Instructor Training Program

NewsLetter

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Large Scale Test Facility, JAEA

TOPICS

Instructor Training Program (ITP)

Develop instructors in the nuclear field in Asia

ITP is conducted by Nuclear Human Resource Development Center (NuHRDeC), the Japan Atomic Energy Agency (JAEA) since 1996 under contract with the Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT). The aim of ITP is to contribute to human resource development (HRD) in the field of nuclear technology in Asian countries, and to make nuclear facility located areas in Japan as a hub for international activities. ITP initially started with two participating countries, and currently number of countries has increased up to 12.

■ Instructor Training Course (ITC) -Training in Japan-

Instructor Training Course (ITC) consists of 5 courses: Reactor Engineering I, II, III, Environmental Radioactivity Monitoring and Nuclear/Radiological Emergency Preparedness. The purpose of ITC is to foster technical instructors in ITC participating countries through 6-8 week courses in Japan where participants can join lectures by experts, exercises using a variety of equipment, and visits to nuclear facilities.

■ Follow-up Training Course (FTC) -Training in ITC Participating Countries-

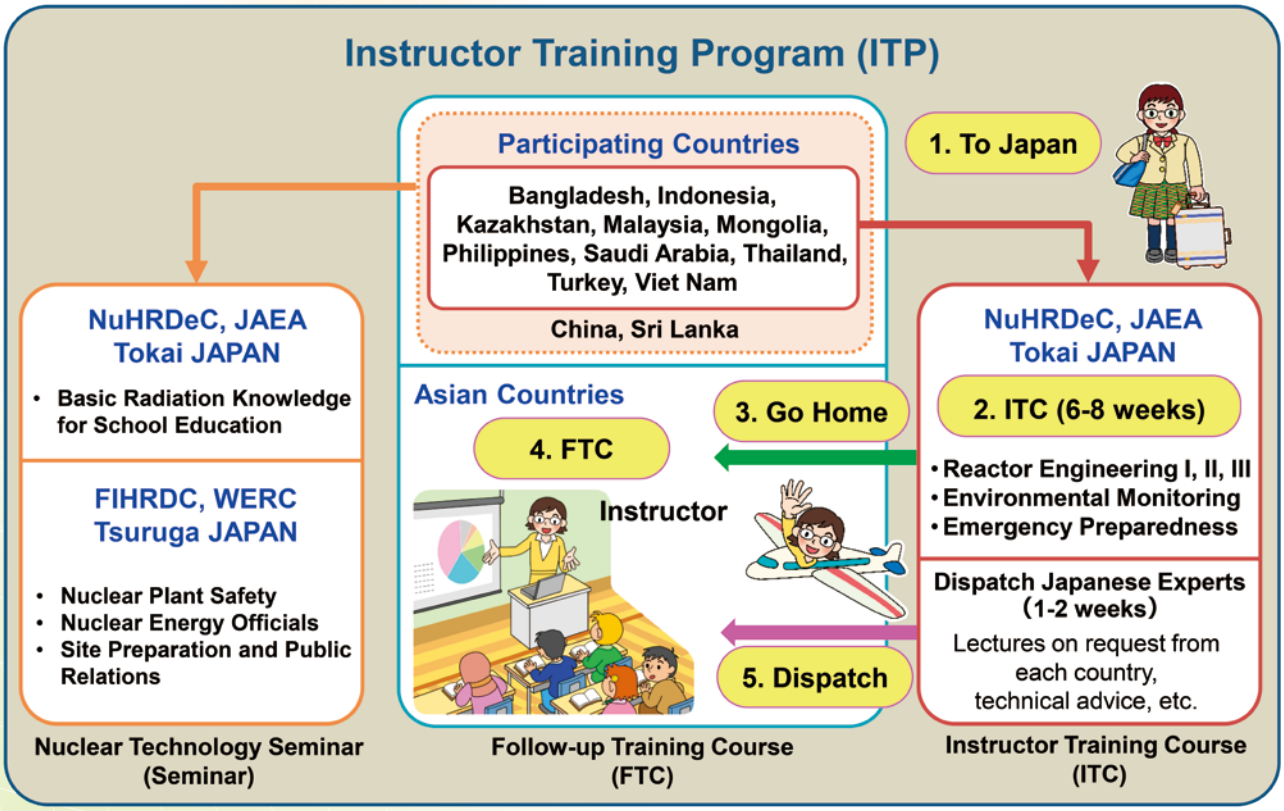
Follow-up Training Course (FTC) is held in each ITC participating country. The ITC participants give lectures in FTC by making the best use of knowledge and experience gained from ITC. They become excellent instructors by the accumulation of teaching experiences year by year through FTC. Japanese experts are dispatched to FTC to give lectures and technical advice for the establishment of the self-sustainable training courses.

■ Nuclear Technology Seminar (Seminar) -Development of Engineers and Specialists-

Nuclear Technology Seminar (Seminar) is designed to cultivate engineers and specialists in a specific area of nuclear technology. The seminar participants are invited to Japan for 1-4 weeks to learn necessary knowledge at lectures and to have experience of international cooperation through facility tours and joint events with residents of nuclear facility located areas. In Fukui prefecture, 3 seminars are held, and 1 seminar is held in Ibaraki prefecture.

