NEWSLETTER
RADIOACTIVE WASTE MANAGEMENT
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The FNCA 2003 Workshop on RWM to be held in Jakarta in December 2003

The FNCA 2003 Workshop on Radioactive Waste Management (RWM) is scheduled to be held between December 15 to 19, and includes a technical visit for BATAN's Serpong Site.

The workshop will be hosted by the National Nuclear Energy Agency (BATAN) of Indonesia as the local host organization, and the Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan, in cooperation with Japan Atomic Industrial Forum, Inc. (JAIF).

In the upcoming workshop, each representative of FNCA countries will report on latest topics relating to RWM issues as per country reports. Following the country reports, round table discussions will be held on issues involving Correspondence to International Trend Including ICRP, and Joint Convention on Safety of Spent Fuel and Radioactive Waste Management, Interim Reporting of TENORM Task, and the 3-year work plan of FNCA RWM.

TENORM: Technologically Enhanced Naturally Occurring Radioactive Materials

Sub-meetings will be held focusing on the "Disposal of LILW including waste acceptance criteria", "Management of Waste arising from decommissioning of small to medium scale nuclear facilities".

Overall Schedule

Sunday, December 14
Arrival of overseas participants at Jakarta City

Monday, December 15
The 1st day of the workshop
- Country Report

Tuesday, December 16
The 2nd day of the workshop
- Round table discussion (1)
  Correspondence to International Trend Including ICRP, and Joint Convention on Safety of Spent Fuel and Radioactive Waste Management
- Sub-meeting (1)
  Disposal of LILW including waste acceptance criteria
- Sub-meeting (2)
  Management of wastes arising from decommissioning of small to medium scale nuclear facilities

Wednesday, December 17
The 3rd day of the workshop
- Technical Visit for Serpong site of BATAN

Thursday, December 18
The 4th day of the workshop
- Roundtable Discussion (2)
  Interim Reporting of TENORM Task
- Round Table Discussion (3)
  Review, Modification on 3-year Plan

Friday, December 19
The final day of the workshop
- Closing Session
  Discussion on Minutes

The Persons in Charge of Local Secretariat for the Workshop

Dr. Asmedi Suripto
FNCA RWM Project Leader of Indonesia
Director, Center for Development of Radioactive Waste Management
National Nuclear Energy Agency (BATAN)

Dr. Djarot Sulistio Wisnubroto
Center for Development of Radioactive Waste Management, BATAN

Mr. Gangsar
Center for Development of Radioactive Waste Management, BATAN

Overview of TENORM Issues

at Putrajaya, Malaysia

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

(Right)
Dr. Nobuyuki SUGIURA
Research Associate, Medical Science
Research Center for Nuclear Science and Technology,
The University of Tokyo

The natural background radiation had been out of the framework of radiological protection because of its natural occurrence. Some of technologically enhanced naturally occurring radioactive material (TENORM), such as radon and monazite sand, gradually became a target for radiological protection. In ICRP publ.60 (1990), the following four natural sources were listed as part of occupational exposure:

a) operations in workplaces where the radon concentration is high,
b) operations with materials that contain significant traces of natural radionuclides,
c) operation of jet craft, and
d) space flight.

All of the above were considered to be controlled from the viewpoint of amenable to control.

The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) has accumulated a large amount of data on NORM/TENORM issues in a world-wide scale over a long period of time. It was reported in UNSCEAR 2000 that the public exposure could be enhanced by NORM, such as phosphate acid processing, treatment of mineral ore, uranium mining, zircon sand, production of titanium pigment, fossil fuel, oil and its extraction, building material and so on.

On the other hand, the IAEA published the Basic Safety Standard (BSS) in 1996 incorporated with the radiological protection principle of ICRP publ.60. In the BSS, the exemption levels for each radionuclide were proposed including natural radionuclides. Discussion for the introduction of BSS exemption levels into the regulatory system has commenced mainly in Europe and Japan. In the European discussion, the new concept of "work activity" was introduced and the 300 mSv/yr of dose criteria was set instead of 10 mSv/yr for "practice". In the Japanese discussions, the direct application of the BSS exemption level to NORM is not appropriate and it is better to use the intervention exemption concept, which was introduced in ICRP publ.82.

In international movements related to NORM/TENORM situations, the Radioactive Waste Management group in FNCA organized a TENORM subgroup for discussion/survey of NORM/TENORM problems. The TENORM discussion meetings were held at Australia in February 2003 and in Malaysia and Viet Nam in August 2003. Further meetings are planned to be held in China and Thailand in 2004.

