



## Contents

- 10<sup>th</sup> Ministerial Level Meeting (MM) P.1
- Message from FNCA Coordinator of Japan P.3
- FNCA Meetings and Workshops in JFY 2009 P.3
- Introduction of 11 On-going Project P.4
- 10<sup>th</sup> Coordinators Meeting P.15
- 1<sup>st</sup> Meeting of Study Panel on the Approaches toward Infrastructure Development for Nuclear Power P.16
- 11<sup>th</sup> Coordinators Meeting P.17
- Brief Summary of Country Reports Presented at the 10<sup>th</sup> MM P.18
- What is FNCA? P.20

## THE 10<sup>TH</sup> FNCA MINISTERIAL LEVEL MEETING

December 16<sup>th</sup>, 2009 Tokyo Japan

The 10<sup>th</sup> FNCA Ministerial Level Meeting was held on December 16<sup>th</sup>, 2009, at Mita Conference Hall in Tokyo, Japan, hosted by the Japan Atomic Energy Commission (JAEC) and the Cabinet Office of Japan (CAO). The meeting was attended by Ministerial-level delegates (including 4 Ministers, 2 Vice-Ministers, and 3 Chairpersons of nuclear energy authority, commission, and agency) representing 10 FNCA member countries: Australia, Bangladesh, China, Indonesia, Japan, South Korea, Malaysia, the Philippines, Thailand and Vietnam, and they discussed international cooperation in the field of nuclear development from a broad standpoint.



Mr. Naoto KAN, Deputy Prime Minister, Minister of State for Science and Technology Policy, Government of Japan

The opening session was initiated with welcoming remarks by

Mr. Naoto KAN, Deputy Prime Minister of Japan. He stated that he positions nuclear power as an important part of "Green Innovation," which does not emit CO<sub>2</sub>. He also showed the intention to steadily promote nuclear power on the premise of safety. He also mentioned the international situation related to nuclear power and the FNCA's initiatives over the past ten years and hoped that each member country would continue the active participation in and cooperation with the FNCA's activities.

Following the video message by Mr. Yukiya AMANO, Director General of the International Atomic Energy Agency (IAEA), the delegate from each member country successively reported on activities in nuclear power generation and the application of radiation in his country. Dr. Shunsuke KONDO, Chairman of the Japan Atomic Energy Commission (JAEC), presented the Japan's country report. In the following session, the presentations of the JFY 2009 FNCA



Round Table Discussion

activities including Project Activities, Study Panel on Infrastructure Development for Nuclear Power, and Case Study for Nuclear CDM (Clean Development Mechanism) were delivered.

A round table discussion on the cooperation for further promotion of nuclear energy use in FNCA countries was initiated after a lead-off speech, delivered by Dr. Shunsuke KONDO. It was agreed to hold discussions at the 11<sup>th</sup> Coordinators Meeting in March 2010 on how to share knowledge concerning countermeasures against earthquakes, tsunamis, volcanic eruptions, and other natural hazards and on how to enhance FNCA's activities by capitalizing on each country's strengths. Regarding the inclusion of nuclear power in "Crediting Mechanisms" (including the CDM), the meeting agreed that member countries should prepare cooperatively for both the domestic (in the government environmental sector) and the international discussions.

After the lead speech delivered by Dr. Sueo MACHI, FNCA Coordinator of Japan, a round table discussion on cooperation for the further promotion of radiation and isotope application in FNCA countries were carried out and the following was suggested:

- 1) cooperation in the practical use of research reactors for isotope supply (for nuclear medicine) and semiconductor production in the most appropriate ways through networking by the member countries,
  - 2) promotion of international sharing of large-scale facilities,
  - 3) holding a forum on commercialization (suggested by the Philippines) to share information and experience regarding promotion of the practical use of nuclear technologies developed in the FNCA,
- and

- 4) holding a business forum (suggested by Malaysia) co-organized by related organizations and companies.

The major conclusions of the meeting are as follows:

- The FCNA recognizes that the case studies conducted under the FNCA framework on the assumption of including nuclear power in the Clean Development Mechanism (CDM) under the United Nations Framework Convention on Climate Change (UNFCCC) have now been quantitatively shown to be beneficial. The FCNA will promote both domestically and internationally the inclusion of nuclear power in crediting mechanisms in the post-2012 international framework on climate change.
- Using the systems established in the member countries which are already generating Nuclear Power, the FCNA will promote knowledge sharing regarding countermeasures against natural hazards such as earthquakes and tsunamis, and will also develop human resources and technical infrastructure regarding nuclear security and non-proliferation/safeguards.
- The FCNA will study the possibility of enhancing collaboration among member countries regarding efficient utilization of existing research reactors as well as new ones in preliminary planning, including networks for the manufacture and supply of isotopes (including Molybdenum-99) and silicon-based semiconductor materials. Also the FNCA will consider setting up commercialization forums for practical use of nuclear technologies.

The next Ministerial Level Meeting is to be held next year in China.



**Co-memorative photo of the heads of the delegations**

From Left Dr. Ron HUTCHINGS (Australian Nuclear Science and Technology Organisation), Dr. Arch. Yeafesh OSMAN (Ministry of Science and Information & Communication Technology, Bangladesh) Mr. CHEN Qiufa (China Atomic Energy Authority), Dr. Hudi HASTOWO (National Nuclear Energy Agency, Indonesia), Mr. Naoto KAN (Deputy Prime Minister, Minister of State for Science and Technology Policy, Government of Japan), Mr. LEE Sang-Mok (Ministry of Education, Science and Technology, Korea), DATUK SERI Dr. Maximus J. ONGKILI (Ministry of Science, Technology and Innovation, Malaysia), Dr. Estrella F. ALABASTRO (Department of Science and Technology, The Philippines), Dr. Suchinda CHOTIPANICH (Ministry of Science and Technology, Thailand), Dr. VUONG Huu Tan (Vietnam Atomic Energy Institute)



## *Message from FNCA Coordinator of Japan*

### **STRATEGY OF FNCA BRINGING MAXIMUM BENEFIT TO MEMBER COUNTRIES**

**Dr. Sueo Machi** FNCA Coordinator of JAPAN

The Ministerial Meeting in December 2009 celebrated its 10<sup>th</sup> Anniversary with encouraging address of H.E. Mr. N. Kan, Deputy Prime Minister of Japan and messages from Mr. Y. Amano, Director General of IAEA.

Ten years ago the 1<sup>st</sup> Ministerial Meeting adapted the Vision of FNCA stating it should work for enhancing socio-economic development through active regional partnership by safe utilization of nuclear science and technology.

The FNCA is implementing three strategic and thematic programs; (1) strengthening infrastructure and capacity building of member countries in nuclear science and technology, (2) applications of nuclear technology for agriculture, human health and industry, and (3) infrastructure building for introduction of nuclear power.

Bangladesh, Indonesia, Malaysia, Thailand and Vietnam have announced to introduce the first nuclear power plant in 10 to 15 years because nuclear power is essential to secure energy and to mitigate green house gas emission. Since 2004 the FNCA Study Panels on Nuclear Power have been providing opportunities to share experience and knowledge on nuclear power to support the development of infrastructure for introduction of nuclear power.

The FNCA success stories with tangible results in the fields of nuclear applications are, for example, the development new mutant lines of banana resistant to disease to be soon used by farmers, and new plant growth promoter produced by radiation degradation of chitosan from crab shell which is commercially used in some countries. Both results contribute to promotion of sustainable agriculture by reducing applications of chemical fertilizers and pesticides. The other success story is development of effective chemo-radio therapy protocol for uterine cancer achieving recovery rate of 60.4% at 4 years after treatment by study of collaborative clinical tests in member countries.

Remaining challenges of the FNCA is further strengthening linkage with specific end-users of nuclear technology developed by projects to achieve more tangible benefits for sustainable development.