Develop instructors in Asian countries

- Establish a nuclear HRD network in Asia
- Build an international activity base at nuclear facility located areas
- Facilitate cooperation between Japan and Asian countries in the nuclear field



WERC: The Wakasa Wan Energy Research Center
FIHRDC: Fukui International Human Resources Development Center for Atomic Energy

1 ITC on Reactor Engineering
JRR-1 Simulator Training

2 FTC on Nuclear/Radiological Emergency Preparedness
Decontamination Exercise (Mongolia)

3 Seminar on Basic Radiation Knowledge for School Education
Decontamination Exercise

Accumulated Number of ITP Participants
(1996~2018)

Instructor Training Course	398
Follow-up Training Course	4,921 *
Nuclear Technology Seminar	455

* The number of participants is the expected number. (as of 4 February 2019)

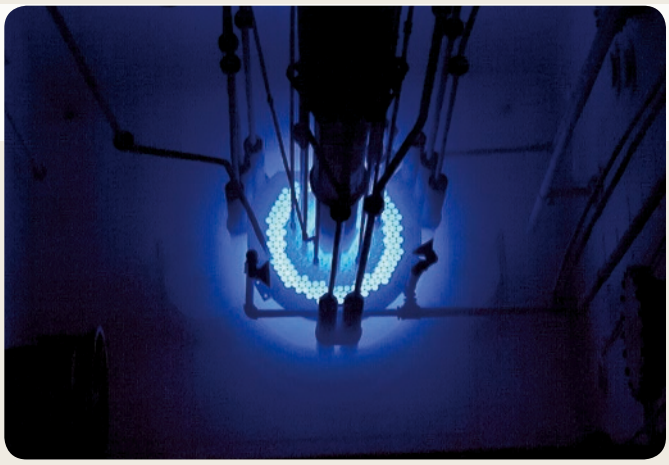
Instructor Training Course (ITC)

Training in Japan

Reactor Engineering, Non Destructive Testing Exercise

Reactor Engineering I, II, III

Period: 20 August – 12 October 2018 (8 weeks)
Place: Tokai, Ibaraki Prefecture, JAPAN
Participants: 19



Course Outline:
Participants acquire a wide range of basic knowledge on nuclear engineering and teaching skills to become instructors in their own countries. The course is open to engineers, researchers in nuclear related organizations and academic staff. The course consists of Reactor Engineering I (reactor physics), Reactor Engineering II (thermal hydraulics, nuclear fuels/materials) and Reactor Engineering III (nuclear safety), and provides 25 lectures, 13 experiments/exercises and 17 facility tours.

Visit to the Restarted NSRR
Participants in ITC on Reactor Engineering visited Nuclear Safety Research Reactor (NSRR) of JAEA. NSRR is a research reactor called TRIGA, constructed by General Atomics in USA for studying the nuclear fuel safety. Since its first criticality in June 1975, a large number of pulse irradiation experiments for nuclear fuels simulating Reactivity Initiated Accidents (RIA; accidents show rapid increase in reactor power due to anticipated control rod withdrawal and so on.) had been carried out, and the research results had been reflected in the nuclear reactor safety regulation in Japan. NSRR was restarted at the end of June 2018 after meeting the new safety regulation established after Fukushima Daiichi Nuclear Power Station Accident (Fukushima Daiichi NPS Accident) of Tokyo Electric Power Company Holdings, Incorporated (TEPCO) in March 2011.
After the lecture on reactor fuel behavior under RIA and loss of coolant accident, participants entered NSRR reactor room to see the core up-close, and watched experiment record movies on how the fuel breaks under RIA. During the visit, many focused questions on the pulse operation and the details of the experiment were coming up. The visit to NSRR could help to deepen their understanding on what they had learned in the classroom.

Nuclear/Radiological Emergency Preparedness

Period: 18 June – 27 July (6 weeks)
Place: Tokai, Ibaraki Prefecture, JAPAN
Participants: 7

Course Outline:
Participants acquire knowledge and skills on emergency response, in case of a radiation accident inside and outside nuclear or radiation handling facilities. The course is open to engineers, researchers in nuclear related organizations and academic staff. In 2018, the course provided 24 lectures, 12 experiments/exercises and 10 facility tours. Part of the course curricula is common to ITC on Environmental Radioactivity Monitoring.

Learn from DMAT, the University of Tokyo Hospital
Following the Fukushima Daiichi NPS accident, the importance of medical response to nuclear/radiaological emergency has been further appraised. Given these public expectations, as a disaster base medical center, the University of Tokyo Hospital formulated a Disaster Medical Assistance Team (DMAT) to be dispatched and provide medical care to disaster areas. Visit to the University of Tokyo and it's hospital was included in the course curricula of ITC on Nuclear/Radiological Emergency Preparedness and Environmental Radioactivity Monitoring for the first time in 2018. There, participants learned about the activities of DMAT by Prof. Naoto Morimura and environmental radioactivity monitoring by Prof. Takeshi Iimoto.

In Japan, DMAT was established in 2005, and now the number is about 1600 throughout Japan. In the event of a large-scale disaster, professionally trained doctors, nurses, and coordinators collaborate with disaster base hospitals in the affected areas, and immediately activate a disaster response and on-site emergency medical treatment.
In this facility visit, the experiences of DMAT after the Great East Japan Earthquake on 11 March 2011, were shared with the participants. Learnings from the actual disaster response helped to deepen their understanding on the importance of the disaster medical management and its difficulty.

