NEWSLETTER
RADIOACTIVE WASTE MANAGEMENT

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The 5th RWM Seminar to be held this November

The 5th Radioactive Waste Management (RWM) Seminar is scheduled for November 9-12, including a technical tour to relevant facileties in the Philippines.

A new program has been added this year for experts to make presentations and exchange opinions on specific subjects. In this connection, the schedule can be flexible, for instance, holding the sub-meeting before the Seminar.

Overall schedule

Monday, 8
Arrival of foreign participants
Tuesday, 9
Sub-meeting of the Seminar
Wednesday, 10
5th Seminar on Radioactive Waste Management
Thursday, 11
Ditto
Friday, 12
Technical Tour
Saturday, 13
Departure of foreign participants

Tentative program

<1st day>
Opening Session
Session 1:
Country Report on the Annual Progress in Each Country
Session 2:
Recent Technical Topics
<2nd day>
Session 3:
Round-table Discussion

The focal points of the 5th RWM Seminar

"The Forum for Nuclear Cooperation in Asia (FNCA)" was launched in the 10th ICNCA conference under the new cooperation framework to carry out strengthened activities for cooperation (see page 7, 8). As part of the framework efforts, the first event of the "Coordinator Meting" will be held in March, 2000 in Tokyo. The meeting will review the activities of the existing six fields including the RWM activities. In preparation for this review, the round table discussion of this year will examine the middle and long term RWM Plan in connection with how to proceed with the future regional cooperation. In addition, the "Sub-meetings" to be started this year will be expected to produce a new dimension of cooperation. The subjects to be discussed in the Sub-meetings are currently under preparation in the Philippines.

The persons in charge of the seminar

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Topics in Japan

Asia Cooperation Center started to work at Japan Atomic Industrial Forum

Asia Cooperation Center started to work at Japan Atomic Industrial Forum. As of July 1, 1999, JAIF's Asia Cooporation Center (ACC) was established to support the Office of the Coordinator, Forum for Nuclear Cooperation in Asia (FNCA). We hope that the center could serve for active, efficient, and effective promotion of the activities of regional nuclear cooperation in Asia through assistance by the member countries of the FNCA.

The JAIF has been reorganized as of July 1. It is divided into five departments. Asia Cooperation Center is regarded as one of the departments. The staff members of the center are shown in the photograph.

Standing Left to Right: Tsuyoshi Takei, Makoto Funakoshi, Takayoshi Kaneta, Akihiko Yamaguchi and Naoki Miyamoto. Front Low,L to R: Kaoru Sasaki, Nobuyuki Inoue, Hiroko Aoki, Hideo Nakasugi and Tomoko Endo.

RWM's Project Leader of Japan was nominated

Under the new structure of the "Forum for Nuclear Cooperation in Asia" established this year, Mr. Shingo Tashiro has been registered as a Project Leader of Japan for Radioactive Waste Management. He has been a former contact person.

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The staffs in charge of RWM in the JAIF's Asia Cooperation Center to support Mr. S. Tashiro, Project Leader, are Mr. Nobuyuki Inoue, Deputy General Manager and Dr. Shinichi Fukuda, Project Manager, ACC. In the meantime, Ms. Hiroko Aoki, General Manager and Mr. Hideo Nakasugi, Head of Coordinator Office, ACC make overall coordinations.

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Clearance Level for Solid Materials

Dr. Toshiso Kosako
Research Center for Nuclear Science and Technology,
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In recent days, the words of clearance and clearance level are frequently used in the field of radioactive waste. This short note is showing current Japanese situations on this issue.

Clearance is defined as: removal of radioactive materials or radioactive objects within authorized practices from any further control by the Regulatory Authority. Clearance level is defined as: values, established by the Regulatory Authority and expressed in terms of activity concentrations and/or total activity, at or below which sources of radiation may be released from regulatory control.

The radioactive materials that have no possibility of use are called as radioactive wastes and their legal position change from utilization system to waste management system. On very low level radioactive wastes it is possible to ignore their human risk for their smallness of radiation impacts, and to use a clearance concept is reasonable to get an optimized use of radiation. We have already used this concept, legally, to gas and liquid discharge to the environment from nuclear facilities for the reason of small impact to environment after the diffusion of these fluids.

