- Activities to improve the refinery's Solomon Energy Intensity Index (EII), a benchmark of energy efficiency, including a local onsite survey of energy conservation; selection of energy-saving measures and examination of improvement plans; and proposal and acceptance regarding the implementation of countermeasures
- Examination of the installation of an air preheater to a heating furnace
- Examination of a change in amine solution (change from the current monoethanolamine (MEA) solution to a methyldiethanolamine (MDEA) solution)
- Survey of corrosion/fouling, establishing the focus of the issue, and proposing improvement measures

### (2) Phase 2 (FY2011)

- Basic design and evaluation of the change in amine solution

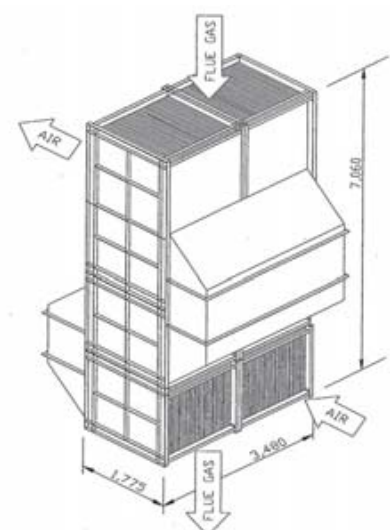


Fig. 2 External appearance of the air preheater system



Information exchange among researchers

- Proposal of a final improvement plan for the corrosion/fouling issue
- Examination of treatment methods for lagoon wastewater

The following is an outline of two of the issues examined in this project.

For energy efficiency improvement, measures were examined to improve furnace efficiency by installing an air preheater to an existing natural-draft crude oil furnace. Fig. 1 shows the general concept, and Fig. 2 the external appearance of the air preheater system. The system is composed of an air preheater, a new burner, blower, ducts that connect the above, instrumentation devices, and an adjustment damper. Based on operating data from the Mesaieed Refinery, various measures were examined for reducing the consumption of heavy oil that is used to fuel the furnace.

In regard to the corrosion/fouling issue, current issues related to the crude distillation unit, condensate distillation unit and gas oil hydrodesulfurization unit were extracted, and measures for their improvement were examined. In fiscal 2011, the fundamental cause of corrosion was surveyed mainly in regard to the crude distillation unit. After extracting possible causes from the results of data analysis using an analysis tool, onsite survey and interviews regarding operating methods, operational improvement methods and the corrosion countermeasures shown in Fig. 3 were proposed to the refinery.

### 3. Observations

This project effectively addressed energy efficiency improvement by proposing measures for reducing fuel gas and steam consumption. In regard to the corrosion/fouling issue, an issue of extremely strong concern among the project members, improvement measures were proposed and guidance was provided in fiscal 2010 based on the knowledge and experience of Japanese refineries. In fiscal 2011, further steps were taken to survey the severe stage of corrosion at the top of the crude distillation unit, examine the corrosion mechanism, and to draft and propose improvement methods. JCCP hopes these improvement measures will be realized in the future.

The Mesaieed Refinery is pushing forward a plan to expand its facilities, and has strong needs to examine measures for strengthening international competitive ability, such as by eliminating the bottleneck in existing facilities and improving the recovery rate of waste heat. An environmental project is also under way to recycle 100% of wastewater produced in the refinery. In response to this situation, JCCP will continue to provide technical support and contribute to the improvement, development and safe operations of the Mesaieed Refinery, to strengthen its relationship with QP, as well as to contribute to deepening ties between Qatar and Japan.

<by Hiroaki Hara, Technical Cooperation Dept.>



Fig. 3 Corrosion countermeasures



# Researcher Invitation Program

The fiscal 2011 JCCP Researcher Invitation Program invited three researchers to Japan before the end of August, and has subsequently invited four more researchers from Venezuela, Iraq and Kuwait, who respectively arrived in Japan between September 2011 and February 2012 and engaged in the following studies with the cooperation of the Japan Petroleum Institute and Japanese universities/research institutions.