Environmental Radioactivity Monitoring

Period: 18 June – 27 July 2018 (6 weeks)
Place: Tokai, Ibaraki Prefecture, JAPAN
Participants: 8

Course Outline:
Participants acquire knowledge and skills on environmental radioactivity monitoring. The course is open to engineers, researchers in nuclear related organizations and academic staff, and provides 26 lectures, 8 experiments/exercises and 13 facility tours. Part of the course curricula is common to ITC on Nuclear/Radiological Emergency Preparedness.

Learn Sampling for Radioactivity Measurement
In order to secure the safety of local residents, it is very important to monitor radiation and radioactivity in and around nuclear facilities. Therefore, local governments and nuclear-related organizations like JAEA measure radioactivity in environmental samples such as vegetables, drinking water, soil and seafood on a regular basis. Participants of ITC on Environmental Radioactivity Monitoring were taught about the collecting methods of soil samples in both normal and emergency conditions. While sampled soil is directly put into the measurement container to avoid cross contamination in emergency, in a normal situation, collected soil is pretreated to make it uniform in order to obtain the average data. During the exercise, the participants were carefully checking every procedure with the instructor.
In addition, the participants tried soil core sampling to find the vertical distribution of radioactive materials. Before the measurement of the samples, they presumed the depth of the radioactive substances derived from Fukushima Daiichi NPS accident. They found out the radioactive materials actually came from Fukushima Daiichi NPS by calculating radioactivity ratio in their samples.
Participating in this practical training that they have not experienced in their countries, they became more knowledgeable on environmental radioactivity monitoring.

Follow-up Training Course (FTC)
Training in ITC Participating Countries

Nuclear/Radiological Emergency Preparedness, Integrated Emergency Response Drill, Philippines

Reactor Engineering

Advanced FTC – Indonesia

National Nuclear Energy Agency (BATAN) has been systematically fostering human resources to develop the nuclear industry in Indonesia over the long period of time. In response to the efforts of BATAN, JAEA also has continued technical support through ITC and FTC, and now they have become able to manage FTC on Reactor Engineering of its basic levels on their own. Along with the promotion of their technical capacity which have been cultivated so far, BATAN took it as a turning point, and decided to move onto the advance levels of FTC where participants can get upskilled and acquire practical knowledge. As the first step, FTC themed SRAC was held in 2018. SRAC is a calculation code system developed by JAEA, and it has been utilized for neutronic design calculations of many research reactors in Japan. At the request of BATAN, a Japanese expert in SRAC was dispatched and gave a lecture on code calculation training with 3 local lecturers, who were also past ITC participants. FTC was conducted in the BATAN's conference room. Although some participants had difficulty in using the code properly, as they got personal tutoring by the lecturer or tutoring each other, all the 18 participants became able to correctly execute a series of calculations in the end.
In BATAN, a modification plan of a research reactor is ongoing, so they will take advantage to use the knowledge gotten from this time for the plan.

Nuclear/Radiological Emergency Preparedness

Practical Training Using Radioactive Material – Philippines

The radiation emergency response in Philippines is implemented based on the National Radiological Emergency Preparedness and Response Plan (RADPLAN) in the control of the Philippine Nuclear Research Institute (PNRI). Also, PNRI holds FTC on Nuclear / Radiological Emergency Preparedness on the PNRI premises in Quezon City, to enhance participants' emergency response capacity and deepen the cooperative relationship between the related departments and other domestic organizations.
During FTC 2018, past ITC participants mainly worked as lecturers and instructors. For the practice of environmental sampling in case of emergency, soil, grass and leaves were collected on the PNRI premises. In the surface pollution decontamination practice,

FTC Activities in JFY2018

Country	Course	Duration				Participant
Bangladesh	Reactor Engineering	10 Feb	-	28 Feb	2018	20*
	Nuclear/Radiological Emergency Preparedness	25 Nov	-	6 Dec	2018	21
	Environmental Radioactivity Monitoring	13 Jan	-	17 Jan	2019	23
Indonesia	Reactor Engineering	30 Jul	-	10 Aug	2018	18
	Environmental Radioactivity Monitoring	3 Sep	-	7 Sep	2018	30
Kazakhstan	Reactor Engineering	22 Oct	-	26 Oct	2018	11
	Nuclear/Radiological Emergency Preparedness	21 Jan	-	25 Jan	2019	12
	Environmental Radioactivity Monitoring	18 Jun	-	22 Jun	2018	17
Malaysia	Reactor Engineering	18 Feb	-	1 Mar	2019	25*
	Nuclear/Radiological Emergency Preparedness	18 Feb	-	1 Mar	2019	25*
	Environmental Radioactivity Monitoring	18 Feb	-	22 Feb	2019	22*
Mongolia	Reactor Engineering	7 Jan	-	18 Jan	2019	21
	Nuclear/Radiological Emergency Preparedness	20 Aug	-	24 Aug	2018	24
	Environmental Radioactivity Monitoring	27 Aug	-	31 Aug	2018	15
Philippines	Reactor Engineering	2 Jul	-	13 Jul	2018	19
	Nuclear/Radiological Emergency Preparedness	12 Nov	-	16 Nov	2018	26
	Environmental Radioactivity Monitoring	22 Oct	-	26 Oct	2018	18
Thailand	Reactor Engineering	21 May	-	25 May	2018	12
	Environmental Radioactivity Monitoring	4 Feb	-	15 Feb	2019	10*
Turkey	Reactor Engineering	25 Jun	-	29 Jun	2018	43
Viet Nam	Reactor Engineering	26 Nov	-	30 Nov	2018	13
	Nuclear/Radiological Emergency Preparedness	1 Oct	-	5 Oct	2018	18
	Environmental Radioactivity Monitoring	17 Sep	-	21 Sep	2018	11
9 Countries	23 Courses					Total 454*