## **FNCA MEETINGS AND WORKSHOPS IN JFY 2009**

<b>Meeting/Workshops</b>		<b>Date</b>	<b>Venue</b>
The 1 <sup>st</sup> Meeting of Study Panel on the Approaches toward Infrastructure Development for Nuclear Power		Jul. 30-31, 2009	Tokyo, Japan
10 <sup>th</sup> Ministerial Level Meeting		Dec. 16, 2009	Tokyo, Japan
11 <sup>th</sup> Coordinators Meeting		Mar. 11-12, 2010	Tokyo, Japan
Research Reactor Utilization	Research Reactor Technology Project Workshop	Sep. 7-11, 2009	Aomori, Japan
	Neutron Activation Analysis Project Workshop		
Application for Agriculture	Mutation Breeding Project Workshop	Sep. 21-24, 2009	Hangzhou, China
	Biofertilizer Project Workshop	Nov. 2-5, 2009	Bangkok, Thailand
Application for Medical Care	Radiation Oncology Project Workshop	Jan. 18-21, 2010	Kuching, Malaysia
	Cyclotron and PET in Medicine Project Workshop	Feb. 28-Mar. 2, 2010	Kuala Lumpur, Malaysia
Public Information	Project Leaders Meeting of Public Information of Nuclear Energy (PLM)	Dec. 7-11, 2009	Manila, The Philippines
Human Resources Development	Human Resources Development Project Workshop	Jun. 22-25, 2009	Fukui, Japan
Radiation Safety and Radioactive Waste Management	Radiation Safety and Radioactive Waste Management Project Workshop	Aug. 3-7, 2009	Hanoi, Vietnam
Safety Management Systems for Nuclear Facilities	Safety Management Systems for Nuclear Facilities Project Workshop	Feb. 9-11, 2010	Sydney, Australia
Industrial Application	Electron Accelerator Application Project Workshop	Mar. 1-5, 2010	Jakarta, Indonesia

\* JFY = Japanese Fiscal Year. JFY 2009: April 1<sup>st</sup>, 2009 – March 31<sup>st</sup>, 2010

\*\*This Newsletter includes the topics of the 10<sup>th</sup> FNCA Coordinators Meeting (March 11-13, 2009, Tokyo)



# INTRODUCTION OF 11 ON-GOING FNCA PROJECTS

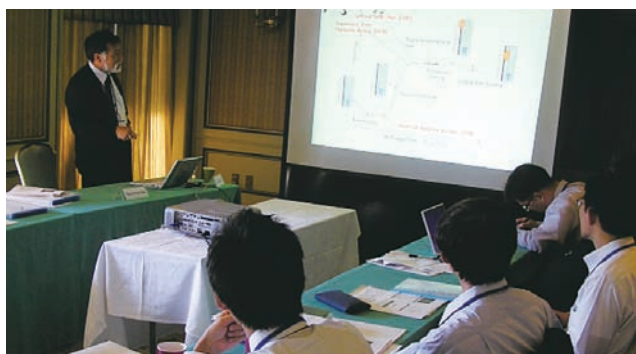
## Research Reactor Utilization

### Research Reactor Technology Project

This project aims to improve safety analysis techniques for the safe operation of research reactors, and currently focuses on safety analysis of Reactivity Initiated Accidents (RIAs) and Loss of Flow Accidents (LOFAs). The goal of this project is for every member country to have its own safety analysis techniques. The cooperative research being conducted is based on the steady state thermal hydraulic code, “COOLOD” and the nuclear and thermal hydraulic coupling code for transient change, “EUREKA,” both of which were developed in Japan.



Participants viewing a sample analysis at the workshop



Lecture on general research reactor thermal hydraulic

### Project Accomplishments To-Date

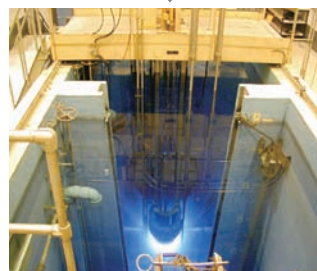
This project, through diffusion of Japanese-developed reactor behavioral analysis codes and specialist training programs, helped member countries to improve their skills related to reactor core burn-up calculations and anti-transient state safety analysis. This has made a contribution to safer and more reliable operation of research reactors in member countries.

### Neutron Activation Analysis Project

In the current phase, the subjects for analysis are geochemical, food, and environmental samples. The results and accomplishments of these tests are shared with end-users, thus contributing to the various research of participant countries and demonstrating the usefulness of activation analysis.



Marine sediments sample collection



Sample activation in research reactor



Gamma spectroscopic analysis

### Project Accomplishments To-Date

The past eight years' analyses of the environmental samples taken throughout Asia using the K-zero method, which is a type of neutron activation analysis (NAA) and is commonly used in member countries, have made contribution to the environmental administration in member countries.

### Workshop Outline

The Research Reactor Utilization Project workshop was held on September 7<sup>th</sup>-11<sup>th</sup>, 2009 in Hachinohe, Aomori,

Japan. Like the previous year, the workshop was composed of the “Research Reactor Technologies (RRT)” and the “Neutron Activation Analysis (NAA)” subprojects. A total of 30 participants including 16 from 9 member countries Australia, Bangladesh, China, Indonesia, South Korea, Malaysia, The Philippines, Thailand, and Vietnam, and 14 from Japan took part.

In the RRT project workshop, each country reported the thermal-hydraulic calculation results of their country’s research reactor using the COOLOD N2 system, and found that those results were consistent with their previous calculations and measurements. Also, the demonstrations of analyzing EUREKA2/RR, which is the nuclear and thermal-hydraulic coupling code for transient change, as well as exercises using its sample problems were conducted. It was decided that each country would implement RIA analysis and LOFA analysis using EUREKA 2/RR in their countries and then report their results at the next workshop.

In the NAA workshop, participants reported on the current state of NAA utilization in their respective research reactors and the progress of Forum for Nuclear Cooperation in Asia (FNCA) activity and, further, discussed plans for future activity. In order to further promote cooperative work with the government ministries relevant to mineral exploitation, it was suggested that the FNCA create easy-to-understand pamphlets on the matter. It was also decided that Japan would distribute its unknown sediment deposit samples (each having the same components) to each country for on-site NAA. The results would then be compared/verified and used to demonstrate the great analytical capability of NAA.

In addition to the workshop, on September 10<sup>th</sup>, the FNCA held a public symposium, “Aomori’s Role in Future Nuclear Power Human Resources Development,” at Hachinohe Institute of Technology. About 100 people from electric/energy companies, research institutes, university and the local community participated in the symposium. At first, on behalf of Ministry of Education, Culture, Sports, Science and Technology (MEXT), which is the host of this symposium, Mr. Keiichi HAKOZAKI, Deputy Director-General, Research and Development Bureau, MEXT, delivered opening remarks, followed by welcoming addresses made by Mr. Ikuo SASAKI, Director General, Energy Policy Bureau, Aomori Prefectural Government, and Dr. Eng. Masami SHOYA, President, Hachinohe Institute of Technology.

They introduced environment and energy related pro-

grams being implemented in Aomori prefecture as well as the vision of Aomori Prefecture toward the human resources development of nuclear power and promotion of the research and development, which was formulated in 2008. Following these speeches, lectures and a panel discussion about nuclear human resource development for the future and expectation of the role in Aomori region were carried out.

On September 11<sup>th</sup>, workshop participants visited nuclear power related Institutes located in Rokkashomura, such as Institute for Environmental Sciences, Aomori Research and Development Center (Japan Atomic Energy Agency) and Japan Nuclear Fuel Ltd.



RRT Project Workshop Participants



Neutron Activation Analysis Project Workshop Participants



Panel Discussion at the Symposium

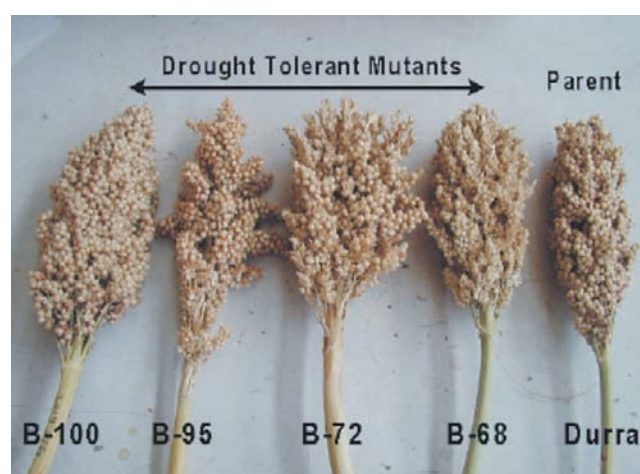
**Panelist:** (from front) **Dr. Kiyonobu Yamashita:** Director, Department of Research Reactors and Tandem Accelerator, Japan Atomic Energy Agency (JAEA), **Prof. Mitsuru Ebihara:** Professor, Division of Chemistry, Graduate School of Science and Engineering Tokyo Metropolitan University (TMU), **Prof. Keizo Ishii:** Professor, Tohoku University Graduate School of Engineering, Department of Quantum Science and Energy Engineering, **Dr. Eng. Katsunori Abe:** Professor, Head of Research Institute for Interdisciplinary Science, Hachinohe Institute of Technology, **Dr. Sueo Machi:** FNCA Coordinator of Japan



# Application for Agriculture

## Mutation Breeding Project

This project aims at contribution to increase of food production and to improvement of food quality in Asia, by developing new mutant varieties by using radiation with disease resistance, insect resistance, and drought tolerance of important crops, such as rice, bananas, orchids, sorghum, and soybeans.



