NEWSLETTER

RADIOACTIVE WASTE MANAGEMENT

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The FNCA 2004 Workshop on RWM to be held in Kuala Lumpur, Malaysia at the last week of September 2004

The FNCA 2004 Workshop on radioactive Waste Management (RWM) is scheduled to be held from September 27 to October 1, 2004.

The workshop will be hosted by Malaysian Institute for Nuclear Technology Research (MINT) in cooperation with Atomic Energy Licensing Board (AELB) as the local host organizations, and the Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan, in cooperation with Japan Atomic Industrial Forum, Inc. (JAIF)

In the workshop, each representative from FNCA countries will report on progress status of radioactive Waste Management including action plan on the safety and security of Spent Radiation Sources (SRS) and Radioactive Wastes as country reports.

Following the country reports, roundtable discussions and sub-meetings focused on following issues will be discussed.

- Regulatory aspects including exclusion, exemption, and clearance on NORM/TENORM.
  NORM; Naturally Occurring Radioactive Material
  TENORM; Technologically Enhanced Naturally Occurring Radioactive Material
- Waste treatment and characterization
- Siting activities and safety assessment for disposal of Low and Intermediate Level Waste (LILW)
- Disposal of LILW including waste acceptance criteria

2004's activity on TENORM Task Group will be reported to the participants for further discussion. And evaluation of past activity in FNCA RWM Project will be done. The 3-year work plan for 2005-2007 will be discussed, too.

Tentative Schedule of the RWM Workshop

Sunday, September 26

Arrival of overseas participants at Kuala Lumpur City

Monday, September 27

The 1st day of the Workshop
- Country Report
- Roundtable discussion: Evaluation of past activities (Project Review)

Tuesday, September 28

The 2nd day of the Workshop
- Sub-meetings to be open to wider audience
- Mini-exhibition/Poster presentations

Wednesday, September 29

The 3rd day of the Workshop
- Technical visit to NORM/TENORM related facility
- Technical visit to MINT and AELB

Thursday, September 30

The 4th day of the Workshop
- Roundtable discussion and/or Sub-meeting

Friday, October 1

The final day of the Workshop
- Roundtable discussion on the 3-year work plan
- Closing Session

The Persons taking Charge of the RWM Workshop from Local Hosting Organizations

Dr. Syed Abdul Malik Syed Zain
FNCA RWM Project Leader of Malaysia
Manager, Radioactive Waste Management Centre
Technical Services Division
Malaysian Institute for Nuclear Technology Research (MINT)

Mr. Nik Marzukee Nik Ibrahim
Radioactive Waste Management Centre
Technical Services Division, MINT

Mr. Mohd Yasin bin Sudin
Director of Enforcement Division
Atomic Energy Licensing Board (AELB)
Ministry of Science, Technology & The Environment

Recent Trend in the Safety Policy for Radiation Protection and Radioactive Waste Management in Japan.

Prof. Toshiso Kosako
FNCA RWM Project Leader of Japan
Associate Professor, Engineering Research Center for Nuclear Science and Technology,
The University of Tokyo

Dr. Hidenori Yonehara
Team Leader
Radon Research Group
Research Center for Radiation Safety
National Institute of Radiological Sciences (NIRS)

The Regulatory System for the management and control of radiation sources in Japan will be considerably changed in 2005. A major revision of "The Law concerning Prevention of Radiation Hazards due to Radioisotopes, etc." has already been carried out. The detailed provisions in governmental and ministerial ordinances under the law will be prepared by June 2005. The main goal of the revision is to introduce and implement the exemption level provided in the IAEA International Basic Safety Standards (BSS). As the exemption levels for sealed sources will become more stringent in the new regulation system, various types of instruments containing a radiation source, such as a smoke detector or a small check radiation source, which are currently not regulated in the current system will be subject to regulation under the new system. To avoid confusion and to ensure a smooth transition among the general users, a new design approval system will be established for the regulation of these types of sealed radiation sources. In addition to the introduction of the international exemption level, a legal basis for the land disposal of radioactive waste from facilities will be prepared in revision of this system. All radioactive waste currently arising from a radiation source and/or a radioactive material facility under regulation has been to date kept in temporary waste storage facilities, awaiting the possible of available future land disposal.