* The expected number of participants. (as of 4 February 2019)

radioactive material with a short half-life in liquid was sprinkled on the outdoor concrete, and then FTC participants decontaminated it. Through the practical training, they could experience the difficulty in the characterization and decontamination of radioactive materials. Furthermore, the integrated radiological emergency field exercise was conducted to prepare for the future emergency case. The real radiation source was hidden on the assumption that the radiation source has been scattered due to hospital explosion, and the participants searched to retrieve it using survey meters. These kinds of practical trainings in FTC make Philippines prepare for actual radiation accidents by seeking for facilitating collaboration with PNRI and the initial responders (ex. fire fighters).

Environmental Radioactivity Monitoring

FTC in Da Lat - Viet Nam

FTC in Viet Nam on Environmental Radioactivity Monitoring is held every year, alternately in Da Lat in the southern part and in Ha Noi in the northern part. FTC 2018 was held at Nuclear Research Institute (NRI) in Da Lat which was managed mainly by past ITC participants.

Although Viet Nam itself canceled the plan to introduce nuclear power generation which had proceeded, there are many nuclear power plants in operation in the neighboring countries. Viet Nam's primary concern is environmental contamination by an accident of the NPPs. Accordingly, the government is promoting the networking of environmental monitoring system as a national project, and human resource development of young generation is needed. FTC plays an important role in training the necessary human resources for the project.

10 past ITC participants from NRI, who were well-qualified for the fundamental subjects, took part in this FTC as instructors. For the subjects of Environmental Radioactivity Monitoring under Nuclear Disaster and Forecast System of Oceanic Dispersion, JAEA dispatched experts to support them with the latest knowledge.

The local participants were very enthusiastic and were also actively involved in Q & A sessions of all lectures and practical trainings. Even some of them came from Ho Chi Minh to attend, environmental radioactivity monitoring seems to have been drawing a lot of interest in Viet Nam. For the future development, NRI hopes that JAEA continues to support consistantly.

Voice from Past ITC Participants

Ms. Wannee Srinuttrakul

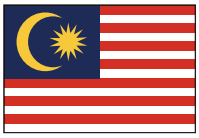
Thailand Institute of Nuclear Technology (TINT)
ITC 2012 on Environmental Radioactivity Monitoring

My Experience in ITC

I had a great opportunity to participate in ITC on Environmental Radioactivity Monitoring in 2012. ITC included various lectures, exercises and facility visits. The training program provided me valuable information from scientific know-how to Japanese culture. I was impressed by the way that the instructors transferred their knowledge with such kindness and friendliness to participants. My experience in ITC was shared in TINT Magazine, titled “Radiation and radioactivity survey in Fukushima” in 2013.

My Experience in FTC

FTC on Environmental Radioactivity Monitoring in Thailand was originally organized for one week at TINT in 2013. With JAEA’s suggestion to extend the period, FTC Thailand became a two-week course since 2014. I was in charge of FTC as a coordinator from 2013 to 2016. My involvement to FTC includes giving lectures on collection and pretreatment of environmental samples. Translating from English lecture materials into Thai language for Thai participants is also what I have been doing for FTC. I also wrote an article on “Collecting methods of environmental samples for radioactivity monitoring” in TINT Knowledge Management 2018 from my experience of ITC and FTC.
Although the plan to construct NPP in Thailand is postponed, human resource development in the nuclear field, especially in environmental radioactivity monitoring, is required because neighboring countries will have NPPs in the near future. I think FTC plays an important role for that. FTC also raises awareness of nuclear organization, with related institutes and universities on environmental radiation/radioactivity monitoring



Mr. Khairol Nizam Bin Mohamed

Malaysian Nuclear Agency (Nuklear Malaysia)
ITC 2014 on Reactor Engineering III

My Experience in FTC

In Malaysia, first FTC on Reactor Engineering was conducted in 2013. To date, 7 courses were organized in Nuklear Malaysia and other institutes namely Universiti Teknologi Malaysia, Universiti Tenaga Nasional and Universiti Kebangsaan Malaysia. I have been fully involved in FTC since I attended ITC in 2014. The topic of my first lecture in FTC 2015 was Basic Concept of Nuclear Reactor Plant Safety. It was a great experience for me to share the knowledge with young and talented students. In 2016, I was given the task to deliver two lectures, Basic Concept of Nuclear Reactor Plant Safety, and Severe Accident and Accident Management. FTC adds value to various nuclear enhancement programs in Malaysia. Hence, Malaysia is committed to continue its support for all FTC programs in the future for the benefit of all Malaysian.

