Summary Report

The Third Forum for Nuclear Cooperation in Asia

October 30-31, 2002
Seoul, Korea

Hosted by
Ministry of Science and Technology of Korea
and Atomic Energy Commission, Cabinet Office of Japan

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Chairperson's Summary of the Third Meeting of the Forum for Nuclear Cooperation in Asia

1. The Third Meeting of the Forum for Nuclear Cooperation in Asia (FNCA) was held in Seoul, Korea in the 30th-31st of October 2002 under the basic theme 'Atoms for the Next Generation'. Ministers and Senior Officials responsible for the peaceful nuclear research, development and utilization from nine Asian countries - Australia, the People's Republic of China, Indonesia, Japan, the Republic of Korea, Malaysia, the Philippines, Thailand and Viet Nam - participated in the meeting. Observers from the International Atomic Energy Agency (IAEA) and a regional organization also participated. The Third FNCA Ministerial Level Meeting began with the Welcoming Address by Dr. Young Bok Chae, Minister of Science and Technology, Korea, followed by the Congratulatory Address by Mr. Hiroyuki Hosoda, Minister of State for Science and Technology Policy, Japan, and the Opening Address by Professor Yoichi Fuji-ie, Chairman, Atomic Energy Commission of Japan. The Chairperson, Dr. Chang-Kun Lee, Commissioner, Atomic Energy Commission of Korea, reiterated the basic spirit of the FNCA by revisiting the FNCA Vision Statement and Goals.

2. Mr. Soichi Nagamatsu, Deputy Director General for Science and Technology Policy of Cabinet Office of Japan reported the summary of the Senior Officials Meeting (SOM) that was held the previous day. The summary report indicated the progresses of on-going FNCA cooperative projects, and also highlighted three new projects, i.e., 'Application of Electron Beam Accelerator,' 'Tc-99m Generator Production' and 'Bio-Fertilizer.' These three new projects were basically approved at the SOM in Tokyo in 2001, and have already been initiated since 2002. Another new project on 'Sustainable Development and Nuclear Energy in Asia' was reported for final endorsement at the Third FNCA MM. As for the new project on the 'Asian Institute of Nuclear Science and Technology (AINST)', it was agreed that this proposal should be reexamined in the light of discussions at the roundtable meeting on Human Resource

Development summarized under point 5 below with particular consideration on the IAEA's planned initiation of the International Nuclear University (INU). The proposed project on 'Marine Environmental Pollution Research' was endorsed but subject to revision not to duplicate RCA activities. With this report, the SOM Summary Report was duly adopted at the MM.

3. Each FNCA Country presented its respective country report at Session 1 in the morning of the 31st of October 2002. The Session was co-chaired by the Minister of Science and Technology of Korea and the Chairman of Atomic Energy Commission of Japan. The reports covered various endeavors of peaceful nuclear programs in each country including the latest progress of nuclear research and development, together with recent policy developments. After reviewing FNCA activities in the previous years, the participating countries expressed appreciation for the tangible progress of activities, and paid attention to the future cooperation within the FNCA framework. In the country reports, various issues were covered. Subsequent questions, answers and comments covered the following topics:

   - The vision of the FNCA that nuclear energy should be used strictly for peaceful purposes in the framework of NPT, and the forthcoming meeting in Japan on the universalization of the Additional Protocol for Safeguards,
   - Concern regarding the news on North Korean nuclear weapons program and the strong hope that the matter should be resolved peacefully and as early as possible,
   - An Asian Mutual Fund for nuclear liability,
   - Nuclear knowledge preservation particularly for the young generation, and other matters of concern.

   At the meeting, all delegates reiterated the importance of cooperation among the FNCA Countries following the FNCA's goals set by the member countries for the benefits of a better life in a more comfortable environment.

4. In the afternoon session, a representative from IAEA (Mr. M.N. Razley, Section Head, East Asia and the Pacific Section, Department of Technical Cooperation) who participated in this meeting as an observer, delivered a presentation on "Improving Human Welfare through Partnership and Integrated Technologies." Mr. Razely introduced some of the IAEA's efforts to benefit the FNCA countries, particularly to the Asia-Pacific Region that the nuclear techniques could provide.

5. At the Round Table Discussion, the FNCA Countries expressed their views and made comments on two topics, namely: 'Strategy for Human Resources Development (HRD)', and 'Sustainable Development and Nuclear Energy.' The first roundtable discussion topic entitled 'Strategy for HRD' was introduced by Mr. K. W. Han (Head of the Nuclear Training Center at Korea Atomic Energy Research Institute). The leadoff speaker emphasized the necessity for nuclear knowledge preservation as a preparatory measure for inducing the second nuclear Renaissance. This view gained other delegates' consensus along with the additional comments that continuous effort should be made to develop human resources in keeping abreast with today's needs and modus operandi. In particular, the following issues were considered important:

   - Promotion of the exchange of information on human resources development strategies in connection with nuclear knowledge management,
   - Development of programs for attracting the young generation to nuclear science and technology,
   - Harmonization of different interests in technical areas,
   - Formulation of an Asian network of higher education and training in nuclear technology for the preparation of the establishment of the International Nuclear University in the future,
   - Cooperation and interaction with other regions for human resources development.

In addition, it was suggested that a survey on available human resources with a clearly targeted direction and the future resource need be carried out in FNCA countries, which will provide valuable data for the development of HRD strategy. After further discussion, it was agreed that a high level task group be formed to further scope the potential activities under this topic.

6. Another topic 'Sustainable Development and Nuclear Energy' was introduced for the roundtable discussion by Japan (Mr. T. Endo, Vice-Chairman, Atomic Energy Commission of Japan). He presented an assessment on the utilization of nuclear energy both to power and non-power applications as its contribution to the sustainable development in the modern society. He further added that the proper use of nuclear energy can realize the achievement of the 3E's: 'Energy security', 'Environmental protection' and 'Economic growth'. Many delegates shared the same view with these points that Mr. T. Endo made. Delegates recognized again the close relationship between energy supply and sustainable development. Many delegates expressed the view that nuclear energy would be one of the most important energy sources in the present and beyond. The relationship between the Clean Development Mechanism (CDM) and nuclear energy was discussed, and it was acknowledged that further studies including the proposed project could provide a firm platform for future considerations.

7. The fourth FNCA meeting is scheduled in Autumn 2003 in Japan.

Program of the Third Forum for Nuclear Cooperation in Asia (3rd FNCA)

1) Date: Thursday, October 31, 2002
2) Place: ASEM Hall, COEX, Seoul, Korea
3) Sponsored by: The Ministry of Science & Technology (MOST) of Korea
   The Atomic Energy Commission (AEC), Cabinet Office of Japan
4) Supported by: The Korea Atomic Energy Research Institute (KAERI)
   The Korea Institute of Nuclear Safety (KINS)
   The Korea Cancer Center Hospital (KCCH)
   The Korea Hydro and Nuclear Power Company (KHNP) and
   The Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan
5) In Cooperation with: Japan Atomic Industrial Forum, Inc. (JAIF)
6) Basic Theme: "Atoms for the Next Generation "
7) Working Language: English

Thursday, October 31

Ministerial Level Meeting (MM)

09:00-09:30 **Registration**

09:30-09:50 **Opening Session**

Chair: Dr. Chang Kun Lee
Commissioner, The Atomic Energy Commission (AEC) of Korea

- Welcome Address:
  H.E. Dr. Young Bok Chae
  Minister of Science and Technology
- Congratulatory Remarks:
  H.E. Mr. Hiroyuki Hosoda
  Minister of State for Science and Technology Policy
- Opening Address:
  Prof. Yoichi Fuji-ie
  Chairman, The Atomic Energy Commission (AEC) of Japan

- Taking Memorial Photo

09:50-10:00 **Report:** "Progress of FNCA Activities and the Report from the Senior Officials Meeting (SOM)"
Chair: Dr. Chang Kun Lee
Commissioner, The Atomic Energy Commission (AEC) of Korea
Report: Mr. Soichi Nagamatsu
Deputy Director General for Science and Technology Policy
Cabinet Office of Japan

10:00-12:00 **Session 1: Country Report**
- Nuclear Research and Development Policy of the Country and FNCA Activities

Co-Chairs:
(Part I) Korea: H.E. Dr. Young Bok Chae
Minister for Science and Technology
(Part II) Japan: Prof. Yoichi Fuji-ie, Chairman, AEC of Japan

10:00-10:40 Country Report (Part I)
10:00-10:10 Australia
10:10-10:20 China
10:20-10:30 Indonesia
10:30-10:40 Japan
10:40-10:50 Coffee Break
10:50-12:00 Country Report (Part II)
10:50-11:00 Korea
11:00-11:10 Malaysia
11:10-11:20 The Philippines
11:20-11:30 Thailand
11:30-11:40 Vietnam
11:40-12:00 Discussion

12:00-13:30 **Lunch hosted by H.E. Mr. Hiroyuki Hosoda**
Minister of State for Science and Technology Policy
< Lunch: at Room 203, 2nd floor, COEX >
< Lunch for Head Delegates: at Room 208A, 2nd floor, COEX >

13:30-13:45 **Presentation**: "Improving Human Welfare through Partnership and Integrated Technologies".
Mr.Mohd.Nordin Razley
Section Head for Division of Africa and East Asia and the Pacific
The International Atomic Energy (IAEA)

13:45-15:15 **Session 2: Round Table Discussion**
Topic 1: Strategy of Human Resources Development
Moderator: Dr. Chang Kun Lee, Commissioner, AEC of Korea
Lead-off Speaker: Dr. Kyung Won Han
Head of Nuclear Training Center
Korea Atomic Energy Research Institute

15:15-15:30 **Coffee Break**

15:30-17:00 **Session 2 (Cont.)**
Topic 2: Sustainable Development and Nuclear Energy
Moderator and Lead-off Speaker:
Mr. Tetsuya Endo, Vice-Chairman, AEC of Japan

17:00-17:15 **Coffee Break**

17:15-17:30 **Closing Session**
Chair: Dr. Chang Kun Lee, Commissioner, AEC of Korea
1) Chairman's Summary
2) Closing Remarks: Korea
3) Remarks: Mr. Tetsuya Endo, Vice-Chairman, AEC of Japan

19:20 **Dinner jointly hosted by Ministry of Science and Technology (MOST) of Korea and Atomic Energy Commission (AEC) of Japan**
< at Restaurant in Korea House >

List of Participants

Australia	Prof. Helen Margaret Garnett Exective Director Australian Nuclear Science and Technology Organisation (ANSTO)
China	H.E. Mr. Zhang Huazhu Chairman China Atomic Energy Authority (CAEA)
	Mr. Zhang Jing Director China Atomic Energy Authority (CAEA)
	Mr. Yang Changli Director Dept. of International Cooperation China National Nuclear Corporation (CNNC)
	Mr. Feng Yi Director China Atomic Energy Authority (CAEA)
	Mr. Li Xiang Chief Officer China Atomic Energy Authority (CAEA)
	Mr. Lu Xiaoming Secretary of the Chairman China Atomic Energy Authority (CAEA)
	Ms. Zhang Shaoping Official China Atomic Energy Authority (CAEA)

Indonesia	Dr. Soedyartomo Soentono Chairman National Nuclear Energy Agency (BATAN)
	Dr. Hudi Hastowo Deputy Chairman for Development of Nuclear Technology and Energy National Nuclear Energy Agency (BATAN)
	Dr. Bakri Arbie Senior Staff National Nuclear Energy Agency (BATAN)
Korea	H.E. Dr. Young Bok Chae Minister Ministry of Science and Technology (MOST)
	Dr. Chang Kun, Lee Commissioner Atomic Energy Commission (AEC) of Korea
	Dr. Chung Won Cho Director General Atomic Energy Bureau, The Ministry of Science and Technology (MOST)
	Mr. Chang Woo Kim Director Nuclear Cooperation International Division The Ministry of Science and Technology (MOST)
	Mr. Hak Beom Lee Deputy Director Nuclear Cooperation International Division The Ministry of Science and Technology (MOST)
	Dr. In Soon Chang President Korea Atomic Energy Research Institute (KAERI)

Dr. Kyung Won Han
Head of Nuclear Training Center
Korea Atomic Energy Research Institute (KAERI)

Mr. John Keuk Chung
Public Information and International Cooperation, The Korea Atomic Energy Research Institute (KAERI)

Malaysia

The Hon. Dato' Seri Law Hieng Ding
Minister
Ministry of Science, Technology and the Environment (MOSTE)

Dato' Dr. Ahmad Sobri Haji Hashim
Director General
Malaysian Institute for Nuclear Technology Research (MINT)

Dr. Daud Mohamad
Deputy Director General (Corporate Programme)
Malaysian Institute for Nuclear Technology Research (MINT)

Mr. Jini Wat
Principal Private Secretary
Ministry of Science, Technology and the Environment (MOSTE)

The Philippines

Dr. Estrella F. Alabastro
Secretary
Department of Science and Technology (DOST)

Dr. Alumandra M. Dela Rosa
Acting Director
Philippine Nuclear Research Institute (PNRI)

Ms. Pilar C. Roceles
Supervising Science Research Specialist
Philippine Nuclear Research Institute (PNRI)

Thailand	Mr. Sunthad Somchevita Permanent Secretary Office of the Permanent Secretary, Ministry of Science and Technology (MOST)
	Mr. Kriengkorn Bejraputra Secretary General Office of Atoms for Peace (OAP)
	Dr. Manoon Aramrattana Deputy Secretary General Office of Atoms for Peace (OAP)
Vietnam	H.E. Mr. Hoang Van Huay Vice Minister Ministry of Science and Technology (MOST)
	Dr. Vuong Huu Tan Chairman Vietnam Atomic Energy Commission (VAEC)
	Mr. Le Doan Phac Deputy Director Vietnam Atomic Energy Commission (VAEC)
Japan	H.E. Mr. Hiroyuki Hosoda Minister State for Science and Technology Policy
	Prof. Yoichi Fuji-ie Chairman Atomic Energy Commission (AEC)
	Mr. Tetsuya Endo Vice-Chairman Atomic Energy Commission (AEC)

Mr. Tetsuo Takeuchi
Commissioner
Atomic Energy Commission (AEC)

Mr. Soichi Nagamatsu
Deputy Director General for Science and Technology Policy
Cabinet Office (CAO)

Mr. Yuji Sakakibara
Director for Atomic Energy
Cabinet Office (CAO)

Mr. Daisuke Takahashi
Section Chief for Atomic Energy
Cabinet Office (CAO)

Mr. Kazunori Hashimoto
Staff Official, Secretariat of the Atomic Energy Commission
Cabinet Office (CAO)

Mr. Shinya Takeuchi
Director for Atomic Energy Division, Research and Development Bureau
Ministry of Education, Culture, Sports, Science and Technology (MEXT)

FNCA Coordinator of Japan

Dr. Sueo Machi
FNCA Coordinator of Japan
Asia Cooperation Center, Japan Atomic Industrial Forum, INC. (ACC-JAIF)

- Observer -

IAEA

Mr. M.N. Razley
Section Head, East Asia and the Pacific Section
Department of Technical Cooperation
International Atomic Energy Agency (IAEA)

1-1 Opening Session

1-1-1 Welcoming Remarks

by
Dr. Young Bok Chae
Minister of Science and Technology
Republic of Korea

Honorable Ministers,

Distinguished Delegates,

It is my great honor to deliver the welcoming remarks at the opening of the ministerial meeting of the 3rd Forum for Nuclear Cooperation in Asia.