In the IAEA, a coherent system for the concepts of exemption, exclusion and clearance has been discussed for a number of years. After the IAEA was requested, in the General Conference held in 2000, to discuss the establishment of the level for radioactive concentrations for the smooth international trade of commodities by some countries whose territories were contaminated by the Chernobyl accident, the Radiation Safety Standard Committee (RASSC) and the Waste Safety Standards Committee (WASSC) began to discuss this issue. From the results of discussions over a period of more than 3 years, a Draft Safety Guide (DS161), entitled "Application of the Concepts of Exclusion, Exemption and Clearance" was approved by the Committees in March 2004. The exclusion levels for radionuclides of natural origin and the exemption levels for radionuclides of artificial origin in bulk amount were provided in the document. The exemption level given in Schedule I of the BSS can be applied only to the exemption of moderate quantities of materials which is considered to be less than 1 ton. The levels for 257 artificial radionuclides were provided which were derived with calculation based on dose criteria of 10 µSv/y for normal situation of exposure and 1 mSv/y for only low probability events. The natural radionuclides were derived using the concept of "exclusion" prescribed in BSS. The values were selected on the basis of consideration of the upper end of the worldwide distribution in soil reported in The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR). The value for K-40 was selected to be 10 Bq/g and the value for all other nuclides, such as U-238 and Th-232, was selected as 1 Bq/g. In relation to the application of the values provided in the document, the values were selected for application to the general regulation of radioactive materials and to the clearance level and to regulatory control in national and international trade of commodities. These values for radionuclides of artificial and natural origin were referred in draft of a new ICRP recommendation as "exclusion level". This implied that the values would be used widely as the lowest values on the scope of regulation in future.

The clearance level for radioactive waste released from nuclear facilities under nuclear safety regulation in Japan had been discussed in committee meetings of the Nuclear Safety Commission (NSC) of Japan. The clearance based on the concept provided in IAEA TECDOC-855 was considered and values of clearance level for different types of nuclear facilities, such as

Table 1: Comparison of values for exemption and clearance provided by IAEA, NRC and Japan (Bq/g)

Nuclide	Exclusion Exemption Clearance	Exemption	Clearance		
	DS161	BSS	TECDOC-855	TECDOC-1000	NRC, Japan
H-3	100	1,000,000	1,000-10,000	1,000,000	200
C-14	1	10,000	100-1,000	10,000	5
K-40	10	100	-	-	-
Mn-54	0.1	10	0.1-1,000	-	1
Co-60	0.1	10	0.1-1	-	0.4
Sr-90	1	100	1-10	-	1
Cs-134	0.1	10	0.1-1	-	0.5
Cs-137	0.1	10	0.1-1	-	1
Eu-152	0.1	10	0.1-1	-	0.4
Eu-154	0.1	10	-	-	0.4
U,Th (Natural)	1	1	0.1-1	1 (Th-232)	-

major types of nuclear reactors including heavy-water reactor, fast reactor, and facilities for nuclear fuel were calculated using exposure scenarios and parameters which are suitable to specific Japanese conditions. After the DS161 was approved, NSC started to consider the validity of the clearance level for Japanese nuclear facilities calculated in NRC in comparison with the condition of the derivation of values in DS161. The regulatory bodies would establish following the results of the discussion in the NSC, the system of clearance of waste released from nuclear facilities within one year. The values for exemption and clearance for major nuclides provided by IAEA TECDOC and DS161, and NSC are shown in the Table 1. Because differences among these values may cause some confusion among general public, the values provided in DS161 can be considered to be a unitary standard value for general clearance level as most conservative values.

The new ICRP recommendation is planned to be published in 2005. The concepts of exclusion, exemption and clearance which are provided in the framework of previous recommendation should be reconsidered under new framework of radiation protection.

National Uniformity for Radiation Protection in Australia and the Implications in regard to NORM

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FNCA RWM Project Leader of Australia
Waste Operations & Technology Development
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Australian Nuclear Science & Technology Organisation (ANSTO)

The application of radiological protection regulations is currently not uniform throughout Australia. There are nine separate jurisdictions (State, Territory and Commonwealth) having responsibility for radiation safety legislation associated with artificial and naturally occurring radioactive material (NORM). The lack of uniformity in areas such as licensing, exemption limits and definitions (see Table 1), and the fact that some parts of regulations in individual jurisdictions do not meet current international best practice, creates problems across jurisdictions.

