



# Knowledge Co-Creation Program (Group & Region Focus)

GENERAL INFORMATION ON

HIGH EFFICIENT AND CLEAN THERMAL POWER  
-FOR EXECUTIVES-

課題別研修「高効率クリーン火力発電の推進」

**JFY 2019**

NO. J1904109 / ID. 1984586

Course Period in Japan: From August 25, 2019 to September 18, 2019

This information pertains to one of the JICA Knowledge Co-Creation Program (Group & Region Focus) of the Japan International Cooperation Agency (JICA), which shall be implemented as part of the Official Development Assistance of the Government of Japan based on bilateral agreement between both Governments.

‘JICA Knowledge Co-Creation (KCC) Program’ as a New Start

In the Development Cooperation Charter which is released from the Japanese Cabinet on February 2015, it is clearly pointed out that *“In its development cooperation, Japan has maintained the spirit of jointly creating things that suit partner countries while respecting ownership, intentions and intrinsic characteristics of the country concerned based on a field-oriented approach through dialogue and collaboration. It has also maintained the approach of building reciprocal relationships with developing countries in which both sides learn from each other and grow and develop together.”* We believe that this ‘Knowledge Co-Creation Program’ will serve as a center of mutual learning process.

# ***I. Concept***

## **Background**

Appropriate power development and secured power supply are essential for sustainable development for developing countries. At the same time, efforts for realization towards low carbon society are also required for developing countries, after “Paris agreement” under the 21st United Nations Climate Change Conference (COP 21) in 2015. Under these circumstances, the importance of steady development of “High Efficient and Clean Thermal Power” as national base power source and its operation and maintenance has been increased in the view point of both “Energy Security” and “Climate Change Measures”.

On the other hand, the high efficiency thermal power generation in Japan, such as Gas Turbine Combined Cycle (hereinafter referred to as “GTCC”), Ultra Supercritical Coal-fired power generation (hereinafter referred to as “USC”), Advanced Ultra Supercritical Coal-fired power generation (hereinafter referred to as “A-USC”) and, Integrated Gasification Combined Cycle (hereinafter referred to as “IGCC”) realizes the world's highest level of power generation efficiency and a minimal output of carbon dioxide emissions into the environment and is been kept as good condition under its appropriate operation and maintenance.

Those Japanese technologies and know-how would be valuable also for developing countries which are proceeding with thermal power development for their energy source.

## **For what?**

This program aims to introduce Japanese advanced technology of high efficiency thermal power generation, such as GTCC, USC, A-USC and IGCC.

## **For whom?**

This program is offered to governmental organizations in charge of power and energy policy planning and implementation or generation development.

## **How?**

This program covers comprehensive contents related to high efficiency thermal power generation development such as installation, operation and maintenance.

Outcome of this program is to enhance the planning capacity for thermal power generation. Participants will also visit thermal power plants in Japan.

## II. Description

1. **Title (J-No.): High Efficient and Clean Thermal Power -for Executives- (J1904109)**
2. **Course Period in JAPAN**  
August 25 to September 18, 2019
3. **Target Regions or Countries**  
Brazil, Egypt, Mozambique, Myanmar, Sri Lanka, Tanzania and Thailand
4. **Eligible / Target Organization**  
Governmental ministries / agencies in charge of power and energy policy planning and implementation or electric power source development
5. **Course Capacity (Upper limit of Participants)**  
8 participants
6. **Language to be used in this program**  
English
7. **Course Objective**  
The participants understand Japanese advanced technology of high efficiency thermal power generation, such as GTCC, USC, A-USC and IGCC. They will be able to introduce to promote those technologies in their countries.
8. **Overall Goal**  
To promote high efficiency and clean thermal power generation, such as GTCC, USC, A-USC and IGCC.
9. **Expected Module Output and Contents**  
This program consists of the following components. Details on each component are given below:

<b>(1) Preliminary Phase in a participant's home country</b> (June 2019 to Aug. 2019) <i>Applicants are required to submit the Job Report and the Issue Analysis Sheet (IAS) together with the application form for selection in Japan.</i>	
Expected Module Output	Activities
Job Report and IAS is formulated	Formulation and submission of the job report and the Issue Analysis Sheet with the application form