Summary of Australia-Japan TENORM Meeting in Australia

Mr. Lubi Dimitrovski
FNCA RWM Project Leader of Australia
Head
Waste Operations & Technology Development
Nuclear Technology
Australian Nuclear Science & Technology Organisation (ANSTO)

During the recent Radioactive Waste Management (RWM) FNCA 2002 Workshop held in Daejeon in November 2002 a draft 3-Year Work Plan was prepared. The plan proposed that the RWM Task Group would focus on NORM waste issues over the next 2 years (2003/2004). Resulting from this a Task Group on TENORM waste from Japan visited Australia between 10-14 February 2003. The task group from Japan consisted of Prof. Toshiso Kosako (Japan Project Leader, RWM, The University of Tokyo; Prof. Takao Iida, Nagoya University; Dr, Hirokuni Yamanisi, National Institute of Fission Science, Dr. Takeshi Iimoto and Dr. Nobuyiki Sugiura, The University of Tokyo.

The task group, sponsored by MEXT, held preliminary discussions with a number of technical experts in Australia including representatives from ANSTO, the New South Wales Environment Protection Agency and followed up with a visit to the large mining operation site at the Roxby Downs, Olympic Dam Project in South Australia

The opening session was held at ANSTO and the delegates from Japan were welcomed by Professor Henderson-Sellers, Director of ANSTO Environment.

Presentations by ANSTO scientists and from the Task Group delegates were carried out during the first day.

Discussion Panel

Australia (on left)	*Japan (on right)*
Doug Collier	Prof. Toshiso KOSAKO
Dr John Harries	Dr Nobuyuki SUGIURA
Brian Holland	Prof. Takao IIDA
Dr Wlodek Zahorowski	Dr. Takeshi IIMOTO
Lubi Dimitrovski	Dr. Hirokuni YAMANISHI

Presentations from ANSTO included:

- an update on NORM in the Mining Industry which addressed recent ANSTO involvement with the IAEA on NORM, the implementation of BSS 115 since 1996 and a review of the Draft Safety Standard 161 – "Radionuclide content in commodities not requiring regulation for purposes of radiation protection"
- a summary of NORM issues relevant to the Australian Mining Industry
- an overview of the radon issues in TENORM
- international regulations existing in the NORM industry and wastes
- disposal of radioactive materials

Presentations were also made by the Japanese Task Group delegates and included an opening address on the aim of the visit and the intensions and frames of reference of the FNCA. Presentations also followed on:

- exemption levels for NORM wastes
- waste issues arising from uranium mining
- the use of phosphate rock is fertiliser production and consumer goods
- radon in terms of Technology Enhanced Natural Radiation.

The presentations were followed by technical discussions and a tour of the ANSTO Waste Management facilities.

On the following day the Task Group attended a meeting with NSW EPA representatives for discussions on NORM occurrences. Discussions focussed on rehabilitation of mineral sand mining sites, rehabilitation of an old radium refinery, assessments of Po-210 and Pb-210 in smelter/sinter plant dusts, occurrences in refractory bricks, ceramic insulators, glazed products, zircon abrasives and radionuclides in coal washery scales. Discussions also focussed on regulatory issues including the need to approve/formalise disposal and recycle options and the need to decide on regulatory requirements for the higher-activity scales and sludges.

The Task Group then travelled to Melbourne for further discussions on NORM issues with officers from the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) Health Branch.

A visit to the Roxby Down.s, Olympic Dam Project site was made on Thursday 13th February. The site visit provided an insight into operational control issues relating to NORM on a large mining site, the regulatory controls that are required and the deportment of the radionuclides in smelter dusts.

The visit of the Task Group to Australia provide an opportunity to address common NORM/TENORM related concerns and issues and provided a valuable forum for an exchange of information.

Olympic Dam Uranium Mining and Processing Site

Crusher and Separator

Bird's-Eye View of Processing Site

Copper Refinement Facility

TENORM Task Group Discussion/Survey Meeting

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

TENORM Management Task Group launched its first activity of JFY2003 by holding a Malaysia-Japan TENORM Discussion/Survey Meeting. The meeting was mainly held at MINT, Kuala Lumpur from August 4 –8, 2003. The Discussion/Survey attempted to highlight TENORM issues which were of concern by some countries in the region, as well finding lasting solutions to the issues.

Delegates involving in one of the Discussion at MINT

Site visit to the plant undergoing dismantling

The Japanese delegation was led by Prof. Toshiso Kosako and comprised of Dr. Nobuyuki Sugiura, Mr. Kunihiro Nakai and Mr. Mitsutoshi Odera. The delegates from Malaysian team, on the other hand, were derived from several agencies namely MINT, AELB, Asian Rare Earth (ARE) Company and TOR Minerals. The last two were private companies which generated the TENORM waste in their work processes.