On behalf of the Korean Government, I sincerely welcome all of you from the FNCA countries and the IAEA.

In Asia, nuclear power has been emerging as a major energy source. Currently, 96 nuclear power plants are in operation in the Asian region. 17 new plants are under construction and at least 19 more are planned. To meet this growing trend and to secure the safety of people and environment, cooperation in our region is expected to be further increased.

Through dialogues among member countries, we are sure to formulate cooperative network in nuclear power generation and its safety assurances. Developed technology and experiences will be shared. Exchange of experts and manpower training could be made. Our common goal for safety could be pursued.

In addition, security issues related to nuclear facility and radioactive materials has become a growing concern. Nuclear experts recommend a new concept, namely "Design Basis Threat (DBT)", where safety and security are closely linked. We also expect security matters to be addressed in our meeting.

Non-power applications of nuclear energy are continually increasing. Application of radiation and radioisotopes has a wide scope in such fields as food, agriculture, health care, environment and industrial technology. In Asia, more than 400 cyclotron are used for the production of isotopes. It is also well known that radiation science and technology is the basis of modern nano-bio technology. I believe that active cooperation in radiation and radioisotopes has a great potential to socio-economic development in our region.

The FNCA has made a great contribution toward the promotion of the safe and peaceful uses of nuclear energy, through active implementation of various projects, such as utilization of research reactor, application of radioisotopes and radiation for agriculture and medical use.

The FNCA is facing new challenges for further development. New challenges include promotion of radioisotope production and distribution, nuclear safety networking among member countries, and study on the establishment of nuclear liability system among countries who have nuclear power plants.

I hope the FNCA continues to grow as a regional forum in the area of nuclear energy, by coping with existing tasks and new challenges.

Honorable Ministers and Distinguished Delegates,

The FNCA is the forum to strengthen regional partnership in the peaceful and safe utilization of nuclear technology. The Korean government, as the host country of the 3rd FNCA meeting, will do its best to support the success of the meeting.

Availing this opportunity, I would also like to recognize the efforts of Japanese government and Japan Atomic Industrial Forum for their contribution.

Thank you.

1-1-2 Congratulatory Remarks

by
Mr. Hiroyuki Hosoda
Minister of State for Science and Technology Policy
Japan

Thank you for that kind introduction. I am Hiroyuki Hosoda. On September 30, I became minister of state for science and technology policy. At the opening of this ministerial level meeting of the Third Forum for Nuclear Cooperation in Asia (FNCA), I would like to say a few words on behalf of the sponsors.

First, allow me to personally welcome each of you -- all who traveled here from Australia, China, Indonesia, Malaysia, the Philippines, Thailand and Vietnam. We, Japan, would also like to express our warmest appreciation to our co-sponsor and host, the Ministry of Science and Technology of Korea.

The theme of the forum this year is "Atoms for the Next Generation." Taking that as our keynote, this meeting this afternoon will address two topics: "Strategy of Human Resources Development" and "Sustainable Development and Nuclear Energy." Given the economic growth projected here in Asia, we can all expect to face challenges in simultaneously sustaining that growth, ensuring the energy supplies we will need to do so, and attending to the need for environmental protection. With this recognition, it is quite timely to discuss the use of nuclear energy in Asia together with the issue of the human resources required to support nuclear development and use. I hope this meeting will lead the way to new partnerships in Asia.

Japan is committed to using nuclear energy exclusively for peaceful purposes, and is actively engaged in global non-proliferation efforts. Nuclear weapons development by North Korea is directly related to security in Asia. Japan has, therefore, been insisting that North Korea comply with its international commitments, and is continuing to work to

realize a Korean Peninsula free of nuclear weapons.

Japan is not blessed with significant natural energy resources, either oil or coal, and depends on imports for 96% of its energy. In these circumstances, nuclear power accounts for 35% of generated electricity. It plays an obviously important role in the national energy supply scheme. Japan ratified the Kyoto Protocol this past June. Our efforts to combat global warming include energy conservation measures, new-energies measures, and fuel conversion measures, for example, the promotion of nuclear energy. Expectations are particularly high for nuclear power generation, which Japan identifies as a key power source. Japan is working, as well, to establish the nuclear fuel cycle, whereby nuclear power generation can be made even more efficient.

Recently, however, it was revealed that some utility companies had, in the past, falsified records of their self-inspections and periodic inspections at their nuclear power plants. The government is endeavoring to strengthen its safety regulations and restore people's confidence.

The purpose of the FNCA is to contribute to socio-economic development through active partnerships among its members. Its role is certain to become even greater hereafter.

I closing, then, let me just say that I hope what is discussed today will contribute to the peaceful uses of nuclear energy, and help the participating countries in the own further development in the nuclear area.

Thank you.

1-1-3 Opening Address

by
Prof. Yoichi Fuji-ie
Chairman
Atomic Energy Commission of Japan

Good morning, ladies and gentlemen. At the opening of this ministerial level meeting of the Third Forum for Nuclear Cooperation in Asia (FNCA), let me first of all express our heartfelt appreciation to each of you for being here today. It is a great pleasure for Japan to be co-sponsoring this event together with the Ministry of Science and Technology of Korea.

The FNCA vision is to contribute to socio-economic development through active regional partnerships in the peaceful, safe utilization of nuclear technology. This is the third ministerial level meeting; the first was in Thailand in 2000. Conditions among the countries in Asia vary considerably, and this must always be remembered when working together internationally. Given its vision, however, and its commitment to mutual understanding and cooperation, I believe the FNCA is a place where lasting, effective cooperative relationships can be built.

As has been the case so far, I hope this meeting, too, will serve as a vehicle for tackling common issues, freely exchanging opinions, and deepening understanding among our countries. This year our theme is "Atoms for the Next Generation." I am eager to hear what each country has to say on this forward-looking subject.

Today, we will air our views in a roundtable discussion on two subjects: "Strategy of Human Resource Development" and "Sustainable Development and Nuclear Energy."
Human resource development is a requirement common to all our countries, but I think some of the conditions are different. FNCA is, among other things, developing basic data on human resource development in each country, and can provide information useful in creating strategies for it. Through today's discussions, I hope we will all come to better understand each other.

As for the other theme, "Sustainable Development and Nuclear Energy," there must be a variety of thoughts according to each country's circumstances and the state of its energy supplies. In Japan, where we have dramatically few natural energy resources, nuclear power is expected to play a great role, from the viewpoints both of energy security and environmental protection -- reducing carbon dioxide emissions. This topic is carried over from the previous meeting, and I hope we will go even deeper into it this time.

I look forward to joining today's discussions and making a personal contribution. In closing, let me just say again that I hope these sessions will contribute to the on-going promotion of peaceful nuclear development in the Asian region.

1-2 Session 1: Country Report

1-2-1 Country Report of Australia

by
Professor Helen Garnett
Executive Director
Australian Nuclear Science and Technology Organization

Your Excellencies, Distinguished delegates, ladies and gentlemen, on behalf of Australia I am pleased to contribute to this the third meeting of the Forum for Nuclear Cooperation in Asia, which is being co-hosted by the Ministry of Science and Technology Republic of Korea and the Atomic Energy Commission of Japan. I bring warm greetings from my country and congratulate the organisers on the excellent arrangements made for this meeting.

1. Recent Domestic Events

1.1 Replacement Research Reactor (RRR)

I am pleased that there has been steady, ongoing progress with the replacement research reactor project. As I reported at the first FNCA in Bangkok, the Australian Nuclear Science and Technology Organisation (ANSTO) signed a contract in mid-2000 for the design, construction and commissioning of a 20 MW research reactor with the Argentine company INVAP S.E. which in turn has arrangements with a number of Australian engineering companies. Loading of fuel is scheduled to commence in May 2005 and to be complete in January 2006.

Following the licence application evaluation process, which included significant interaction with and input from the public, the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) issued a licence to construct the reactor on 5 April 2002. Site work commenced soon after.

During the excavation phase, geotechnical inspections were carried out to check the geology of the site, in accordance with international best practice and also in accordance with recommendations by the independent regulator ARPANSA. These ongoing geological inspections were carried out by the New Zealand company, the Institute of Geological and Nuclear Sciences (IGNS). As an outcome of these regular inspections, geological faulting within the finished excavation site was identified in June 2002, which required further investigation.

On 12 September ANSTO provided ARPANSA with detailed further information on the geology of the site. This information showed that the geological and seismological basis of the design, described in the Preliminary Safety Analysis Report submitted to ARPANSA in 2001, remained valid. Faulting found on the site had a minimum mean age of last movement of nine million years. Such old and inactive faulting is fully consistent with the guidelines from the International Atomic Energy Agency for power reactors, notwithstanding that the RRR is much smaller and a research reactor. On 22 October 2002 ARPANSA agreed that the faulting is not 'capable of resulting in a surface displacement' and that construction can proceed.

It is important in this context to share our experiences. Prior to 1997 there was no totally separate nuclear regulator in Australia. The nuclear regulatory body had gradually split from ANSTO but had no legal status and reported through the same Minister.

ANSTO foresaw that this situation was not desirable and hence when the announcement to fund the replacement research reactor was made, a simultaneous announcement was made that a Regulatory Agency, supported by appropriate national legislation, would be established.

This legislation took a year to develop but ARPANSA was finally born. It reports to the Minister of Health. Having a separate regulatory body clearly involving its own consultants, and its own experts, has been an essential part of our relatively smooth progress.

The announcement that the geology and design are suitable only a week ago, met with very little media attention or fanfare. We are proceeding.

1.2 Radioactive Waste Management

The Australian Government has been undertaking an extensive and thorough site selection process for a national low-level radioactive waste repository. The selection process has been carried out in several phases. The first phase established a methodology for site selection. The second phase applied the methodology and identified a short list of eight regions. The third phase identified the central-north region of South Australia for further investigation and site selection studies. From the 18 sites identified at the first stage in June 1998, the second stage reduced the number to five and the third stage identified the preferred site at Evetts Field West in the Woomera Prohibited Area in the central north region of South Australia and two alternatives.

Before construction of the low-level radioactive waste repository can commence, the preferred site must satisfactorily comply with an environmental impact assessment (EIS) and radiological licensing processes. A Draft EIS has been prepared and was open for public comment for three months as from July 2002. If, after evaluating the EIS and the public submissions, the Minister for the Environment

and Heritage approves the project, the Government will then seek a licence to construct and operate the repository from the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). The repository is provisionally anticipated to commence operations around 2004.

In relation to a national store for long-lived intermediate level waste, the Australian Government announced in 2000 that there would be a national search for a suitable site. Because of a lack of support from some states, the Government announced that it would proceed with the search for a national store on Commonwealth land for the storage of intermediate level waste generated by Commonwealth Agencies. An expert group has developed selection criteria for the site. The suitability of Commonwealth land for the national store will be assessed against the selection criteria, and a shortlist of potential sites is planned to be identified by the end of 2002 or early 2003. The co-location of this store with the low level radioactive waste repository was ruled out.

The national store will be designed to operate for at least 50 years. A geological repository for disposal cannot be justified at present because of the limited amount of intermediate level waste likely to be generated by Australia in the foreseeable future.

Unlike low level and intermediate level radioactive waste, Australia does not generate any high level waste. The Australian Government has indicated that it has no intention of accepting radioactive waste from other countries for storage or disposal in Australia.

2. Recent Regional Cooperation Activities under FNCA

Australia has been pleased to continue its support for FNCA activities in the areas of nuclear safety culture, radioactive waste management and small angle neutron scattering.

2.1 Safety Culture Workshop

The Nuclear Safety Culture Workshop for 2002 is now scheduled to be held at Dalat in January 2003.

The fifth FNCA Safety Culture Workshop, which was held in Tokyo in September 2001, considered the possibility of collecting data on the status of research reactors in FNCA countries. This was designed as a preliminary activity before undertaking "in-club reviews" of reactors. One of the conclusions made in the Tokyo meeting Summary Report was:

"17. The workshop recommended a peer review process to foster safety culture in research reactors by identifying good practice and areas for improvement. The review should commence with the preparation of a report that identifies the research reactor organisations and facilities and focus

on factors affecting safety culture. Australia and Japan agreed to produce a draft list of topics for circulation by the end of January. The workshop further recommended that this topic and possible follow up visits to specific reactors should be discussed by the FNCA Coordinators."

The proposal asked that each FNCA participating country report on one of their research reactors (or the reactors at one location) in their country. The countries were encouraged to make use of the survey data supplied from time to time to the IAEA research reactor data base. Australia prepared a draft list of topics and, after incorporation of suggestions from FNCA countries, submitted this proposal to the FNCA Coordinators Meeting in March 2002, where it was endorsed.

The Viet Nam Nuclear Research Institute has agreed to a review mission to the Dalat research reactor in the context of the next Workshop to be hosted there. It is anticipated that this will provide momentum to acceptance of missions by other countries and will provide a forum for open and frank discussion of good aspects of safety culture and areas for possible improvement. Australia is completing its specimen safety culture report on the HIFAR. This document includes information on topics such as: organisation and management; emergency preparedness; education and training; operation and maintenance; and, radiation protection. It will be distributed to other participating organisation to demonstrate the type and level of response expected.

As with previous Nuclear Safety Culture Workshops, sessions will be set aside for reporting on

- the eleven agreed benchmarks for safety culture implementation.

- changes to the national and organisational arrangements associated with Nuclear Safety Convention Articles 7-10 and 14 and 16.

- progress against the six agreed indicators of implementation of safety culture.

These agreed reporting topics will serve not only as a means of sharing ideas and lessons in safety culture development but will act also as a driving mechanism to encourage ongoing improvement by all countries. It is anticipated that, as with previous workshops, useful insights will be made and shared at this workshop.

A significant part of each workshop is set aside to discuss recent incidents that might have implications for safety culture. It is expected that Japan will be reporting on recent revelations at TEPCO and sharing early insights that might be available.

2.2 Radioactive Waste Management

The FNCA Radioactive Waste Workshop is scheduled to be held in Daejon, Korea, 18 to 22 November and will be attended by representatives from the participating countries involved in policy making, regulation, and R&D on radioactive waste management. Australia is planning to participate and will be represented by Mr Lubi Dimitrovski, Manager, ANSTO Waste Operations and Technical Development

Following on actions from the previous workshop, Australia has contributed a section to the draft consolidated report on radioactive waste management in the region. The text of this report will be finalised at the Daejon meeting. Australia will also contribute to sub-meetings at this workshop on waste characterisation and on technologically enhanced naturally occurring radioactive material (TENORM).

2.3 Small Angle Neutron Scattering (SANS)

The Neutron Scattering Sub-workshop held in Beijing, China, in late 2001, shifted the focus of the activities from Small Angle Neutron Scattering (SANS) instrumentation and techniques development, to investigating problems of socio-economic benefit to the region. The 2001 Sub-workshop initiated two important processes:

(i) an effective communication system, based on group email, and

(ii) a project proposal and review system.