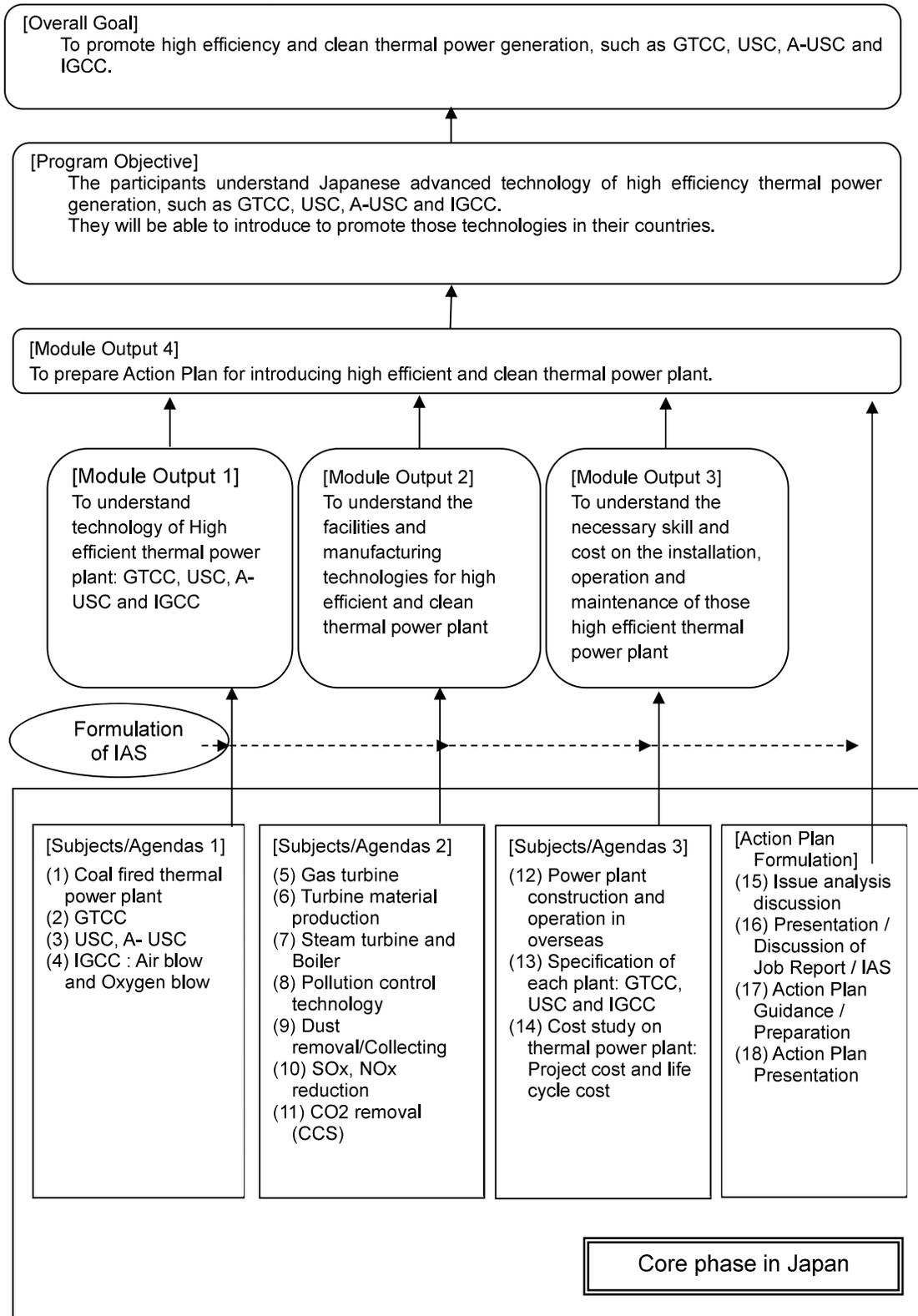
**(2) Core Phase in Japan**  
 (Aug. 25, 2019 to Sep. 18, 2019)  
*Participants dispatched by the organizations to attend the Program implemented in Japan.*