The opening meeting was chaired by Dr. Daud Mohamad, Deputy Director General (Corporate) of MINT who welcomed the delegates and expressed his wishes to see the beneficial outputs for both countries as a result of this meeting. Presentations from both sides of the delegation on TENORM issues followed after the opening sessions. In the afternoon the delegates were able to visit MINT's waste management facilities.

Members of the group had also the opportunity to visit the new AELB's headquarters, located adjacent to MINTechpark. The delegations were received by Dr. Rehir Dahlan, the Director General of AELB. Discussions held there were mainly on regulatory issues.

In the following day, members of the group visited ARE company, a mineral processing industry situated in Ipoh, some 300 km away to the north of Kuala Lumpur. During the visit, the delegates were briefed, discussed and also visited several facilities belonging to the company. One of the most important facilities was the Long Term Storage Facility which currently stored majority of TENORM waste in Malaysia. The ARE company had ceased operation since 1994 and now is in the process of decommissioning the contaminated plants.

Whilst the delegates were in Ipoh, they had also an opportunity to visit another factory, the TOR Minerals which was situated about hundreds meters away from the ARE. The company processed ilmenite to obtain titanium oxides, and the extraction process also generated TENORM by-products of a different in nature. All discussions and visits had definitely increased the understanding among members of the delegation over the issues raised throughout the discussions.

During the exit meeting, both countries expressed their satisfaction and mutually agreed on two recommendations i.e. to strengthen the linkages of the regulatory body with relevant national agencies on radioactive waste management, and secondly on the exchange information as well as providing technical supports to concur with ICRP and IAEA documents.

2,400 drums of oil sludge have already gathered in the storage facility of MINT.

The reconstruction of LTSF (Long Term Storage Facility) has begun.

80,000 drums of Th waste has been storaged in the LTSF. The maximum dose rate at the surface of drum can be 200μSv/hr.

Interim Report of TENORM Discussion/Survey Meeting in Viet Nam

at Yonggwang NPP, Korea

(Left)
Dr. Tran Kim Hung
FNCA RWM Project Leader of Viet Nam
Director
Department of International Relations & Planning
Vietnam Atomic Energy Commission (VAEC)

(Right)
Dr. Nguyen Ba Tien
Deputy Director
Purification Technology Division
Institute for Technology of Radioactive and Rare Elements (ITRRE, VAEC)

According to the proposal and agreement of the Radioactive Waste Management Workshop held at Daejeon, Korea, on November 2002, a new task group on TENORM/NORM was authorized as a new project under the FNCA framework. The Viet Nam - Japan TENORM Discussion/Survey Meeting was implemented in Ha Noi, Viet Nam on August 25-29,2003.

The topics taken up at the TENORM Meeting in Viet Nam were as follows:

a. Abstract of the TENORM Meeting result at Australia and Malaysia,
b. Recent status of TENORM in each country.
c. Outline of TENORM regulations in each country.
d. Summary of ICRP publ. 82: Protection of the public in the situation of Prolonged Radiation Exposure.
e. Summary of EC RP122 and IAEA DS161.
f. Ways of Cooperation on TENORM within the FNCA framework.

Through an open exchange of views and experiences, it is recognized that TENORM is one of the most important issues for both countries. Both countries agreed that this kind of activity, based upon a common understanding on critical issues, is the most effective means in strengthening how to solve TENORM issues in each country.

Both countries agreed that the following recommendations and further survey should be taken to solve TENORM issues in each FNCA countries:

a. Strengthening the linkages of the regulatory body with relevant national agencies concerned with the Radioactive Waste Management.
b. Exchanging information and providing mutual technical support, concerning the implementation of relevant ICRP recommendations and IAEA documents.

Besides, the Task Group had implemented technical visits to Phung Interim Storage Facility and Thua Thien Hue Mineral Company. Through these technical visits, Japanese and Vietnamese experts gained good information about the status of exploitation and processing of beach sand in Viet Nam. Experts of Task Group recommended the leaders of Thua Thien Hue Mineral that TENORM is to be controlled as following the international safety standard from the view point of trade and guided them to solve the problems of TENORM management.

The Task Group had successfully implemented all topics of the TENORM discussion and survey meeting in Viet Nam.

The black beach sand is pumped up with white sand and sea water from the bottom of pond.

The black beach sand is separated from white sand by the cyclone separation method.

Monazite, ilmenite and zircon sand are produced at the factory in Hue city.