The development of acceptable and uniform national radiation protection legislation became one of the responsibilities of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), when it was

Table 1: Current and Proposed Exemption Levels for Radioactivity in Australia

State or Territory	Exemption Requirements
Current	
Queensland (QLD)	BSS exemption levels on individual radionuclides
Western Australia (WA)	Total activity concentration 30 Bq/g
Victoria (VIC)	Total activity concentration 30 Bq/g
Tasmania (TAS)	Total activity concentration 31 Bq/g
South Australia (SA)	Total activity concentration 35 Bq/g
New South Wales* (NSW)	Total activity concentration 100 Bq/g AND if $\left(\frac{A_1}{40}+\frac{A_2}{400}+\frac{A_3}{4000}+\frac{A_4}{40{,}000}\right)^{**} \geqq 1$
Northern Territory (NT)	Total activity 370 kBq
Proposed	
National Directory for Radiation Protection	BSS exemption levels on individual radionuclides

* In NSW a radioactive ore is defined as (a) in the case of an ore that contains uranium but not thorium, 0.02 per cent by weight of uranium; or (b) in the case of an ore that contains thorium but not uranium, 0.05 per cent by weight of thorium; or (c) in the case of an ore that contains both uranium and thorium, a percentage by weight of uranium and thorium such that the expression: [U/0.02 + Th/0.05] $\geqq$1.
** A_1-A_4 are activities in kBq for different groups of radionuclides in the NSW Regulations.

established as Australia's national radiation protection body to administer the ARPANS Act (1998) and Regulations (1999).

The National Directory for Radiation Protection

The objective of the Directory is "to provide cost effective uniform requirements for protecting people and the environment against harmful effects of ionizing and non-ionizing radiation". After a national competition policy review and a regulatory impact study, 19 recommendations were made and included into 12 national implementation projects. Of these, the eight projects listed in Table 2 relate to national uniformity and the Directory.

Australia is a significant world producer of mineral products and other commodities from a range of mining and mining based industries that have already been identified by IAEA studies as being typically affected by NORM/TENORM issues [IAEA 2003]. These industries are aware of the proposed new regulatory guidelines through workshops and invitations for public submissions, and have had the opportunity to comment on the draft versions of the Directory to express their concerns regarding potential increases in regulatory control and costs. In response to the concerns expressed, ARPANSA has recommended to the Australian Health Ministers, that edition 1 of the Directory is not applied to the mining and mineral production sectors until:

* a further regulatory impact study has been completed;
* a new code for radiation protection in mining and milling is produced; and
* protocols for determining exemption are clarified.

Introduction of the NDRP and Implications Regarding NORM

In addition to the implications for regulators (a regulatory impact statement has been carried out in this regard), some of the issues of concern to the mining industry, who deal or may need to deal with NORM in the future, include the following:

Industry has been concerned that the Directory will lead to greater scrutiny and greater cost with questionable benefits. The proposed exclusion from edition 1 of the Directory to allow more consultation and clarification should allay many concerns1. However, increased costs will arise from the need for more accurate and more expensive analyses and monitoring/reporting requirements, should the need for licencing be required in some industries.

Table 2: National Implementation Plans for the Development of the Directory

Project	Details	Project Status
Fractionation	Dealing with duplication and discrepancies between radiation protection legislation and other industry specific legislation within a jurisdiction (eg, radiation safety, mining, occupational health & safety).	Report from NUIP(RC) expected in March 2004, for consideration in later editions of the Directory.
Regulatory Styles	Consideration of performance-based versus prescriptive approaches.	Consultant's Report received in early 2004, for consideration in later editions of the Directory.
Third-party Certification	Developing a nationally consistent approach to third-party certification systems.	Consultant's report due in early 2004, for consideration in later editions.
National Uniformity	Implementation of the National Directory.	Will be completed with promulgation of Edition 1.
National Incident Register	Developing a national system for incident reporting for radiation incidents	A system for incident reporting is included in Edition 1.
Occupational Licensing	Review of provisions for licensing occupational groups using radiation.	Several groups are included in Edition 1 of the Directory and further work will be undertaken by NUIP(RC) for later editions
Trans-boundary Issues	Examining overlap between jurisdictions, and mutual recognition issues.	Edition 1 addresses this matter by establishing competencies and criteria for uniform application. This will be developed further in later editions
Regional Communities	Establishing principles to ensure policies address the needs of rural, remote and Aboriginal and Torres Strait Islander communities.	Provisions in edition 1 of the Directory address radiology services in rural and remote areas.