The outcome was a coordinated project entitled 'Development of Evaluation Technology for Natural and Synthetic Polymer Materials using Small Angle Neutron Scattering (SANS)'. The project has five sub-headings:

(i) γ-irradiated carrageenan (food gum)

(ii) water-soluble copolymers

(iii) random ionomers

(iv) molecular deformation of partially deuterated polyethylene

(v) blends of natural rubber and polyolefins.

The project plan involved the preparation of samples using specialist facilities in each contributing country, and the collection of data at one of the SANS facilities in the region (JAERI, KAERI,

BATAN, MINT, ANSTO). The project is maintaining the original schedule with sample preparation and data collection almost complete. Data analysis will be shared between regional groups with relevant expertise. A summary report will be prepared for submission to the FNCA Workshop in 2003.

ANSTO played an advisory role in the development of the regional research project and will use its expertise in SANS data analysis and interpretation particularly for sub-projects (i), (ii), (iii) and (v).

3. Conclusion

I look forward to Australia continuing to play an active role in the FNCA and supporting the further mutual cooperation in the utilisation of nuclear science and technology for the benefit of the region and for addressing identified regional problems. In addition to the formal activities, these high level meetings enable informal exchanges on many issues of mutual interest and importance. In this vein I am pleased to note that later this year Japan has agreed to host a meeting promoting universal adherence to the additional safeguards protocol. This too will contribute to mutual understanding and cooperation in the region and I hope it will also encourage further countries to make the commitment.

On behalf of Australia I again thank the Ministry of Science and Technology, Republic of Korea and the Atomic Energy Commission of Japan for their efforts in facilitating this important Forum meeting,

1-2-2 Country Report of China

by
Mr. Zhang Huazhu
Chairman
China Atomic Energy Authority

Mr. Chairman,

I am honored to be invited to the current Ministerial Meeting of the Third FNCA. At the outset, please allow me to express warm congratulations on the convening of the Forum, our sincere appreciation to the governments of the Republic of Korea and Japan for their support and organization, and extend greetings to all delegations.

This meeting gives us an opportunity to introduce to each other the nuclear energy development in member states and exploring cooperation. Now, I would like to brief you on the latest nuclear energy development in China.

China's nuclear power achieved steady development this year. Unit 1 of Qinshan Phase II and Unit 1 of Lingao NPP were put into commercial operation successively, increasing the total installed capacity to 3,700 MW. The Unit 2 of Lingao NPP has been connected to power grid and will be put into commercial operation by the end of this year. The Unit 1 of Qinshan Phase III is in the final stage of commissioning. The other 4 units under construction are progressing successfully and will be put into operation respectively from 2003 to 2005, when the total installed nuclear power capacity in the mainland will reach 9,000 MW, supplying about 3% of the total power generation of the country.

The Chinese Government unswervingly sticks to the principle of "safety and quality come first" and gives top priority to safety in developing nuclear power. The first NPPs have caused no negative effects to the environment in more than 10 years of operation, which fully proves the successful designing, safe and reliable operation of China's nuclear power.

China's nuclear fuel industry, consistent with the nuclear power construction, has gained considerable progress. Its capability and level scaled a new height with technology upgraded through independent development and international cooperation. The manufacturers have achieved the localization of fuel assembly fabrication for light water reactors and Candu reactors and are able to fabricate deep-burn-up fuel assemblies to meet the requirement of the 18-month reloading cycle of 1000 MW NPPs. Technology upgrade or significant progress has been achieved in other links of fuel cycle, which cut down the production cost of nuclear fuel and guaranteed further development of nuclear power.

In addition to the progress in nuclear power, China's nuclear technology applications

have made significant development. There are more than 300 enterprises and institutions engaged in nuclear application technology development and production with a total annual output of 20 billion yuan RMB. The industrial electron accelerators and Cobalt sources installation maintained a yearly growth rate of more than 20% since 1990, one of the fastest in the world. The successful development of X-ray customs container inspection system, mails electron-beam sterilizers provide new effective means against smuggling and terrorism. Nuclear technologies are applied widely in various agricultural fields and have brought remarkable beneficiary effects to the economy, society and ecology. China, with a rapid development momentum of nuclear medical appliances, has 7 radioactive medicine manufacture bases and more than 1000 hospitals with nuclear medicine technology. The popularization and promotion of nuclear medicine contributed to improving the people's health level.

We will continue to promote the application of nuclear technology to industry, agriculture, medicine, environmental protection, and security; and increase the industrialization scale and technology level according to the market demands to contribute to the settle issues of agriculture, ecological environment, water management and medical care.

Mr. Chairman,

The Chinese Government has identified the principle of "moderate development of nuclear power" in its Tenth Five-Year Plan for National Economy and Social Development. Planning and feasibility studies are under way for new nuclear power projects. Like most other countries in the world, China adopted the "three-step-development" from thermo neutron reactor to fast neutron breeding reactor to controlled fusion reactor as its technology development route. Thermo reactor is now and will remain the dominant reactor type for a long time to come. At the same time, we continue studies on fast reactor and fusion technology, actively participate international cooperation and follow up the development trend of the whole world.

Mr. Chairman,

The Chinese Delegation is glad to note that "Atoms for Next Generation" is the theme of the current FNCA conference. More than 500 government officers, representatives of international organizations, personages from industries and experts attended the 13th Pacific Basin Nuclear Conference in Shenzhen, China last week. The participants made comprehensive discussion on the relationship between nuclear energy and sustainable development and reached a general consensus, which is just as China's Premier Zhu Rongji said in his message to the conference that "nuclear energy and technology play an increasingly important role in the sustainable development of the national economy as the economy develops and the people's demands on energy and environmental protection constantly grow in the 21st Century".

Mr. Chairman, Colleagues,

The nations vary in views on climate changes, and the role of nuclear energy to relieving climate changes in particular. The Chinese Government holds a positive opinion on the role of nuclear energy in easing energy shortage and climate changes and believes that nuclear, as a safe, economical and clean energy, will be the primary solution to the world's sustainable development. We support including nuclear power in the Clean Development Mechanism.

I would like to take this opportunity to inform you that China has ratified the Kyodo Protocol to the United Nations Framework Convention on Climate Change. It fully represents China's positive attitude to participating in international cooperation for environmental protection and promoting sustainable development of the whole world. China is willing to join hands with other FNCA Member States to make due contribution to the development of peaceful uses of nuclear energy in this region.

Mr. Chairman,

Ever since its establishment in 2000, FNCA has regarded its principle to "positively carry out peaceful and safe application of nuclear energy to promote social and economic development". Its Member States exchanges information and experience concerning nuclear energy development and nuclear technology applications, discusses issues of common concern or common interest, and coordinates their activities under the framework of FNCA, which strongly enhanced nuclear cooperation among them. Considering the special features of FNCA, the Chinese Delegation proposes that a more feasible and applicable cooperation plan be drafted on the basis of full recognition and objective treatment of the differences of member states in nuclear technology level and comprehensive understanding of each member state's nuclear development strategy and requirements to seek common development.

Mr. Chairman, Colleagues,

Asian Countries boast great potential in nuclear energy and technology development in the 21st Century. FNCA, as an arena for exchanging information and exploring cooperation in the nuclear field, undertakes credible responsibilities of promoting peaceful uses of nuclear energy in Asia. We are convinced that our efforts will be fruitful and make contribution to the peaceful uses of nuclear energy in Asia and even the world as long as all member countries abide by the fundamental principle of the FNCA, strengthen cooperation and stand on equal footing.

Thank you.

1-2-3 Country Report of Indonesia
"Nuclear Energy Activities for Better Life in Indonesia"

by
M. Hatta Rajasa
State Minister for Research and Technology

Your Excellencies,
Distinguished Delegates,
Ladies and Gentlemen,

It is indeed a great pleasure and an honor for me to be invited on behalf of my country, Indonesia, to participate again in this distinguished Forum for Nuclear Co-operation in Asia. Please kindly allow me, first of all, to express my deep appreciation to my colleagues the Minister of Science and Technology of the Republic of Korea and the Minister of State for Science and Technology Policy of Japan. This third Forum enables me to express, for the second time, my views and hopes that this cooperation would be fruitful for all member countries and it certainly is for Indonesia.

Ladies and Gentlemen,

As you are all aware, although recently some progress on the economic recovery has been encouraging, Indonesia is still struggling to recover from the multiple crises. Science and technology is imperative to contribute the solution. A law regarding the National System for Research, Development, and Application of Science and Technology has been enacted by the Indonesian Parliament to be the Law no 18, 2002 couple months ago. This law strengthens, among others, the role of science and technology for accelerating the achievement of various objectives set by our country. Furthermore, we are in the progress to have a more solid co-ordination program among research and development institutions, including the National Nuclear Energy Agency (BATAN) and Nuclear Regulatory Control Board (BAPETEN), as well as with the industries and NGOs to set the "Landmarks 2020", which are actually significant targets to be reached by all of us focusing on supply security of food and energy, the two most essential objects for not only survival, but also for wealth creation, and last but not least, sustainable development.

Ladies and Gentlemen,

Looking back at my previous list of priority being mentioned at the last Meeting, among the highests on the list are Biotechnology, Agroindustry, Health, Alternative Energy and Information Technology, while on the promotion of the application of nuclear and radiation technologies, it was mentioned to be agriculture, nuclear education, accelerator technology, and alternative energy. These are indeed congruent with the National Landmarks 2020, together with our activities in FNCA, they are synergistic.

In Indonesia, BATAN continues to carry out research and development in agriculture joining the FNCA activities in this field, namely mutation breeding and bio-fertilizer. Beside continuing the research and development on the topics relating to drought tolerance in sorghum and soybean as well as insect resistance in orchids, BATAN continues to develop new varieties of rice. Some candidates of the new varieties have been indicated, after the last two namely Merauke and Woyla, in responding to some customer taste satisfaction. It is also attempted to establish supply security of the new rice varieties located at some provinces to enhance the supply system of the crops. In the mean time the development of various formulae of food supplements for ruminansia animals has been progressing aiming at the utilization of locally available material.

Ladies and Gentlemen,

Ever since couple years, the number of government personnel, the civil servant, has been the subject of the zero growth policy leading to the negative growth of nuclear scientists and engineers working with government, although the number of human resource having been graduated in this field has only been fairly managed to satisfy the industry starting to ask more personnel with this qualification. As mentioned previously, the inauguration of Polytechnic Institute of Nuclear Technology at Yogyakarta last year was timely, however improvement in the quality and quantity is indispensable. In the near future, the role of government, especially BATAN and BAPETEN as a promoting and regulatory bodies respectively will still be very significant in building up the nuclear industries in Indonesia. Recruitment of these personnel for BATAN an BAPETEN has recently been prioritized by the government. I should therefore like to re-mentioned that we welcome the idea of the

International Nuclear University proposed by Korea not only is it an important asset to maintain and enhance the nuclear science and technology in the world, especially in our region but also for us in Indonesia that just about to embark enhancing program in nuclear industries. May I again in this opportunity propose to have cooperation under the auspices of FNCA to install a network system with training centers and advanced nuclear facilities in our region.

Ladies and Gentlemen,

For quite some years BATAN has been trying to develop capability relating to accelerator taking into consideration the future important role of this technology for various purposes. It is expected that this activities support the medium term program to build a demonstration accelerator to be utilized for research and development in the fields of activities to achieve the Landmarks. Co-operation in this field with FNCA member states is certainly welcomed.

In the mean time studies relating to the utilization of nuclear power plants are pursued as scheduled. While the comprehensive study of energy sources for electricity is nearly completed, the economic pre-feasibility study of nuclear desalination is progressing encouragingly. Both studies are involving IAEA, while the second one also involves Korea. Tentative results of the first study shows the introduction of nuclear power plant (NPP) to optimize the energy mix for Java Bali grid will be sometime in 2015, while very small NPP might be introduced to other grids. The pre-project activities are done accordingly, such as activities relating to candidate site permit. In the field of energy, BATAN utilizing nuclear techniques has also been doing activities relating to geothermal such as reserve calculation as well as starting the mutation breeding of castor oil plants, i.e. *Yatropha curcas* L., and *Ricinus communis* L. to innovate new varieties for plant and crop producing more bio-diesel.

Ladies and Gentlemen,

The on going FNCA activities have been progressing as expected, i.e. the Utilization of Research Reactor covering the production of Tc-99m, neutron activation analyses, and neutron scattering; Application of Radioisotopes and Radiation for Agriculture consisting of mutation breeding, bio-fertilizer, etc; Application of Radioisotopes and Radiation for Medical Use such as breast and nasopharyngeal cancers; Public Information of Nuclear Energy;

Radioactive Waste Management; Nuclear Safety Culture; Human Resources Development; and Application of Electron Accelerator. Indonesia expects the program on Asian Institute of Nuclear Science and Technology as well as Sustainable Development and Nuclear Energy in Asia could be started by 2003. We would like to confirm that we are ready for being host for the Utilization of Research Reactor Workshop this coming January as well as Radioactive Waste Management Workshop sometime in October 2003.

Your Excellencies,
Distinguished Delegates,
Ladies and Gentlemen,

Please allow me to conclude by expressing our strong endorsement for the FNCA and our readiness to participate fully in all of its activities. Lastly, I would like also to express our deep gratitude to our host MOST of Korea and Atomic Energy Commission of Japan for convening this third Meeting of the FNCA.

Thank you very much

1-2-4 Country Report of Japan

by
Prof. Yoichi Fuji-ie
Chairman
Atomic Energy Commission

As the theme of the 3rd FNCA is ”Atoms for the Next Generation,” I would like to speak about the future of nuclear energy in Japan.

The Long-Term Nuclear Program

Japan's nuclear policy is spelled out in its "Long-Term Program for Research, Development, and Utilization of Nuclear Energy" -- known more simply as the ”Long-Term Nuclear Program," November 2000. The Long-Term Nuclear Program sets out an overall view and long-term outlook for nuclear energy research, development and utilization in the 21st century. It also performs a valuable function as a message to the people of Japan and the international community.

The program provides that nuclear power generation will continue to be positioned as the nation’s key source of electric power, and will be utilized to the maximum possible extent. It confirms that the fundamental aim will be to achieve the reprocessing of spent fuel and the use of the recovered plutonium and uranium in light water reactors and fast reactors. It is the policy of the Atomic Energy Commission to pursue and realize the principles and policies set forth in the Long-Term Nuclear Program.

Japan’s Nuclear Energy Policy and Recent Issues

Japan adopted its own Global Warming Prevention Program, and ratified the Kyoto Protocol last June. A part of the program calls for increasing nuclear power generation by 30% in 2010 from the level of 2000. Nuclear power generation contributes substantially to reducing carbon dioxide emissions in Japan.

Given Japan’s situation in terms of geography and natural resources, nuclear power generation also contributes to improving energy self-sufficiency and the stability of energy

supplies. This is why Japan is continuing its R&D on the use of plutonium in fast reactors, and is planning to use plutonium in light water reactors.

Unfortunately, at this point I must say that, since the discovery of falsifications of data in self-inspection reports by a Japanese utility company, another violation of law has been revealed in regard to inspections of a primary containment vessel. We must acknowledge that confidence in nuclear power in Japan has been damaged. Although the need for the nuclear fuel cycle in Japan has not changed -- the use of plutonium in light water reactors is stalled as a result. We now face the critical need to rebuild public confidence in nuclear energy and in the fuel cycle.