Recent Discussions in Japanese Radiation Council

Introduction of IAEA BSS*-exemption levels to Japanese regulation

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

Dr. Nobuyuki SUGIURA
Research Associate, Medical Science
Research Center for Nuclear Science and Technology,
The University of Tokyo

Mr. Minoru OKOSHI
General Manager
Waste Management Division 1
Dept. of Decommissioning & Waste Management
Japan Atomic Energy Research Institute (JAERI)

* International Basic Safety Standards for protection against ionizing radiation and the safety of radiation sources, IAEA safety series No.115, 1996

at Ha Noi, Viet Nam

The Japanese Radiation Council, chaired by Prof. Yasuhito Sasaki, has the role of discussing and unifying technical standards on radiation safety. When regulatory authorities in Japan enact any technical standards on radiation safety, it is required to be put through a consultation process by the Council. The Council is composed of twenty committee members who are the specialists in the field of radiological protection. The General administrative group can be set up under the Council to discuss the issues in more specialized fields. Presently, the general administrative group, chaired by Prof. Toshiso Kosako, has discussed an introduction to propose BSS exemption levels to the Japanese regulatory system and NORM/TENORM regulation.

As to the introduction of the IAEA BSS exemption level, the general administrative group published the report in October 2002 following 27 meetings over a 3-year period. Finally, a decision to introduce the BSS exemption levels (activity/concentration) for the artificial sources, without any modifications, into the regulatory system has been made. The main reasons for adoption of the BSS exemption levels are as follows:

- The levels are derived based on the latest principles of radiological protection and scientific knowledge, and
- The levels are internationally coherent, especially for the regulations for the safe transport of radioactive material (IAEA ST-1 incorporate the same levels).

In order to agree on how to implement the exemption levels in Japanese legislation, the advisory committee was organized by the MEXT (Ministry of Education, Culture, Sports, Science and Technology) and the issues are still under discussion.

In the chapter, “problems to be considered” of the report, the NORM/TENORM problem is listed up as the first issue to be resolved. As discussed in RP-122 part 2, published by the EC, the BSS exemption levels are not applied to the large quantities of material processed and released by NORM industries because they are derived only for moderate quantities of material. The general administrative group met 9 times during 2003 to discuss the NORM problems and the Council adopted the report on the exemption of NORM in October 2003. The main conclusions are as follows:

- It is suitable to apply not only “practice” concept but also “intervention” concept to NORM regulation, because the pathways of exposure to NORM have already existed widely, and
- The applied radiological protection principles should be different depending on the situation of NORM utilization, the controllability, the degree of hazard risk and so on.
- Therefore, the categorization of NORM is very important. NORM except for radon was categorized into 7 categories as shown in the below table. Category 1 should be excluded from the radiation control. The intervention concept would be applied to Categories 2 and 3. To control the materials belonging to categories 4 and 5, both concepts relating to practice and intervention should be applied. The dose criteria for exemption are considered as 1mSv/y for these categories. The value covers both the dose limit for the public and intervention exemption level recommended by ICRP Publ. 82.

  For Category 6, the consumer products have practical characteristics much stronger as compared to other categories. Therefore, 10 mSv/y is basically applied as the dose criteria. Category 7 should be regulated as an artificial source.

Table: Categorization of NORM and Typical Examples

1	Raw materials, such as mineral ore without procedure to enhance activity concentrations
2	Waste rock residues from past mine or industrial activities
3	Secondary products such as ash and scale produced by NORM industries
4	Waste rock residues from present mine or industrial activities
5	Mining, raw materials for industrial use (manufacture, energy production, mining)
6	Consumer products including NORM
7	Refined nuclear material (e.g. Th), radiation sources (e.g. Ra-226)

JNC's advanced thermal reactor Fugen is now preparing for decommissioning

Mr. Tomio KAWATA
Executive director
Japan Nuclear Cycle Development Institute (JNC)

On March 29, 2003, the Japan Nuclear Cycle Development Institute (JNC) terminated the operation of the 165 MWe nuclear power reactor Fugen which had been brought into service 25 years ago at Tsuruga (Figure 1). Fugen was a prototype advanced thermal reactor (ATR)

Figure1. Fugen Nuclear Power Station

developed by the Power Reactor and Nuclear Fuel Development Corporation (PNC), the predecessor of the JNC, and featured with a calandria-type tank filled with heavy water moderator and multiple fuel channels cooled by light water. It had a unique capability to burn both uranium-plutonium mixed oxide (MOX) fuel and regular uranium dioxide (UO2) fuel in various core loading ratios. It burned during an entire operation period a total of 772 MOX fuel assemblies which marked a world record of MOX fuel burning in a single thermal power reactor, and demonstrated an excellent performance of MOX fuel for driving a power reactor. Fugen also served for more than a decade as a training center for operation and management technology of heavy water reactor, and accepted a total of 56 trainees from 6 Asian countries. Fugen was recently awarded the Nuclear Historical Landmark Award by the American Nuclear Society for the first time in Asia.