Edition 1 of the Directory has adopted:
* the exemption radioactivity limits that are more restrictive i.e. lower, than those in most of the current regulations (see Table 3 for examples); and
* the occupational and public dose limits contained in the IAEA Basic Safety Standard, BSS 115 [IAEA 1996].

Table 3: Comparison of Directory Exemption Levels with Current Jurisdictions and IAEA Exemption Levels (MBq)

	Directory	IAEA	ACT **	NSW	NT	QLD	SA	TAS	VIC	WA
Thorium (nat)	0.001	0.001	4	40	Unlisted	0.001	5	*	4	4
Uranium (nat)	0.001	0.001	4	40	Unlisted	0.001	5	*	4	4
Radium -226	0.01	0.01	0.004	0.04	0.037	0.01	0.005	0.00004	0.0004	0.0004

* The Tasmanian regulations exempt a natural material with concentration less than 31 Bq/g, but do not have an activity limit on quantity. The limit for Th-232 is 0.25 Bq. The limit for U-238 is 1.4 Bq.
** ACT stands for Australian Capital Territory

The Directory and associated Codes and standards may not be interpreted uniformly across Australian jurisdictions. It is in the best interests of industry and Regulators to work closely together to ensure that regulation is implemented in a realistic and practical way and not be too prescriptive.

Management Strategy for Public Acceptance of TENORM Released into the Environment from a Phosphate Fertilizer Industrial Facility in the Philippines

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Release of technologically-enhanced naturally-occurring radioactive materials (TENORM) into the environment is a growing concern in the Philippines with increasing industrial use of raw materials containing natural radionuclides. Among this is the production of phosphate fertilizer from phosphate rocks where its by-product, phosphogypsum (PG), may contain elevated levels of radionuclides particularly radium-226 (^{226}Ra) and radon-222 (^{222}Rn). The Philippine Nuclear Research Institute (PNRI) embarked on an investigative and management strategy to address specific environmental concern by the local residents in the vicinity of the phosphate fertilizer industrial facility located in an island in central Philippines. The study involves collaboration between the industrial facility management, the local government unit (LGU), a non-governmental organization (NGO) and the PNRI with the objective of assessment of TENORM released in the environment and the subsequent management and possible utilization of PG in the LGU reclamation project located in the foreshore of the town.

Radiological assessment of the industrial facility and its vicinity provided data on the potential risk associated with use of PG to ensure radiation protection of the general public. Gamma radiation dose rate measurements using portable gamma spectrometer (BNC SAM 935) and portable scintillometer (Saphymo_Stel Scintillometer SPP_2_NF) within the industrial facility indicated elevated radiation level but confined mostly in the stack ponds and in storage areas for raw ore and fertilizer. Gamma spectral analysis using high purity germanium detector (HPGe) for specific radionuclides in PG from stack ponds showed varying levels of ^{226}Ra and ^{222}Rn activity per pond due primarily to varying concentrations of natural radionuclides in the original raw phosphate ores.

Baseline studies outside of the facility were conducted to serve as benchmark for radionuclide concentrations in soil and marine samples including seawater, sediment and biota. Concentrations of gamma radionuclides in marine samples collected in the foreshore of the industrial plant and in soil samples from various locations within the town showed activity concentrations comparable to radioactivity level elsewhere in the Philippines. The results strongly suggest that ^{226}Ra and ^{222}Rn in PG are not released into the environment at levels that would give rise to radiological hazard to the residents of the town. The activity of PG in certain stack ponds are low enough to be used in the reclamation project provided it is remixed with materials of low radioactivity.

The study assuaged LGU and NGO apprehensions regarding the release of radioactive materials into the environment and its possible health implications if PG is used in the town reclamation project. Thus, the PNRI was instrumental in bridging the perceptual and socio-economic gaps between the LGU and NGO, on the one hand, and the industry, on the other. Public acceptance is needed in the continuous operation and economic growth of industries using raw materials containing naturally-occurring radionuclides. Hence, collaboration between the LGU and the NGO and the Industrial Manager in the study is a management strategy which could be used to promote peaceful uses of nuclear technology including TENORM.