As a Guest Lecturer of ITC

In September 2018, I made a comeback to ITC as a guest lecturer. It was a great honor to see enthusiastic participants from different countries and backgrounds. I delivered three lectures such as Basic Concept of Nuclear Reactor Plant Safety, Strategies and Implementation of Reactor Safety, and Reactor Management Systems.
I must say that the experience gained as a guest lecturer is definitely fruitful opportunity to improve myself. Alhough the topics presented in ITC were more specific and detailed ones compared to those in FTC, ITC participants are well versed in those topics and a plenty of productive discussions were held during the lectures based on each country’s experience.
The young generation of our country needs continuous support in propelling nuclear technologies for better future. I would be happy to keep contributing to ITC and FTC

Mr. Selim Aydin

Turkish Atomic Energy Authority (TAEK)
ITC 2015 on Nuclear/Radiological Emergency Preparedness

My Experience in ITC

I am a physicist and continuing my Ph.D. in Nuclear Physics. I have been actively engaged in a calibration laboratory (Secondary Standard Dosimetry Laboratory) under TAEK. There are 8 laboratories such as facility for Co-60 therapy, calibration laboratories for calibration of dosimeters used for radiation protection purposes, and so on.
I participated in ITC on Nuclear/Radiological Emergency Preparedness in 2015. The training gave me a great opportunity to acquire knowledge and skills for nuclear/radiological emergency situations (such as crisis management at nuclear hazards and organizing an emergency team). The technical visits in Japan were also very helpful for me to enhance my knowledge. Thankfully in 2018, I was invited as a guest lecturer to attend ITC 2018 as well as experience Japanese culture and see polite people again.

My Experience in FTC

The first FTC in Turkey on Nuclear/Radiological Emergency Preparedness and Environmental Radioactivity Monitoring was conducted in 2017. The two courses were combined in one and it was held for two weeks. Since I already learned a lot in ITC, it made me feel confident in organizing FTC. There were 12 participants from TAEK. For the next event, we are planning to invite more experts from the Disaster and Emergency Management Authority to exchange expertise of different areas. After conducting FTC, awareness to develop human resources in the field of emergency preparedness has increased in Turkey.

Mr. Bultger Tumendemberel

Mongolian University of Science and Technology (MUST)
ITC 2013 on Reactor Engineering III

Organizing the first FTC on Reactor Engineering

I am a nuclear physicist and studied residual radioactive problem in Russia. Since my graduation, I have been working in the field of non destructive testing (NDT) besides teaching at university. My participation in ITC on Reactor Engineering went back to 2013 and it was a great opportunity to replenish my knowledge.
After attending ITC, I organized the first FTC at MUST as a coordinator in 2014. We had 15 participants; they were university lecturers, researchers and engineers from Nuclear Energy Agency and other institutes. I delivered a lecture on Materials Engineering and conducted a hands-on exercise on NDT. Other lecturers from MUST gave talks on Thermal Engineering, and Structural Mechanics. Since then, I have been actively engaged in FTC as a lecturer.

Contributing to HRD in Nuclear Field in Mongolia

With my great effort during the last five years, Nuclear Fuel Technology Program in undergraduate course finally opened at the school of material and science at MUST in 2018. At present, we have more than 10 lecturers for the program.
My aim for teaching in FTC is to disseminate the knowledge on nuclear engineering and support the development of national infrastructure to introduce nuclear power plant in Mongolia. In order to assist future Mongolian scientists, I am going to write text books on “Radiation Ecology” and “Fundamentals of Engineering Application of Nuclear Radiation and Energy” in my mother language so that they can learn nuclear engineering more easily.

Nuclear Technology Seminar

Development of Engineers and Specialists

Basic Radiation Knowledge for School Education, Joint Exercise with Local High School Students

Basic Radiation Knowledge for School Education

Period: 5 November – 16 November 2018 (2 weeks)
Place: Tokai, Ibaraki Prefecture, JAPAN
Participants: 18

Course Outline:

The course objective is to foster human resources who will disseminate correct knowledge of nuclear energy and radiation to the public and students in Asian countries. The course is open to persons in charge of public relations in nuclear research institutes, officials in educational administration of governmental agencies, and to school teachers. The course covers basic topics such as an introduction to nuclear energy and radiation, radiation effects on human body, radiation education in Japan, and public information. The course also offers exercises to learn effective methods for teaching radiation knowledge for the public and students.

Public Communication and Media Training

In order to communicate knowledge about nuclear power and radiation to the general public, it is indispensable to make explanations easy to understand in a trusted way. In Public Communication & Media Training class, participants had a chance to learn about effective approaches to communicate better.

Conducting message transfer games, they could experience how difficult it is to convey message correctly. Furthermore, to learn the usage of non-verbal languages, they mutually checked their facial expressions and gave feedback to each other. Understanding the importance of giving a good impression to others was an outcome of this learning process.

Through the lecture and hands-on training, they were able to know how to efficiently disseminate knowledge and information on nuclear power and radiation, and gain practical skills on that. “It was a very interesting and helpful practice.”, “When we are giving lectures, facial expression and body language of the lecturer are important a lot.,” participants said after the class.

Nuclear Plant Safety

Period: 15 October – 9 November 2018 (4 weeks)
Place: Tsuruga, Fukui Prefecture, JAPAN
Participants: 11

Course Outline:
The course is open to engineers and researchers who are engaged in operation of commercial and research reactors or research and development in the field of radiation application and fundamental nuclear technology in Asian countries. The course provides participants with lectures on safety technology of reactor facilities such as commercial and research reactors in Japan, exercises, nuclear related-facility tours as well as information exchange by discussing on each country's nuclear power generation plan.
In 2018, participants visited to the Japan Atomic Power Company's Tsuruga Training Center where a full scope simulator of Tsuruga Power Station Unit 2 is. After the explanation about design considerations of the power station and necessity of its full scope simulator, the participants had operation practice sessions on starting, stopping and controlling power of nuclear reactor, as directed by instructor. Participants seriously worked on simulator operations.

