



Overseas Reports

【Training completion report and appreciation】



*Please find attached my report on the training.
 A big personal thanks to you for all your assistance and patience which made this trip possible.
 I truly enjoyed the experience and learnt a lot.
 God bless you, From Kofi*

- 1) Course Leader: Mr. Taisuke FUJII
- 2) Former Participant: Mr. ASIEDU Kofi Amoako

May 02, 2018

Kitakyushu International Techno-cooperative Association
 Training Division

This issue of Overseas Reports covers the training completion report and appreciation of participant who attended the training course, “High Efficient and Clean Thermal Power -for Executives-(B)” Mr. Taisuke FUJII, the course leader, introduced us his report.

1. Introduction of the participant, who has given the report

Nickname	Photo	Name	Country	Period of JICA Training Course
Kofi-san		Mr. ASIEDU Kofi Amoako	GHANA	Jan. 28, 2018 to Feb. 17, 2018



Famous sights of Ghana

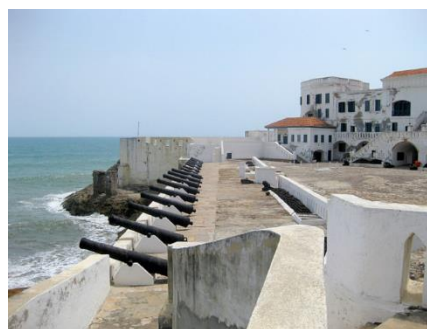
Ghana is a country facing the Gulf of Guinea in West Africa, known for its diverse wildlife, old forts, and quiet beaches.

【Tetteh Quarshie Memorial farm】



In 1879, Tetteh Quarshie Cacao plantation was begun and built a brand as the current chocolate power.

【Cape Coast Castle】



Cape Coast Castle, the most popular sightseeing spot in Ghana

【Mole National Park】



Walking safari park, National park with savanna and forest spreading along several rivers



The memorial photo of the closing ceremony of “High Efficient and Clean Thermal Power -for Executives-(B)” course,

2. Message from Mr. T. Fujii, Course Leader



This training course was scheduled very tightly in a short three weeks. Participants joined lectures on the Japanese technology for the high efficiency and clean thermal power, which is the most advanced in the world, and visited different thermal power plants and manufacturing plants of power-generating facilities.

As you already know, this winter was colder than usual and most of the participants are from southern country. Kofi-san also is a power engineer from Ghana, Africa.

All the nine participants worked on lectures and site visits enthusiastically, and it was always running out of time due to many questions. They seemed to have been impressed by Japanese technological development, manufacturing technology and energy policy trying to supply sustainable and quality electricity with consideration for environment.

Kofi-san had asked sharp questions to lecturers earnestly among participants. His homeland, Ghana is rich in resources, but it is required to improve power infrastructure for the anticipated economic growth in the future. He completed his Action Plan to utilize the knowledge gained from the training for the development of his country.

I am looking forward to his future success.

3. Letter from Kofi - san



REPORT ON HIGH EFFICIENT AND CLEAN THERMAL POWER COURSE ATTENDED

1) Basic Information

- a. Name of Participant – Kofi Amoako Asiedu
- b. Name of Organization – Volta River Authority
- c. Training Course – High Efficient and Clean Thermal Power for Executives (B)
- d. Organizer – JICA in partnership with KITA
- e. Location – Japan
- f. Duration – 3 Weeks

2) Overview of training program

The course, organized by JICA in association with the Kitakyushu International Techno-cooperative Association (KITA) was held in Japan from Jan. 28 to Feb. 17, 2018. Nine participants from eight countries took part, namely: Cuba, Ghana, India, Mozambique, Myanmar, Papua New Guinea, Tanzania and Uzbekistan.

The program introduced Japanese advanced technology for high efficiency thermal power generation, such as ultra-supercritical coal-fired power generation (USC), integrated coal gasification combined cycle (IGCC) and gas turbine combined cycle (GTCC) to representatives from the various countries. Representatives were selected from governmental organizations in charge of power, energy policy planning and implementation and generation development.

During the core phase in Japan, various modules were covered as follows:

- To understand technology of High efficient thermal power plant: SC, USC, GTCC, and IGCC
- To understand the facilities and manufacturing technologies for high efficient and clean thermal power plant including gas and steam turbine and boiler material production and manufacturing,

pollution control technology and environmental technologies such as dust removal/collecting SO_x, NO_x reduction and CO₂ removal (CCS).

- To understand the necessary skill and cost on the installation, operation and maintenance of those high efficient thermal power plant
- To prepare Action Plan for introducing high efficient and clean thermal power plant

The methodology was through lectures, observation, field study, discussion and presentations.

Classroom sessions were held to discuss Japanese energy policy and introduce the various technologies.