## 1. Intevep, Venezuela

### Researcher:

Dr. Luis Felipe D'Elia Camacho  
Strategic Research Department in Refining, Refining and Industrialization Division

### Host institution:

Department of Energy Engineering and Science, Nagoya University Graduate School of Engineering  
Dr. Masaki Matsuda, Professor

### Study period:

Sept. 7 – Nov. 4, 2011

### Research theme:

“Development of Novel Functional Carbonaceous Material from Petcoke”

Venezuelan petcoke contains high rates of sulfur and metal content which may affect efficiency and hamper utilization, so it is vital to evaluate them by actually producing porous carbonaceous material from petcoke. At



Mr. Sattar Jalil Hussein and Mr. Khaleefa K. Uwaid from Iraq (left and right)

Nagoya University, research guidance was provided for producing the porous carbonaceous material, measuring and evaluating steam and nitrogen adsorption isotherm, and measuring Raman spectroscopy, NMR and KRD. As a result, the produced activated carbon showed that the higher the activation temperature and the weight ratio of the activator agent to KOH, the larger the specific surface area. More specifically, at an activation temperature of 800°C and an activator agent-to-KOH weight ratio of 6, an extremely high specific surface area of 3,668m<sup>2</sup>/g was obtained. Dr. Camacho and the university agreed to continue the exchange of views on the impact of metal and sulfur content on inactivation reactions and specific applications for production of activated carbons.

Dr. Camacho visited JCCP on October 26 to present his study results.

## 2. Petroleum R&D Center, Ministry of Oil-Iraq

### Researchers:

- (1) Mr. Sattar Jalil Hussein
- (2) Mr. Khaleefa K. Uwaid

### Host institution and study period:

- (1) Catalysts Research Center, Kitakyushu Operation Center, JGC Catalysts and Chemicals, Ltd. (JGC C&C)  
Nov. 1 – 18, 2011

### Research theme:

“Refining Catalyst Evaluation”



Dr. Luis Felipe D'Elia Camacho from Venezuela (third from left)

(2) Interdisciplinary Faculty of Science and Engineering, Shimane University

Dr. Takeshi Kubota, Associate Professor

Nov. 21 – 30, 2011

*Research theme:*

“Characterization of Catalysts by Means of Gas Adsorption and Spectroscopy”

Mr. Hussein and Mr. Uwaid, both from the Ministry of Oil–Iraq, engaged in catalyst analysis at JGC C&C, comparing the results of an analysis conducted in Iraq with results obtained at JGC C&C using a catalyst they brought with them from Iraq. At Shimane University, they studied theories and technologies related to the characterization method of analyzing catalyst composition and properties.

The two researchers visited JCCP on December 2 to present their study results.

### 3. Kuwait Institute for Scientific Research (KISR), Kuwait

*Researcher:*

Dr. Narges A. H. A. Ghaloum

Associate Research Scientist, Refining Department, Research & Studies Center, KISR

*Host institution:*

Graduate School of Engineering, Kyoto University

Dr. Koichi Eguchi, Professor

*Study period:*

February 6 – March 1, 2012

*Research theme:*

“Hydrogen Production from Hydrocarbon Technologies and Related Catalyst Development”

In recent years, studies have been conducted on a number of new types of hydrogen fuels in search



*Dr. Narges A. H. A. Ghaloum of KISR  
(front row, second from the right)*

of reforming processes that would allow efficient utilization of hydrogen in fuel cell systems. Within this trend, the focus of the study conducted at Kyoto University was placed on the steam reforming reaction of dimethylethanol ( $\text{CH}_3\text{OCH}_3$ ) and ethanol ( $\text{C}_2\text{H}_5\text{OH}$ ). The Eguchi Laboratory introduced the R&D of a spinel-type oxide catalyst, and Dr. Ghaloum studied the method of evaluating the catalyst by preparing the catalyst using a citric acid complex and conducting a steam reforming reaction test. She also examined methods for evaluating the physical properties of the prepared catalyst. In addition, based on the knowledge of catalyst preparation and oxygen sensor production acquired in the study, Dr. Ghaloum studied measurement and calculation methods for obtaining data on the composition and methane conversion rates of various gases through actual measurement using an oxygen sensor, while also acquiring knowledge of test processes and the assembly and mechanism of reactors and ideas for producing the devices needed to conduct actual tests.