Nuclear Energy Officials

Period: 23 July – 10 August 2018 (3 weeks)
Place: Tsuruga, Fukui Prefecture, JAPAN
Participants: 9

Course Outline:
The course is open to governmental officials who are engaged in nuclear administration. The course provides participants with lectures on a wide range of necessary topics for nuclear administrators such as nuclear energy policy, security administration, safety culture, safety measures and safety management for nuclear facilities, and human resource development. The course also offers tours to nuclear-related facilities as well as information exchange and discussion on each country's nuclear power generation plan.
In 2018, participants visited Ohi nuclear power station of the Kansai Electric Power Company, Incorporated., and were lectured about safety measures of the power station at the center for public relations. After that, they entered the power station to see spent fuel pool through the window. In addition, they had a chance to observe emergency generators and cooling pumps that were newly installed after the Fukushima Daiichi NPS accident. Especially, they showed their interest on fuel assembly exchange and storage, and the equipment for emergency purpose.

Site Preparation and Public Relations

Period: 27 August – 31 August 2018 (1 week)
Place: Tsuruga, Fukui Prefecture, JAPAN
Participants: 10

Course Outline:
The course is open to governmental officials who are engaged in nuclear regulation and public relations. The course offers lectures on laws and assessment regarding site preparation of nuclear facilities, public relations activities, risk communication as well as a visit to a planned construction site of nuclear power reactors and information exchange and discussion on each country's nuclear power generation plan.
In 2018, participants visited the planned construction site of the Japan Atomic Power Company's Tsuruga power station units 3 and 4 which will become the first advanced pressurized water reactor in Japan. After being explained about the construction preparation at the Tsuruga visitor center, the participants moved to the planned construction site to view the reactor installation location and its back slope condition. Checking installation points of intake and discharge canals, they seemed to imagine the completion of the power station.

TOPICS
Public Relations Activities in NPP Sited Areas

Environmental Radioactivity Monitoring, 1 Commutan Fukusima

Fukushima Prefecture: Commutan Fukushima

"Commutan Fukushima" was opened on July 21, 2016 and located in the information and communication building of Fukushima Prefectural Centre for Environmental Creation(CEC). Fukushima Prefecture established Commutan Fukushima to help people understand radiation and environmental problems from an everyday life perspective and deepen the awareness of the recovery and creation of Fukushima's environment. There are permanent exhibitions on radiation and Fukushima's current situation. In addition, it has facilities for a variety of purposes, including halls and conference rooms that can accommodate 200 people.

Participants of ITC on Environmental Radioactivity Monitoring watched the video of the situation of the Great East Japan Earthquake and the efforts for reconstruction, and then the participants took a tour for the exhibition featuring the damage from the earthquake and the current situation of Fukushima. At the radiation laboratory section, they tried touchable displays prepared for learning radiation. Also, the participants could watch the original program called "Environment Creation Theater" which has a spherical screen projected in all directions. The program is a compact compilation of basic knowledge of radiation and attractions of Fukushima.

After the facility visit, following feedbacks were offered by them, "Beautiful Fukushima before the disaster has become a terrible situation due to nuclear accidents and tsunami, and came to understood the circumstances under which people are working to restore it. Large-scale natural disasters occur in various parts of the world, but it is difficult to recover to their original state. Fukushima case can be a good example of disaster recovery over the world" and, "Very easy to understand the statistics of evacuated people in a visual form in the pictures." They seemed to have got to understand the situation of Fukushima and their efforts for reconstruction.

"Commutan Fukushima" The information and communication building of CEC

■ Address: 2-10 Fukasaku, Tamura-gun, Fukushima Prefecture ■ TEL: +81-247-61-5721 ■ Opening Hours: 9:00 AM – 5:00PM
■ Closing Days: Every Monday (open on Mondays that fall on National Holidays and closed on the following day instead), Year-end and New Year's Holidays (12/29 – 1/3)
■ Admission: Free ■ HP: http://www.com-fukushima.jp

2 3 Fukushima Environmental Safety Center, JAEA

Miharu, Fukushima Prefecture: Environmental Safety Center

Participants in ITC on Environmental Radioactivity Monitoring visited “Fukushima Environmental Safety Center” located in Miharu, Fukushima Prefecture. On the spot, JAEA specialists gave them lectures about environmental radiation/radioactivity monitoring and environmental impact in time of nuclear emergency. In the lecture, various monitoring methods using an aircraft and a drone were introduced, and detailed explanations on the actual results to each measurement method were given. In the lecture on behavior of cesium in the environment, the participants could learn in depth how cesium migrates from forest to underground and river water with the actual measurement results. As they have had little chance to directly communicate to learn about Fukushima, they had much interest in knowing about Fukushima’s current situation, questioning a lot such as “How long can people stay in the difficult-to-return zones?” or “What are they going to do with the removed contaminated soil?” It was a fruitful time to learn not only the measurement methods but also the behavior of how cesium has been dispersed in Fukushima, as they said after the visit.

Niigata Prefecture: Atomuseum

TEPCO’s Kashiwazaki-Kariwa Nuclear Power Station (KK NPS) is located in Kashiwazaki City and Kariwa Village of Niigata Prefecture. KK NPS is the world’s largest electric-generating station as a simple nuclear power station which has 5 units of Boiling Water Reactor and 2 units of Advanced Boiling Water Reactor. In the process of invitation and construction of KK NPS, the local governments of Kashiwazaki and Kariwa had made a request of Niigata Prefecture to build facilities aiming at disseminating knowledge about peaceful use of nuclear energy such as nuclear power generation and utilization of radiation. In response to this, Niigata Prefecture decided to establish “Kashiwazaki Nuclear Public Information Center” in 1986, and later it was given the nickname “Atomuseum” in 1997. Currently, Public Interest Incorporated Foundation Kashiwazaki Nuclear Public Information Center operates Atomuseum.