Three thermal plants and several power plant component manufacturing plants were visited as follows:

1. Kyushu Electric Power Co. Inc.(KEP Co) – Matsuura Power Station

700MW Coal Fired Power Station using coal supplied from primarily Australia. Station adopts flue gas treatment (Electrostatic Precipitator, DeNox and DeSO_x equipment)

2. KEP Co – Shin-Oita Thermal Power Station

2,800MW station comprising 14 generating units using LNG from Australia, Indonesia, Russia and others supplied by Oita LNG Co. Inc., a KEP Co subsidiary.

3. Osaki CoolGen Corporation

166MW large scale demonstration plant for oxygen-blown integrated coal gasification combined cycle (IGCC) technology

4. Toshiba Corporation – Keihin Product Operations

Manufacturers of gas turbines, steam turbines, boilers, generators, environmental equipment, control systems and fuel cells as well as reactor internal pumps, advanced control rod drive mechanisms, etc. for nuclear power plants. They also manufacture components of hydro turbines such as turbine runners, spiral casings and rotors for geothermal power plants

5. Mitsubishi Hitachi Power Systems, Ltd. (MHPS) – Takasago Works

Turbine manufacturing technology (Gas turbine)

6. Mitsubishi Hitachi Power Systems, Ltd. (MHPS) – Nagasaki Shipyard and Machinery Works

Turbine manufacturing technology (steam turbine and boiler)
Visited works and museum

7. Mitsubishi Hitachi Power Systems, Ltd. (MHPS) – Koyagi Works

Boiler, Generator Manufacturing technology

8. Japan Casting and Forging Corporation

Manufacture LP and HP turbine rotors for steam turbines, generator rotors, turbine casings, compressor shafts and discs, nuclear reactor vessels, marine propeller shafts, general industrial machinery, etc.

9. Carbon Dioxide Absorption (CCS) demonstration plant at Toshiba Mikawa power plant Omuta

~ **Participant expectations** ~

My expectations of the course were fully met. I was exposed to the policy by which Japan seeks to secure its energy and electricity future as well as the technologies it is building by itself to achieve its energy policy. The course leaders were clear about the intentions for this course and they were fully met.

3) New Learning and intended application

I learnt about use of LNG to power thermal power stations and saw an LNG tanker and terminal and onshore LNG tanks. Ghana is entering into arrangements to bring LNG in for power generation and I believe this new knowledge will help me to contribute to adopting LNG for my station.

I visited facilities for manufacturing of steam turbine, boiler and generator components and visited combined cycle power plants. My plant, KTPS is a candidate project for conversion to combined cycle from simple cycle operations. My exposure to these plants and manufacturing plants should enable me to contribute to this.

I learnt about coal technologies, USC, A-USCC and IGCC. It remains part of Ghana's plans to use coal in the future, and VRA has signed a joint venture agreement for the construction of a 700MW coal power station. Given the opportunity, I will contribute to this project.

4) Relevant experiences from other countries

Generally, the developing countries in the southern hemisphere all seemed to have identical problems with low electricity use per capita, low electricity penetration, poor infrastructure and low investment.

They also had the same opportunities, with abundant natural resources, a young population and growing economies. This is not the case with Japan, who are only 6% energy self-sufficient and have an aging population. Despite this, Japan properly acknowledges its problems and plans to overcome them with discipline.

From the other countries, I learnt about their power sectors and how they are overcoming their challenges in power generation.

5) Program to share knowledge

Part of my action plan involved making presentations to management and the business development group at VRA. I will also be holding presentations at plant and department level to share knowledge acquired. In addition, copies of my training material will be maintained in the station library. Finally, all material available in electronic format will be uploaded on the plant shared drive.

6) Training impact

The impact of the training was truly great and its benefit to my organization, especially if the action plan is properly implemented will be great. As mentioned, the theme of the program ties in with the future plans of VRA to convert simple cycle plants to combined cycle and install coal fired plants. In the future, as pressure mounts to improve the environmental impact of plants, information gathered on measures to keep thermal power “clean” such as deNOx, deSOx and electrostatic precipitator equipment will be used to advise on the installation of such equipment.

7) Action Plan

Make presentation to management and the VRA Business Development Unit on the training outcomes and opportunities for introducing Japanese high efficient and clean energy technologies in upcoming projects. – Next 1 Month

Review feasibility studies undertaken on the gas conversion and Coal Projects and present a report to the Business Development Unit and Management. – Next 3 months

Develop a position paper with the Business Development Unit working on both the KTPP and TTPC simple cycle expansion projects and the Coal project for onward submission to management for acceptance. – Within 6 months

8) Comments and recommendation

I thought some aspects of the classroom lectures might require more time like, “Power plant operations in overseas”, “Energy policy of Japan” and “Economic analysis of power plants” Other than that, it was a brilliantly organized course, very well planned and organized and very beneficial in all aspects. The exposure to the technologies and the culture have really broadened my perspectives. I am grateful for the opportunity and highly recommend it for all interested participants.

Thank you for the opportunity.



Photo Album of the JICA / KITA Training Course



The memorial photo after lecture

Plant Visit



Study Tour



Sightseeing



End of report