Indonesian Sorghum Varieties(Right: Parent Strain, Left 4: Improved Strains by Gamma-ray)

## Project Accomplishments To-Date

Mutation breeding is extremely effective in improving varieties that have seed sterility or have no effective trait in germplasm. Furthermore, it is possible to leave elite character while removing undesirable ones.

Up until now, mutant varieties have been developed and registered as new varieties of breeding, and also used as parent materials for further development. In addition, the relative techniques such as mass propagation of insect pest for screening and plant tissue cultures have been developed. In 2004, the Mutation Breeding Manual (MBM) (<http://www.fnca.mext.go.jp/mb/mbm/mbm.html>), which explains from basic information to applied techniques for mutation induction methods and relative cytological and biological methods, was published. The MBM has been widely distributed and used in participant countries and has helped to communicate the project's accomplishments to the world.

## Workshop Outline

The Mutation Breeding workshop was held on September 21<sup>st</sup>-24<sup>th</sup>, 2009 in Hangzhou, China. Those attending included 16 participants from 9 member countries, namely Bangladesh, China, Indonesia, Japan, South Korea, Malaysia, The Philippines, Thailand, and Vietnam, as well as the IAEA/RCA. At the workshop, three research topics, modification of composition contents in rice, disease resistance in banana and insect resistance in orchid were presented and discussed. Regarding modification of composition contents in rice, member countries reported the progress of their research activities. In addition, the reports on the ion beam irradiation experiment in rice seed of each member country, conducted at Japan Atomic Energy Agency (JAEA) in 2009, were presented. It was found that the radiated rice plant has been expectedly growing up, and the survival rate and optimum dose were gained. This year marks the end of the orchid sub-project and it was announced that the promising mutant lines obtained from the project will be registered as new variety and prevailed to farmers. There was also new discussion regarding cooperation with the IAEA/RCA, and reciprocal attendance and information sharing were suggested.



Opening Ceremony of Workshop on Mutation Breeding in Hangzhou, China



Technical Visit to China National Rice Research Institute (CNIRRI)

## Biofertilizer Project

This project aims to develop biofertilizers that combines carrier sterilized by radiation with several soil microorganisms such as rhizobium and mycorrhiza which are beneficial in promoting plant growth, and, as a result, to realize environmentally-friendly and sustainable agriculture in Asia which can reduce excessive use of chemical fertilizer and increase yield of crops. The current objectives are to disseminate high-quality biofertilizers which are sterilized with radiation, and also to develop multi-functional biofertilizer having effects on promoting plant growth or inhibiting plant diseases.



*Biofertilizer in Indonesia Using Radiation Sterilization*

## Project Accomplishments To-Date

Difficulties of cooperative works between nuclear research organizations having irradiation facilities and agricultural research organizations developing biofertilizers have been a major issue. However, with great effort made by the project leaders and researchers in each country, access to radiation sterilization facilities and transferring the relevant technique to the public is being promoted and biofertilizers using radiation sterilization are already made a sale throughout Indonesia and some other countries.



*Phosphate Solubilizing Biofertilizer*

## Workshop Outline

The Biofertilizer Project workshop was held on November 2<sup>nd</sup>-5<sup>th</sup>, 2009 in Bangkok, Thailand. Attendance were 14 representatives from 8 member countries namely China, Indonesia, Japan, South Korea, Malaysia, The Philippines, Thailand, and Vietnam.

The participants presented their research progress reports and discussed strategies for further extending biofertilizers and radiation sterilizer. They reviewed their activities and, as major subjects to perform, placed (1) further experiments of radiation sterilization method of carrier for decision of appropriate doses, and (2) further study to produce mixture or single culture with multi-functions. In addition, the preparation of an international standard manual for quality control of biofertilizers was proposed. Also, the participants visited the biofertilizer factory, test field of Department of Agriculture and Thai Irradiation Center.



*Visiting the Field of Department of Agriculture*



*Inoculating Biofertilizer into Rice Seeds*



# Application for Medical Care

## Radiation Oncology Project

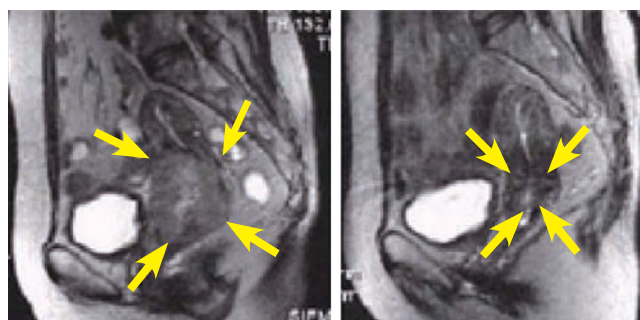
The aim of this project is to raise the performance level and the implementation of radiation oncology in Asia. In order to establish radiation oncology protocols in those regions of Asia with high cancer rates (e.g. cervical cancer, nasopharyngeal cancer, etc.), this project will conduct co-operative clinical trials and provide scientific evidence of efficacy.

### Project Accomplishments To-Date

By conducting international joint clinical trials among Asian countries on an unprecedented scale and taking into consideration the physiological as well as economical differences between Asia and Europe/America, progress is being made toward developing a safe, low side-effect, and inexpensive treatment method. The post-treatment survival rate is equaling and even surpassing those of other international clinical trials, and the treatment itself is being widely implemented among Asian countries.

The internationally accredited anti-cervical-cancer protocol “Cervix-III” provides chemotherapy using anticancer drug and simultaneously two typical radiation oncology which are “external irradiation(radiation from outside)” and “internal irradiation(a hermetically sealed radioactive insert to expose the patient internally)”. Four years after the therapy, the local control rate and the overall survival rate were 78.4% and 60.4%, respectively.

### Chemoradiotherapy for Locally Advanced Cervical Cancer (Cervix-III)



Before Therapy: Large Cervical Tumors

After Therapy: Tumors Eliminated

## Workshop Outline

The Radiation Oncology Project workshop was held on January 18<sup>th</sup>-21<sup>st</sup>, 2010 in Kuching, Malaysia. Attending were 17 representatives from 9 member countries, Bangladesh, China, Indonesia, Japan, South Korea, Malaysia, The Philippines, Thailand, and Vietnam. There were a total of 5 sessions at the workshop on topics including locally advanced cervical and nasopharyngeal cancers, quality assurance (QA), and quality control (QC), where participant countries presented their clinical trials and discussed those trials with other participants.

In the Chemoradiotherapy for Locally Advanced Cervical Cancer session, the newest data from each country were presented, and it was proven that the FNCA Chemoradiotherapy protocol, CERVIX-III, is safe and effective for patients throughout Asia. There was also a public lecture given at the Sarawak General Hospital, which was attended by 64 healthcare professionals. The lecture covered topics including an introduction to the current state of Japanese radiation oncology, as well as presentations from South Korea and Thailand on extracranial oncotherapy using the CyberKnife system's localized radiation oncology and combined chemo-radiotherapy methods for cervical cancer.