Since the shutdown in March 2003, Fugen project has entered the pre-decommissioning preparation phase which is scheduled to last for 10 years as illustrated in Figure 2. During this period, all the spent fuel assemblies remained in the core and stored in the cooling pond are to be shipped out to the Tokai Reprocessing Plant (TRP). Heavy water is also to be retrieved from the moderator tank and transported elsewhere for treatment. As one of variations of water cooled power reactors, Fugen shares many common features with light water reactors (LWRs) whereas it has several features unique to ATR such as relatively complex structure in the core and the primary cooling system, and the use of heavy water as a moderator. Therefore, decommissioning technologies common to LWRs are applicable for most of the system other than the reactor core and its vicinity, but some developmental and demonstration activities are necessary to cope with the matter peculiar to Fugen and to make decommissioning safer, more efficient and more economical. Major technical areas of interest for R&Ds in preparation phase are listed in Table 1.

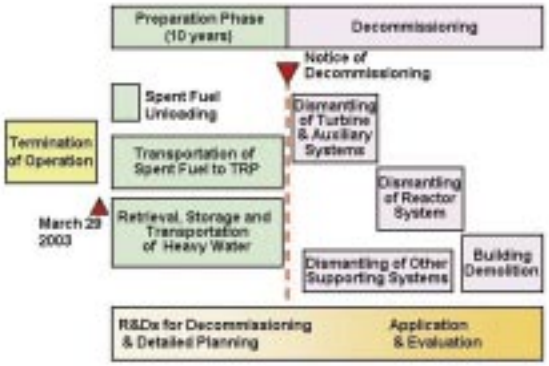


Figure2. Basic Plan for Fugen Decommissioning

Table 1. Areas of Interest for R&Ds for Fugen Decommissioning

Area	Subject
R&D areas specific to Fugen	Retrieval of heavy water (HW) and dismantling of HW related system
	Dismantling of pressure tubes and calandria tank
	Engineering support system
Application and improvement of technologies commonly applicable to LWRs and others	Radioactivity/ waste inventory assessment
	Decontamination
	Dismantling of turbine and auxiliary systems and building demolition
	Waste treatment/reduction
	Material reuse
	Clearance verification and radiation survey
Others	Collection of material aging data

In establishing a general plan for decommissioning, the evaluation of radioactivity distribution and inventory is very important, because such data are crucial for estimating radiation exposures to the workers and the amount of various kinds of radioactive waste, and thus for determining the decommissioning strategy and the cost. In order to improve the accuracy of such evalua-

tion, several kinds of activation foils were set around the reactor core and shielding and their measurement results were used for verifying neutron transportation codes ANISN and DOT-3.5. Contamination level for buildings, equipment and pipings were also evaluated by sampling measurements and direct survey. Based on such preparatory evaluation and measurements, the amount of the waste to be generated by decommissioning was evaluated as shown in Table 2.

Table 2. Estimated Amount of Waste to be Generated from Fugen Decommissioning

(10^3 ton)

		Metal	Concrete	Total
Low-level radioactive waste	Level-1	< 0.2	0	<0.2
	Level-2	1	0	1
	Level-3	2	1	3
Non-radioactive waste	Clearance	4	30	34
	Non-radioactive	10	320	330
Total		20	350	370

In order to minimize the decommissioning cost, the optimization of the decommissioning strategy to minimize work load and waste generation and to assure a compliance with safety and environmental requirements is necessary, and the system engineering approach is required for achieving such goal. For this purpose, development of a decommissioning engineering support system is in progress by integrating a decommissioning management code system COSMARD, data base management system, 3-D CAD system and virtual reality (VR)/visualization system as illustrated in Figure 3.

Fugen decommissioning project is a leading project where valuable experiences and engineering knowhows are expected to be accumulated for the application to future decommissioning of water moderated power reactors in Japan and in the world.