Expected Module Output	Subjects/Agendas	Methodology
To understand technology of High efficient thermal power plant: GTCC, USC, A-USC and IGCC.	(1) Coal fired thermal power plant (2) GTCC (3) USC, A-USC (3) IGCC : Air blow and Oxygen blow	Lecture Observation Field Study
To understand the facilities and manufacturing technologies for high efficient and clean thermal power plant	(5) Gas turbine (6) Turbine material production (7) Steam turbine and Boiler (8) Pollution control technology (9) Dust removal/Collecting (10) SO <sub>x</sub> , NO <sub>x</sub> reduction (11) CO <sub>2</sub> removal (CCS : CO <sub>2</sub> capture and storage)	Lecture Observation Field Study
To understand the necessary skill and cost on the installation, operation and maintenance of those high efficient thermal power plant	(12) Power plant construction and operation in overseas (13) Specification of each plant : GTCC, USC and IGCC (14) Cost study on thermal power plant: Project cost and life cycle cost	Lecture Observation Field Study
To prepare Action Plan for introducing high efficient and clean thermal power plant	(15) Issue analysis discussion (16) Presentation/Discussion of Job Report/IAS (17) Action Plan Guidance/Preparation (18) Action Plan Presentation	Discussion Presentation/ Discussion Lecture Presentation

**(3) Finalization Phase in a participant's home country**  
 (After returning home country)  
*Participating organizations produce final outputs by making use of results brought back by participants.*

Expected Module Output	Activities
To discuss and promote the action plans in the participants' organizations	Application and implementation of the action plan back in the participant's country

## 10. Structure of the program



### ***III. Conditions and Procedures for Application***

#### **1. Expectations from the Participating Organizations**

- (1) This program is designed primarily for organizations that intend to address specific issues or problems identified in their operation. Participating organizations are expected to use the project for those specific purposes.
- (2) This program is enriched with contents and facilitation schemes specially developed in collaboration with relevant prominent organizations in Japan. These special features enable the project to meet specific requirements of applying organizations and effectively facilitate them toward solutions for the issues and problems.

#### **2. Nominee Qualifications**

Applying Organizations are expected to select nominees who meet the following qualifications:

##### **(1) Essential Qualifications**

- 1) Current Duties: be a managerial official in administration of Government ministries/agencies, planning and implementation of power and energy policy planning and implementation of generation.
- 2) Experience in the relevant field: have more than 5 years.
- 3) Educational Background: be a graduate of university or equivalent level, preferably with a background of engineering or science.
- 4) Language: have a competent command of spoken and written English which is equal to TOEFL iBT 100 or more (This workshop includes active participation in discussions, which requires high competence of English ability. Please attach an official certificate for English ability such as TOEFL, TOEIC etc., if possible)
- 5) Health: must be in good health, both physically and mentally, to participate in the Program in Japan. Pregnant applicants are not recommended to apply due to the potential risk of health and life issues of mother and fetus.

\*Please note that this training course includes many site visits on foot.

##### **(2) Recommendable Qualifications**

- 1) Relation with JICA projects: preferable to be involved with JICA projects currently or in the past.
- 2) Age: between the ages of twenty-five (25) and fifty (50) years

#### **3. Required Documents for Application**

- (1) **Application Form:** The Application Form is available at **the JICA office (or the Embassy of Japan)**.
- (2) **Photocopy of passport:** to be submitted with the application form, if you possess your passport which you will carry when entering Japan for this program. If not, you

are requested to submit its photocopy as soon as you obtain it.

\*Photocopy should include the followings:

Name, Date of birth, Nationality, Sex, Passport number and Expire date.

**(3) Nominee's English Score Sheet:** to be submitted with the application form. If you have any official documentation of English ability. (e.g., TOEFL, TOEIC, IELTS)

**(4) Job Report and Issue Analysis Sheet (IAS)**

To be submitted with the application form. Fill in Annex 1 and 2 of this General Information, and submit it along with the Application Form. Job Report and IAS are necessary documents for screening of an applicant. Each participant will be required to present his/her Job report and IAS in approx. 10 minutes in an early stage of the course. Visual materials such as PowerPoint and pictures may be helpful for your presentation if you bring them. When you use Power Point, it is preferable to use letters more than 24-point and not to use pictures on the background. An applicant should submit his/her IAS with approval of his/her superior and an IAS without approval of an applicant's superior is not accepted.