Workshop Participants

## Cyclotron and PET in Medicine Project

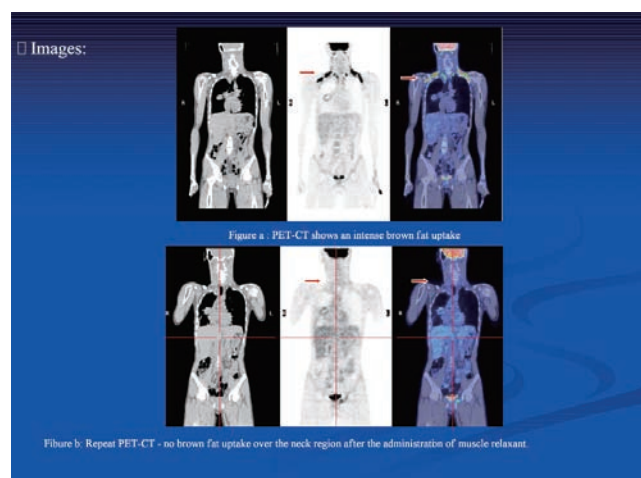
This project is aimed at improvement and dissemination of nuclear diagnosis technologies for Asian people, which can contribute to earlier detection and treatment of diseases



using advanced technology. This project's work focuses on PET and Cyclotron diagnostic imaging technologies and radiation safety.

## Project Accomplishments To-Date

A pair of guidelines were set up for PET diagnosis which is more widely utilized in Asian countries. They are guideline for radiation protection and performance evaluation of PET-CT imaging equipment and guideline for FDG (a radiopharmaceutical used in PET scanning) quality assurance & quality control, which will be the standard for PET equipment quality control. The project has also begun publishing a Clinical Diagnostic Atlas (glossary of symptoms) on CD for doctors to refer to when viewing a PET scan image. This atlas contains not only images but also explanatory and cautionary notes in order to increase the clinical utility of the location. These accomplishments have been made effective uses of PET in developing countries where PET is rapidly disseminated.



□ Teaching Point :

- Increased brown fat uptake is an important benign variant. It presents a rapidly metabolizable energy source and important in thermoregulation.
- It contains high concentrations of adrenergic receptors (stimulatory) and benzodiazepine receptors (inhibitory).
- Brown fat is metabolically active in response to anxiety and/or via stimulation of adrenergic stimulation.
- Administration of short acting benzodiazepine (diazepam 5 mg) 25 minutes prior to FDG administration can prevent brown fat uptake
- This method is helpful in head and neck cancer patients, young patients with lymphoma, young/anxious/nervous patients and patients with a cold and shivering.
- Cross references: normal variant
- References:
- Amol M.T, Ghassan El-Haddad, David L.L, FDG-PET and PET/CT – Part 1, Indian J Radiol Imaging Aug 2007; 17(3): 169-180
- Contributor : Penang Hospital, Malaysia

Contents of the FNCA Cyclotron and PET in Medicine Project Diagnostic Atlas (Glossary of Symptoms)

## Workshop Outline

The Cyclotron and PET in Medicine Project workshop was held on February 28<sup>th</sup> - March 2<sup>nd</sup>, 2010 in Kuala Lumpur, Malaysia. The workshop was attended by 20 representatives from 7 member countries namely China, Indonesia, Japan, Malaysia, The Philippines, Thailand and Vietnam.

The participants presented and discussed the reports on recent news and clinical studies regarding PET/Cyclotron as well as the current status of the project and future work plans. It was proposed to continue collecting the data of at least 10 cases /per member country by October 2010 toward the completion of the ATLAS in 2011 which covers wider areas beyond cancer. The preparation of the guideline for radiation safety aspect in cyclotron and PET radiopharmaceutical production was also suggested. Member countries agreed that Malaysia implements a personnel environmental monitoring study using glass dosimeter by the end of 2010 for the purpose of optimizing personal exposure dose profile in PET/CT and Cyclotron facilities. The progress of this study is to be presented at the next workshop.



FNCA 2010 Cyclotron and PET in Medicine Project Workshop



Workshop Participants

# Public Information

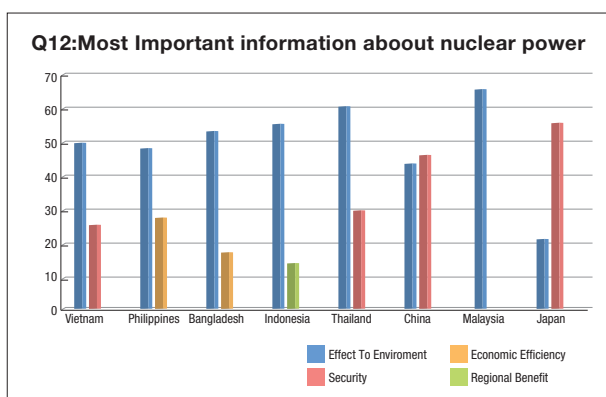
## Public Information Project

The importance of public information of nuclear energy in Asian countries is greater than ever. The objectives of this project are to exchange information of public information activities being performed in member countries, to mutually increase awareness of the public information, and to discuss more effective public information strategies.

### Project Accomplishments To-Date

According to the request from FNCA public information project leaders, the Regional Speakers Bureau (RSB), which is a system of dispatching experts to encourage nuclear power related events (ie. seminar, lecture, and symposium) to be held in member countries, was conducted from 2002 to 2008. The RSB, as a result, has made a contribution to increase in the public acceptance of each member country.

In 2002, “Joint Cross-National Questionnaire Survey on the Literacy in Science and Technology and Use of Radiation among High-School Students in Seven FNCA Countries” was conducted, in order to survey students’ knowledge of, level of familiarity with, image of radiation, as well as their interests and general scientific / technological knowledge.



Example of Preliminary Public Opinion Survey in 2009

### Project Leaders Meeting Outline

The Project Leaders Meeting of Public Information of Nuclear Energy (PLM) was held on December 7<sup>th</sup> -11<sup>th</sup>, 2009 in Manila, the Philippines. The meeting was attended

by 11 representatives from 8 member countries (Bangladesh, China, Indonesia, Japan, Malaysia, The Philippines, Thailand, and Vietnam), and an expert from Korea was also in attendance as an observer. In the PLM, the participants delivered country reports on “the status of nuclear power development and radiation application”, “present and future public information activities in each country”, and “the outcomes gained from FNCA activities”. There was also discussion about “Public Opinion Survey on Nuclear Energy”, based on the decision in 2008 PLM and approval in the 10<sup>th</sup> Coordinators Meeting. In order to discover the tendency of public opinion and validity of questionnaires which can be applicable to the full-scale survey to be implemented from JFY 2010 onward, the Preliminary Survey was carried out including more than 100 high school students of each country. With reference to these results, member countries made specific plans to conduct the Full Scale Public Opinion Survey, and it was decided to include 300 students from both high schools and universities by means of random sampling. The Full Scale Public Opinion Survey would be conducted in FNCA member countries during the year 2010.



Project Leaders Meeting of Public Information of Nuclear Energy (PLM)



Open Seminar



# Human Resources Development

## Human Resources Development Project

This project aims to improve mutual cooperation among FNCA member countries and to be useful in strengthening nuclear power technology fundamentals through understanding the scientific and technical human resources needs of each country, exchanging information, conducting surveys, and investigating the possible cooperation among the member countries.

### Project Accomplishments To-Date

Since its launch in 1999, the project has conducted surveys to find out human resources needs in member countries, and created a basic staff development database, as part of its work. Starting in 2006, the project began preparing for establishment of the Asian Nuclear Training and Education Program (ANTEP), which is a system to network the needs of each country with available programs offered by member countries. The ANTEP website was set up in October 2007, and updated in December 2008.

### Workshop Outline

The Human Resources Development (HRD) Project workshop was held on June 22<sup>nd</sup>-25<sup>th</sup>, 2009 in Tsuruga, Fukui, Japan.