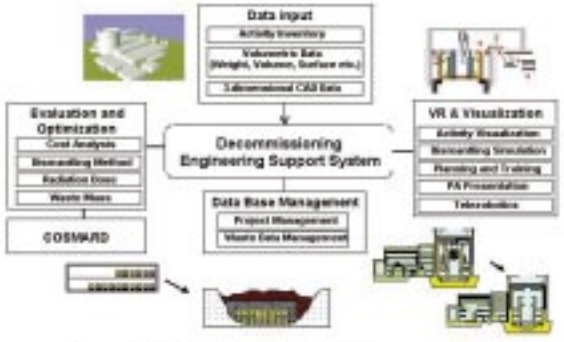


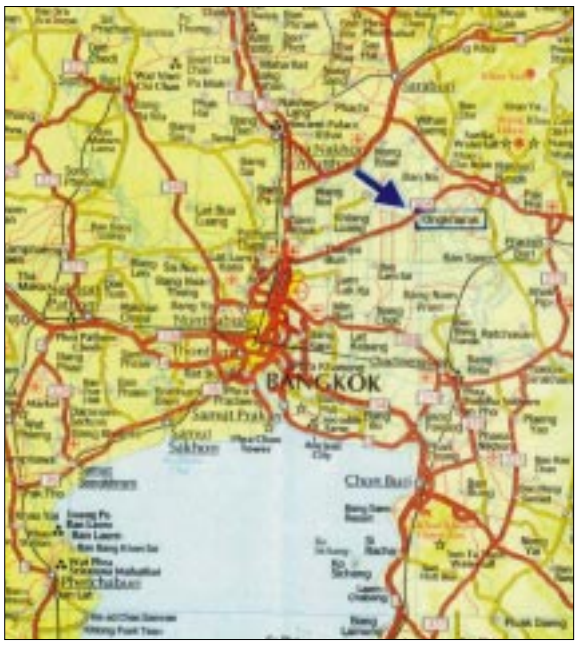
Figure3. Schematic Concept of Decommissioning Engineering Support System

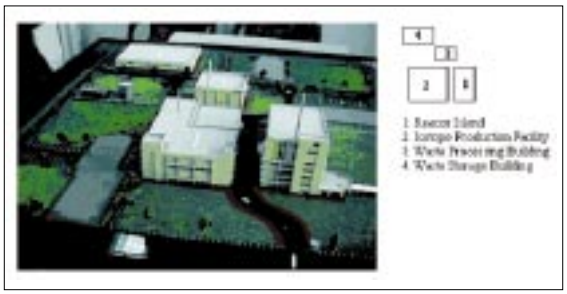
The Progress of ONRC Project in Thailand

Ms. Nanthavan Chantaraprachoom
Senior Nuclear Chemist,
Radioactive Waste Management Project,
Office of Atoms for Peace (OAP)

The Ongkharak Nuclear Research Center (ONRC) Project which delayed for 5 years, now received a construction permit from the Thai Atomic Energy Commission on 29 September 2003. The Commission on Atomic Energy for Peace; the only agency authorized to approved the project, and to issue the construction permit of the 10 megawatt nuclear research reactor. It will be built in Ongkharak district, Nakhon Nayok province. The research reactor has contracted to San Diego-based General Atomic since 1997.

The commission, which represents state agencies such as the Office of Atoms for Peace (OAP), and Public Health and Industry ministries, based its decision on the reactor safety issues. The OAP Secretary General informed that Argonne National Laboratory, under the US Department of Energy, had verified safety aspects of the technology. The cooling technology and the environmental impact assessment report (EIA) were the last two safety issues needing approval. EIA is a chapter in the preliminary safety analysis report. It is not a condition for the construction.





Schematic Model of ONRC Research Reactor and Related Facilities

Siting of Radioactive Waste Management Facility in Korea

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

Ministry of Commerce, Industry and Energy(MOCIE) selected a candidate site for Korean Radioactive Waste Management Facility(RWMF). Low level radioactive waste repository, spent fuel interim storage facility and related research labs will be included in the RWMF.

In order to construct the RWMF by 2008, Nuclear Environment Technology Institute (NETEC) had made every effort to obtain candidate sites on behalf of MOCIE. In 2000, NETEC announced the public invitation of the RWMF for a year. Then, lots of efforts concentrated on the public relations of safety and benefits of RWMF, in particular, in the 9 possible coastal areas. Among the 9 coastal areas, petitions by residents to invite RWMF were made in 7 areas. But the petitions were declined by local self-governing body because of political and site-specific reasons.

Since all the efforts to select the site through public invitation were ended in vain, MOCIE had changed the siting policy from the public invitation to the designation by operator. In order to select feasible candidate sites, NETEC had carried out a project for one year from December 2001. Four candidate sites, Namjung-Myon and Geunnam-Myon in the east coastal area and Hongnong-Eup and Haeri-Myon in the west coastal area, were selected from the project. On February 4, 2003, four sites were announced as candidate sites for RWMF by MOCIE.