Dr. Ghaloum visited JCCP on February 17 to present her study results.

*<by Sadao Wada, Technical Cooperation Dept.>*

# Reporting Meeting of the Long-term Researcher Dispatch Program

JCCP's technical cooperation programs include a program for dispatching Japanese experts to oil-producing countries. So far since 2007, JCCP has dispatched researchers to provide assistance on advanced studies at King Fahd University of Petroleum and Minerals (KFUPM), Saudi Aramco and Kuwait Institute for Scientific Research (KISR). An overview of the reporting meeting that was held at JCCP on May 17, 2012 is provided below.

In fiscal 2011, the following researchers engaged in research and guidance at their respective host institutions.

## 1. Dr. Hideshi Hattori, Professor Emeritus of Hokkaido University

### (1) Host institution:

Center for Refining & Petrochemicals, Research Institute (CRPRI), KFUPM

### (2) Field of research assistance:

Support for research of solid acid and solid base catalysts for petroleum refining and petrochemical applications

Dr. Hattori has been conducting research and guidance at KFUPM's Center for Refining & Petrochemicals, Research Institute since this Long-term Researcher Dispatch Program was launched in fiscal 2007. In fiscal 2011, he provided counsel and proposals regarding studies being pursued or planned at CRPRI.

For example, in fiscal 2011 Dr. Hattori commenced and provided his support in the project on "Development of catalysts for styrene and ethylbenzene production through toluene side chain alkylation," which was submitted for a research grant in fiscal 2010 as a project of King Abdulaziz City for Science and Technology (KACST) and was accepted for the grant in fiscal 2011. Dr. Hattori also provided guidance to a graduate student writing a master's thesis on the project.

Additionally, Dr. Hattori provided retraining in infrared spectroscopic measurement of adsorbed pyridine, a solid acid property measurement method he transferred to KFUPM after designing and producing

the device last fiscal year, and supported the technical transfer of infrared measurement of carbon dioxide adsorption based on the measurement of solid base properties. He also provided research assistance by giving advice in an Aramco project on solid acid catalysts announced by KFUPM.

Furthermore, in the first workshop that was held between KAUST'S Catalysis Center (KCC) and KFUPM's CRPRI, Dr. Hattori gave a lecture on solid acid catalysts.

In the reporting meeting held on May 17, Dr. Hattori summarized his research activities in fiscal 2011 as follows: (1) Continuous support of the KACST project (on solid base catalysts and styrene production) and guidance for a master's thesis; (2) Support for the formulation of an Aramco project (butene hydration) and an SABIC project (styrene synthesis); (3) Transfer of catalyst research technologies (IR measurement, TPD measurement, reactor); and (4) Promotion of research exchange between KFUPM and KAUST.

## 2. Dr. Katsuomi Takehira, Professor Emeritus of Hiroshima University

### (1) Host institution:

KAUST Center-in-Development (KCID) on Transformative Research in Petrochemicals and Polymers established in KFUPM

### (2) Field of research assistance:

R&D of catalysts for petrochemical feedstock production by dehydrogenation

Dr. Takehira's research continued on the progress made last year and examined an iron oxide catalyst derived from Mg-Al hydrotalcite for the development of styrene production catalyst by ethylbenzene dehydrogenation. By evaluating the activity of various catalysts and conducting an FT-IR measurement of ethylbenzene and pyridine adsorbed species on the catalyst surface, he clarified the ethylbenzene dehydrogenation reaction mechanism on the surface of a highly active Fe-Co/Mg(Al)O catalyst. Dr. Takehira presented a part of these results at the EUROPACAT X congress that was held





Reporting meeting held at JCCP on May 17, 2012

in Glasgow, Scotland from August 28 to September 2, 2011, and in two papers published in *Applied Catalysis A*, in addition to the two papers that were published last fiscal year in the same journal.