A total of 19 participants from 7 member countries, namely Bangladesh, Indonesia, Malaysia, The Philippines, Thailand, Vietnam and Japan attended the workshop. On the first day, approximately 110 people attended at the Fukui Prefecture International Exchange Meeting Hall for a public symposium. Following two opening speeches made by Mr. Nobuaki ASAHI, Fukui Prefecture Lieutenant Governor, and Dr. Shigeki SAKURAI, Deputy Director-General of Research and Development Bureau, Ministry of Education, Culture, Sports, Science and Technology (MEXT), lectures on “Present situation of education and research activities open to Asia” were given by Director and Vice Dean Dr. Hideyuki NAKAGAWA of Fukui University, Director Dr. Toshikazu TAKEDA of the Fukui University Research Institute of Nuclear Engineering, and Laboratory Director Dr. Kazutaka YAMAMOTO of the Wakasa Wan Energy Research Center’s Particle Beam Therapy Research Labora-

tory. There was also panel discussion on the topic of “The Role of the Fukui Area in Asia’s Nuclear Human Resources Development”. From the second day, the 19 representatives including Human Resources Development Project Leaders from the above 7 member countries took part in the workshop and they had a discussion about the following topics: (1) How to strengthen HRD for introduction of nuclear power; (2) Priority areas of HRD other than nuclear power plant (NPP) and national plan to meet needs; and (3) How to improve FNCA Workshop of HRD. It was stressed that each country needs to conduct its own independent human resources development independently and that it is important for each country to establish a “national team” for preparing its national strategy and coordinating with the related government offices and other related organizations. It was also confirmed that international cooperation with experienced countries such as Japan, China and South Korea would be indispensable. Furthermore, participating members discussed the possibility of inviting, to the future workshops, government officials responsible for human resources development in each member country.



Workshop



Open Seminar

# Radiation Safety and Radioactive Waste Management

## Radiation Safety and Radioactive Waste Management Project

This project aims at safety improvement of radiation safety and radioactive waste management in the Asian region by sharing and exchanging information about radioactive waste as well as knowledge gained through member countries' experiences. This project superseded Radioactive Waste Management Project and started in 2008.

In each country, the use of radiation in industry, agriculture, medical treatment, and various other fields is rapidly increasing, and at the same time, several countries are looking into introducing nuclear power plants. In consideration of such tendency, member countries have been discussing how to promote the standardization (calibration) on personnel dosimeter, focusing on appropriate radiation exposure management.



*Lecture on Standardization of Radiation Management*

## Project Accomplishments To-Date

After exchanging information regarding each country's current status, it was recognized that many of member countries have already obtained the traceability to the IAEA and/or other countries and also established secondary standard through the participation in the IAEA International comparison projects even though they have not yet gained the primary standard.

The number of accreditation to ISO/IEC17025 has been rapidly increasing. It was also recognized that general awareness of importance of quality assurance and control is growing. In addition, recent information regarding radioactive waste management was exchanged.

## Workshop Outline

The Radiation Safety and Radioactive Waste Management Project workshop was held on August 3<sup>rd</sup>-7<sup>th</sup>, 2009 in Hanoi, Vietnam. A total of 20 representatives from 9 member countries namely Australia, Bangladesh, China, Indonesia, Japan, Malaysia, The Philippines, Thailand, and Vietnam were in attendance. The workshop consisted of Country Report presentations, specific topic sub-meetings, and roundtable discussions. For the consultation and information exchange on exposure control and the radiation sources handling in Vietnam, there was also a technical visit to the Vietnam Atomic Energy Institute's (VAEI) research laboratory and a public hospital located in Hanoi city.

Because the workshop was held in Vietnam, which is moving towards the construction of its first nuclear power plant, the 4<sup>th</sup> day of the workshop contained a special sub-meeting held as an open seminar on the topic, "Preparation for Radiation Safety and Radioactive Waste Management for first NPPs." A Vietnamese regulatory representative as well as the operations representative gave presentations on Vietnam's nuclear development status. Following those reports, the case of the initial stages in Japan was introduced by DVD, especially in the aspects of Japanese experiences on preparing radiation safety system and radioactive waste management for first NPPs.



*A Radiation Source Calibrator at the Vietnam Atomic Energy Institute (VAEI)*



*A Poster Session: Radiation Source Calibrator-Related Device Introduction and Q&A*



# Safety Management Systems for Nuclear Facilities

## Safety Management Systems for Nuclear Facilities Project

The Safety Management Systems for Nuclear Facilities (SMS) Project newly started in 2009 under the leadership of Australia. It is a successor to the Nuclear Safety Culture (NSC) Project initiated by Australia, which operated between 1996 and 2008. The NSC Project was aimed toward fostering nuclear safety culture in member countries through self assessment and peer review of research reactors. At the final NSC workshop held in March 2008 in Beijing, China, it was concluded that the project had fulfilled its goals and would close. The replacement of NSC Project with SMS project recommended by Australia was approved and has participants from 10 member countries, Australia, Bangladesh, China, Indonesia, Japan, Korea, Malaysia, The Philippines, Thailand, and Vietnam. The SMS project carries out its activities reflecting the findings obtained from self assessment and peer reviews that are implemented under the NSC project.



Workshop Participants

### Project Accomplishments To-Date

The NSC Project developed self-assessment / peer review tool specified in Asian region, which was originally developed primarily from IAEA guidance material and allowed effective self-assessment of overall nuclear safety centering on safety culture in research reactors in member countries. Peer reviews for research reactors located in 4 countries, namely Vietnam, South Korea, Indonesia, and

Malaysia, were carried out based on this tool, and the comments from the peer reviews have made great contribution to the strength of safety measures and safety improvement in member countries.

### Workshop Outline

The first Safety Management Systems for Nuclear Facilities Project (SMS) workshop was held on February 9<sup>th</sup>-11<sup>th</sup>, 2010 in Sydney, Australia. A total of 14 Participants from all 10 member countries (Australia, Bangladesh, China, Indonesia, Japan, South Korea, Malaysia, The Philippines, Thailand, and Vietnam) attended. At the workshop, each member country gave a Country Report presentation in which they described the outlines of their nuclear facilities and ideas for safety management systems. There was also review of guidance materials such as the IAEA Safety Standards. The participants also discussed the schedule, target facilities, scope, and new self-assessment tool in order to start peer reviews at research reactor facilities in each member country in 2010.



Workshop

# Industrial Application

## Electron Accelerator Application Project

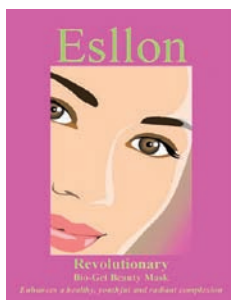
This project aims to widen the scope of electron accelerator application in the industrial field, and is currently investigating the use of low-energy electron beam accelerators, high-energy electron accelerators, and gamma radiation. In recent years, FNCA and IAEA/RCA have been sharing information as well as experiment data related to radiation processing of natural polymers in order to further research into developing profitable products for end-users.

### Project Accomplishments To-Date

In the medical field, carrageenan hydrogel wound dressings were commercialized in South Korea. In Malaysia, beauty face masks made from sago starch hydrogels has come onto the market. Vietnam and China have successfully produced plant growth promoters and feed additives made from naturally occurring polymers, respectively.

In October 2009, the “FNCA Guideline on development of hydrogel and oligo saccharides by radiation processing”\* was released, and has since contributed to researchers’ and manufacturing personnel’s development of high-quality products.

#### Commercialized Products Made from Radiation Processed Natural polymers



A Beauty Face Mask from Malaysia: “Eslon”



Natural Polymers Plant Growth Promoter from Vietnam: “T&D 4DD”

#### Field Test Using the Plant Growth Promoter (T&D4DD) at Tea Plant in Vietnam



Control



T&D 4DD used

## Workshop Outline

The Electron Accelerator Application Project workshop was held on March 1<sup>st</sup>-5<sup>th</sup>, 2010 in Jakarta, Indonesia. In addition to the participants from the 8 FNCA participant countries, namely Bangladesh, China, Indonesia, Japan, Malaysia, the Philippines, Thailand, and Vietnam, a coordinator from the IAEA/RCA Project Lead Country, Malaysia, also attended the workshop.

Presentations and discussions about the optimization of radiation processing of oligo chitosan and the application of super water absorbents were major parts of the workshop. Participant countries also affirmed their cooperation and intent to share information in order to optimize the production technology as well as to reduce cost of preparing natural polymer based products by radiation processing. Since some member countries will be conducting field test using super water absorbent products, collaborative research and development with agricultural scientists and farmers was also emphasized.