We can't expect radionuclide diffusion on solid materials. For this reason we kept all solid materials in the storage as radioactive wastes even in case of quite small activity concentration. But, the decommissioning 1GW class power reactors becomes a real problem and the reasonable clearance is inevitable. Large amount of concrete and metal that contain very low level radioactive materials require the clearance. To consider the clearance is important to get reasonability. Then, what kind of concept and procedure are required to making up of reasonable clearance level for solid materials?

Here I would like to introduce recent discussions on the clearance level in the Atomic Energy Commission's Advisory Committee on Measures for Radioactive Waste.

At first, the individual dose for exemption was set as 10 μSv/y following ICRP. Using this value, the clearance level was obtained through the following dose estimation procedure.

①Estimation of total waste(concrete and metals only) from PWR, BWR and GCR(gas cooled reactor),
②Making up scenarios depending on the pathway of waste; on the whole, one is (a)general waste disposal, another is (b)reuse; in detail, all considerable pathways were listed up
③Setting of dose conversion factors and environmental migration parameters in scenario pathways
④Estimation of individual dose to each pathway
⑤Probabilistic estimation of dose using the distribution of parameters used in the analysis; the lowest 97.5% value was set as a clearance level to keep the conservation in safety analysis.

The derived clearance level in this work was compared with the vales by IAEA. The final values are summarized to a simplified table as "clearance level for solid materials arising from nuclear reactors" (see Table 1).

Hereafter, the problems like the verification of radioactivity etc. will be discussed continuously. In recent future a "small size" clearance from research and medical fields will be also obtained. Such discussions are continuing in the governmental committee. Radioactive waste management is important in the healthy development of nuclear utilization. For the reasonable management of radioactive waste the decision and operation of the clearance level is in-

evitable.

Table 1 Clearance level for solid materials arising from nuclear reactors:(Bq/g)

Radionuclide	Derived value	Range in IAEA-TECDOC-855
H-3	200	1000-10000
Mn-54	1	0.1-1
Co-60	0.4	0.1-1
Sr-90	1	1-10
Cs-134	0.5	0.1-1
Cs-137	1	0.1-1
Eu-152	0.4	0.1-1
Eu-154	0.4	--
Total α emitters	0.2	0.1-1

(Pu-239,Am-241)

News from Regional Countries

Plan for Siting of Surface Radioactive Waste Repository in the Philippines

Dr. Eulinia M. Valdezco

The Philippine Nuclear Research Institute (PNRI) of the Department of Science and Technology leads a group of government agencies in locating a low level repository for all radioactive wastes generated in the country. The group which includes the Department of Energy, the National Power Corporation, the Department of Environment and Natural Resources and the Office of the President established an updated site screening criteria that covers a wide rage of technical, environmental, economic and social factors to assess candidate areas on a national scale. The siting process involves two separate but interrelated stages, i.e. site screening and site evaluation. Site screening mainly involves desk compilation of existing information and data sourced from a wide variety of government and private institutions. Reconnaissance of field investigations will be undertaken to verify, update and gather additional information. Initial site assessment for rapid evaluation is expected to produce a manageable number of candidate sites that will be investigated. A quantitative or qualitative scoring approach will be used to rank the selected sites. The identified suitable sites will be subjected for through surface and subsurface site characterization and investigations in the second stage. The second stage of the siting process allows the characterization of the ground water flow conditions, its chemistry and the surrounding rock environment in a more comprehensive manner. Data and information that will be generated in this stage will be used for developing a detailed model for performance assessment as well as for preparing environmental impact state-

The Radioactive Waste Management team of the Radiation Protection Services group of the Philippine Nuclear Research Institute.
Standing Left to Right: Remigio Sarmiento Jr., Edith Marcelo, Leticia Alberto, Eulinia Valdezco, Erlinda Bague, Estrella Caseria and Abelardo Inovero.
Front Row, L to R: Cesar Salabit, Alfonso Manalo, Ver Soriano and Demetrio Salom.

On the other hand, public participation will be employed in all phases of the siting process. Initial survey instruments containing information on social, economic and cultural dimensions of prospec-

tive beneficiaries of the project have been prepared during the initial phase of the project. This instrument can be expanded so that it can be utilized for all prospective candidate areas.