Ambient gamma dose rate measurements by the PNRI team, industrial Manager and NGO using a portable spectrometer and a scintillometer

The Upgrading of Phung Interim Storage

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Vietnam Atomic Energy Commission (VAEC)

Dr. Nguyen Ba Tien
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Institute for Technology of Radioactive and Rare Elements
(ITRRE, VAEC)

In Viet Nam there is no NPP yet, but in the past decades, the applications of the nuclear technology in the field of industry, health service, agriculture, in geological survey, petrol exploitation, and research have rapidly developed. The management of presently utilized sources, spent and non-spent sources, orphan sources, radioactive wastes from laboratories, hospitals and other end-users must consequently be upgraded to meet the requirements of international safety standards.

The Institute for Technology of Radioactive and Rare Elements (ITRRE) is responsible for the treatment and management of all kinds of radwastes in the Northern part of Viet Nam. The Phung Interim Storage Facility is operated by the ITRRE. The Facility is located about 25 km west of Ha Noi. In this facility, there is nearly 130 tons of LLRW that include uranium ores, uranium tailing, waste from monazite processing and other radwastes from research activities from 1981. Starting this year, it is expected that ITRRE will manage, yearly, about 10-30 tons uranium tailing from uranium ores processing, 2-3 tons of solid waste from a monazite pilot plant and nearly 5 tons solid radwastes from laboratories.

Last year, in the technical visit of FNCA Task Group on TENORM Discussion/Survey Meeting in Viet Nam, the Japanese experts noted that some improvements in the infrastructure of the Facility need to be put in place. For example, there is need to put up an individual house for radwastes storage. Untreated radwastes were stored in two concrete tanks. The ground level of the tanks was about 2 m below from the surrounding ground level and this poses some danger due to the potential flooding of this area during the rainy season. Thus an important task of ITRRE is the upgrading the infrastructure of the facility to improve safety of all radwastes.

For this year, ITRRE has started the upgrading by filling up with soil the area where the tanks are set, such that the ground level is now higher than 2 m. The temporary vault for untreated radwaste, the radwaste treatment house, and the new house for treated radwastes were built. The ITRRE is requesting the support from the Ministry of Science and Technology (MOST) of Viet Nam, the International Atomic Energy Agency (IAEA), and the FNCA to upgrade the current laboratory for radioactive waste treatment, to train key personnel and to carry out researches on radioactive waste treatment and management.

The temporary vault for untreated wastes

The radwaste treatment house

The new storage

Announcing New Public Solicitation on Siting for the Radioactive Waste Management Facility in Korea

Dr. Myung-Jae Song
FNCA RWM Project Leader of Korea
President
Nuclear Environment Technology Institute (NETEC)
Korea Hydro & Nuclear Power Co., Ltd. (KHNP)

On February 4, 2004, the Korean government announced a new public solicitation process on siting for the radioactive waste management facility. The government acknowledged the lack of convergence for the resident opinion while selecting Wie-do as a candidate site in 2003. Accordingly, "the resident's self-governing principle" what the resident vote is mandatory is added to the new solicitation process. According to the new process, petition of attraction is open to all the other local communities. The resident vote should be carried out before petition by "the resident vote law" promulgated recently.

New Public Solicitation Process and Itinerary

- Petition of attraction by residents (by May 31)
- Convergence of resident's opinion & preliminary application(by Sept. 15)
- Resident vote & Final application(by Nov. 30)
- Evaluation by site selection committee
- Selection of candidate site(by Dec. 31)

All the processes and activities will be guaranteed and embodied to assure the open solicitation process as follows:

1. Guarantee of open information for site selection plan and facility's safety
   - From site investigation to construction and operation, direct participation of residents will be legislated.
   - The site to be selected by the current process does not include the spent fuel reprocessing facility and the permanent repository for high-level radioactive waste.
   - In order to promote a better understanding about radioactive waste management, "Safety Assurance Group" will be organized and operated.
2. Participation of the public and social groups on the establishment process of energy policy
   - In order to activate the participation and discussion on the promotion process of energy policy, "the public and government joint forum for energy policy" will be organized and operated.