During the afternoon of the 3<sup>rd</sup> day of the workshop, an open seminar and exhibition on the “Perspective of Radiation Processing Applications” was held at the Center for the Application of Isotopes and Radiation Technology, National Nuclear Energy Agency (BATAN). Around 80 participants from various institutions including research sectors, corporations, and universities were in attendance. Two representatives from Japan, FNCA Coordinator of Japan, Sueo Machi and Project Leader, Masao Tamada, each gave presentations titled “Global Status of Industrial Application of Radiation Processing” and “Recent Promising Research Outcome on Radiation Processing in Japan”.



Open Seminar at the Center for the Application of Isotopes and Radiation Technology, BATAN

\* This guideline is available on the FNCA website.  
[[http://www.fnca.mext.go.jp/english/e\\_project.html](http://www.fnca.mext.go.jp/english/e_project.html)]



# THE 10<sup>TH</sup> FNCA COORDINATORS MEETING

March 11<sup>th</sup>-13<sup>th</sup>, 2009 Tokyo Japan

The 10<sup>th</sup> FNCA Coordinators Meeting was held on March 11<sup>th</sup> - 13<sup>th</sup>, 2009, at Mita Conference Hall in Tokyo, Japan, hosted by Japan Atomic Energy Commission (JAEC), Cabinet Office of Japan (CAO), and the Ministry of Education, Culture,



Dr. Sueo MACHI, Chairperson of the 10<sup>th</sup> Coordinators Meeting

Sports, Science and Technology (MEXT). The Meeting was attended by delegates from 10 FNCA member countries, and a Senior Official from RCA Regional Office, IAEA also participated as the observer. Japanese Attendee include members of JAEC and administrative officers of CAO, MEXT, Ministry of Foreign Affairs of Japan (MOFA), Ministry of Economy, Trade and Industry (METI) and members of the FNCA projects.

At the beginning of the meeting, the summary report on the 9<sup>th</sup> Ministerial Level Meeting and the 2009 Panel Meeting were presented, followed by a presentation of introduction about "International Nuclear Safety Master's Degree Program" by a South Korean delegate.



Participants in the 10<sup>th</sup> Coordinators Meeting

In the session titled "Study Panel on the Approach toward Infrastructure Development for Nuclear Power", Dr. Sueo MACHI, FNCA Coordinator of Japan, proposed to divide Nuclear Power Plant (NPP) introduction process into three stages: (1) Feasibility study and site selection, (2) Design/license and field construction and (3) Commercial operation and maintenance. It was also suggested that the actual experiences of infrastructure development by China, Japan, and Korea should be applied to the infrastructure development activities of the member countries working

toward the NPP introduction.

Regarding the CDM (Clean Development Mechanism) case study for nuclear power plant, seven countries, which are interested in introduction of nuclear power plant, agreed to carry out the study covering economical merit and certified emission reduction (CER) of green house gases. The secretariat suggested that case studies of member countries, accordingly, be discussed at the 1<sup>st</sup> meeting of the 3<sup>rd</sup>-phase Study Panel, and be reported to the 10<sup>th</sup> FNCA Ministerial level Meeting to be held in November or December 2009.

After the discussion on the CDM case study, the activities of on-going 11 FNCA projects were reviewed. The extension of 4 projects entering final year of their project phases, PET and Cyclotron in Medicine project (JFY2009-JFY2011), Banana Sub-project in Mutation Breeding Project (JFY2009-JFY2011), and Electron Accelerator Application Project (JFY2009 - JFY2011), as well as the setup of a new project on Nuclear Safety Management System (NSMS) (JFY2009 - JFY2013), were approved.

The progress toward establishment of the Human Resources Development (HRD) database was then reported. Member countries agreed to bring the first version of the database into practical use in April 2009.



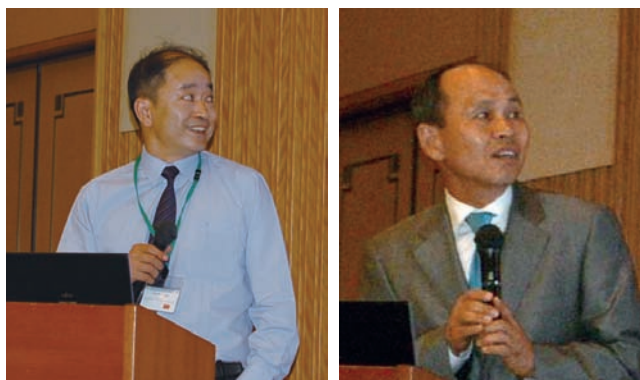
Participants from FNCA member countries

# THE FNCA 1<sup>ST</sup> MEETING OF STUDY PANEL ON THE APPROACHES TOWARD INFRA- STRUCTURE DEVELOPMENT FOR NUCLEAR POWER

July 30<sup>th</sup> - 31<sup>st</sup>, 2009 Tokyo, Japan

The first Meeting of Study Panel on the Approaches toward Infrastructure Development for Nuclear Power was held on July 30<sup>th</sup> - 31<sup>st</sup> 2009, at Mita Conference Hall in Tokyo, Japan, hosted by Japan Atomic Energy Commission (JAEC) and Cabinet Office of Japan (CAO).

In view of the recent movement toward introduction of nuclear power in Asia, FNCA has been holding the study panel since JFY 2004 on the role of nuclear energy in Asia and on the cooperation for promoting nuclear energy. The third phase (2009-2011) of Study Panel started in JFY 2009 for the purpose of discussing efficient and effective infrastructure development for introduction of nuclear power based on the member countries' experiences.



**Left: Prof. Wu Chunxi**, Vice President China Institute of Nuclear Information & Economics

**Right: Mr. CHAE Song Suk**, Member, Korea Nuclear International Corporation Foundation (KONICOF)

The first Meeting of Study Panel on the Approaches toward Infrastructure Development for Nuclear Power was chaired by Mr. Takahiko ITO, Commissioner of JAEC, and attended by senior officials in charge of introduction of nuclear power and experts from electric companies of nine FNCA member countries, namely Bangladesh, China, Indonesia, Japan, South Korea, Malaysia, The Philippines, Thailand and Vietnam, and an expert from IAEA. Japan, China and Korea, which already use nuclear power to generate electricity, introduced knowledge obtained through their actual experiences of infrastructure development for nuclear power, and the participants discussed how to apply those experiences to their domestic activities in each member country and their international cooperation.

As a result, member countries shared the lessons learned



**Left: Mr. Hideaki SUZUKI**,

Vice President of Japan Atomic Energy Company

**Right: Mr. Hiroto UOZUMI**, Senior Vice President of HITACHI-GE Nuclear Energy Ltd.

from experienced countries' experiences, including success and failure in the early stage of introduction of nuclear power, which could not be obtained from textbooks and seminars in the past.

The panel also confirmed, 1) that those countries planning to introduce NPPs should develop necessary infrastructure for nuclear power, using existing bilateral or multilateral frameworks as much as possible, 2) that the outcome of this panel should be made best use for efficient and effective infrastructure development, 3) that the experienced countries with operating NPPs should give assistance to the planning countries for their infrastructure development, if necessary, 4) that both planning and experienced countries should recognize that it is indispensable to abide by safety, security, and safeguards in developing nuclear power, and should make best efforts to keep the functions for safety, security, and safeguards, and so on.



Participants in the 1<sup>st</sup> meeting of the Study Panel Approaches toward Infrastructure Development for Nuclear Power



# THE 11<sup>TH</sup> FNCA COORDINATORS MEETING

March 11<sup>th</sup>-12<sup>th</sup>, 2010 Tokyo, Japan

The 11<sup>th</sup> FNCA Coordinators Meeting was held on March 11<sup>th</sup> - 12<sup>th</sup>, 2010, at Mita Conference Hall in Tokyo, Japan, hosted by Japan Atomic Energy Commission (JAEC), Cabinet Office of Japan (CAO), and the Ministry of Education, Culture, Sports, Science and Technology (MEXT). As well as delegates from 10 FNCA member countries, representatives from Kazakhstan, Mongolia, IAEA, and RCA Regional Office also attended the meeting as the observers.

The opening session began with a welcome speech made from Dr. Shunsuke KONDO, Chairman of Japan Atomic Energy Commission, followed by a summary report presentation of the 10<sup>th</sup> Ministerial Level Meeting delivered by Dr. Suetoshi MACHI, FNCA Coordinator of Japan.