#### **4. Procedures for Application and Selection**

##### **(1) Submission of the Application Documents**

Closing date for applications: **Please inquire to the JICA office (or the Embassy of Japan).**

(After receiving applications, the JICA office (or the Embassy of Japan) will send them to the JICA Kyushu Center in JAPAN by **June 25, 2019.**)

**There is a possibility that your application will be not accept due to overdue deadline.**

##### **(2) Selection**

After receiving the documents through proper channels from your government, the JICA office (or the embassy of Japan) will conduct screenings, and then forward the documents to the JICA Center in Japan. Selection will be made by the JICA Center in consultation with concerned organizations in Japan. The applying organization with the best intention to utilize the opportunity of this program will be highly valued in the selection. Qualifications of applicants who belong to the military or other military-related organizations and/or who are enlisted in the military will be examined by the Government of Japan on a case-by-case basis, consistent with the Development Cooperation Charter of Japan, taking into consideration their duties, positions in the organization, and other relevant information in a comprehensive manner.

##### **(3) Notice of Acceptance**

Notification of results will be made by the JICA office (or the Embassy of Japan) not later than **July 25, 2019.**

## **5. Conditions for Attendance**

- (1) to strictly adhere to the program schedule.
- (2) not to change the program topics.
- (3) not to extend the period of stay in Japan.
- (4) not to be accompanied by family members during the program.
- (5) to return to home countries at the end of the program in accordance with the travel schedule designated by JICA.
- (6) to refrain from engaging in any political activities, or any form of employment for profit or gain.
- (7) to observe Japanese laws and ordinances. If there is any violation of said laws and ordinances, participants may be required to return part or all of the training expenditure depending on the severity of said violation.
- (8) to observe the rules and regulations of the accommodation and not to change the accommodation designated by JICA.

## **IV. Administrative Arrangements**

### **1. Organizer**

- (1) **Name:** JICA Kyushu, Training Program Division
- (2) **Contact:** kicctp@jica.go.jp

### **2. Implementing Partner**

- (1) **Name:** Kitakyushu International Techno-cooperative Association (KITA)
- (2) **URL:** <http://www.kita.or.jp/english/index.html>

### **3. Travel to Japan**

- (1) **Air Ticket:** The cost of a round-trip ticket between an international airport designated by JICA and Japan will be borne by JICA.
- (2) **Travel Insurance:** Coverage is from time of arrival up to departure in Japan. Thus traveling time outside Japan will not be covered.

### **4. Accommodation in Japan**

JICA will arrange the following accommodations for the participants in Japan:

#### **[TOKYO]**

JICA Tokyo Center (JICA TOKYO)

Address: 2-49-5 Nishihara, Shibuya-ku, Tokyo 151-0066, Japan

TEL: +81-3-3485-7051 FAX: +81-3-3485-7904

#### **[KITAKYUSHU]**

JICA Kyushu Center (JICA KYUSHU)

Address: 2-2-1 Hirano, Yahata Higashi-ku, Kitakyushu-shi, Fukuoka, 805-8505, Japan

TEL: +81-93-671-6311 FAX: +81-93-671-0979

("81": country code for Japan, "93" and "3": local area code)

If there is no vacancy at JICA KYUSHU, JICA will arrange alternative accommodations for the participants. Please refer to facility guide of JICA KYUSHU at:

<http://www.jica.go.jp/english/about/organization/domestic/pdf/kyushu01.pdf>

### **5. Expenses**

The following expenses will be provided for the participants by JICA:

- (1) Allowances for accommodation, meals, living expenses, outfit and shipping
- (2) Expenses for study tours (basically in the form of train tickets)
- (3) Free medical care for participants who become ill after arriving in Japan (costs related to pre-existing illness, pregnancy, or dental treatment are not included)
- (4) Expenses for program implementation, including materials

For more details, please see "III. ALLOWANCES" of the brochure for participants titled "KENSU-IN GUIDE BOOK," which will be given before departure for Japan.

## **6. Pre-departure Orientation**

A pre-departure orientation will be held at the respective country's JICA office (or Japanese Embassy), to provide participants with details on travel to Japan, conditions of the workshop and other matters.