R&D Activities for the Radwaste Management in Korea

Development for the C-14 Sampling and Measurement Device for PWR

In order to monitor C-14 nuclide in PWR, NETEC-KHNP devised the constant C-14 sampling instrument which can collect CO_2 and methane type C-14 separately. It is composed of three main components, such as primary CO_2 sampler, a methane oxidization assembly and a secondary CO_2 sampler. Two-mole NaOH bubblers collect all CO_2 in the gas to produce sodium carbonate (Na_2CO_3). Then, the methane oxidization assembly converts methane and CO to CO_2. The catalyst is composed of equal mixture of Alumina with Palladium to convert methane and CO into CO_2. Retaining time of the gas in catalytic is designed to be about 25 seconds to maximize conversion.

Four sampling instruments were installed in Yonggwang unit 4 on Jan. 2003 to collect the C-14 sample. These sampling instruments will be operated 2 years to produce several kinds of C-14 data. The annual activity is 0.03TBq/GWe, which would be small amount compared to the world's PWR average of 0.22TBq/GWe (UNSCEAR 2000). Based on the result, the environmental effects of C-14 at PWR will be evaluated and will provide us an optimal C-14 monitoring method.

C-14 Sampling Instrument installed in Yonggwang Unit 4

Commercial Vitrification Facility Project Started

In December 2003, NETEC-KHNP officially started the construction project of a commercial vitrification facility at Ulchin nuclear power site. Hyundai MOBIS was awarded the project contract to provide the engineering services, equipment procurement as well as the installation of a commercial vitrification facility. The vitrification facility is scheduled to be installed and begin commercial operation in 2007. The technology has various advantages over the conventional radioactive waste treatment methods, such as remarkable volume reduction and the enhancement of disposal safety.

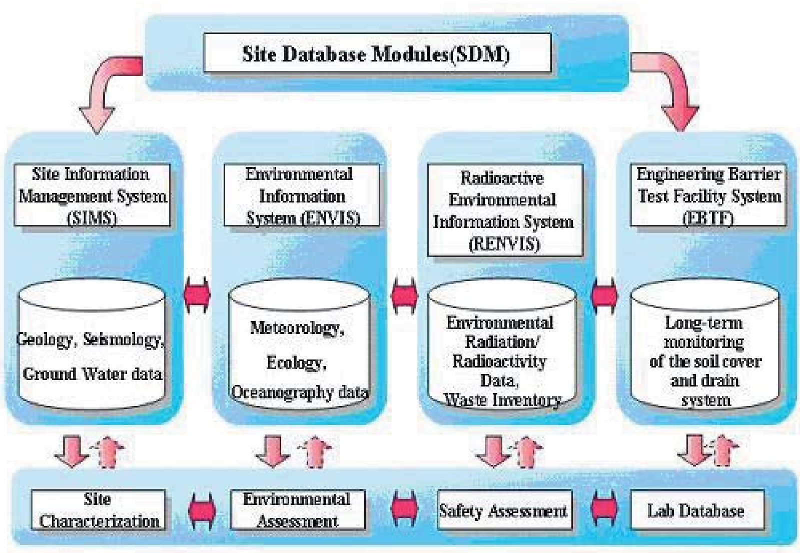
In 1994, NETEC launched a research and development program for vitrification technology in order to treat the low-level radioactive wastes from nuclear power plants. Since then, vitrification process has been developed jointly by NETEC, SGN of France and Hyundai MOBIS. Its performance has been successfully demonstrated through a number of pilot tests which finally led to the accumulation of various data and information for the design and engineering of the commercial vitrification facility.

Project kick-off meeting on January 8, 2004

Development of SITES for Radioactive Waste Disposal Facility

A radioactive waste disposal management facility produces a lot of environmental and site specific information. It also produces the safety assessment data which are required for the licensing documents to the regulatory agency. For the purpose of effective management of those data, the program of the "Sites Information and Total Environmental data management System(SITES)" has been developed in Korea. These piles of data have to be managed institutionally for the effective application. Particularly, the disposal site will be monitored for a long period of time even after its closure.