The Atomic Energy Commission (AEC) was, in fact, already on record with regard to public confidence and the promotion of the nuclear fuel cycle in Japan. In order to gain public understanding, the commission is convinced that the need for a national fuel-cycle effort must be explained to the people in ways that are easier to understand

In addition, work has been under way since December 2001, to integrate two nuclear-related entities -- the Japan Atomic Energy Research Institute (JAERI) and the Japan Nuclear Cycle Development Institute (JNC). This will help to further rationalize nuclear R&D.

In the effort to gain public acceptance, important concerns are, of course, safety, non-proliferation, and the proper disposal of radioactive waste.

Advanced Nuclear Science and Engineering

Nuclear fusion is a promising future energy source, and we are promoting the International Thermonuclear Experimental Reactor (ITER) project, together with the European Union and Russia. At the ITER Negotiation Meeting last June, Japan submitted Rokkasho-mura, in Aomori Prefecture, as a candidate site for the ITER construction. We will continue to make vigorous efforts on this project.

It is predicted that the demand for hydrogen, as fuel for fuel cells and for other purposes, will increase rapidly in the near future. Research on hydrogen production using high-temperature gas reactors is another example of how Japan seeks to apply nuclear energy in diverse, positive ways.

The fruits of nuclear science and technology go far beyond power generation. Nuclear science and engineering bring new knowledge to basic science and have the potential to provide the most advanced methods of research in both life sciences and material sciences. In Japan, advanced R&D is going on in the areas of nuclear fusion, particle accelerators, innovative reactors, and basic and fundamental research.

Radiation use similarly ranges from basic and applied research to practical applications. Indeed, the use of radiation is the subject of most interest to many FNCA countries. This year, FNCA cooperation projects began on development of biofertilizers using radiation to reduce the environmental load from agriculture, and on industrial applications for low energy electron accelerators to expand future radiation use in Asia. Japan, of course, cooperates with FNCA countries in such research and development. But it is also important that education and training on the management and protection of radioactive materials be improved. To that end, Japan accepts 200 trainees or more every year from countries in Asia -- mainly FNCA countries -- for training in safety management, and as part of research exchange activities.

Nuclear Energy and the International Community

The peaceful uses of nuclear energy yield so many benefits. But in order to preserve those uses, the nuclear non-proliferation regime must be sustained and strengthened.

According to an announcement by the U.S. Department of State on October 16, North Korea is embarked on a program of enriching uranium for nuclear weapons, contrary to the 1994 Agreed Framework between the U.S. and North Korea. Such development is, as well, a flagrant violation of the Non-Proliferation Treaty (NPT) which is the fundamental agreement in international society, and other related international commitments. We, the AEC, issued the statement on this matter on October 22. We call strongly on North Korea to dismantle its nuclear weapons program in a prompt and verifiable manner and to immediately accept inspection by the IAEA.

The IAEA's Additional Protocol improves its capabilities of inspection by enlarging the scope of information to be provided to it and by providing for "complementary access" for inspectors. Japan remains committed to seeing the Additional Protocol accepted by as many nations as possible. To keep the momentum up, Japan will host, in cooperation with the

IAEA, an International Conference for the Universalization of the Additional Protocol, in December this year in Tokyo. You should already have received invitation letters, and I encourage you, as FNCA members, to participate. Currently, Japan, Australia, Indonesia and China conclude the Additional Protocol among FNCA countries. I hope the nations represented here in this forum who have not conclude the model additional protocol, will join us soon in doing so.

The Asian region is well on the way to becoming one of three global centers in the use of nuclear energy, together with North America and Europe. At the same time, conditions in Asia vary, and it is necessary that international cooperation take the circumstances of each country into account.

The vision of the FNCA is recognized as an effective mechanism for enhancing socio-economic development through active regional partnerships, based on mutual understanding and cooperative international efforts. Reflecting the ideas and approaches of the various participating countries is, therefore, something I believe the FNCA is uniquely suited for.

Japan will continue to pursue cooperation through the activities of the FNCA, and continue to promote the peaceful use of nuclear energy in Asia.

1-2-5 Country Report of Korea

by
Dr. Chung Won Cho
Director General for Atomic Energy Bureau
Ministry of Science and Technology

Mr. Chairman,
Your Excellencies,
Ladies and Gentlemen,

It is a great pleasure for me to deliver country report of Korea at the 3rd FNCA meeting.

National Policy on Nuclear Energy

Korea has committed to use of nuclear energy as a major energy resource. The Korean government established the “Comprehensive Promotion Plan for Nuclear Energy” every five years, which includes basic policy directions and implementation programs.

In this year the second 5-year plan started. It emphasizes the future nuclear reactor technology development and balanced coordination of power and non-power application.

In accordance with this comprehensive plan, Korea launched a long-term national R&D Program for the period of ten years from 1997 to 2006.

Major R&D programs are as follows:

- Development of I & C system for KSNP (Korean Standard Nuclear Power Plant) ,
- Construction of the pilot plant of System-integrated Modular Advanced Reactor (SMART) with the capacity of 65 MWt for both power generation and desalination,
- Proton Accelerator Project of 100 MeV and 20mA,

- Participation in Gen IV International Forum and the IAEA's International Project on Innovative Nuclear Reactor and Fuel Cycle (INPRO).

In the area of nuclear reactor, the localization of 1,000 MWe KSNP was achieved in 1995. The improved version of KSNP plus is under development. Korea is also developing an advanced power reactor (APR) technology, called APR1400, with the capacity of 1,400 MWe. The Ministry of Science and Technology issued a standard design certificate for APR1400 in May 2002.

APR1400 has advanced characteristics such as 60-year lifetime, passive safety features with economic competitiveness.

At present, 17 units of nuclear power plant are in operation, supplying 40% of total electricity. Three KSNPs are under construction, and 8 more units will be built by the year 2015. First APR1400 is planned to be commissioned in 2010.

To accelerate Radiation Technology (RT) development, the Korean government has drafted "Act on the Utilization of Radiation and Radioisotopes" for its review and approval of National Assembly. This Act aims to secure RT research fund and formulation of related industries and manpower development, and establishment of Radiation and Radioisotopes R&D Center under KAERI by 2005.

With regard to safety regulation, the Korean government places nuclear safety on its top priority.

Nuclear Safety Commission of Korea approved "Severe Accident Policy" and introduced "Periodic Safety Review" for all existing nuclear power plants every 10 years.

As for safety culture, 「the Nuclear Safety Charter」, which consists of eight principles, was promulgated on September 6, 2001.

Regional Cooperation in the Asia Pacific Region

It is said that the 21st century will be the age of Asia, with rapid economic growth. We expect Asia to continue its growth potential.

To meet the growing demand for nuclear energy, manpower development will be the most important factor. The IAEA has adopted knowledge preservation program as one of the Agency's projects at the IAEA meeting held in Vienna in June this year. Korea proposed the concept of "International Nuclear University", which arms around nuclear related school or training programs among member states including cyber-networking mechanism.

Korea has newly established three international training and education institutes: Nuclear Training Center in KAERI, Nuclear Safety Training Center in KINS and Radiation Emergency Training Center in KCCH. On the young nuclear manpower issue, the 2nd International Youth Nuclear Congress (IYNC) was held in Korea last April. We hope the Young Nuclear Association could be formulated in Asia under the framework of IYNC.

There are 96 nuclear power plants in operation in Asia.

After the September 11, security matter including possible radiological device terror has become an international issue. It is recommended in FNCA to share the measures taken or related expertise and information among member countries.

As for the liability system, we would like to toss the idea proposed by Korean Nuclear Utilities, namely Asian Mutual Fund for Nuclear Liability. Utilities expressed its desire to study new system, replacing current insurance payment, among nuclear utilities in Asia. They expect the Fund be more beneficial to all the utilities.

In the light of safety regulation of nuclear facilities, we may suggest that we consider establishing nuclear regulators' dialogue in Asia. We need to have standardized safety rules and learning process based upon each other's experiences.

FNCA Projects

On the theme of this 3rd FNCA meeting “Atoms for the Next Generation”, Korea is of the view that the round table discussion topics, “Strategy of Human Development”, and “Sustainable Development and Nuclear Energy” are very timely and important. We sincerely wish the action items be drawn out of round table to realize the spirit of “Atoms for the Next Generation”.

In relation to the implementation of the FNCA’s projects, Korea hopes that every project will pay more attention to securing the necessary manpower in preparation for the new nuclear era in Asia to come.

In addition, Korea would like to commend FNCA for its projects that emphasize Radiation Technology development. We recommend to extend technology development to possible joint production and supply of radioisotopes in our region.

With these remarks, Korea, with our Asian colleagues here today, reaffirms its cooperation for the promotion of safe and peaceful uses of nuclear energy.

Thank you very much for your attention.

1-2-6 Country Report of Malaysia

by
Dato' Seri Law Hieng Ding
Minister of Science, Technology and the Environment

Mr. Chairman

Distinguished Delegates

Ladies and Gentlemen

It gives me great pleasure to congratulate you, Mr.Chaiman, your colleagues and the Government of Korea for organising the third Forum for Nuclear Cooperation in Asia (FNCA) this year. I also complement the Atomic Energy Commission (AEC) of Japan for their commendable efforts to enhance cooperation in the peaceful uses of nuclear science and technology in the neighbouring Asian region.

Let me also from the outset express our satisfaction with the steady progress made under this cooperation. Malaysia has participated in all the activities carried out under the FNCA and benefited from the cooperation. It has enabled us to strengthen our national nuclear science and technology programme as well as sharing our experiences with the neighbouring countries. In this regard, I would also like to express our gratitude to FNCA for supporting our recent "International Nuclear Conference 2002" with the participation of several speakers and participants from FNCA countries.

Mr. Chairman,

Let me now share with you some of our experiences related to the basic theme of this meeting which is “Atoms for the Next Generation”. We believe that nuclear science and technology is very important and will continue to play a significant role in our economic development, wealth creation and social well-being in the future.

We recognised that in the health sector, nuclear science and technology has been accepted and widely used as a modern and superior technology to improve the quality of healthcare in many countries including the developing countries. In Malaysia, we have seen the trend whereby more and more modern nuclear medicine, oncology and radiotherapy centres were established in both public and private sector hospitals to provide better healthcare services. New technologies such as the use of short-lived radioisotopes from cyclotron and the use of PET in medicine will be available soon in Malaysia. This development is expected to continue in the future with the application of radioisotopes and radiation in medicine becomes an integral part of modern healthcare system, easily available and affordable by the general population.

In the agricultural sector, we believe that nuclear technique such as mutagesis together with other technology especially biotechnology and information technology will be greatly utilised to increase food production. and other agricultural products. We have already seen many new varieties of food crops as well as ornamental plants produced using new technology and have been commercialised. In addition, nuclear techniques have also been widely used to increase agricultural productivity, control of pest and diseases and in reducing post-harvest losses. The area of food sufficiency and food security are also of concerns to many countries to feed their growing population. Even though the issue such as Genetically Modified Organism (GMO) has been of concern to

many people lately, it does not relate to the use of nuclear technique. In addition to food production, nuclear technique will also become important to support the development of our biotechnology industry in areas such as production of biomaterials, pharmaceuticals, herbal medicine and nutraceuticals utilising our vast biodiversity.

Mr. Chairman,

We recognised that nuclear power is a very clean energy in term of emission of flue gases and greenhouse gases in comparison to other sources of energy such as coal, oil and gas. Hence nuclear power contributed less to the global environmental problem. However Malaysia has no plan to use nuclear power for power generation as she is blessed with abundance energy resources. The current energy policy is to utilise indigenous energy resources which are gas, coal, hydro, oil and biomass. The introduction of biomass which is renewable energy will also help us in solving problem of waste from the palm oil industry. Nuclear power remains as the last option in our energy policy as the concerns for nuclear power lie in the safety of nuclear power plants as well as those related to the disposal of radioactive wastes. We believe every nation should be free to make their own choices on the types of energy sources based on their national needs and obligations. Hence it should not be linked to other initiative such as the Clean Development Mechanism (CDM).

Mr. Chairman

In the industrial sector, nuclear technology has been widely used in Malaysia to improve the efficiency and effectiveness of the industrial plants. This is mainly through the use of non-destructive testing, tracer technology and nucleonic control system in industries such as oil and gas, construction, chemical and manufacturing . In addition, radiation

processing technology has also been widely used for sterization of medical and non-medical products, polymer modification and production of new materials. The utilisation of this technology is expected to expand to new areas such as in the treatment of industrial waste water, municipal waste and production of biomaterials. The technology has been accepted as environmentally friendly and contributed towards solving some environmental problems.

Mr. Chairman

The implementation of nuclear science and technology in Malaysia is carried out in partnership and close cooperation between the public and private sectors as well as international cooperation. The cooperation has also enhanced networking and partnership between the local institutions and their counterparts overseas and this has contributed towards sustainability of our national nuclear science and technology programmes. We would like to continue this cooperation in the future as it has benefited both parties involved. In this regards the FNCA has played a very important role to foster close cooperation among the Asian countries in many areas of common interest.

Mr.Chaiman

In conclusion, Malaysia would like to reaffirm her strong commitment to the FNCA, to continue to actively participate in the FNCA activities and to host some of the FNCA activities in the future. In this regard, we would like to make an offer to host the Workshop on Electron Beam Accelerator in 2003, Workshop on Human Resource Management in 2004, Workshop on Mutation Breeding in 2005 and the Seventh FNCA in 2006.

Thank you for your attention.

1-2-7 Country Report of the Philippines
Atoms for the Next Generation:
Aligning Philippine S&T Policy and Activities

by
Dr. Estrella F. Alabastro
Secretary
Department of Science and Technology

Mr. Chairman,

Excellencies,

Ladies and Gentlemen:

I am deeply honored to address the FNCA Ministerial Meeting for the first time since ascending as Secretary of the Philippines' Department of Science and Technology. On behalf of the Philippine Government, my delegation and I officially thank the Government of Korea and the Government of Japan for kindly inviting us to the 3rd FNCA Meeting. It is a very opportune Meeting indeed, as the Forum discusses this year "Nuclear Research and Development Policy".

We live in truly exciting times - hallmarked by breakthroughs in information and communication, continuous materials innovation, and strides in genetic discoveries - while, on the other hand, nurturing a growing concern over the burden we place on our environment and on generations of the future because of our progressive development activities.

The Philippines is not exempt from such trepidation, thus, the agenda of the national

government remains strongly anchored on the precepts of a development that is sustainable and the pursuit of a national vision that hinges - in the words of Her Excellency, President Gloria Macapagal-Arroyo-on the three pillars of prosperity, freedom, and justice.

Cutting poverty by ensuring economic growth that is accompanied by social equity and ecological responsibility is a fight that is to be won, and the framework forged to accomplish just that serves to guide our national programs.

The Philippine Agenda 21 (or PA 21) is the country's blueprint for sustainable development. It envisions "a bettor quality of life for all Filipinos through the development of a just, moral, creative, spiritual, economically vibrant, caring, diverse yet cohesive society characterized by appropriate productivity, participatory and democratic processes, and living in harmony and within the limits of the carrying capacity of nature and the integrity of creation". It embodies our development aspirations.