## ***V. Other Information***

### **1. Report and Presentation**

#### **(1) Job Report & Issue Analysis Sheet (IAS)**

Each applicant is required to submit his/her own Job Report & Issue Analysis Sheet following the instruction. Participants will have a presentation of his/her Job Report & Issue Analysis Sheet up to 10 minutes at the earlier stage of the training in order to share knowledge and background with other participants as well as instructors. Visual materials such as Power Point and pictures may be helpful for your presentation if you bring them with you.

#### **(2) Action Plan**

Accepted participants are required to formulate an action plan at the end of the training program in Japan to show your ideas and plans, which you carry out after return home, reflecting the knowledge and method acquired from the training. Each participant will have 10 minutes for presentation.

Also, participants are required to complete IAS by the end of the training and present it at the Action Plan Presentation.

#### **(3) Bring own laptop computer**

The participants are kindly requested to bring their laptop computer for making reports, if they have one.

### **2. Remarks**

JICA training is implemented for the purpose of development of human resources who will promote the advancement of the countries, but not for the enrichment of individuals or private companies. Matters of a trade secret and patent techniques will remain confidential and inaccessible during the training.

## **VI. ANNEX**

- 1. Job Report**
- 2. Issue Analysis Sheet (IAS)**
- 3. Issue Analysis Sheet (IAS) Guidelines**
- 4. Training Schedule (tentative)**

**Annex 1**

**High Efficient and Clean Thermal Power -for Executives-  
(JFY 2019)  
Job Report**

Name:

Country:

Organization and present post:

E-mail:

FAX:

Remarks 1: The Report should be typewritten in English (12-point font, appropriately spaced, A4 size paper) and total pages of the report should be limited to 3 pages (not including organization chart).

Remarks 2: Please don't forget to check the analysis sheet

Remarks 3: Each participant is required to have presentation in 10 minutes based on this Job Report at the early stage of the training for the purpose of making the training more effective and fruitful by comprehending the situations and problems of the participants each other.

Remarks 4: It is also requested to prepare a PowerPoint for the presentation. When you use PowerPoint, it is preferable to use letters more than 24 points and not to use pictures on the background.

Remarks 5: Please itemize your answer and make them specific.

**1. Organization and main tasks (up to 1 page)**

(1) Main tasks of the organization

(Please include annual turnover or product amount, name of products and number of employees)

(2) Organization chart:

Please draw a chart of your organization including the department (section) names with the number of staffs in it and mark where you are positioned. (The chart should be attached and not be counted in this page limit.)

(3) Brief description of your assignments.

**2. Existing problems in your section (up to 1 page)**

(1) Current problems you are facing in your section (Please describe concrete details.)

(2) Countermeasures for these problems

(3) Obstacles in the process of solving those problems

**3. Expectations for the training course (up to 1 page)**

(1) Most interesting subjects or topics in this training course and reasons why you pick up the subjects

(2) How do you expect to apply skills and knowledge according the listed items in Curriculum after you return to your home country?

(3) Other matters you are expecting for this course, if any  
 (Basically this training program is fixed and cannot be changed upon your request.)

4. Participants' requests for the training topics.

Describe subjects which you have particular interests in the training, and you would like to study through the training in the order of priority.

ref: Structure of the program, Training schedule (tentative)

Priority	Subjects which you are interested in	Contents (Please write in detail)
	(Example) Subjects/Agendas 2 (9) Dust removal/Collecting (10) SOx, NOx reduction (11) CO2 removal (CCS)	Carbon Dioxide Absorption Equipment Plant
1		
2		
3		

**Annex 2****Issue Analysis Sheet (IAS)**

Country: \_\_\_\_\_ Name: \_\_\_\_\_

No	<b>【A】* Issues that you confront.</b>	<b>【B】 Actions that you are taking.</b>
1	<b>【I】 Task or The information that I need.</b>	<b>【II】 Useful information that I obtained /found.      【III】 Lecturer</b>

No	<b>【A】* Issues that you confront.</b>	<b>【B】 Actions that you are taking.</b>
2	<b>【I】 Task or The information that I need.</b>	<b>【II】 Useful information that I obtained /found.      【III】 Lecturer</b>