The current activities in and future plans of 11 on-going projects categorized into 8 fields were then reported and discussed. The key decisions and outcomes are as follows.

- For Neutron Activation Analysis project, the Philippines and Bangladesh showed their interests to join the subproject of Geological Mapping and Mineral Exploration, and their participation has been formally approved,

- For Mutation Breeding project, the sub-project of Mutation Breeding for Insect Resistant Orchid is to be terminated in JFY 2009,

- For Electron Accelerator Application project, it was suggested that there should be further strengthening of collaboration between project leaders and agriculture sectors for extension of application of plant growth promoter made from natural polymers as well as of necessary field tests of super water absorbent (SWA),

- For Human Resources Development (HRD), the main challenge of this project is how to meet rapidly increasing demand of HRD for nuclear power. Since this issue is of vital importance, it was agreed to invite senior officials in charge of nuclear HRD in member countries to participate in the HRD project workshop in 2010 to discuss strategy of HRD,

- For Safety Management Systems for Nuclear Facilities, which is a newly established project in JFY 2009 and its 1<sup>st</sup> workshop was held in Sydney, it was decided to have a workshop combined with peer reviews, and also self assessment of Safety Management Systems in nuclear facilities, as the major project activities.

The next session was led by a participant from IAEA who made a presentation to introduce the IAEA's Technical Cooperation Program. RCA activities were then presented. FNCA and RCA agreed to promote their cooperative activities centering on information exchange in the field of radiation processing of natural polymers, radiation oncology, and mutation breeding.

In the session of Review Summary for FY2009 and Plan for FY2010, summaries of reviewing the 11 projects and the current MEXT nuclear cooperation programs in Asian countries as well as MEXT's new approaches were reported. It was explained that, as new approaches of the MEXT, the HRD would add new themes "the non-proliferation" "safeguards" and "HRD for nuclear security" so as to promote wider information exchange, which was willingly accepted by the participants.

A special session was scheduled for Dr. Erlan G. BATYRBEKOV, First Deputy Director General, National Nuclear Center of the Re-

public of Kazakhstan and Mr. MANLAIJAV Gun-aajav, Director of the Nuclear Technology Authority, Nuclear Energy Agency (NEA), (Mongolia). They made presentations on the activities for peaceful use of nuclear power in Kazakhstan, and Mongolia, respectively.

Dr. Akira OMOTO, Commissioner of JAEC, presented the results of the 1<sup>st</sup> meeting of Study Panel on the Approaches toward Infrastructure Development for Nuclear Power and proposed agenda items for the 2<sup>nd</sup> meeting of the Study Panel. Dr. LIM Chae-Young, Head of Nuclear Technology Policy Section, Korea Atomic Energy Research Institute (KAERI), proposed almost the same items for the agenda. It was agreed to hold the 2<sup>nd</sup> meeting on July 1<sup>st</sup> and 2<sup>nd</sup>, 2010, in Seoul, Korea.

The following session discussed follow-up items of the 10<sup>th</sup> Ministerial Level Meeting. Dr. Shohei MOTOHASHI, Deputy Director-General, Seismic Safety Division, Japan Nuclear Energy Safety Organization (JNES), presented the current issues of seismic safety research for nuclear installation such as the revision of seismic design guide in 2006 and influences brought to Kashiwazaki TEPCO NPPs by Chuetsu-oki Earthquake occurred in 2007. There was also discussion about the Business Forum, proposed by Malaysia, and the Forum for Exchanging Experience on Commercialization of Beneficial Nuclear Technology, suggested by the Philippines at the 10<sup>th</sup> FNCA Ministerial Level Meeting. It was recommended to hold the Business Forum in parallel to the Ministerial Level Meeting (MM) in China in November, 2010. The details of the Forum for Exchanging Experience on Commercialization of Beneficial Nuclear Technology will be confirmed after further consultation.

Regarding the plans for the establishment of a regional network for research reactor utilization and supply/production of isotopes, Mr. Tetsuo IDO, Executive Director, Japan Radiation Isotope Association (JRIA), reported on challenges of stable supply of medical isotopes and action plans to build the Asian- Oceania network. After the discussion, it was decided to specifically discuss these topics at the 2010 FNCA Research Reactor Technology Project workshop to be held in China and make a road-map for isotope supply in Asian-Oceanian region.

In the session titled "Future Plan of FNCA Activities", Mr. Hiromi SASAI, Executive Officer, Department of General Policy, Fukui Prefectural Government, introduced general information of Fukui prefecture as well as Fukui's Energy R&D Centralization Plan. It was decided to hold the 12<sup>th</sup> Coordinators Meeting in Fukui, in February or March 2011.



Participants in the 11<sup>th</sup> FNCA Coordinators Meeting

# BRIEF SUMMARY OF COUNTRY REPORTS PRESENTED AT THE 10<sup>TH</sup> MINISTERIAL LEVEL MEETING

## Australia

### Dr. Ron HUTCHINGS

Acting Executive General Manager, Australian Nuclear Science and Technology Organisation (ANSTO)

The Australian government currently has no plans to introduce nuclear power in Australia. However, the government accepts that nuclear power is an important part of the global energy mix. In this context, the government continues to support uranium mining, subject, of course, to rigorous environmental and safety considerations.

A supplemental budget for new neutron research instruments at the OPAL research reactor facility was approved, which is expected to lead an expansion of studies into climate change and other environmental issues. We have taken on leadership and sponsorship of the newly approved Safety Management Systems Project. ANSTO is pleased to host the project's first workshop, in Sydney in February 2010.



## Bangladesh

### Arch. Yeafesh OSMAN

State Minister, Ministry of Science and Information & Communication Technology

For poverty reduction and sustainable development, nuclear is considered as an "inevitable option" for Bangladesh in terms of economics, environment, safety, and energy security. Meanwhile, Bangladesh has signed MOUs with a number of friendly supplier countries, and we are promoting activities that strengthen nuclear infrastructure development. A project on site development is being conducted to finalize site development and a Site Safety Report. Considering that human resources development remains one of the most important issues for introduction of NPP, stronger cooperation among all of the FNCA member countries is indispensable.



## China

### Mr. CHEN Qiufa

Chairman, China Atomic Energy Authority

The Chinese government made a commitment to reduce carbon emission per gross domestic product (GDP) by 40~45% from the 2005 figure by 2020. This will bring new opportunity for nuclear power development in China. Through 50 years' efforts, China has mastered the key technologies for uranium exploration, mining, purification, conversion, enrichment, fuel element fabrication, and spent fuel reprocessing, and established an almost entirely complete nuclear industrial system. More Chinese experts and scholars will be encouraged to take part in FNCA's research activities in nuclear medicine, agricultural applications, and so on.



## Indonesia

### Dr. Hudi HASTOWO

Chairman, National Nuclear Energy Agency

Act No. 17 passed in 2007 states that the first nuclear power plant shall be available in 2015-2019, premised on strict safety. Regarding the preparation of NPP national regulations, the Nuclear Energy regulatory Agency (BAPETEN) has embarked on a comprehensive program to develop all the necessary infrastructure, including the development of the necessary human resources, particularly in activities related to licensing and inspection of NPPs. Since Human Resources Development (HRD) is still a common challenge among all the FNCA member countries, HRD project should be given first priority. All the FNCA member countries should use ANSN (Asian Nuclear Safety Network).



## Japan

### Dr. Shunsuke KONDO

Chairman, Japan Atomic Energy Commission

Research and development of fast reactors and related fuel cycles is being promoted, aiming for the commercialization in about 2050. As for other uses of radiation, Japan has various radiation facilities, including TIARA, the HIMAC next-generation heavy ion accelerator facility, and J-PARC. In the field of nuclear security, Japan follows the IAEA's standards on "The Physical Protection of Nuclear Material and Nuclear Facilities" (INFCIRC/225/Rev.4). Furthermore, Japan has initiated projects to improve nuclear security, mainly in the Asian region, through contributions such as those to the IAEA Nuclear Security Fund. Japan hopes to continue hosting IAEA seminars and plans to expand its assistance to countries planning to adopt nuclear power generation by supporting their infrastructure development and so on.