Mr. Chairman,

At the Department of Science and Technology, we are guided by the National Science and Technology Plan for the period 2002 to 2020, which is intended to be an indicative plan covering our visions, goals, strategies and thrusts to be pursued over the said twenty-year time frame. We have set milestone years at 2004, 2010, and 2020, by which time we should have realized our short-, medium-, and long-term goals.

In particular, we envision that by 2004, science and technology shall be an important factor and catalyst for national productivity and competitiveness, and shall have been duly recognized as a means for solving pressing national problems.

By 2010, S&T shall be the foundation for accelerated economic growth and improved quality of life, and the Philippines shall have carved niches in selected areas of strength, becoming an internationally-competitive knowledge provider and user in identified S&T areas.

By 2020, we shall have instituted a well-developed science and technology-based Small & Medium Enterprises (SME) sector, world-class universities in S&T, internationally-recognized scientists and engineers, and model states in S&T management and governance.

Niching and clustering of areas identified by the government as significant potential beneficiaries of technology, or potential enterprise sectors, will be an important strategy in pursuing our goals, together with the maintenance of strong government-industry-academe-civil society and international linkages in S&T, promotion/popularization of science and technology, strengthening of support to industry, and improvement of S&T governance.

Nuclear science and technology can find its niche in the priority areas of agriculture, health, biotechnology, earth and marine sciences, energy, materials science, manufacturing and process engineering, and environment.

Mr. Chairman,

To expound just a bit further, and in order to buttress our position on the criticality of managing knowledge, allow me to delve deeper into the subject, focusing in particular on the issue of preserving nuclear knowledge vis-à-vis emerging world realities.

It is a simple equation. All nuclear technology and innovation relies on nuclear knowledge. An aging workforce is increasingly pervading the nuclear sector. Without acting now, invaluable assets in critical nuclear knowledge and capacity might soon be lost. To ensure the continued operation of existing and future nuclear installations, a succeeding generation of nuclear experts is required. The threat of losing nuclear knowledge is both a safety concern for the industry, and a potential predicament in our development pursuits. It is thus apt that the Forum, as early as now, in its desire to ensure "Atoms for the Next Generation", has identified human resources development as part of its primary agenda. The challenges attendant to strengthening our manpower base are beseeching action.

The realization of the Department of Science and Technology's vision in general, and that of the Philippine Nuclear Research Institute specifically, would rely heavily on technical and economic interactions: both among sectors of Philippine industry, academe and government; and externally, through regional cooperation exchanges and fora such as what we are cultivating at the FNCA.

Mr. Chairman,

In this regard, I am pleased to report to the body the achievement of the Philippines in the areas of cooperation covered by the Forum.

On Mutation Breeding: The Philippines is actively involved in the multilateral research project on "Drought Tolerance in Soybean" which was initiated this year. The exchange of soybean seeds with Vietnam was also accomplished. On the biofertilizer Project, we are happy to note that the country is in an advanced stage of development of the biofertilizer, Bio-N, for which a nation-wide demonstration in the field was also launched. In support of the FNCA plan of activities, may I also take this opportunity to confirm our offer to host the Workshop on Mutation Breeding in 2003.

On the Utilization of Research Reactors: I am pleased to report that the Philippines is actively taking part in the collaborative project on the Characterization/analysis of carrageenan and carrageenan blends irradiated with gamma rays. In addition, it is my honor to inform that the PNRI presently has the most extensive data on the elemental profile of Metro Manila air. We look forward to contributing to the Forum's activities on air pollution through the established local expertise on x-ray fluorescence.

On the Utilization of Radioisotopes and Radiation for Medical Use: We have participated in the clinical study on radiation therapy for locally-advanced uterine cervix cancer, and continue to be part of the new cooperative clinical trials on other cancer types.

On Radioactive Waste Management: Domestic initiatives in the aspect of strengthening radiation protection infrastructure included efforts to strengthen our regulatory capability, implementation of a Philippine Action Plan for the safety of sealed radiation sources, and conduct of various activities on Radiological Emergency Planning and Preparedness.

On Nuclear Safety Culture: It is a recognized fact that the promotion of nuclear safety culture is of paramount importance in the sustainability of nuclear science and technology. In line with that, we have initiated the institutionalization of nuclear safety culture in the country. Further, in support of the FNCA plan of activities, I am again taking this opportunity to offer the Philippines as host to the 2003 Workshop on Nuclear Safety Culture.

On Public Information on Nuclear Energy: I am pleased to relay that the Philippines continues to implement various activities aimed at educating and informing the public of the various beneficial applications of nuclear energy. Special effort is being made to target the young generation in our campaigns, especially since they will be the major players in a forthcoming nuclear generation. In this regard, my delegation thanks the FNCA project, under its Regional Speakers Bureau, for sending three excellent experts as speakers during the National Atomic Energy Week celebration in 2001.

On Human Resources Development: The Philippines is honored to have been given the opportunity to host from October 8 to 10, 2002 the 4th Workshop on Human Resources Development. In our country, a ten-year National Strategy for Human Resources

Development in the Nuclear Field has been drawn up, envisaging an implementation level that would involve other ministries such as the Department of Education (DepEd) and the Commission on Higher Education.

Excellencies, Ladies and Gentlemen:

It truly gives me pleasure to be presenting to this distinguished body the achievements made by the country in consonance with the regional cooperative effort spearheaded by the Forum. I am hopeful that through this meaningful exchange, we can steer as member nations and as a regional bloc our programs and vision towards the betterment of this generation and the next, through the contributions of nuclear science and technology.

I congratulate the Government of Korea and the Government of Japan for the extensive preparations for this Meeting and for the cordial reception extended to the delegates.

Mabuhay, and sincere wishes for a successful Meeting!

1-2-8 Country Report of Thailand

Strengthening Research and Development, and Utilization of Nuclear Technology in Thailand

by
Mr. Sunthad Somchevita,
Permanent Secretary
Ministry of Science and Technology

Excellencies;

Distinguished Delegates;

Honored Guests;

Ladies and Gentlemen;

1. It is indeed an honor and privilege for me to have the opportunity to attend this distinguished forum. On behalf of the Royal Thai Government, I would like to thank the Minister for Science and Technology of the Republic of Korea and the Atomic Energy Commission of Japan for the invitation extended to our Minister to attend this meeting. Unfortunately, the Minister is pre-occupied with urgent matters at home and designates me to attend this important meeting on his behalf.

2. On personal note, I am pleased to meet again those attended the First FNCA Ministerial Meeting in Bangkok two years ago and also pleased to meet new colleagues at this meeting. I look forward to productive meeting and I am prepared to share with you our experience and difficulties in the past year on peaceful utilization of nuclear technology. I am confident that this high level meeting will help our countries to develop a proper balance among risks, benefits and non-proliferation in utilizing nuclear technology for sustainable development.

Major Policy

3. Peaceful use of atomic energy in Thailand has been the founding principle of atomic energy applications since its introduction to the Kingdom in 1962. The Royal Government of Thailand is also committed to peaceful utilization of atomic energy wold-wide by supporting Non-Proliferation Treaty (NPT) regime, and nuclear, radiation

and waste safety regime. In addition, Thailand is an active Member State of the International Atomic Energy Agency (IAEA), a Signatory State to the Comprehensive Nuclear Test Ban Treaty (CTBT), and a member and the depositary state for the South East Asia Nuclear Weapon-Free Zone (SEANWFZ). Among other development, we are committed to developing world peace and stability.

National Infrastructure

4. The Atomic Energy for Peace Act was established in 1962 as the basic legislation for peaceful utilization of nuclear energy. The subsequent Thai Atomic Energy Commission (Thai AEC) was established to be a policy organ for the Thai government to ensure the founding principle being readily implemented, and safe use of atomic energy is carried out. By virtue of the same law, the Office of Atomic Energy for Peace (OAEP) was also established as the Secretariat to the Thai AEC, as the regulatory authority and as the national research and development institute.

5. The major strategic development policy of the Thai AEC is in line with that of the International Atomic Energy Agency, or IAEA. That is to carry out principal role in establishing operational policy and strategic programmes, guidelines and technical programmes for peaceful application of nuclear technology. The role includes coordination with the Permanent Missions to the IAEA in Vienna along with other relevant public and private organizations in Thailand on policy issues and technical cooperation programme with the IAEA. Apart from being the Secretariat, OAEP is entrusted to carry out tasks relevant to its principal role which include ensuring that Thailand adheres to the NPT regime and properly establishes national infrastructure for safe and peaceful application of nuclear technology.

Re-organization

6. In the past 40 years, utilization of atomic energy in Thailand has been beneficial to national socio-economic development. The Thai society has benefited safe use of radiation, nuclear energy and nuclear materials, which contributed to better health care, increased agricultural products, high quality industrial production and public safety. However, since the United Nations Conference on Environment and Development (UNCED) in 1992, the world communities have increasing concerns on human safety and clean environment of which safe utilization of atomic energy is identified as a

global issue. The International Atomic Energy Agency (IAEA) has been working closely with its Member States, including Thailand, on upgrading of radiation protection infrastructure to ensure proper and timely implementation of its International Basic Safety Standards. The major recommendation to Thailand had been to urgently establish proper national infrastructure for radiation protection of which regulatory authority is to be "independently managed" from management of the operators - users of radiation sources. The issue of "independent regulatory authority" has been a major concern of the Government, which required major re-organization of OAEP and revision of the basic atomic energy law. Incidentally, the radiological accident in Thailand in 2000 accelerated the re-organization process. While awaiting re-organization to be completed and the revised law to be enacted, the old Ministerial Regulation (safety regulation) was drafted to incorporate major lessons learned from the accident to be addressed to the extent allowable by the present Act. The new regulation is due to be promulgated by the end of this year. Furthermore, revision of the Act has been initiated with the assistance of the IAEA.

7. With the current major policy of the Government to re-structure the whole Thai bureaucracy starting this October, OAEP has been re-structured to be separated into two entities under the new Ministry of Science and Technology (MOST). They are the Office of Atoms for Peace (OAP) and the Thailand Institute on Nuclear Technology (TINT). The OAP is a government agency with major functions on coordination on policy and strategic plans on all atomic energy matters, and as the single regulatory authority. The TINT is a public agency (under government control) with major function on research and development on nuclear technology, similar to the status of Japan Atomic Energy Research Institute (JAERI) or the Korean Atomic Energy Research Institute (KAERI).

Strategic Development

8. On national infrastructure development, the re-organization is considered strategic. Role of OAP in policy coordination and strategic plan development for peaceful utilization of atomic energy in Thailand will be strengthened to support development for national and international peace and security and for national socio-economic development. The single regulatory role is to be also strengthened to ensure reduced risk and increased benefit of nuclear technology application in the country. However, to

further strengthening both roles of OAP, internationally accepted standards and measures are to be incorporated in management strategy of OAP. Revision of the present Atomic Energy for Peace Act (1962) is required. The revision is to incorporate new major elements to facilitate flexibility and effectiveness of the Act for OAP to enforce both national compliance of the NPT regime and safe regulations in compliance with the international standards and measures set out by the International Atomic Energy Agency (IAEA).

9. On research and development, and utilization of nuclear technology, the new Thailand Institute of Nuclear Technology (TINT) is considered strategic. TINT will be established with corporate-like management arrangement from which its business is carried out with partners from both public and private sectors. The current Ministerial Policy calls for TINT to redirect its mission to support export of agricultural produce through irradiation and development of Small and Medium Enterprises (SMEs). Its main research tools are research reactors and irradiation facilities.

10. In addition, there are other strategic development using nuclear technology in other institutes and laboratories, which will be strengthened through policy guidance and strategic plans. They include Fast Neutron Accelerator Facility at Chiengmai University, National Synchrotron Research Center of MOST and nuclear engineering facility at Chulalongkorn University.

11. For nuclear power, it is recognized to have large capacity in producing competitive electricity without emission of greenhouse gases. It remains an option for future energy development in Thailand, and consultation with the public is required.

Activities under Forum for Nuclear Cooperation in Asia (FNCA)

12. Thailand has been actively participating in various FNCA activities in the past year. The seven areas of cooperation among the FNCA member countries are still relevant to the above mentioned strategic development. They need to be expanded.

Conclusion

13. In the past 40 years, Thailand has gone through different stages of research and development, and peaceful utilization of nuclear technology. Our experience has spelled out number of success and shortcomings of the technological uses. The success has been kept up for sustainable development while the shortcomings are to be strengthened for further success and sustainability. Today, policy and planning, and safety infrastructure have been strengthened to support future development needs in Thailand as well as supporting our commitment in international peace and security. We are hopeful that the current restructuring of the former OAEP will lead to more productive and sustainable utilization of nuclear technology in next decades. I am also certain that the development will increased our productive participation in technical cooperation with international organizations including those with the IAEA and those under FNCA strategy.

1-2-9 Country Report of Viet Nam

Vietnam Nuclear Research and Development Policy and FNCA Activities

by
Prof. HOANG Van Huay
Deputy Minister of Science and Technology of Viet Nam

Your Excellencies,

Distinguished Delegates,

Ladies and Gentlemen.

It is great honor of the Delegation of Viet Nam to be here in Seoul and to participate in the third meeting of the Forum for Nuclear Cooperation in Asia (FNCA), which being co-hosted by the Ministry of Science and Technology of Korea and the Atomic Energy Commission of Japan.

On behalf of our Delegation, I warmly welcome the excellent arrangements made by Korea and Japan for this important meeting and wish to take this opportunity to present our best compliment to distinguished Ministers, Senior Officials, and Participants from FNCA member countries.

It is my pleasure to briefly present some issues in relation to the nuclear policy, nuclear power and sustainable development in Viet Nam, and progress being made by Viet Nam in the implementation of cooperative activities under the FNCA framework.

1. Nuclear Policy of Viet Nam

Vietnam's consistent policy on peaceful uses of nuclear energy has been evidenced by our conclusions with the NPT (1982), the South East Asian Nuclear Weapon Free Zone Treaty (1995), and the CTBT (1997). Recently, the Government has entrusted the MOST with CTBT National Contact-Point, which duty is to co-ordinate activities of relevant organizations in order to submit to the National Assembly for the Treaty ratification. Furthermore, Vietnam is considering possibility of conclusion with other treaties and conventions, such as Additional Protocol, International Convention on

Physical Protection of Nuclear Materials.

Under that policy, Viet Nam plans to strengthen the research and development, and utilization of nuclear energy serving the cause of national socio-economic development, making significant contribution to the enhance of productivity, improvement of quality, reduction of production costs, and health service. In order to orient and facilitate nuclear activities, a draft "*National nuclear policy and long-term program for research, development and utilization of atomic energy*" is under formulation and compilation.

2. Study on Nuclear Power Development

In the national energy policy, nuclear power is considered as one of the important and indispensable energy sources and playing a role in the sustainable development of the country. Studies on the introduction of nuclear power in Viet Nam are being carried out with the good results. In order to acquire the public acceptance and consensus to the nuclear power development, public information and propagation through mass media, especially television, play an extremely important role. On March of this year, a Viet Nam - IAEA Workshop entitled "*Regional Public Information on the Nuclear Energy and Sustainable Development in Asia*" was held in Ha Noi. During that time, atomic energy and nuclear power news was broadcasting on the Vietnam Television (VTV) and caused positive impression to the viewers. According to the result of the recent public opinion survey on nuclear power on the Internet, among the 15,000 participants, there were about more than seventy percent (70%) saying "Yes" to the nuclear power development in Viet Nam.