Development of other information package that can be used for all print and broadcast media will also be prepared for a national information campaign. As a corollary activity to site investigation activities, R&D on Safety Assessment and Waste Treatment are also actively being undertaken at the PNRI. The PNRI through its Radio-logical Impact Assessment group has access to a number of specific computer models that can be integrated for a complete systems analysis. A scoping exercise using some of the models acquired from the USA was performed for the most common radionuclides found in low level wastes. Although most of the parameters used in the models are not site specific, the results obtained will be most useful in providing the basis for a more focussed investigation process.

The PNRI radioactive waste management team is headed by Dr. Eulinia M. Valdezco, Head of the Radiation Protection Services of the Institute and concurrently designated as chairperson of the Subcommittee on Radioactive Waste Management, Nuclear Power Steering Committee.

Development of Vitrification Technology for Low and Intermediate-Level Radioactive Waste

Dr. PARK Wan-Jae
Principal Resercher,
Radiation Safety Division

Radioactive waste generated from nuclear power plants (NPP) needs to be safely treated and disposed of. Presently, most of countries have some difficulties in selection of national disposal site to dispose of them safely. Hence, it has been necessary to develop a new treatment technology can significantly reduce waste volume with almost no effect on the environment and subsequently, can be able to be stored on NPP site for longer term. Based with the several years long feasibility study, vitrification of low- and intermediate-level radio-active waste was concluded to be a very promising treatment technology because of its high volume reduction and its inherent stability as the final waste form. Also found was it economically competi- tive in comparison with other convent- ional treatment meth-

The exterior view of Vitrification Facility for LILW in Korea

Korea (KEPCO/NETEC) has studied since July 1996 to develop the pilot plant through the joint study with France. Recently completed was the construction of a LILW vitrification pilot plant with a 300kW cold crucible melter heated by direct induced current (CCM) and a 200kW plasma torch melter (PTM), including an effective off-gas treatment system. The pilot plant is being operated to demonstrate the vitrification for the both combustible and non-combustible waste from NPP.

A series of performance test will be completed by August 1999 and then, the

actual pilot tests will be carried out until January of 2000. Both conceptual system and detailed engineering design for the full commercial application with capacity of 250 kg/h is expected to finalize from results of these tests in the very near future.

International Symposium for Radiation Safety Management '99

Dr. PARK Wan-Jae

ISRSM'99 will be held on November 4-6, 1999 at Tajion, Republic of Korea. Organized by the Nuclear Environment Technology Institute of Korea Electric Power Corporation (KEPCO/NETEC), the symposium is in cooperation with the IAEA and Korean Nuclear Society (KNS).

The symposium is to provide an international forum on the science and technology of newly implemented or newly developed technology for low-and intermediate-level radioactive waste management and radiation protection. Scientists, engineers, managers, and researchers are invited to participate in this meeting to discuss, review, display, and/or learn about the on-going state of the art or future technology for treatment and/or management of low- and intermediate-level radioactive waste and for radiation protection. Topics are as follows;

1. Radiation protection technology
2. Radioactive waste treatment with high temperature melting technology
3. Low-level radioactive waste treatment technology
4. Decontamination and decommissioning technology
5. Radioactive waste disposal
6. Spent fuel storage & transportation technology
7. Radiation management experiences at nuclear power plants

Recent Governmental Activities

Dr. Tran Ung
Director, Vietnam Radiation Protection and Nuclear Safety Authority(VRPA)
Ministry of Science Technology and Environment(MOSTE)

1. Under the assistance of the IAEA the National Training Course on Treatment and Management of the radioactive wastes from the hospitals had been
   held in Hanoi from 21-24 September 1998 , consisted of 29 participants. The lectures were the IAEA experts and Vietnamese.
2. The Regulations on Radioactive Waste Management will be enacted soon. The Regulations consist of 4 chapters and

   Chapter 1. General Provisions
   Chapter 2. Nonproliferation, Registration and Licensing
   Chapter 3. Treatment of Radioactive Waste
   Chapter 4. Implementation Provisions

IAEA / RCA Activities- The Reference Concept for the Shallow Land Disposal of LILW is discussed

