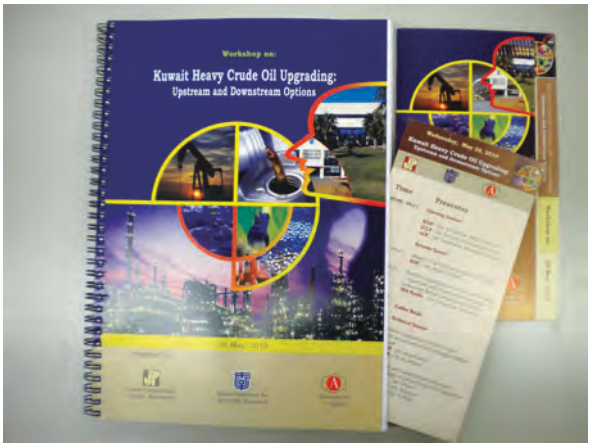
Workshop on Kuwait Heavy Crude Oil Upgrading

On May 26, 2010, a workshop was held at the Petroleum Research & Study Center (PRSC) of Kuwait Institute for Scientific Research (KISR) in Kuwait, to report on the results of the joint JCCP-KISR technical cooperation project on "Heavy Crude Oil Upgrading in Kuwait Using Thermal Cracking Process." More than 50 participants from various companies and organizations attended the workshop and participated in active Q&A sessions following each presentation. The participants were from various oil companies in Kuwait, including Kuwait Petroleum Corporation (KPC), Kuwait Oil Company (KOC), and Kuwait National Petroleum Company (KNPC), and from institutions such as the Organization of Arab Petroleum Exporting Countries (OAPEC) and Kuwait University.

1. Overview of the Workshop

The project aims to create a business model for making practical use of Kuwait's large quantities of high-sulfur heavy crude oil by converting it to more useful light, low-sulfur crude oil using Japanese upgrading technology (Eureka process), and to ultimately examine its potential for commercialization.

Candidate sites for construction of the upgrading facility include at the foot of an oil well or near a refinery. The scale of the facility would be relatively small in the case of the former and large in the case of the latter. The project's potential for commercialization will be evaluated based on a comprehensive assessment of factors such as the relationship between the properties of Kuwait heavy crude oil and thermal cracking reaction, and market studies of reformed crude oil. Due consideration will also be given to the intentions of KOC, the authority for Kuwait heavy crude development.



Preliminary proceedings and pamphlets of the workshop

2. Workshop

The workshop opened with an opening address by Dr. Meena Marafi, Manager, PRSC KISR, followed by brief messages from Dr. Abdulhameed Al-Hashem, Director, PRSC KISR, Mr. Morihiro Yoshida, Managing Director of JCCP, and Mr. Yoshio Yokoyama, Director of Arabian Oil Company, Ltd.

Dr. Meena Marafi, Manager, PRSC KISR, delivering the opening address

As keynote speakers, Dr. Alenezi from KOC gave a speech on the development of Lower Fars heavy crude oil in Kuwait, and Mr. Ronald L. Dickenson, President of SFA Pacific Inc., spoke about various technologies for developing of heavy crude oil. Mr. Dickenson mentioned the Ivanhoe HTL process, a coker process that requires short retention time, has begun to draw attention as a field upgrader, although operational results have only been obtained from a prototype so far. He also mentioned that the slurry residual oil hydrocracking process which uses nano catalysts is a promising new process, and that a 23,000B/D plant is under construction at a refinery operated by Eni S.p.A. The Eureka process, Mr. Dickenson noted, is an extremely innovative thermal cracking process.

In the technical session which followed the keynote speeches, Dr. Mamun Absi-Halabi, Principal Research Scientist, PRSC, spoke on the direct reforming of heavy crude oil, and Mr. Omori from Arabian Oil Company and Messrs. Shimizu and Uchida from Chiyoda Corporation introduced the Eureka thermal cracking unit and explained its technical advantages. The Eureka process is similar to the coker process, but differs greatly in that its thermal cracking residue is liquid pitch, where it is solid coke in the coker process. The Japanese researchers explained that the liquid state of the residue from the Eureka process makes the process ideal when combined with a gasification process, and also emphasized the potential of Eureka as a field upgrader.

After a brief lunch break, Dr. Faisal Alhumaidan, Associate Research Scientist, PRSC KISR, reported on the results of a vacuum residue thermal cracking test conducted on three different types of heavy crude oil (Ratawi, Lower Fars, and Eocene) using a pilot vacuum residue thermal cracking unit installed in PRSC last fiscal year. The results indicated that vacuum residue from Eocene is relatively easier to crack compared to the other types of crude oil. He also presented interim results of an analysis of thermal cracking speed. Next, Dr. M. Ramadhan gave a presentation on the results of

Dr. M. Ramadhan giving a presentation

Mr. Morihiro Yoshida, Managing Director of JCCP, delivering an opening speech

a market survey of heavy crude oil and synthetic crude oil, and lastly, Mr. Hayashida from Arabian Oil Company discussed the economic advantages of operating a Eureka unit. Mr. Hayashida noted that if a Eureka unit is installed at the foot of an oil well as a field upgrader, the Eureka pitch could be used to produce steam and the steam used in the production process of heavy crude oil. The economic efficiency of the process, he explained, would be extremely high, delivering an IRR of 30 – 40%, both when Eureka is used in a large process combined with gasification and when it is used as a small field upgrader.

The workshop came to a close with a proposal to install a pilot Eureka plant in the Mina Al Shuaiba Refinery, which is one of three refineries in Kuwait.

We feel that the true meaning of technical transfer lies in the commercialization of the technology after completion of the JCCP technical cooperation project, and that this may be achieved by going beyond the scope of a debriefing session with the counterpart organization and widely disclosing information of the project to the entire oil sector in Kuwait, recognizing it as the future owner of the project. It can be said that one of the reasons why this workshop was successful was because KISR shared this awareness with strong conviction.

<by Hiroshi Iida, Technical Cooperation Dept.>