In Atomuseum, there are an exhibition hall and training rooms with the large screens where children can play and learn about nuclear power generation and radiation. Kashiwazaki Nuclear Public Information Center also organizes and conducts many other projects on public information or nuclear related activities for people in the prefecture. Through the projects, Atomuseum is committed to disseminating correct knowledge of nuclear energy and radiation. In 2018, participants called at Atomuseum a day before the visit to KK NPS. The participants were asking a lot of questions to learn more about Atomuseum’s public relations activities at the thought of their future contribution to nuclear energy promotion in their countries. Playing TV-games like hitting uranium with neutron to generate energy, or watching an exhibited cloud chamber, they enjoyed the exhibits easy to understand also for general people. Although it was a short visit, it must be a good opportunity for them to have learned the experience of various public relations activities in NPS located regions.

"Atomuseum" Kashiwazaki Nuclear Public Information Center

■ Address: 1-3-32 Arahama, Kashiwazaki city, Niigata Prefecture ■ TEL: +81-257-22-1896 ■ Opening Hours: 9:00AM – 4:30PM
■ Closing Days: Every Monday (open on Mondays that fall on National Holidays and closed on the following day instead), Year- end and New Year’s Holidays
■ Admission: Free ■ HP: http://www.atomuseum.jp

Interview

Chairman
Mr. Mahbubul Hoq
Bangladesh Atomic Energy Commission (BAEC)

Professional Background

My specialty is nuclear instrument and maintenance. I have been working at BAEC for 30 years and worked as a scientific officer. Also, I have served as a director of Institute of Electronic, and Director General of Atomic Energy Research Establishment and Member (Physical Sciences). I am engaged actively in overall activities for the implementation of Rooppur Nuclear Power Plant project in Bangladesh. In March 2018, I was inaugurated as the 23rd chairman of BAEC.

Human Resource Development (HRD) Policies in Nuclear Field in Bangladesh

Our policy is to develop nuclear knowledgeable human resources for the development of sustainable nuclear power program including other nuclear technology and application. As an embarking country on nuclear power program, we have been committed to the development of nuclear infrastructures based on the IAEA Milestones Approach. A lot of actions have also been taken for the development of nuclear knowledgeable society, e.g. to improve academic curriculum of nuclear science and technology, and nuclear energy from the second grade of universities, polytechnics and vocational institutes. As several universities have started nuclear power program in nuclear engineering department in both undergraduate and post graduate education, BAEC gives cooperation with private and public universities.

Evaluation of ITP and Expectations for Japan

Bangladesh joined ITP in 2007 and 40 capable personnel have been trained in ITC so far. Past ITC participants increased their knowledge and are now confident in developing human resource in BAEC as well as other organizations in Bangladesh. In addition, many of them teach at universities. We are working with various organizations/forums for the development of nuclear human resources e.g., IAEA, RCA, ANSN, FNCA, and ITP is the only platform that plays vital role to train up mass people and to establish self-sustainable training program. We strongly expect JAEA to continue this program.

Nuclear and Radiation Education at Asian Universities

Al-Farabi Kazakh National University (KazNU)
Department of Chemistry and Chemical Technology

Current Nuclear Education at KazNU

In order to develop human resources for the nuclear and uranium industry, the program Chemical technology of inorganic materials was established in 2015 under faculty of general and inorganic chemistry, department of chemistry and chemical technology, KazNU, for the preparation of MSc course. This program was established in 2014 after the Presidential Decree approved the State Program of Industrial and Innovative Development of the Republic of Kazakhstan for 2015-2019. Since then, 30 students on average enrolled in the program every academic year. During the study, students acquire about 48 credits, including such disciplines as Geological and industrial types of deposits of radioactive raw materials, Methods of analytical and radiation control of productions, Radiation safety and radiation protection and Chemistry and chemical technology of uranium.

Past ITP Participants' Contribution toward Nuclear Education

6 teaching staff of KazNU have participated in ITC on Environmental Radioactivity Monitoring in JAEA since 2011. After coming back to our home country, all of them have been actively involved in teaching master students in the field of nuclear science. The modern knowledge obtained during ITC is absolutely useful and timely because nuclear industry in Kazakhstan is vigorously developing and is one of the important sectors of our economy. KazNU and the Institute of Nuclear Physics conduct FTC in cooperation with JAEA for workers of nuclear industry and university students every year. FTC program includes basic and advanced knowledge in nuclear physics, nuclear energy, radiochemistry and radioecology, which is important for workers in nuclear and uranium industry of Republic of Kazakhstan. We would like to thank JAEA coordinators and lecturers for their invaluable contribution to FTC.

University of Dhaka
Department of Nuclear Engineering

History and Nuclear Engineering Education Program in Bangladesh

In 2012, the Department of Nuclear Engineering, University of Dhaka began its academic activity in order to develop human resources for building and maintaining nuclear facilities. It was the first and is the only program of such kind in Bangladesh. In the first year, 25 master students enrolled in the nuclear engineering program and the next year, another 25 students joined the program in undergraduate course. In 2018, a total of 125 students are enrolled in the program. So far, 50 master students and 20 undergraduate students have completed the program. More than 15 graduates are now working at Nuclear Power Company of Bangladesh Limited (NPCBL) and BAEC.