In the reporting meeting held on May 17, Dr. Takehira reported the results of his three-year research assistance, from 2009 to 2011, as follows: (1) Development of a new catalyst for styrene production by ethylbenzene dehydrogenation (preparation of a new iron oxide catalyst derived from Mg-Al hydrotalcite); (2) Catalyst preparation and characterization; (3) Results and observations of a test for development of a new Fe/Mg(Al)O catalyst for steam-less dehydrogenation; and (4) Summary of the research on development of a new Fe/Mg(Al)O catalyst for steam-less dehydrogenation.

### 3. Dr. Hidehiro Higashi (former researcher at JGC Catalysts and Chemicals Ltd.)

(1) Host institution:

Kuwait Institute for Scientific Research (KISR)

(2) Field of research assistance:

“Operational improvement of the up-flow reactor using a cold-flow model” and “Study on the application of air nanobubbles to refinery facilities”

In fiscal 2011, Dr. Higashi launched a three-year project for the construction of a cold-flow simulator that would attach a tracking device to the reactor so that flows inside the reactor could be observed. By allowing the interior of the reactor to be seen, the project aims to

address the current situation in which the existing bottom oil desulfurization unit is extremely difficult to operate and is creating urgent needs for operational enhancement and improvement measures.

Dr. Higashi also commenced studies on the separation of water and oil using nanobubbles in a dissolved air flotation (DAF) unit for refinery wastewater, and on the application of a Maalox (mercaptan oxidation) unit, which is normally used for removal of sulfur content from naphtha and kerosene, to the recycling of treated water.

In addition to the above, Dr. Higashi continued his ongoing initiative to provide operational guidance for the pilot plants at KISR; supported the study conducted by KNPC and KISR on preventing drifts and differential pressure increases in the Guard Reactor (G.Rx) of a direct desulfurization unit; constructed three high linear velocity (HLV) pilot plants; and contributed to the modification of existing pilot plants.

In the reporting meeting held on May 17, Dr. Higashi reported on the following: (1) KISR’s future vision; (2) KISR’s joint projects with KNPC; (3) Measures for prevention of Dela-P increases and drifts in the direct desulfurization unit; and (4) Research on the combined use of catalysts from various catalyst makers.

By continuing to send advanced Japanese researchers to oil-producing countries to engage in research and provide research assistance, JCCP hopes to contribute to strengthening relationships between oil-producing countries and Japan in the areas of technical transfer and personnel exchanges.

<by Sadao Wada, Technical Cooperation Dept.>

## Personnel Changes

### Training Department

#### Outgoing Personnel



Akio HOSHINO



Kenji SAITO

#### Incoming Personnel



Eiji OKUYAMA



Kenichi MOROTA

### Administration Department

#### Outgoing Personnel



Makoto NAKAMURA

#### Incoming Personnel



Kosuke INOUE

### Technical Cooperation Department

#### Outgoing Personnel



Kenji IKUSHIMA

#### Incoming Personnel



Michio FUJITANI



Yukiteru WATANABE

### Technical Cooperation Department ↓ Training Department

#### Transfer Personnel



Minoru HORIKE

## Announcement

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# Please Help Us Update Our Roster

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Thank you for reading *JCCP NEWS* as always.

JCCP has reached a significant milestone in its history and celebrated 30 years of operations last November.

In commemorating this achievement, we extended our deepest appreciation to you all for your support and cooperation in our activities.

All of you who have participated in a JCCP training program in the past (graduates) are a precious asset to JCCP. We therefore wish to take this occasion to confirm your current addresses and update our roster of former participants so that we may reconnect and maintain contact with you into the future.