No	<b>【A】* Issues that you confront.</b>	<b>【B】 Actions that you are taking.</b>
3	<b>【I】 Task or The information that I need.</b>	<b>【II】 Useful information that I obtained /found.      【III】 Lecturer</b>

**【 I 】,【 II 】,【 III 】** These columns will be filled during the training course.

**\*You shall describe challenges you are facing in your section also in the Job Report. Among them, in column A, please describe only those issues you expect to solve utilizing information and knowledge being delivered in this training course.**

## Issue Analysis Sheet (IAS) Guidelines

### 1. What is IAS?

- (1) IAS is a tool to logically organize relationships between issues and contents of the training program in Japan.
- (2) IAS will help the nominee to clarify his/her challenges to be covered in each expected module output and to formulate solutions to them.
- (3) The sheet is to be utilized as a logical process control sheet to draw up improvement plans for the issues by filling out the sheet in phases from prior to the nominee's arrival through to the end of the training.
- (4) In addition, it is used for the course leader and lecturers to understand the issues that each participant is confronting, and provide him/her with technical advice, useful references and solutions through the training program in Japan.

### 2. How to fill out IAS?

- (1) Please describe the issues you confront in column "**A: Issues that you confront**". You shall describe challenges you are facing in your section also in the Job Report. Among them, in column A, please describe only those issues you expect to solve utilizing information and knowledge being delivered in this training course. Prepare the separate rows for each problem; if necessary, please add new rows.
- (2) In column "**B: Actions that you are taking**", please describe actions that you are taking to solve the issues shown in "**Column A**". This information is very important to carry out the training course and also to make Action Plan as a fruit of the training.
- (3) It's not necessary to fill in column "**I : Task or the information that I need**", column "**II : Useful information that I obtained/found**" and column "**III : Lecturer**". These columns shall be filled out during the training.
- (4) "**Column I**" shall be clarified and filled out in the subject "**Task extraction using IAS**" implemented at the earlier time in the training.
- (5) "**Column II**" and "**Column III**" shall be filled out during the training and you are required to present completed IAS in the subject "**Action Plan Presentation**".

**Annex 4**
**Training Schedule (tentative)**

Day		time	Method-ology	Subjects	Place
8/25	Sun			Arrival to Japan	JICA TOKYO
8/26	Mon	am pm	L L	Briefing Program orientation, Course orientation	JICA TOKYO
8/27	Tue	am  pm	L  L D	JICA initiatives policy for thermal power plants GTCC project NEDO's high efficiency thermal power plant technology Task extraction based on the Issue analysis sheet (IAS)	JICA TOKYO
8/28	Wed	am  pm	L  L	High efficiency thermal power plant -Power Generation for 21th Century- Environmental technologies -For clean & better environment-	JICA TOKYO
8/29	Thu	am pm	T L/F T	Tokyo to Iwaki Nakoso power station with IGCC Iwaki to Tokyo	Iwaki
8/30	Fri	am  pm	L  L/F  D	High efficiency steam turbine USC project Turbine manufacturing technology-1 : Steam turbine Review & Discussion	Yokohama    JICA TOKYO
8/31	Sat			Holiday	JICA TOKYO
9/1	Sun			Holiday	JICA TOKYO
9/2	Mon	am pm	L T	Carbon dioxide capture technology Tokyo to Himeji (Shinkansen)	Yokohama
9/3	Tue	am pm	L L/F	GTCC technology Turbine manufacturing technology-2 : Gas turbine	Takasago
9/4	Wed	am pm	T P	Himeji to Kokura/Kitakyusyu (Shinkansen) Job report presentation	JICA KYUSHU
9/5	Thu	am pm	T L/F T	JICA KYUSHU to Oita Sin Oita power station -GTCC Oita to JICA KYUSHU	Oita
9/6	Fri	am pm	L L/F D	Maintain and improvement of performance Refreshment of old power station Review & Discussion	Kitakyusyu  JICA KYUSHU
9/7	Sat			Holiday	JICA KYUSHU
9/8	Sun			Holiday	JICA KYUSHU