The SITES is composed of the three modules such as Overview, Sites Database Modules (SDM) and Monitoring & Assessment (M&A). The SDM is composed of four sub-modules such as Site Information Management System (SIMS), Environmental Information System (ENVIS), Radioactive ENVironmental Information System (RENVIS) and Engineering Barrier Test Facility system (EBTF). The Monitoring and Assessment modules will be developed in the near future.



Schematic diagram of the SITES

Dismantling and Conditioning of Radium-226 in Thailand

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Radioactive Waste Management Program (RWMP)
Office of Atoms for Peace (OAP)

The sealed radium-226 source was primary used for more than 40 years in the country, in medicine as in the form of needles - tubes for brachytherapy and applicators for external betatherapy. In industrial, research and educational utilizations, Ra-226 sources were used as coal level gauges, lightning preventors and calibration sources, which all these sources were needed to be dismantled. The dismantling of Ra-226 coal level gauge using an electrical blade for cutting the weld of lead container, automatic sawing the source stem behind shielding and the sources after dismantling were shown in Figure 1, 2 and 3 respectively.

The strategy of safe management of spent radium sources was the optimization of conditioning technique. The approach comprised the encapsulation of spent radium sources in a stainless-steel capsule, capsule-lid welding, leakage test, following by placing the radium capsules in a special designed lead container (Figure 4), welding the lead-lid, putting the lead container in 200 L concrete-lined steel drum and locking the container inside the drum with the coded-steel bar. For the safe interim storage, the drums were then closed by their lids with the appropriate security seal.

From 17 - 28 May 2004, the second radium conditioning was operated by the support of International Atomic Energy Agency (IAEA) under the national workplan for managing radioactive waste in Thailand : INT/4/131 together with the cooperation of the experts from Korean Atomic Energy Research Institute (KAERI). As the conditioning results, the 477 pieces of 1923.75 mg (71.18 GBq) of radium sources were conditioned in 6 packages (200 L concrete-lined steel drums), coded, radiation dose rate measured and safely stored at OAP interim storage. The Ra-226 conditioned drums and the conditioning operation team were shown in Figure 5 and 6.

Figure 1: Weld Cutting

Figure 2 : Automatic Sawing

Figure 3 : Ra-226 after Cutting

Figure 4 : Placing Ra-226 Capsule

Figure 5 : Ra-226 Conditioned Drums

Figure 6 : Operation Team

Security System Upgrade for The New Interim Storage Building

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National Nuclear Energy Agency (BATAN)

Based on the vulnerability assessment report of BATAN, the following is one the threatened situations around Radioactive Waste Management Center (RWMS):

Theft of radioactive sources stored as wastes in the interim storages which may result in direct threat in the form radiological dispersion affecting the general public health or in indirect threat in the form of political and/or financial blackmail to the authority which in turn will make the authority lost its credibility.

In attempting to address the threats from malevolent acts involving spent radioactive sources, there are several components that must be considered:

- Management of sources only within an authorized, regulated, legal framework.
- Prevention of acquisition of spent radioactive sources by those with malevolent intent.
- Detection of actual theft or loss in order to appropriately respond and allow recovery efforts to start as soon as possible.

RWMS-BATAN is now developing a security system for the new interim storage building (that has been inaugurated by the Chairman of BATAN on August 19, 2004) where many spent radiation sources coming from hospitals and industries will be stored. The system includes the development of administrative and technical measures. This system is an integrated concept of safety and security involving safety arrangements, radiation protection measures and appropriate design to achieve the necessary level of protection against unauthorized acquisition of spent radioactive sources.

A part of the development of the security system, now is under consideration, is the upgrade of technical measures (pose a physical barrier to the radioactive source, device or facility in order to separate it from unauthorized personnel and to deter, or to prevent, in advertent or unauthorized access to, or removal of, a spent radioactive source). Two factors now is under evaluation:

1. Control to Access Gate

The main access gate (there would be only one gate open at anytime) has to be guarded 24 hours. With a special procedure, only authorized personnel are allowed to enter the facility inside the fence.

2. Control and Monitor Device Installation

In order to have control the area unattended there shall be control devices installed. The output can then be displayed in closed circuit.

The new interim storage building.