The university's major research areas include reactor engineering, nuclear safety, security, fuel cycles, and nuclear medicine. Students are doing these researches with the cooperation of BAEC, NPCBL, and Bangladesh Atomic Energy Regulatory Authority. Most of the experiments are conducted at the university's laboratories except for the reactor experiments which are performed at BAEC TRIGA Research Reactor.

Past ITC Participants' Contribution toward Nuclear Education

BAEC organizes FTC every year for BAEC and NPCBL scientists, university lecturers and other officials. Most of the lectures and exercises are carried out by past ITC participants. Some of past ITC participants have been invited as guest lecturers of the department of nuclear engineering, University of Dhaka and other universities. They deliver lectures on reactor theory and experimental analysis, thermal hydraulics to the undergraduate and master students. The theoretical and practical knowledge gained from ITC helps us a lot in teaching these courses and also in providing ideas to improve the curriculum. Rooppur Nuclear Power Plant, which is the first nuclear power plant of Bangladesh, is now under construction. It is hoped that JAEA will continue ITC program in future for Bangladeshi nuclear scientists.

ITP Schedule in JFY2019

Course		Course Period	Announcement	Deadline	Selection Result	Place	Participant
ITC	Nuclear Engineering	19 Aug - 11 Oct 2019	Mar 2019	May 2019	Jun 2019	Tokai, JAPAN	18
	Nuclear/Radiological Emergency Preparedness	17 Jun - 26 Jul 2019		Apr 2019	May 2019		6
	Environmental Radioactivity Monitoring	17 Jun - 26 Jul 2019					8
Seminar	Nuclear Plant Safety	30 Sep - 25 Oct 2019	Apr 2019	May 2019	Jun 2019	Tsuruga, JAPAN	10
	Nuclear Energy Officials	2 Dec - 20 Dec 2019	Apr 2019	May 2019	Jun 2019	Tsuruga, JAPAN	10
	Basic Radiation Knowledge for School Education	24 Oct - 8 Nov 2019	Jun 2019	Jul 2019	Aug 2019	Tokai, JAPAN	14
	Site Preparation and Public Relations	16 Sep - 20 Sep 2019	Apr 2019	May 2019	Jun 2019	Tsuruga, JAPAN	10

*The course period of seminars held in Tsuruga may change. (Total Participants : 76)

Mr. Satoshi Sakurai
Director
Nuclear Human Resource Development Center (NuHRDeC)
Japan Atomic Energy Agency (JAEA)

Interview with Director of NuHRDeC

Future Prospects of ITP

In 2018, big earthquake struck Hokkaido, Japan and Indonesia. The present situation surrounding nuclear energy may not allow us to be always optimistic, but there is no doubt that nuclear energy is expected as an important option for diversifying energy sources and effectively addressing global warming. In order for introducing nuclear power generation to Southeast Asian countries, gaining public acceptance as well as making policy decision is necessary. We still have a long way to go for that. Conducting ITP should entail making steady efforts and building long-term engagement.

Japan's Responsibility in Asia

This year marks the 150th anniversary of the Meiji Restoration. 150 years ago, Japan was just a small, powerless country by the easternmost point of Asia. Since then, there have been many twists and turns, Japan has grown and played a significant role to advance Asia's security and prosperity. I believe ITP has also contributed to that. In recent years, with all of the fluctuations in the international situation, it can be seen that various value conflicts occur here and there. Nevertheless I hope that Japan continues to be trusted not only in Asia but also around the world.

ITP Counterparts in JFY2018

Country	Organization	Abbreviation
Bangladesh	Bangladesh Atomic Energy Commission	(BAEC)
Indonesia	National Nuclear Energy Agency	(BATAN)
Kazakhstan	National Nuclear Centre of the Republic of Kazakhstan	(NNC RK)
	Institute of Nuclear Physics	(INP)
Malaysia	Malaysian Nuclear Agency	(Nuklear Malaysia)
Mongolia	Nuclear Energy Commission	(NEC)
Philippines	Philippine Nuclear Research Institute	(PNRI)
Saudi Arabia	King Abdullah City for Atomic and Renewable Energy	(KACARE)
Sri Lanka	Sri Lanka Atomic Energy Board	(SLAEB)
Thailand	Thailand Institute of Nuclear Technology	(TINT)
Turkey	Turkish Atomic Energy Authority	(TAEK)
Viet Nam	Viet Nam Atomic Energy Institute	(VINATOM)

Editor's Note

This is the 5th year to publish Newsletter. We took pictures of participants from a variety of angles in all lectures, exercises, and facility tours in order to fully convey the participants' expressive faces to readers. On a very hot summer day, being careful of heatstroke, they were attending a field training. They were asking questions of instructors eagerly. And they seemed like having a great time during the discussions and joint exercise with Japanese junior high and high school students. This newsletter brings back many memories of all those things with the participants.
In newsletter vol.5, as a featured article, we introduced "Commutan Fukushima" of Fukushima Prefectural Center for Environmental Creation visited for the first time. It was a great opportunity to know how big the disaster was, and how the reconstruction efforts have been made. We hope that they can share all the right knowledge got from Japan with their colleagues and young generations.

Japan Atomic Energy Agency

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