Day		time	Method-ology	Subjects	Place
9/9	Mon	am pm	T L/F	JICA KYUSHU to Nagasaki Turbine manufacturing technology-3 : Steam turbine	Nagasaki
9/10	Tue	am pm	L/F T T	Boiler manufacturing technology Nagasaki Atomic Bomb Museum Nagasaki to Amakusa	Nagasaki
9/11	Wed	am pm	L/F T	Reihoku power station - Supercritical pressure boiler- Amakusa to JICA KYUSHU	Amakusa
9/12	Thu	am pm	L L L/F	Japan's electricity supply & KEPCO's approach Thermal efficiency improvement project Turbine manufacturing technology-4 : Turbine material production	JICA KYUSHU Kitakyusyu
9/13	Fri	am pm	L D D	Action plan lecture Action plan preparation Review & Discussion	JICA KYUSHU
9/14	Sat			Holiday	JICA KYUSHU
9/15	Sun			Holiday	JICA KYUSHU
9/16	Mon	am pm	L L	Economical evaluation of various types of power plants Energy policy of Japan	JICA KYUSHU
9/17	Tue	am pm	P D	Action plan presentation Evaluation meeting Closing ceremony	JICA KYUSHU
9/18	Wed			Departure from Japan	

JICA TOKYO: JICA Tokyo Center

JICA KYUSHU: JICA Kyushu Center

L: Lecture, D: Discussion, F: Field Trip, P: Presentation, T: Travel

## *For Your Reference*

### **JICA and Capacity Development**

The key concept underpinning JICA operations since its establishment in 1974 has been the conviction that “capacity development” is central to the socioeconomic development of any country, regardless of the specific operational scheme one may be undertaking, i.e. expert assignments, development projects, development study projects, training programs, JOCV programs, etc.

Within this wide range of programs, Training Programs have long occupied an important place in JICA operations. Conducted in Japan, they provide partner countries with opportunities to acquire practical knowledge accumulated in Japanese society. Participants dispatched by partner countries might find useful knowledge and re-create their own knowledge for enhancement of their own capacity or that of the organization and society to which they belong.

About 460 pre-organized programs cover a wide range of professional fields, ranging from education, health, infrastructure, energy, trade and finance, to agriculture, rural development, gender mainstreaming, and environmental protection. A variety of programs are being customized to address the specific needs of different target organizations, such as policy-making organizations, service provision organizations, as well as research and academic institutions. Some programs are organized to target a certain group of countries with similar developmental challenges.

### **Japanese Development Experience**

Japan was the first non-Western country to successfully modernize its society and industrialize its economy. At the core of this process, which started more than 140 years ago, was the “*adopt and adapt*” concept by which a wide range of appropriate skills and knowledge have been imported from developed countries; these skills and knowledge have been adapted and/or improved using local skills, knowledge and initiatives. They finally became internalized in Japanese society to suit its local needs and conditions.

From engineering technology to production management methods, most of the know-how that has enabled Japan to become what it is today has emanated from this “*adoption and adaptation*” process, which, of course, has been accompanied by countless failures and errors behind the success stories. We presume that such experiences, both successful and unsuccessful, will be useful to our partners who are trying to address the challenges currently faced by developing countries.

However, it is rather challenging to share with our partners this whole body of Japan’s developmental experience. This difficulty has to do, in part, with the challenge of explaining a body of “tacit knowledge,” a type of knowledge that cannot fully be expressed in words or numbers. Adding to this difficulty are the social and cultural systems of Japan that vastly differ from those of other Western industrialized countries, and hence still remain unfamiliar to many partner countries. Simply stated, coming to Japan might be one way of overcoming such a cultural gap.

JICA, therefore, would like to invite as many leaders of partner countries as possible to come and visit us, to mingle with the Japanese people, and witness the advantages as well as the disadvantages of Japanese systems, so that integration of their findings might help them reach their developmental objectives.



***CORRESPONDENCE***

For enquiries and further information, please contact the JICA office or the Embassy of Japan. Further, address correspondence to:

**JICA Kyushu Center (JICA KYUSHU)**

**Address: 2-2-1 Hirano, Yahatahigashi-ku, Kitakyushu-shi, Fukuoka, 805-8505 Japan**

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