## South Korea

### Mr. LEE Sang-Mok

Deputy Minister for Science and Technology Policy, Ministry of Education, Science and Technology

The Korean government has declared a strong commitment to green growth to establish a cycle that takes both economic growth and environmental well-being into account and plans to continue adding nuclear energy facilities until 2030. Currently, we have 20 nuclear power plants that provide 36% of the total electricity consumed in Korea. Our plan is to bring this up to 59% by the end of 2030. Korea established seven Cyclotron Regional Centers nationwide for the purpose of R&D, medical application of radiation and production of radioisotopes. In all the member countries, HRD is important factor in success of introducing nuclear energy generation. I believe that the FNCA has played this significant role.



## Malaysia

### DATUK SERI Dr. Maximus J. ONGKILI

Federal Minister, Ministry of Science, Technology and Innovation

Regarding the formulation of a new National Energy Policy for 2010-2030, Malaysia has been promoting a comprehensive assessment of the future national energy mix, especially for the power sector. Malaysia is beginning to conduct a comprehensive review of the items required for the introduction of nuclear power such as infrastructure development and so on through a national interagency framework such as a Nuclear Energy Program Implementing Organization (NEPIO) consistent with established recommendations by IAEA. Malaysia is also developing a National Human Capital Development (HCD) Roadmap to support the possible development of a national nuclear power program. In addition, Malaysia is reviewing existing nuclear laws and regulations, with the aim of developing a comprehensive nuclear regulatory infrastructure. Of immediate importance is the need to ensure public acceptance of nuclear energy.



## The Philippines

### Dr. Estrella F. ALABASTRO

Secretary (Minister), Department of Science and Technology

There is interest in reopening the Bataan Nuclear Power Plant (BNPP) due to skyrocketing oil prices and global concern about climate change. Within the framework of a memorandum of understanding (MOU) between the Korea Electric Power Company (KEPCO) and the National Power Corporation (NPC), KEPCO has completed a feasibility study on the rehabilitation of the BNPP. Progress on application of nuclear science and technology in the priority areas of agriculture, health, earth and marine sciences, materials science, manufacturing and process engineering, and the environment is progressing. Within the framework of the FNCA, the Philippines made achievements in Biofertilizer in the agricultural area and in Isotope application for the assessment of ground water system in environmental field.



## Thailand

### Dr. Suchinda CHOTIPANICH

Permanent Secretary, Ministry of Science and Technology

The Thai government is making headway to fulfill its goal of building the country's first two nuclear power plants in the years 2020 and 2021 with the combined capacity of 2,000 megawatts. The Thai Cabinet endorsed the establishment of the Nuclear Power Program Development Office (NPPDO) under the Ministry of Energy. The NPPDO acts as the coordinating body for the implementation of the Nuclear Power Infrastructure Establishment Plan in coordination with other Thai agencies responsible for appropriate technology selection, safety, nuclear waste disposal issues, regulatory infrastructure, legal frameworks, and human resources. Thailand is ready to support close cooperation between the FNCA and the ANSN in order to develop the regional nuclear safety network.



## Vietnam

### Dr. VUONG Huu Tan

President, Vietnam Atomic Energy Institute

The National Assembly officially approved with the agreement of 77.48% of deputies a resolution on the construction of the first nuclear power plants in Ninh Thuan province. Construction of the first unit is to begin in 2014, with operation beginning in 2020. We must actively prepare national infrastructure in accordance with 19 items of guidance from the IAEA including improving the nuclear legislative and regulatory framework, human resource development, and enhancing research and development capability. For promotion of the utilization of radiation and radioisotopes, three centers for PET/cyclotron were built and put into operation in 2009. Radiation mutation techniques have been applied to development of new varieties of rice, soybean, tomato etc. Radiation technology has become a branch of industry with some industrial-scale irradiation centers in the country.



# What is the Forum for Nuclear Cooperation in Asia (FNCA)?

## Name

FNCA : Forum for Nuclear Cooperation in Asia

## Participating Nations

Australia, Bangladesh, China, Indonesia, Japan, South Korea, Malaysia, the Philippines, Thailand and Vietnam, IAEA (Observer)

### Ministerial-Level Meeting

The ministerial-level representatives of each country holding jurisdiction over nuclear activities discuss cooperation measures and nuclear related policies. On the day before the ministerial-level meeting, the senior administrative officer's meeting is to be held.

### Coordinators Meeting

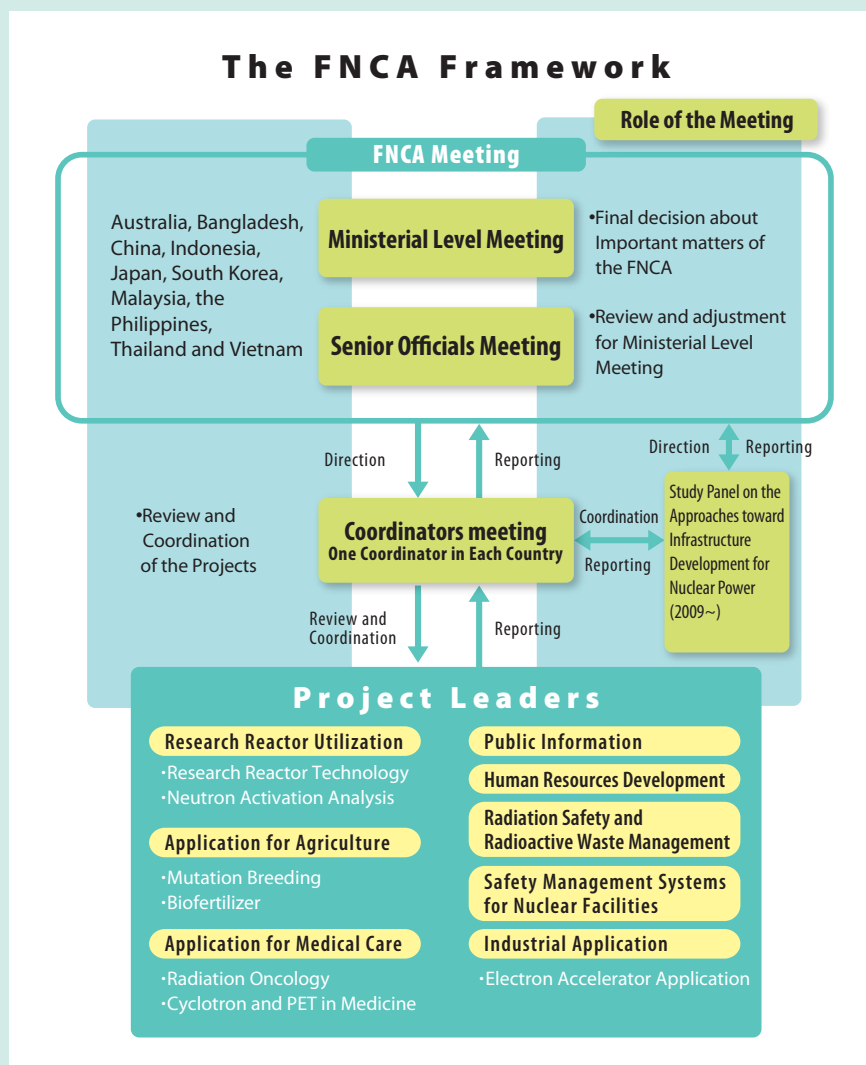
The Coordinators who are selected as a representative by each nation discuss several issues including introduction revision & abolishment, coordination and evaluation of cooperative projects.

### Panel Meeting

To examine & evaluate the role of nuclear energy, and also study problems related to the introduction of nuclear power generation. A new study panel on the Approaches toward Infrastructure Development for Nuclear Power started in 2009.

### Project

Each FNCA participating nation holds workshops through post rotation to discuss activity programs. And in addition to workshops, appropriate expert's meeting are held for each project.



## Nuclear Safety Research Association [NSRA], FNCA Secretariat

5-18-7 Shinbashi Minato-ku Tokyo 105-0004 Japan

TEL: 03-5470-1983 FAX: 03-5470-1991 FNCA Website: <http://www.fnca.mext.go.jp/english/index.html>

This Newsletter is issued by Nuclear Safety Research Association (NSRA) under the contract with the Ministry of Education, Culture, Sports, Science and Technology (MEXT)