With the aim of giving guidance to the implementation of research and development activities on nuclear power, the Government of Viet Nam set up a National Steering Committee for Nuclear Power Development. The two main duties being conducted for submission to the Government by the end of 2003 are the following:

1. Prepare a report on Pre-FS on the first NPP's construction,
2.Study and elucidate seven (7) aspects in relation to the nuclear power development in Viet Nam:
- Planning and plan for construction of nuclear power plants to 2030,
- Nuclear power technology selection,

- Ensuring safety of nuclear power plants,
-Treatment and management of radioactive waste discharged from nuclear power plants,
- Manpower preparation for nuclear power projects
- Nuclear fuel potential in Viet Nam,
-Framework of nuclear organizations, policy and measures necessary to successful implementation of nuclear power development program in Viet Nam.

In the course of implementation of the research and development activities, Viet Nam has received effective and efficient supports from the IAEA, regional countries, especially form Japan and Korea. I would like to take this opportunity to express our sincere appreciation to those valuable assistance and supports.

3. Nuclear Cooperative Activities under the FNCA Framework

Viet Nam has been participating in all FNCA activities. We take note with satisfaction that the seven (7) projects under the FNCA framework have been addressing the significant issues of our region. Viet Nam has actively participated in all FNCA annual workshops and exchanged experiences with other FNCA member countries through those events. In 2001, Viet Nam hosted successfully the 7th Workshop on Radioactive Waste Management.

At this meeting we express our willingness to host other FNCA events planned in 2003, especially to host the Fifth Ministerial Level Meeting of the FNCA be held in 2004.

In conclusion, the Delegation of Viet Nam wishes to welcomes the progress being made in the implementation of nuclear cooperative activities under the FNCA framework. We would like to reaffirm our full supports to the FNCA activities to enhance and to promote the application of nuclear science and technology for the sake of peace and prosperity in the region and in the world.

Thank you for your attention.

1-3 Session 2: Round Table Discussion

1-3-1 Lead-Off Comments on 'Strategy for Human Resources Development'

by Dr. Kyong Won Han
Head of Nuclear Training Center
Korea Atomic Energy Research Institute

1. Introduction

Qualified manpower is an essential element for the successful implementation of national long-term nuclear programs as well as associated R&D programs. Such manpower could only be developed effectively under a well established national strategy, which addresses adequately the need of human resources in terms of technical areas, number of personnel and timing. In establishing such a strategy, account should be taken on the availability of infrastructure for education and training, and the feasibility of networking among institutions concerned at national as well as international levels. In this context, I would like to talk about the need of nuclear human resources in Asia and the effort made by FNCA in addressing the need. Then I will conclude my talk by suggesting some points for consideration in this discussion.

2. Needs of Nuclear Human Resources Development in Asia

Recently, many countries have expressed their concerns, in a number of international meetings, about aging of human workforce in the nuclear field and sharp decline in the number of new entrants to the education and training in nuclear science and technology. In order to better understand and discuss these worldwide phenomena, an IAEA meeting on nuclear knowledge management was held in Vienna in June 2002. The knowledge management was viewed in the aspect of knowledge preservation and succession planning of workforce, which are closely linked to human resources development. Participants of the meeting recommended IAEA to consider 18 activities including integration of existing nuclear data and information bases, networking of institutions for nuclear education and training, facilitating the development of curricula for internationally accepted higher university degrees on nuclear technology, establishment of an International Nuclear University, and attracting

the new generation of students into the nuclear area. The knowledge management issue was further discussed in an IAEA Scientific Forum held in September 2002. Suggestions from the forum included formulation of clusters by nations with a similar economic and cultural situation, and networking for education and training on a regional bases.

It may be obvious that Asian countries share the view on the importance of nuclear manpower development in the same way as discussed above. However, they seem to have more particular reasons for having interests in the human resources development. It is in Asian countries where most of the current constructions of nuclear power plants in the world are taking place. While, a large number of Asian countries seem to focus on non-power activities and consequently have their primary interest, for the time being, in the utilization of radioisotopes. Along this line, Asian countries could be categorized as the following groups:

- countries operating NPPs;
- countries planning construction of NPPs;
- countries conducting R&D on NPPs;
- countries focusing on non-power activities.

This regional specific situation could be interpreted as an indication that there is a high need of human resources to address the increasing activities in nuclear fields in Asian countries. It also indicates that diverse groups of human resources will be required to meet the different areas of interests from the groups mentioned above. In this context, cooperation among Asian countries is felt beneficial in the sense that it can solve common problems of human resource development, which are specific to the region. Also, the idea of regional approach is in line with the concept of cooperation brought about from the aforementioned IAEA meetings.

3. Efforts Made by FNCA on Human Resources Development

It is our recognition that FNCA has made a great effort in promoting regional cooperation to meet the need of human resources for the sustainable development of nuclear industries in Asia. In general, all of the FNCA projects being carried out have contributed to the human resource development by dealing with important subjects, i.e. utilization of research reactors, application of radioisotopes and radiation for agriculture, application of radioisotopes and radiation for medical use, public information of nuclear energy, radioisotope waste management, and nuclear safety culture. Moreover, it is

felt encouraging that FNCA deals with the issue of human resources development under a separate project. The project is promoting the following activities:

- Information of national strategies on human resources development has been exchanged through meetings;
- Investigation has been conducted to collect and analyze basic data about nuclear research institutions, universities, radiation and isotope applications, nuclear training courses, etc. From this year, further survey of basic data will be conducted for better creation of joint projects for member countries;
- Discussions have been initiated to deal with strategy issues on how to attract the young generation, and how to secure the safety of research reactors and in radioisotope utilization;
- Discussions have been conducted on the establishment of Asian Institute of Nuclear Science and Technology (proposed by Indonesia) and International Nuclear University (proposed to the IAEA by Korea). Also an activity of developing a textbook on radiation protection was launched in order to improve and harmonize training capabilities in member countries.

4. Suggestions for Future Cooperation for Human Resources Development

As discussed above, the importance of human resources development in the field of nuclear is recognized worldwide. Asian region is not an exception and in need of regional cooperation in order to solve common problems together in an effective way. FNCA has made a great contribution to the regional cooperation and its effort is expected to continue. In this context, it is felt essential to review the strategies of human resources development at national and regional levels in order to have the future regional cooperation more effective. Now I would like to bring the following items for consideration by the audience in discussing the strategy issue:

- Promotion of exchange of information on human resources development strategies in connection with nuclear knowledge management;
- Development of programs for attracting the young generation to nuclear science and technology;
- Harmonization of diverse interests in technical areas;
- Formulation of an Asian network of higher education and training in nuclear technology for the preparation of the establishment of International Nuclear University in the future;
- Cooperation and interaction with other regions for human resources development.

1-3-2 Lead-Off Comments on 'Sustainable Development and Nuclear Energy'

by
Mr. Tetsuya Endo
Vice-chairman
Atomic Energy Commission

Introduction

Sustainable development is something everyone seeks -- people in developing countries probably most of all. Energy is essential to sustainable development, and requires harmonizing the "three E's": Energy Security, Economic Growth and Environmental Protection. With this in mind, I would like to touch briefly on sustainable development and nuclear energy.

Economic Growth and Energy

The economic fundamentals of Asian countries are good, and I believe firmly that their economic growth will continue hereafter. In that case, energy demand will increase without doubt. Except for those few Asian oil and natural gas producing nations, each nation is highly dependent on Middle Eastern crude oil.

Japan has a very large economy and almost no natural energy resources. Its rate of energy self-sufficiency is only 4% without nuclear energy*. So, for its own energy security, nuclear energy is indispensable.

*With nuclear energy, the rate of energy self-sufficiency is 20%

How we see our energy needs in the medium term is the starting point for discussing the relationship between nuclear energy and sustainable development.

Environmental Problems and Nuclear Energy

The Kyoto Protocol requires that industrially advanced nations reduce their emissions of greenhouse gases -- the cause of global warming -- by an average 5.2% from the level of 1990. They are to do this during the first commitment period under the Protocol, from 2008 through 2012. Specifically, the EU must reduce emissions by 8%; the United States, 7% (but it has not ratified the protocol); and Japan, 6%.

The OECD/NEA published a booklet titled "Nuclear Energy in a Sustainable

Development Perspective" in 2000. The booklet reviews characteristics of nuclear energy from the economic, environmental and social viewpoints in terms of sustainable development, and provides data and analysis on the nuclear energy option.

In another booklet published last July titled "Nuclear Energy and the Kyoto Protocol," the OECD/NEA says that without nuclear power generation, carbon dioxide emissions from power stations in OECD member countries would be higher by about 30% -- by about 1200 million tons per year, 10% of carbon dioxide emissions from all energy use in those countries. The booklet says nuclear power generation has played an important role in reducing greenhouse gases in OECD countries for the past 40 years.

In the negotiations toward implementation of the Kyoto Protocol, however, this was not recognized. Voices from anti-nuclear countries were disproportionately strong, and nuclear energy was excluded, unfortunately, from the Protocol's Clean Development Mechanisms -- CDM's. Nor was the positive role that nuclear energy can play recognized at the Johannesburg Summit. That should certainly be changed for the second commitment period under the Protocol, which starts in 2013.

Relationship between Sustainable Development and Nuclear Energy

Currently, 53 nuclear power plants provide nearly 35% of Japan's total electricity. By 2010, it is expected that another dozen or so units will have been built, increasing the figure to 40%.

To the best of my knowledge, 17 nuclear power plants provide almost 40% of total electricity in Korea. Two nuclear power plants started commercial operation in China this year, bringing the number of nuclear power plants now operating there to five.

Sustainable development and nuclear energy go together in more ways than electricity generation -- more, even, than such well-known things as cancer therapy, mutation breeding in agriculture, and industrial processes. I'm referring now to the area of environmental protection, where radiation can also be used, for example, to reduce or trace pollutants. This, too, is important for social development and long-term improvements to people's well-being.

Conditions of Peaceful Utilization of Nuclear Energy

Nuclear energy has issues: safety problems, weapons proliferation, treatment and disposal of radioactive waste, and public acceptance. But nuclear generation emits no

carbon dioxide. It also has a very high "energy density" -- meaning a great deal of energy is available from a nuclear system.

If the issues can be resolved, the problems overcome, nuclear energy can continue to be a major and very useful energy source, and the positive uses of radiation can be similarly expanded.

Since the purpose of peaceful use is to improve human welfare, utmost care and effort on those four specific issues -- safety, non-proliferation, radioactive waste, and public acceptance -- must be made. And it is most effective, I think, if individual countries do not work alone. We all have much in common. Mutual understanding and cooperative international efforts are needed now.

Where those four issues are linked is in the need to foster the development of appropriate human resources. Everything becomes more difficult if people with professional knowledge are not available to fill important positions when needed.

Position of Nuclear Energy in Sustainable Development

Asian countries can be roughly divided into three groups, depending on the state of their peaceful nuclear use or development. The first group would be countries and regions actively promoting nuclear power generation. The second group consists of countries thinking affirmatively about introducing nuclear power generation sometime in the future. The third group includes countries that do not expect to introduce nuclear power generation for a while, but do focus on uses of radiation.

Similarly, the uses of nuclear energy -- where it is now used -- vary from country to country, reflecting the diversity of conditions in Asia. On the whole, though, I think the peaceful use of nuclear energy contributes greatly to sustainable development in the region.

Final Words

Although there are differences among countries in their uses and plans for nuclear energy, this means their ideas and approaches will be different and creative as well. I hope that my comments will serve as a reference for discussions in the roundtable session.

References

OECD/NEA Nuclear Energy in a Sustainable Development Perspective
OECD/NEA Nuclear Energy and the Kyoto Protocol

1-4 Presentation

IMPROVING HUMAN WELFARE THROUGH PARTNERSHIP AND INTEGRATED TECHNOLOGIES

QIAN Jihui
Deputy Director General
Head of the Department of Technical Cooperation
International Atomic Energy Agency

A Presentation to the Ministerial Level Meeting
3rd FNCA meeting, Seoul, Korea, 31 October 2002

1. Introduction

Almost 50% of the world's poor living in South Asia according to a September 2002 AUSAID document. The recent World Summit on Sustainable Development (WSSD) in Johannesburg recognised that alleviating poverty requires optimal use of technology and the enhancement of national infrastructures. The strategy agreed by participating Ministers at the WSSD was based on improvements in 5 primary WEHAB goals (Water, Energy, Health, Agriculture and Biodiversity).

This presentation will focus on:

- Examples of successes of applied technology in achieving progress in WEHAB-type goals.

The presentation will then show that these successes have been the result of –

- Partnerships between governments, research institutions and international agencies.
- Integration of a range of technologies to solve specific development problems.
- The ability of the IAEA to foster partnerships and assist with technology integration.

2. Examples of Solving Key Problems of Developing Countries

Poverty, deprivation and population growth combine to create a lack of resources and immense difficulties for attempts to raise the living standards of the world's poor. Although many problems remain, there are now signs that smart use of technology can assist in meeting some of the WEHAB goals. Most participants at this meeting are aware of the Agency role in the use of research reactors, energy planning and reactor safety. This presentation focuses on some areas where the Agency's role may be less well known, such as improving access to clean drinking water, food security, health and environmental protection, and bring benefits to the region's poor.

2.1 Drinking Water

2.1.1 Groundwater management

Fresh water is an increasingly scarce resource. Over 1 billion people in Asia now depend on groundwater for drinking. Groundwater does not normally need chemical treatment. However, it is vulnerable to pollution by incursion of seawater and from waste produced by industry, agriculture and domestic activities. Groundwater has become a valuable resource requiring exploration, assessment and sustainable management.

Technology is available to –

- Define or "fingerprint" the sources of groundwater.
- Estimate the extent of a resource (aquifer), and map the underground connections between aquifers.
- Determine the rate of recharge and, therefore, the rate of use that can be sustained.
- Use tracers to track the sources of potential pollution.

Together, these technologies provide the basis for total management of aquifer systems. This can be especially helpful when aquifers are shared between countries. The largest example of modern groundwater resource management is found in the Guarani region of South America. This resource may sustain the needs of 350 million people across four national boundaries. It is already used by 500 cities in Brazil. Technology is assisting this major management task in a project undertaken by the four national governments with the support of the Global Environment Facility (GEF- a consortium of the UNDP, UNEP and World Bank).

In Asia, smaller but still significant groundwater projects are underway in several countries. The Philippines is the Lead Country for a Regional Cooperation Agreement (RCA) project on access to clean drinking water. All the participating countries are enhancing their capacity to manage their resource through active cooperation between water resource authorities and technical institutes. The Mekong Delta was identified as an area for application of water resource management methods by the GEF in a recent meeting in Beijing.

2.1.2 Arsenic Contamination

The World Bank, UNICEF and the individual governments and agencies of developed countries are supporting the Bangladesh Rural Advancement Committee (BRAC) to mitigate major heavy metal contamination of the deep water resource used across most of the rural areas of Bangladesh. The most immediate problem is arsenic, which leads to incurable chronic health problems and, eventually, premature death.

