

# CPJ on Advanced Instrumentation and Control Systems in the Oil Downstream for the ADNOC Group (CPJ-81)

## 1. Urgent International Cooperation and Assistance Program for the UAE ADNOC Group

This customized program-Japan (CPJ) is based on an agreement between the UAE and Japanese government in 2013 to receive 250 ADNOC personnel to JCCP over the next five years. With a target of receiving 50 personnel each year, JCCP plans to implement the five most highly requested courses during this year, the first year of the agreement, upon consultation with ADNOC. The courses are: CPJ-81-14 on “Advanced instrumentation and control systems in the oil downstream”; CPJ-82-14 on “Environmental management and advanced technologies”; CPJ-83-14 on “Refinery maintenance management for productivity increase”; CPJ-84-14 on “Petroleum marketing and trading (February)”; and CPJ-85-14 on “Petroleum marketing and trading (March).” The first year’s target of receiving 50 participants is expected to be reached with these five courses.

Details of the course content and the results of implementation of CPJ-81 “Advanced instrumentation and control systems in the oil downstream” are provided below.

## 2. CPJ-81-14 “Advanced instrumentation and control systems in the oil downstream”

### (1) Background and Objectives

As part of the FY2014 Urgent International Cooperation and Assistance Program, JCCP agreed to provide training that focuses on the advanced instrumentation and control systems for the ADNOC Group. The participants were mainly engineers who specialize in instrumentation equipment and maintenance, so training at JCCP and site visits were designed to cover topics in those fields, and a nine-day course was implemented from January 13 to 23, 2015.

### (2) Program Planning

Although the course was a short-term course specifically themed on instrumentation equipment and maintenance, it incorporated practical training that utilizes relevant equipment as much as possible to maximize the uniqueness of JCCP training. The program thus featured themes that were relevant to the participants’ interests, such as themes that relate to their specialties and themes centered on the latest technologies in the instrumentation field. Additionally, it included popular hands-on training that is offered in regular courses.

- 1) Themes related to participants’ specialties
  - i) Overview and practical training in vibration sensors (onsite training at Shinkawa Sensor Technology Co.’s Hiroshima Factory)
  - ii) Overview of information systems (external lecturer: Osaka Systems Planning, Inc.)
- 2) Themes centered on the latest technologies in the instrumentation field
  - i) Practical engineering training on the latest DCS and wireless instrumentation system (onsite training at Yokogawa Electric Corporation’s Head Office)
  - ii) Overview of instrumentation devices, including online analyzers (onsite training at Yokogawa Electric Corporation’s Komine Factory)
- 3) Popular hands-on training offered in regular courses
  - i) Basics and application of control valves and their maintenance (onsite training at Azbil Corporation’s Shonan Factory)
  - ii) Process control theories and practice (PID tuning) (JCCP CAI classroom)
  - iii) Process control practice (water tank model) (JCCP No. 5 simulator)



Training at Azbil Corporation



Group photo at Yokogawa Electric Corporation

### (3) Summary

#### 1) Training at JCCP

##### i) Practical training in PID control and tuning and process control (water tank model)

Basic training was provided on instrumentation theories through PID control and tuning practice using a dynamic simulator in JCCP's CAI classroom and process control practice using a DCS simulator (water tank model). Although most of the participants were instrumentation engineers, the basic training received high marks from all.

##### ii) Latest information and control systems

An overview was given of information and control systems that are used in refineries and gas plants from both the Japanese and global perspective, and was well received by the participants, who noted that gaining an understanding of company-wide systems was highly beneficial.

#### 2) Site visits

##### i) Shinkawa Sensor Technology, Inc., Hiroshima Factory

The Hiroshima Factory has the capacity to provide training in the measurement principles of vibration level instruments, sensor maintenance methods, diagnosis evaluation methods, etc. It was thus chosen as a destination for onsite training in consideration of the majority of instrumentation engineers among the participants. The lecturer (an Indian-Canadian employee) who attended to the group introduced the

company's products and took the group on a tour of the factory while providing expert technical explanations, and garnered high evaluations from the participants.

##### ii) Azbil Corporation, Shonan Factory

Following an overview of the company and factory, an introduction was given of the Valstaff maintenance support system for control valves produced by the company.

In the afternoon, the participants toured the control valve assembly processes, and engaged in hands-on training in the disassembly and assembly of a control valve. Mr. Omoda, the instructor of the practical training, captured the praise of the participants with his witty conversation and instruction style using whole-body language.

##### iii) Yokogawa Electric Corporation, Head Office and Komine Factory

At the Head Office, an introduction of the global company was followed by practical engineering training in wireless instrumentation systems, providing new knowledge that was well-received by the participants.

As a factory specializing in the production of progress gas chromatography (GC) among its various instrumentation devices, Komine Factory captured the participants' attention with its batch production system.

##### iv) Other

For this course, running water and basins for washing hands and feet were provided on the veranda at Shinkawa Sensor Technology, so that



*Running water (hot water) and basins for washing feet and hands that were prepared by Shinkawa Sensor Technology for Muslim participants so they could practice their prayer ritual*

Muslim participants could practice their ritual prayer. Additionally, during a lunch at Hiroshima International Plaza, the participants happened to encounter primary school children who were also visiting the facility, and enjoyed the opportunity to interact with them by letting the children wear their ethnic Arab costume.

#### **(4) Observations**

As part of the Urgent International Cooperation and Assistance Program, JCCP provided training that focuses on the latest instrumentation and control systems for the



*Interaction with Japanese children at Hiroshima International Plaza*

ADNOC Group. With only a short preparation period from the time the implementation of the course was decided until its actual implementation, there were some difficulties in selecting participants and destinations for site visits that accord with the course theme. However, the sites that were requested to provide onsite training did their utmost within the short period of preparation they had, and contributed greatly to providing highly meaningful training.

The participants of the course, for their part, responded positively and earnestly to their JCCP and Japanese experience, and left a strongly favorable impression on all the companies they visited.