After the announcement, comprehensive development plan of local community to support the siting of RWMF was established in the government. The plan includes a proton accelerator project, the move of Korea Hydro & Nuclear Power Co. (KHNP) headquarters to the local area, and other financial support plans. Based on the comprehensive development plan, MOCIE decided to extend the voluntary public invitation to every local self-governing body by July 15, 2003.

Active public relations on the comprehensive development plan with the safety of radioactive waste disposal were made in some areas. only Buan-Gun of Jeonbuk Province has applied to invite the RWMF in Wi-Do island on July 14, 2003. MOCIE formed a Committee for the evaluation of adequacy as a repository site of the Wi-Do island. Based on the basic geologic, environmental, ecological, and social conditions, the Committee has finally decided the Wi-Do as a candidate site.

Preliminary environmental investigation will be performed for one year, then the Wi-Do will be nominated as the planned area for the development of power resources if the area has no disqualifying problems. After the nomination, specific site characterization study, environmental impact assessment, and the detailed design will be followed. It is expected the construction of RWMF be started on October 2006, and completed by the end of 2008. Interim storage facility of spent fuel will be operated in 2016 as scheduled.

Bird's-Eye View of an Engineered Vault Type Disposal Facility

Introduction of People's Republic of China Law on the Prevention and Control of Radioactive Contamination

Dr. Zhang Jintao
FNCA RWM Project Leader of China
Deputy Director General
Department of Safety, Protection and Quality
China National Nuclear Corporation (CNNC)

The People's Republic of China Law on the Prevention and Control of Radioactive Contamination came into force on the day of October 1, 2003. This law includes eight chapters with 63 articles.

Chapter I.	General provisions
Chapter II.	Supervision and management of prevention and control of radioactive contamination
Chapter III.	Prevention and control of radioactive pollution in nuclear facilities
Chapter IV.	Prevention and control of radioactive pollution in the use of nuclear technology
Chapter V.	Prevention and control of radioactive pollution during the operation of uranium, thorium and other naturally occurring radioactive mining and utilizations
Chapter VI.	Radioactive waste management
Chapter VII.	Legal responsibility
Chapter VIII.	Supplementary

This law is enacted to prevent and control radioactive pollution, to protect the environment and human health, to promote nuclear energy, and to promote the development and peaceful use of nuclear technology.

This law shall apply to the prevention and control of radioactive pollution of site selection, construction, operation, and decommissioning of nuclear facility, to the application of nuclear technology and the operation of uranium, thorium other naturally occurring radioactive mining and utilizations on the territory of the People's Republic of China and in other territorial waters under its jurisdiction.

According to the law, the State shall set prevention priorities, integrate prevention and control measures, enforce rigorous management, and give priority to safety in the prevention and control of radioactive contamination.

As required by the law, the operator of a nuclear facility shall, before the facility's siting, construction, operation, and decommissions, and before loading fuel or engaging in any other activity, apply for a nuclear facility construction and operating licenses, as well as request examination and approval for fuel loading, decommissioning and any other required activity in accordance with the State Council's relevant nuclear facility safety supervision and management provisions.

Units producing, selling and using radioisotope and radiation-emitting devices shall, in accordance with the State Council's relevant radiation protection regulations for radioisotope and radiation-emitting devices, apply for a licence and carry out registration procedures.

Units mining or closing down uranium and thorium mines shall, before applying for a mining licence or conducting decommissioning examination and approval procedures, draw up an environmental impact report and report to the competent environmental protection administration department under the State Council for examination and approval.

It is forbidden for radioactive waste and radioactively contaminated goods to be brought into or transferred through the People's Republic of China.

Current Practices in Dealing with NORM Waste from Selected Industries in the Philippines

Ms. Eulinia M. Valdezco
FNCA RWM Project Leader of the Philippines
Supervising Science Research Specialist & Head
Radiation Protection Services
Philippine Nuclear Research Institute (PNRI)

The wastes associated with coal mining and utilization, and geothermal production has a wide range of physical and chemical properties. These wastes are contaminated with radioactive and chemically toxic substances. The radioactive component, which are mostly due to naturally occurring radioactive materials

(NORM) can be found from extraction of steam from the earth's crust, and during mining and combustion of coal. Aside from the naturally occurring K-40, the other radionuclides found in NORM are Pb-214 and Bi-214 from the decay series of naturally occurring Uranium-238 and Tl-208 and Ac-228 from the decay series of Thorium-232.