Technology for the rapid, cheap and widespread determination of arsenic levels in water is now becoming available. The use of other technologies, however, is only just beginning that will help to trace the movement of underground waters, and the location and uptake of arsenic into the deep water supplies. The challenge is to understand the complex delta systems supporting the underground aquifers of Bangladesh. With this information, better mitigation strategies can be planned.

2.2 Food Security

2.2.1 Eradication of the Tsetse Fly

The diseases inflicted by the tsetse fly on both cattle (nagana) and poor farming communities (sleeping sickness) are the biggest obstacle to increasing agricultural productivity in large parts of Africa. Drugs and insecticides can reduce the scale of the problem but have failed to eliminate it, and the tsetse fly is making a comeback.

Now, other technologies are coming to the rescue and providing assistance to the major efforts of the Food and Agriculture Organisation (FAO). Once the tsetse fly population has been reduced in an area using insecticides or physical methods, the release of overwhelming numbers of sterile male flies will eradicate it. The technology to sterilise, rear and release sterile males at an appropriate time and place has been validated in several small trials. It is now available to make a major impact on a far larger scale to allow poor farmers to own and use livestock for working the fields, food production and income generation.

2.2.2 Plant Breeding and Genetics

Rice is the staple diet and most important crop in many Asian countries, such as Vietnam. New rice varieties are needed to increase production, grain quality, and the ability to withstand unfavourable growth conditions such as drought, pests or soil acidity or salinity.

Induced mutation methods are being used to speed up the selection processes used by plant breeders. In the Mekong delta of Vietnam, one available mutant variety has shorter a maturity time, better disease and pest resistance, an ability to grow in acid soils and can be cropped 2 or 3 times per year. It is also of export quality. This and several other mutant varieties are ensuring the food security of the rural Vietnamese poor, providing higher incomes for farmers and offering the prospect of turning Vietnam into an exporter of rice.

The economic value of induced mutant varieties can be estimated from data from Japan and India. Many mutant varieties are now available with total values of US$937 million in Japan (from18 varieties) and US$ 1748 million in India (from 2 varieties only).

2.2.3 Overcoming saline soils

Environmental degradation is leading to the incursion of salty water into large areas of formerly productive land or an increasingly arid climate. The long-term goal must be to reduce the core problems leading to such loss of productive land, but in the medium term food must be grown that can survive and flourish in such harsh conditions.

Technologies to measure the amount of salt in soil, to measure uptake in plants and to breed plants for salt resistance are used in combination to support FAO programmes aimed at making saline areas productive again, such as in Pakistan.

2.3 Improving the Health of the Poor

2.3.1 Malaria/AIDS

Malaria affects 300-500 million people per year, with 3,000 deaths per day. Most of these are in poor, developing countries with children under 5 especially vulnerable. The WHO targets malaria as one of the biggest killers of humans worldwide and a major contributor to loss of GDP (Gross Domestic Product).

Quinine-based drugs and DDT have helped, but malarial mosquitoes are becoming resistant to drugs and DDT has been replaced by less effective insecticides because of environmental concerns.

New technologies are providing methods to detect drug-resistant malaria on a large-scale not previously possible. This permits health authorities to plan improved control and surveillance methods.

Similar technology is being considered by the WHO-UNAIDS Committee on AIDS vaccines to assist in vaccine development.

2.3.2 Micronutrient availability and fortification

The immediate concern of governments is to provide sufficient daily protein and calories for their people. However, although protein and calories can ensure basic survival, malnutrition will remain while basic food intake lacks essential micronutrients, such as minerals and vitamins. For example, a lack of iron leads to iron-deficiency anaemia.

Micronutrient malnutrition contributes significantly to poor human health and productivity, increased poverty and delayed economic advancement in Asia. Based on the consensus of the World Summit for Children 1990 and the International Conference on Nutrition 1992, a National Plan on Food and Nutrition has been developed in individual countries to virtually eliminate micronutrient malnutrition in the region.

The Asian Development Bank (ADB) is assisting 6 Asian countries with the key strategies to address this problem. The strategies include supplementation and food fortification, as well as improving crop quality through bio-fortification and diet-diversification. Supportive public health measures involving maternal and child health care, control of infection as well as effective communication are essential to sustain program achievement.

However, such programmes will not succeed fully without information on whether the body accepts or rejects the added nutrients, and on exactly how it uses them. Technologies are now providing information to these ADB-sponsored programmes to establish an information database on nutrient content of fortified foods and to trace the fate of the nutrients in the body.

2.3.3 Diagnosis and therapy

As infectious diseases are gradually conquered and life expectancy is increased, developing countries are experiencing a growth in the incidence and importance of other diseases that require new medical interventions, such as –

- Cancer
- Kidney and liver diseases
- Hypothyroidism and goitre

Nuclear medicine and radiotherapy are providing diagnostic, palliative and curative solutions to the 'new' diseases of developing countries.

2.4 Protecting the Environment

2.4.1 Algal blooms (the "Red Tide" problem)

Climatic conditions are promoting the increasing occurrence of algal blooms in coastal waters. Some, but not all, of the outbreaks contain Harmful Algal Blooms (HABs) that produce toxins that concentrate in shellfish, kill marine life and paralyse or kill human consumers. Therefore, HABs can devastate fishing communities financially, and effect the health of consumers.

The Philippines has suffered about half the HAB outbreaks in the region in recent years, and is spearheading a regional effort that has succeeded in the provision of a simpler, cheaper and faster assay for the presence of the key toxin. Through regional application of new technology, the causes and conditions favouring HAB outbreaks are being understood.

The programme in the Philippines is supported by the World Bank and International Maritime Organisation. The technical advances are shared with other countries in the region through an RCA project.

2.4.2 Urban air quality

Increasing urbanisation, industrialisation, population growth and the use of petrol and diesel transport is putting stress on the on the quality of urban air. The result is an explosive growth in respiratory diseases and the chronic debilitating effects and fatalities that are associated with poor air quality.

Technology can now analyse filters that capture pollutants in the air and provide a "fingerprint" that permits authorities to assess the relative contributions from traffic, industry, forest burn-off etc.

Dhaka City, Bangladesh has an especially bad air quality problem thought to be due largely to the huge amounts of lead being emitted in the exhausts of old-style taxis and trucks. With the confidence provided by the new analytical methods, the Department of the Environment and Dhaka City Corporation, Bangladesh, have proceeded with Air Quality Management and reduction of air pollution programmes and obtained World Bank support.

Authorities in the Philippines with the assistance of the World Bank have been able to proceed with greater confidence to introduce lead-free gasoline and then monitor its effects, while the Central Control Board, India has put in place a sampling programme to assess inhalation hazards.

Sharing of information and expertise across the region is being undertaken via an RCA project that was initially funded by the UNDP.

2.4.3 Dam safety and sustainability

Dams provide water, irrigation, flood protection and clean hydropower for many developing countries in the region. They are long-term investments and millions of dollars are spent in preventing leakage, sediment build up and catastrophic failure of the structure.

Technology has been proven to –

- Detect leakage and seepage through dam walls, dam floors and abutments.
- Monitor sedimentation that depletes capacity and can signal erosion that may precede structural failure.

Tracer technologies have been used to guard against dam failure and to assist in the sustainable use reservoirs in projects in South America. Pakistan, India and Indonesia have also been successful in applying the technology. The World Bank is financing dam safety and leakage projects in Thailand and Sri Lanka. An RCA project is bringing the skills dam managers need in tracer technology more widely to countries in the region.

3. The Role of Partnerships

A feature of most of the examples of improving the welfare of the poor in developing countries is that a partnership between agencies providing technical expertise and the end user and/or funding agencies has been essential to their success. Such partnerships ensure that technical expertise is correctly targeted to the most pressing problems and that results are taken up and applied. At the same time, partnerships provide the end user with technical assistance to more effectively and efficiently achieve their goal.

For several decades the IAEA has been a development partner with national governments seeking to build up human capacity and resources in the IAEA's areas of technical competence. Recent decades have seen these partnerships develop further in order to assist –

- transfer of technology from the R&D institutes to the private sector.
- solving of problems related to the development priorities of national governments through partnership with end users of technology.
- regional development, including participation for 30 years in the RCA. This included participation in the recently concluded Joint UNDP/RCA/IAEA Project targeting technology transfer, sustainable industrial growth and environmental management.

The network of nuclear institutes represented by the RCA and partnered by the IAEA includes institutes in advanced, developing and least developed countries. The capacity and capability that can be organised through such networking is substantial, and through the IAEA it can be extended to inter-regional collaborations. All this is available to IAEA member states in the region.

However, all the examples of WEHAB-related projects provided earlier have also been characterised by IAEA partnership with appropriate national end users such a municipal authorities (water and air quality), rural development and agricultural extension agencies (plant breeding), health authorities and private industry

The WEHAB examples emphasised partnerships of the IAEA with major organisations such as the World Bank, Asian Development Bank and UN organisations such as FAO, UNDP and WHO. Through its Technical Co-operation programmes, the IAEA is a credible partner for governments and international agencies. This credibility stems from:

- Linking science to human development needs, through a process of -
    - Capacity building
    - Research and innovation
    - Adaptation for 'fitness for purpose'
    - Application to solve national development problems
    - Evaluation and assessment.
- Rapid project implementation through -
    - Long experience in putting expert missions, training events and automated procurement of equipment into rapid effect
    - A two year programming cycle that keeps national projects relevant and timely.
- Financial stability through -
    - Predictable and assured regular budget based on the UN assessed scale, but independent of the UN system
    - Extra-budgetary contributions to the Technical Co-operation Fund used to deliver goods and services directly to member states
    - Voluntary Fund linked to the Non-Proliferation Treaty.
- Ownership and sustainability, through
    - Regional co-operation mechanisms
    - Leadership of projects by member states
    - A strong regional base of expert services and host institutions
    - Mechanisms for 'outsourcing' of implementation activities to institutions in the region.

4. Integrated Applied Technologies

Another feature of most of the examples of solving development problems is that a range of technical expertise was necessary to be successful. UN policy requires its agencies to increase collaboration, to avoid duplication and to facilitate synergies. Within this policy, it is recognized that the appropriate use of the knowledge of specialist agencies within development programmes, especially those that can deliver science and technology solutions, should be increased.

A strength of the IAEA, through its TC programmes, is that it has at its disposal a wide range of analytical, molecular biology, tracing and high energy sterilisation and processing techniques that can contribute to providing solutions to development problems of the type outlined earlier.

IAEA technologies can be broadly classified as using isotopes or radiation processes backed by research, theoretical and modelling experience. Isotope techniques often use the stable isotopes that are naturally present in all materials. The equipment needed is found in many chemical analytical laboratories. Stable isotopes provide –

- a 'fingerprint' (e.g. sources of water or sources of pollutants)
- a 'tracer' (e.g. uptake and availability of nutrients).

Sometimes the isotope tracers used are radioactive (e.g., for studies of sedimentation, molecular biology, bioassays). Radioactive isotopes are often provided from the output of small research reactors that are now available throughout many developing countries in Asia.

A range of methods for broad-spectrum analysis of elements (e.g., in air pollutants) and for industrial-scale sterilisation and processing are based on the availability of small research reactors and on technology that is similar to that found in hospitals.

The 2002 Review of IAEA Technical Co-operation Strategy endorsed as the strategic goal for TC–

> **To increasingly promote tangible socio-economic impact by contributing directly in a cost-effective manner to the achievement of the major sustainable development priorities of each country.**

A **Central Criterion** used as the basis for TC programming requires a demonstration that there is a related national programme of high priority to the government with financial support. Alternately, a project may enhance a necessary infra-structure such as those related to a core or mandated Agency competency, for example, regulations and safety.

To ensure that the strategic goal and the Central Criterion are met, projects requiring TC support must also have the support and commitment of end users and demonstrate that nuclear technology has a unique advantage or can add value to other techniques being applied to a problem.

When the Agency's portfolio of techniques is added to its ability to partner with other agencies, the result can be a powerful ability to 'customise" solutions to solve problems. Depending upon the problem, the Department of TC can:

- Recommend nuclear-based methods where these are sufficient to solve the problem in a more effective way than non-nuclear methods.
- Recommend a nuclear-based method(s) to contribute as part of a wider technical approach to a problem.
- Marshall the resources of the national institutes that it has helped to establish and, particularly, use the various Regional Resource Units or Centres or Excellence and the individual experts from the region.
- Establish a practical working relationship with the other agencies that are either the end user or funding agency, and play an integrating role with the agencies that provide other technical contributions to solving the problem.

5. Conclusion

Technology is just beginning to contribute to improving the welfare of the region's poor. However, there are promising signs for the future provided appropriate technologies are brought together and work in partnership with the skills of the non-technical agencies requiring assistance.

The IAEA, through the range of technologies and R&D institutes it develops and supports in its TC programmes, and through its experience and credibility as a partner agency, is ready to play its role in assisting the developing countries of the region. The Agency intends to –

- Contribute further to meeting the WEHAB goals agreed to by countries in the region at the WSSD.
- Expand partnerships between R&D institutes and World Bank, ADB, WHO and FAO.
- Foster new partnerships with other regional agencies such as the Mekong Delta Commission, ESCAP and JICA.
- Encourage greater collaboration and synergy between the programmes of IAEA/RCA and FNCA.

Summary Report of the Third Senior Officials Meeting (SOM)

1. The Third Senior Officials Meeting (SOM) was held in Seoul, Korea, co-hosted by the Ministry of Science and Technology of Korea and the Atomic Energy Commission, Cabinet Office of Japan on October 30, 2002 with the participation of the Senior Officials of the FNCA countries. List of the participants is attached (attachment 1).

2. Mr. Chung Won Cho, DG, Atomic Energy Bureau, MOST made opening address.

3. Agenda of the Third SOM was adopted as proposed (attachment 2)

4. Item 1

The report on the Conclusion of the Third FNCA Coordinators Meeting (CM) and on progress in FNCA activities after the last SOM in 2001 was introduced by the FNCA Coordinator of Japan for discussion. The ongoing FNCA projects were noted for their remarkable achievements and progress, namely "Radiation Therapy for Uterine Cervix Cancer", "Nuclear Safety Culture", "Radioactive Waste Management" and "Public Information of Nuclear Energy".

The SOM also noted that three new projects "Application of Electron Beam Accelerator", "Tc-99m Generator Production" and "Bio-fertilizer", which were approved at the last SOM were initiated in 2002 as planned and their work plan has been formulated.

The strategic plans of the project on “Public Information for Nuclear Energy” and the project on “Human Resources Development” agreed upon at the 3rd CM were endorsed by the SOM.

5. Item 2

Under the item on "Management and Operation of FNCA Activities", the proposal that the project on "Sustainable Development and Nuclear Energy in Asia" recommended by the 3rd CM be forwarded to the Third FNCA meeting was endorsed by the SOM. It was noted that the funds for the projects has not been secured.

As for the project on the "Asian Institute of Nuclear Science and Technology (AINST)" proposed by Indonesia, it was suggested that this be re-examined in the view of the ongoing IAEA project on International Nuclear University.

The proposed project on "Marine Environmental Pollution Research and Monitoring Using Nuclear and Nuclear Related Analytical Techniques" was endorsed subject to the revision not to duplicate the RCA activities. It was also noted that the proposal may have some synergy with the ongoing project in "NAA Application for Monitoring Airborne Particles"

With regard to the operation rules of project the SOM endorsed the conclusion of the Third CM on the function of project leading country and the duration of project.