All the Member Countries of the Regional Co-operative Agreement (RCA)

are producing low and intermediate level waste (LILW) from non-power sources, and most of the Member Countries need to develop disposal facilities for waste. It is essential to establish the technical concept of a repository to dispose of nuclear waste. It is also necessary to provide technical guidelines about treatment of nuclear wastes and siting conditions. However, most of the Member Countries do not have adequate in- frastructure or technical expertise to develop a LILW disposal system. There- fore, the International Atomic Energy Agency (IAEA) initiated the RCA project to assist RCA Member Countries in promoting LILW disposal activities from nuclear application. The RCA project entitled "Preparation for the LILW Disposal with emphasis on Non-power Sources" was started in 1996. To implement this project, the first workshop was held in Shanghai, China in 1997, where waste characteristics of nuclear and conceptual requirements of a reference site were identified. Then, a training course was held in Taejon, Korea in 1998 to provide key staff members of waste management organizations in the RCA member countries with the knowledge required for establishing a LILW disposal system.

In June 1999, the Project Coordi- nators Meeting was held in Mumbai, India. Twelve National Project Coordi- nators participated in the meeting from Australia, Bangladesh, China, India, Indonesia, Japan, Korea, Malaysia, the Philippines, Sri Lanka, Thailand, and IAEA. Four observers also participated from India. The purpose of the meeting was to review the project and develop a reference LILW disposal concept. Due to the diverse regional conditions in the Asian and Pacific countries, especially conditions of the climate ranging from arid to wet/tropical weathers, different concepts for facilities are required. As a result, six reference concepts of a repository were identified.

1) Disposal of very low level radioactive wastes in shallow land earthen trenches with limited engineering.
2) Disposal of LILW in near surface in engineered trench with multi-layered covers, constructed in unsaturated zone on a site with arid climate.
3) Disposal of LILW in near surface in engineered trenches with humid climate.
4) Disposal of LILW in near surface in engineered concrete vault with drainage zone on a site with changing level of water table.
5) Rock cavern, abandoned mines or excavated cavity, below water table.
6) Borehole in intermediate depth, cement backfill, below water table.

by Dr. Kenji Shimooka
JAERI,JAPAN

Highlight in 1999

Summary of the 10th ICNCA Conference

The 10th International Conference for Nuclear Cooperation in Asia was held in Tokyo on March 10, 1999. The representatives participated from Australia, China, Indonesia, Japan, Korea, Malaysia, the Philippines, Thailand and Vietnam as well as from the IAEA as observer. The countries evaluated the positive achievements of the past ten years and affirmed the major goals for the future and the major theme of the meeting being the evolution of the framework.

1.Formation of FNCA

1) The conference will be renamed as "Forum for Nuclear Cooperation in

Asia (FNCA)" beginning with the next conference.

2) FNCA will be comprised of an open meeting with representation at the ministerial level or other relevant high level representation consistent with a country's circumstances and other associated Senior Official Meetings (SOM).
3) FNCA consists of the present par- ticipating countries (nine countries) for the time being, and will ask the IAEA to participate continuously as an observer.
4) FNCA will be held in Japan and in a participating country other than Japan every other year. The first FNCA meeting will be held in Thailand in 2000. It is noted that the Republic of Korea expressed her willingness to host the FNCA in 2002.

10th ICNCA Conference in Tokyo, Japan

2.Registration of the Coordinators and Project Leaders

To enhance the regional nuclear co-operative activities (RNCA) under this framework, each participating country will register a Coordinator and seven Project Leaders to facilitate cooperation in the seven fields by August 1999.

The responsibilities of the Coordinator and Project Leaders are as follows:

1) The Coordinator
   - Management of overall cooperative activities in each country.
   - Communication and coordination on RNCA with the Coordinators in the other countries.
   - Making proposals and reports on overall planning of activities and evaluation of results.
2) The Project Leaders
   - Planning of activities in each field of RNCA
   - Management and implementation of activities including seminars and workshops
   - Summarization of the fruits and outcomes of the cooperation activities
   - Communication with the Project Leaders of the other countries in the respective field of RNCA

The names of the Coordinator and the Project Leaders to be registered by each member country will be publicized in the "Forum Newsletter" and in the Home Page of the "AsiaNNet" that is scheduled to start in October.

3.Coordinator Meeting

The Coordinator Meeting will be held in Tokyo around March every year. The terms of reference of the Coordinator Meeting will be as follows:

1) Horizontal coordination of RNCA
2) Coordination of activity plans for overall cooperation under FNCA
3) Review and evaluation of progress and/or status of overall activities
4) Report and recommendation concerning cooperative activities to the FNCA meeting

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