The 5th FNCA Meeting to be held in Ha Noi, Viet Nam

The fifth Ministerial Level Meeting (MM) of the Forum for Nuclear Cooperation in Asia (FNCA) will be held on December 1, 2004 in Ha Noi, Viet Nam, co-sponsored by the Ministry of Science and Technology (MOST) of Viet Nam, and Atomic Energy Commission (AEC) of Japan.

The Senior Officials Meeting (SOM) is also scheduled to be held on November 30, 2004 in conjunction with MM.

The delegates of FNCA countries will make presentation of their country report on nuclear energy research and development policy and the nuclear energy activities. Basic theme of the 5th FNCA Meeting is "Cooperation for Nuclear Human Resources Development in Asia", and roundtable discussions are planned.

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

Member Countries;

Australia, China, Indonesia, Japan, Korea, Malaysia
The Philippines, Thailand, and Viet Nam
* IAEA as an observer

Framework;

The following are the basic outline of cooperation.

1. Ministerial Level Meeting (MM)

Ministerial level representatives responsible for nuclear research, development and utilization attend to discuss nuclear policy or cooperative measures. Senior Officials Meeting (SOM) is attached to MM as an assistant organization.

2. Coordinators Meeting

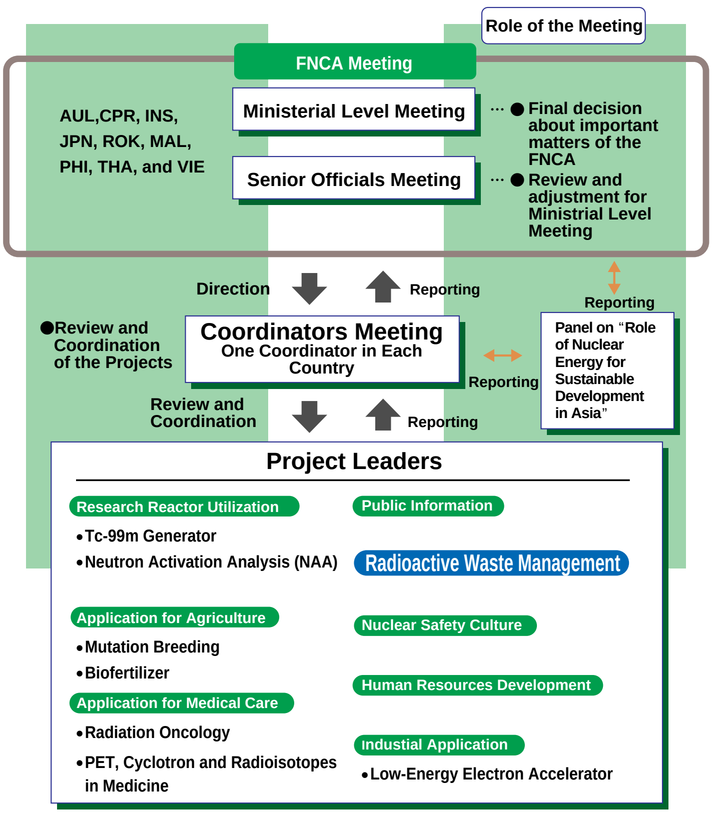
One FNCA Coordinator was appointed for each country, and these Coordinators discuss introduction, modification, abolishment, coordination, evaluation, and so on, of cooperative projects.

3. Cooperative Activities for Each Project.

Vision Statement;

"The FNCA is to be recognized as an effective mechanisms for enhancing socio-economic development through active regional partnership in the peaceful and safe utilization of nuclear technology".

The FNCA Framework



Record of Past RWM Workshops

1)	1995 RWM Seminar	Japan (Tokyo)
2)	1996 RWM Seminar	Malaysia (Kuala Lumpur)
3)	1997 RWM Seminar	China (Beijing)
4)	1998 RWM Workshop	Thailand (Bangkok)
5)	1999 RWM Workshop	The Philippines (Manila)
6)	2000 RWM Workshop	Australia (Sydney)
7)	2001 RWM Workshop	Viet Nam (Da Lat)
8)	2002 RWM Workshop	Korea (Daejeon)
9)	2003 RWM Workshop	Indonesia (Jakarta)
10)	2004 RWM Workshop	Malaysia (Kuala Lumpur)
11)	2005 RWM Workshop	(to be decided in 2004 workshop)

Participants: 293 Persons (cumulatively up to 2003)

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