6. Item 3

The anticipated elements of the statements from the Ministerial Level Representative of each country were briefly introduced for two topics, "Strategy of Human Resources Development" and "Sustainable Development and Nuclear Energy", and comments on the current situation for some countries were presented.

With regard to the first topic "Strategy of Human Resources Development," The Senior Officials underlined the importance of the human resources development in terms of knowledge preservation and recruiting the young generation in the field of nuclear science and applications. They also recognized the necessity of feasibility study on the Asian regional networking scheme for nuclear research and training. Participating countries agreed on the importance of networking not only at the national level but also at the regional level, and emphasized the opportunity to make most of the existing information and knowledge currently available, using the IT assisted educational methodology.

Regarding the second topic "Sustainable Development and Nuclear Energy," the statement that the Nuclear Energy is an important option for sustainable development in the context of economic growth, national energy security, Kyoto Protocol and CDM, was introduced by Japan. The participating countries shared their views on that matter. It was agreed that the

comment by the Ministers will be duly reflected at the summary report of the Third FNCA Meeting.

As for the new project in this field proposed by Indonesia, constructive comments on the scope and methodologies were made and it was suggested that the project be further focused reflecting the following aims:

1. To share the tools, methodologies such as developed by IEA and IAEA for energy planning and the use of these to assist in the assessment of least cost production of electricity and GHG emissions from different energy mixes;
2. To share the results of these studies with other countries in the FNCA so that the regional picture of energy demand and impact of energy mix on GHG emissions can be developed, taking into account the energy security of the region;
3. For those countries interested in undertaking economic feasibility studies to share relevant economic methodologies and assist the use thereof, in order to assess the break even points for small/medium/large reactors in interested countries.

It was agreed that the outcome of such a study could assist in the formulation of national energy policies and that a modified version of the project will be submitted to the next Coordinators Meeting in Japan for adoption of the revised project/work plan.

7. The representative from IAEA made observation about this project proposal since some parts of the proposed work scope have already been carried out under RCA, thus synergy effect could be further sought.

8. The report of the SOM should be submitted to the MM for its consideration.

2-1 Agenda of the Senior Officials Meeting (SOM) of the third FNCA Meeting

1) Date: Wednesday, October 30, 2002
2) Place: ASEM Hall, COEX, Seoul, Korea
3) Sponsored by: The Ministry of Science & Technology (MOST) of Korea
   The Atomic Energy Commission (AEC), Cabinet Office of Japan
4) Supported by: The Korea Atomic Energy Research Institute (KAERI)
   The Korea Institute of Nuclear Safety (KINS)
   The Korea Cancer Center Hospital (KCCH)
   The Korea Hydro and Nuclear Power Company (KHNP) and
   The Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan
5) In Cooperation with: Japan Atomic Industrial Forum, Inc. (JAIF)
6) Basic Theme: "Atoms for the Next Generation "
7) Working Language: English

Wednesday, October 30

Senior Officials Meeting (SOM)

09:00 **Registration**

10:00-10:15 **Opening**

- Opening Address:
  Dr. Chung Won Cho
  Director General, Atomic Energy Bureau
  The Ministry of Science and Technology (MOST)
- Self-introduction of Participants

10:15-11:15 Item **1**

"Report on Third FNCA Coordinators Meeting (CM) and Progress of FNCA Activities"

Chair:
Mr. John Keuk Chung
Public Information and International Cooperation
The Korea Atomic Energy Research Institute (KAERI)

Lead-off Speaker:

Dr. Sueo Machi, FNCA Coordinator of Japan

11:15-12:15 Item **2**

"Management and Operation of FNCA Activities"

Chair:

Dr. Vuong Huu Tan, Chairman

Vietnam Atomic Energy Commission (VAEC)

Lead-off Speaker:

Dr. Sueo Machi, FNCA Coordinator of Japan

- Proposal of New Projects
- Operation Rules of Projects

12:15-13:45 **Lunch jointly hosted by MOST of Korea and AEC of Japan**

< at Room 203, 2nd Floor, COEX >

13:45-16:00 Item **3**

"Preliminary Talks on Round Table Discussion of MM"

Chair:

Dr. Chung Won Cho

Director General, Atomic Energy Bureau, MOST

Topic 1: Strategy of Human Resources Development

- Lead-off Speaker: Dr. Kyung Won Han

  Head of Nuclear Training Center

  Korea Atomic Energy Research Institute
- Introduction of each country's view
- Discussion

Topic 2: Sustainable Development and Nuclear Energy

- Lead-off Speaker: Mr. Soichi Nagamatsu

  Deputy Director General for Science and Technology Policy

  Cabinet Office of Japan
- Introduction of each country's view
- Discussion

16:30-17:00 **Closing**

Chair:

Dr. Chung Won Cho

Director General, Atomic Energy Bureau, MOST

Rapporteur: Korea and Japan

with assistance of Australia and Malaysia

- Summary Report of SOM

Closing Remarks: Mr. Soichi Nagamatsu

Deputy Director General for Science and Technology Policy

Cabinet Office of Japan

19:00 **Welcome Reception and Dinner hosted by**

H.E. Dr. Young Bok Chae, Minister of Science and Technology

< Welcome Reception: at Zelkova, 2nd floor, COEX Inter-Continental >

< Dinner for Head Delegates: at Mercury, 30th floor,

COEX Inter-Continental>

2-2 Report to the 3rd FNCA Meeting

2-2-1 Report on the 3rd FNCA Coordinators Meeting and Progress of FNCA Projects

1. The 3rd FNCA Coordinators Meeting (CM)

(1) The meeting was held from March 6-8, 2002 in Tokyo with the representatives from all FNCA countries. The meeting agenda is attached as *Annex-1*

(2) The Minutes of the meeting are attached as *Annex-2*

(3) Major conclusions are following:

1) The on-going projects including 3 new projects were reviewed and work plan was approved.

2) It was confirmed that the FNCA projects have gained specific focus with the significant shifts in project management from a meeting-oriented approach to a problem-solving one. (Attachment 1 of Annex-2)

3) In order to strengthen the partnership and commitment of participating countries, the role of leading country of project have been clarified and the duration of project has been agreed to be 3 to 5 years as Attachment 5 of *Annex-2*.

4) The strategic plan of the PI project was discussed and formulated as the attachment 4 of *Annex-2* to be submitted to the 3rd FNCA Meeting for its endorsement. The proposal of Joint Survey on "Radiation" for high school student was approved to be implemented in 2002.

5) The strategic plan of Human Resources Development (HRD) Project was agreed as shown in the attachment 4 of *Annex-2* to be submitted to the 3rd FNCA Meeting for its endorsement. The Survey of basic data on HRD in each FNCA country was approved.

6) Four project proposals were reviewed (Item 2).

7) The theme of the 3rd FNCA Meeting "Atoms for the Next Generation" proposed by Korea was supported.

2. Major Progress of FNCA Projects

(1) Radiotherapy of Uterine Cervix Cancer

The project on "Radiotherapy of Uterine Cervix Cancer" has achieved remarkable progress in 210 clinical tests of advanced protocol in participating countries for 5 years. Survival rate for phase III-B patients at 5 years after treatment using the protocol is 54% and the local control rate of tumors is 82%, which show remarkable improvement. The guidebook on the treatment protocol has been published in 2002 for therapists. At the RCA/IAEA Training Workshop on Radiation Oncology held in Japan, this protocol was used. This is a good example of the synergy between the FNCA and the RCA.

(2) Mutation Breeding

The project on "Mutation Breeding" has started a new specific research programme to develop new varieties of drought-resistant sorghum and soybean in 2002, and will also start the development of insect-resistant orchid in 2003. The mutant stock repository for rice has been in operation in Thailand and the Philippines since 2001.

(3) Public Information (PI) for Nuclear Energy

According to the agreement at the 3rd CM, the project on "Public Information (PI) for Nuclear Energy" has carried out the joint survey on "Radiation" for 1,100 high school students in each of the eight participating countries. The results are currently being analyzed to be used for better strategy of PI. A strategic plan of the FNCA project on PI was agreed upon at the 3rd CM as shown in Attachment 4 of the *Annex-2* to be submitted to the 3rd FNCA Meeting for its endorsement.

(4) Nuclear Safety Culture for Research Reactor

For the project on "Nuclear Safety Culture for Research Reactors", self-assessment has been conducted in FNCA countries in reference to the IAEA Safety Convention for NPPs in order to identify the areas for further improvement in fostering safety culture and improving safety management, and the results have been reviewed at the project workshop. At the last project workshop in 2001 "the peer review of safety culture for research reactor" was agreed upon and the first review will be carried out in Vietnam, on the research reactor of Dalat Nuclear Research Institute in conjunction with the project workshop in January 2003.

(5) Human Resources Development (HRD)

As for the project on "Human Resources Development (HRD)", the 3rd CM revised the draft overall strategic plan of HRD project prepared by the FNCA Coordinator of Japan as attachment 4 of *Annex-2* to be submitted at the 3rd FNCA Meeting for its endorsement. The survey of basic data on HRD namely, currently available human resources and the demand to meet national programme are being carried out in FNCA participating countries, which is useful to formulate a national strategy of HRD and the strategy of FNCA's HRD project. The survey and its analysis will

be completed in 3 years according to the work plan agreed by the HRD Workshop in October 2002. Taking into account the results of survey the HRD Project strategy will be revised.

(6) Nuclear Activation Analysis (NAA) Application for Monitoring Airborne Particle

Environmental protection is a long standing serious issue in FNCA countries. The project on "Nuclear Activation Analysis (NAA) Application for Monitoring Airborne Particle" is developing "Ko- method", which greatly improves efficiency of NAA to be affordable in measurement of large number of environmental samples. The Chinese expert has played an important role for the improvement of Ko-method. The sampling of airborne particles is being conducted using filters provided by Japan.

(7) Radioactive Waste Management (RWM)

In the project on " Radioactive Waste Management (RWM)" the Task Group for the sub-project on "Management of Spent Radiation Source" had successful visits to relevant facilities and discussion to further improve the management in Indonesia and Korea in 2002. The consolidated report on RWM is about to be published in December 2002.

(8) Tc-99m Generator Production

New projects on "Tc-99m Generator Production" has started to develop the technology to prepare Tc-99m generator using Mo-99 produced by (n, γ) reaction using Poly-Zirconium Compound (PZC) adsorbent. There has been remarkable progress in design of production system of the generator based on bench scale cold test in Japan. A larger bench scale semi-automatic plant will be installed in BATAN, Indonesia and tested using radioactive Mo-99 before and during the next FNCA Workshop in early 2003. The PZC has been distributed from Japan to participating countries

for their experiments.

(9) Biofertilizer

The project on "Biofertilizer" approved in 2001 has formulated the work plan including the field demonstration in participating countries after 2003. N-15 tracer technique and radiation sterilization will be used for the selection of suitable rhyzobia and preparation of the carrier, respectively.

(10) Application of Accelerator

In the project on "Application of Accelerator" approved last year, the project work plan has been formulated at the 1st Workshop for liquid, solid (powder and thin film) and gaseous targets. At the 2nd Workshop demonstration for liquid system will be conducted by the Japan Atomic Energy Research Institute (JAERI) in December 2002. Cost analysis will be an important element of study.

2-2-2 Management and Operation of FNCA Activities

1. Proposals of New Project

(1) Sustainable Development and Nuclear Energy

"Sustainable Development and Nuclear Energy" is an important issue and was discussed at the 2nd FNCA Meeting followed by two expert meetings participated by China, Indonesia, Japan, Korea and Vietnam. The meetings fully recognized the important roles of nuclear energy in the reduction of GHG (Green House Gas) and the diversification of energy sources, and formulated a work plan as *Annex-3*. The 3rd CM recommended that the 3rd FNCA Meeting should approve a project on "Sustainable Development and Nuclear Energy in Asia". The endorsements or approvals of the SOM and the MM are sought.

(2) Asian Institute of Nuclear Science and Technology (AINST)

The project proposal in 2001 on "Asian Institute of Nuclear Science and Technology (AINST)" from Indonesia was suggested by the 3rd CM to be further investigated by the Workshop of HRD project. The Workshop held on October 8-10, 2002 suggested the AINST concept should be further evolved to maximize the benefits to FNCA participating countries. Feasibility of networking scheme of existing nuclear research/training centres and universities should be studied as pointed out by the strategic plan of the HRD project.

(3) Marine Environmental Pollution Research and Monitoring Using Nuclear and Nuclear-related Analytical Techniques and FNCA Database

The project on "Marine Environmental Pollution Research and Monitoring Using Nuclear and Nuclear-related Analytical Techniques and FNCA Database" (*Annex-4*) proposed by Vietnam was briefly discussed at the 3rd CM in 2002. The meeting

suggested that the FNCA Coordinator of Japan should consult with the IAEA to avoid duplication. In the consultation it was noted that the measurement of radioactivities in marine is being implemented by the RCA Project RAS 8/083 (*Annex-5*). Therefore, a part of the Vietnam proposal on monitoring radioactivities should be deleted. The remaining part, namely monitoring toxic heavy metals in marine may be implemented in combination with ongoing FNCA project on "NAA Application for Monitoring Airborne Particles." because NAA is also useful for the measurement of heavy metals in marine. The proposal will be re-submitted by Vietnam after modification taking these points into consideration for discussion at the next CM.

(4) Nuclear Instrumentation Maintenance Network

The project on "Nuclear Instrumentation Maintenance Network" (*Annex-6*) was proposed by Indonesia just before the 3rd CM and briefly discussed. Some representatives suggested to avoid overlapping with the RCA project with similar activities. In RCA there is no project on instrument maintenance though RAS/4/017 for maintenance of analytical instrument not including medical instruments was initiated in 1999 (*Annex-7*) and implemented through Technical Cooperation among Developing Countries (TCDC) as the regional project and not RCA.

The malfunction of nuclear instruments in medical and scientific institutions is long-standing problem due to the lack of proper maintenance. The proposal includes establishment of the maintenance programme and the training for trainers focusing medical instruments. The consultation and discussion should accordingly be made by e-mail, and an expert meeting should be organized subject to availability of funds for the preparation of maintenance strategy. The more refined and detail plan should be submitted to the 4th CM in 2003 for discussion and approval.

2. Operation Rules of Project

The roles of leading country and the duration of FNCA project were reviewed by the 3rd CM and the rules described in Attachment 5 of *Annex-2*, were adopted. The rules have been in effective since FY 2002.

Table: Projects and Leading Countries

Fields and Projects	Leading Countries
1. Utilization of Research Reactor	
1) Tc-99m	Japan, Indonesia
2) Neutron Activation Analysis	Japan
3) Neutron Scattering	Japan
2. Application of Radioisotopes and Radiation for Agriculture	
1) Mutation Breeding	Japan
2) Bio-fertilizer	Vietnam, Japan
3. Application of Radioisotopes and Radiation for Medical Use	Japan
4. Public Information of Nuclear Energy	Japan
5. Radioactive Waste Management	Japan
6. Nuclear Safety Culture	Australia
7. Human Resources Development	Japan
8. Industrial Application	
・Electron Beam Accelerator	Japan, Vietnam