Our current roster mostly shows information that you provided at the time you participated in a JCCP training program, and could be outdated by now. If there have been any changes in your affiliation (position), email address, or any other contact information, we ask that you provide the latest information on the attached form and return the form to JCCP's Planning & Public Relations Group. Those of you who return the form to us are entitled to receive the latest issues of *JCCP NEWS* and announcements and invitations to exhibitions and reunions.

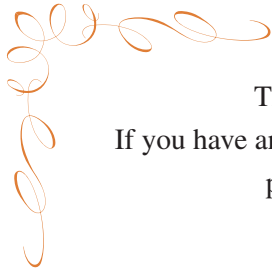
Also, if you know of anyone who is a former participant but is not receiving copies of *JCCP NEWS*, or anyone who wishes to update his/her contact information, we would appreciate it if you would forward this message and the attached form to that person.

Thank you for your cooperation.

Yoshi Tanda  
General Manager, Planning & Coordination

Masumi Kitahara (Ms.)  
Manager, Planning & Public Relations





Thank you for reading *JCCP NEWS*.

If you have any comments or feedback about this newsletter,  
please free to contact us by e-mail.  
Your feedback is appreciated.

Planning & Public Relations Group, Administration Department  
E-mail: [planning@jccp.or.jp](mailto:planning@jccp.or.jp)



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### Editorial Postscript

Thank you for reading *JCCP NEWS*.

As of April 1, JCCP has become a general incorporated foundation. This is the first issue of *JCCP NEWS* following the change, but the English name of our organization remains unchanged, so we will continue to deliver this newsletter under the same title.

As of June 28, we have welcomed a new president, and have published messages from both the outgoing and incoming presidents at the beginning of this newsletter. We ask for your continued patronage of JCCP under the new management.

As you know, JCCP activities consist of personnel exchange programs, technical cooperation programs, and international cooperation, but previous issues of *JCCP NEWS* tended to place heavier weight on personnel exchange programs. To correct this imbalance, we have increased the number of articles on technical cooperation programs beginning with this issue, to provide a more accurate perspective on our efforts to strengthen cooperation with oil-producing countries through both personnel exchange programs and technical cooperation programs to the same extent. It is difficult to include an account of all activities in this newsletter, but we will do our best to report on as many as possible so our readers can gain an overall picture of our achievements.

We will make ongoing improvements with hopes that you will continue to read and enjoy *JCCP NEWS*.

Masumi Kitahara  
JCCP News Editor  
Planning & Public Relations Group



## Japan Cooperation Center, Petroleum (JCCP)

### Headquarters

Sunshine 60 Building 58F, 3-1-1 Higashi-Ikebukuro, Toshima-ku, Tokyo 170-6058, Japan

- |                                    |                      |                      |
|------------------------------------|----------------------|----------------------|
| • Administration Department        | TEL. +81-3-5396-6000 | FAX. +81-3-5396-6006 |
| • Operations Department            | TEL. +81-3-5396-6001 | FAX. +81-3-5396-6006 |
| • Training Department              | TEL. +81-3-5396-6909 | FAX. +81-3-5396-6006 |
| • Technical Cooperation Department | TEL. +81-3-5396-8021 | FAX. +81-3-5396-8015 |

### Overseas Offices

- |   |   |
|---|---|
| • Middle East Office                      | • Riyadh Office                                       |
| #904, Al-Ghaith Office Tower, Hamdan St., | Al Oula Building, 5th Floor, Flat No.508              |
| P.O. Box 51828, Abu Dhabi, U.A.E.         | Al Mohamadiya, King Fahd Road                         |
| TEL. +971-2-627-4410 FAX. +971-2-626-2166 | P.O. Box 61356, Riyadh 11565, Kingdom of Saudi Arabia |
|   | TEL. +966-1-207-9540 FAX. +966-1-207-9539             |

URL: <http://www.jccp.or.jp> E-mail: [webmaster@jccp.or.jp](mailto:webmaster@jccp.or.jp)