Two waste streams exist from coal utilization in the Philippines. Those wastes arising from coal mining and wastes from coal combustion. The preferred disposal route for wastes from this category are by shoreline barrier for mining wastes and ponding for combustion ashes. Combustion ashes are also used for road filling and pavement. The estimated annual generation of mining waste is 9.71 E08 BCM (bulk cubic meter) and about 2.26 E05 metric tonne of ashes. The waste streams from geothermal production are in the form of sludge and scales. Data currently available indicates an amount of the order of a few tones dry sludge per thermal production of sludges and scales arising annually on the average. Reinjection to wells is the principal means of disposal option for these wastes.

At present, the Philippines has no legal restrictions such as authorization requirements or activity limits with respect to releases of natural radioactivity to the environment. Hence a number of environmental problems can be encountered in the disposal of these wastes. The major concerns for the currently employed disposal methods are contamination of groundwater by leachate from disposal ponds and landfills. Moreover, if the sludges and scales are disposed of on the ground without reinjection, seepage into the shallow groundwater may occur. Although reinjection solves this problem, some contamination may still occur since groundwater pollution depends on several factors like hydrogeological characteristics of the site, design of facility, chemical composition, solubility and permeability of the waste, among others.

The Philippine legislature is now proposing an integrated hazardous waste act which will address all environmental issues and concerns related to hazardous waste management, including radioactive wastes, NORM and TENORM wastes. The draft bill is now on its final review process and active consultations with identified stakeholders are actively being pursued.

Introduction of New RWM Project Leaders

Australia

Mr. Lubi Dimitrovski
Head, Waste Operations & Technology Development, Nuclear Technology, Australian Nuclear Science & Technology Organisation (ANSTO)

Mr. Lubi Dimitrovski was nominated as a new Australian RWM Project Leader.

Predecessor: Dr. John Harries

Malaysia

Dr. Syed Abdul Malik
Manager, Radioactive Waste Management Centre (RWMC), Technical Services Division Malaysian Institute for Nuclear Technology Research (MINT)

Dr. Syed Abdul Malik was nominated as a new Malaysian RWM Project Leader.

Predecessor: Mr. Nik Marzukee Nik Ibrahim

Highlight in 2003

The FNCA Meeting to be held in December, in Nago City, Okinawa Prefecture, Japan

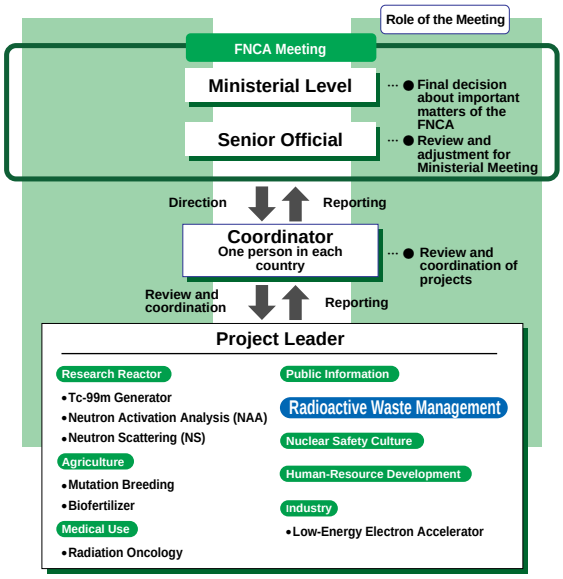
The forth Ministerial Level Meeting (MM) of the Forum for Nuclear Cooperation in Asia (FNCA) will be held on December 3, 2003 in Nago City, Okinawa, Japan, sponsored by the Atomic Energy Commission (AEC) of Japan.

The Senior Officials Meeting (SOM) is also scheduled to be held on December 2, 2003 in conjunction with MM.

Ministerial level representatives and senior officials from FNCA countries will participate in the FNCA Meeting.

The delegates of FNCA countries will make presentation of their country paper on nuclear energy policy, and the following round table discussions on the 2 themes, “Enhancement of Socio-Economic Impact of Nuclear Technology Application” and “Sustainable Development and Nuclear Energy” will be actively discussed among the FNCA countries.

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	(to be decided in 2003 Workshop)

Participants: 253 Persons (cumulatively up to 2002)

Guidance how to find RWM articles in FNCA web-site

How to find RWM articles including introduction of PLs

1) URL of FNCA http://www.fnca.jp/english/
2) Click “Structure of the FNCA”
3) Click “Radioactive Waste Management” which is shown in the left side column, under the title of “FNCA Project”.

How to find past RWM Newsletters in this web-site

1) URL of FNCA http://www.fnca.jp/english/
2) Click “NEWS Letter” at the top of the globe

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