Newsletter
Radioactive Waste Management
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The FNCA 2002 Workshop on RWM

- Daejeon, Korea -

The FNCA 2002 Workshop on Radioactive Waste Management(RWM) was held from November 18-22, 2002, at Daejeon, Korea. This workshop was hosted by the Ministery of Science and Technology(MOST) of Korea, the Korea Hydro and Nuclear Power Co., Ltd.(KHNP) / Nuclear Environment Technology Institute(NETEC) of Korea and the Ministry of Education, Culture, Sports, Science and Technology(MEXT) of Japan, in cooperation with Japan Atomic Industrial Forum, Inc.(JAIF).

Representatives from policy making organizations, regulation sectors, and R&D institutes on radioactive waste management attended the workshop from countries under the FNCA frame work, i.e. Australia, China, Indonesia, Japan, Korea, Malaysia, the Philippines, Thailand, and Vietnam. An IAEA export also participated in the workshop upon the invitation from the workshop organizers.

In the first session of the first day, country reports were presented about present status and progress of radioactive waste management activities in each FNCA country. A number of countries reported on the status of control and regulation against transfer of radioactive materials across the borders.

In the second session, the discussion confirmed the final draft of the Consolidated Report on Radioactive Waste Management prepared earlier, and the way to effectively implement the findings.

In the third and fourth sessions on the second day, sub-meetings were held on "Radioactive Waste from Decommissioning" and "Waste Characterization" respectively. The sub-meetings provided with an in-depth discussion and promoted the exchange of information and the sharing of experiences, and thus promoted mutual understandings. A poster session to introduce industrial level technologies in relation to radioactive waste management was also held.

On the third day, a technical visit to Yonggwang Nuclear Power Unit 1 was made. New radwaste treatment facility of Unit 6 and solid radwaste storage building were introduced to the visitors.

On the fourth day, the Sub-meeting on TENORM(Technologically Enhanced Naturally Occurring Radioactive Materials) was held to exchange technical information and experiences on this increasingly important global issue.

In session 6, results of the Spent Radiation Source Management Task Group carried out by the Philippines, Thailand, Indonesia, Korea, and Japan were reported with the ways to strengthen the SRS management in the region.

Finally, the participants reviewed and agreed on the rolling 3-year work plan on radioactive waste management in FNCA.

Participants agreed that the continuation of this program will contribute to the safe radioactive waste management and radiation protection in the FNCA countries in the context of the global environment.

Tokai-1 Decommissioning Project

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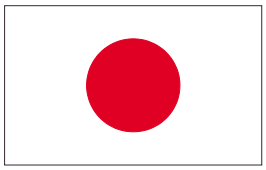


Japan

Tokai-1 (Gas Cooled Reactor) nuclear power plant of the Japan Atomic Power Company started commercial operation in 1966 as the first commercial nuclear power plant in Japan and ceased its operation in 1998. As de-fuelling activities were completed, JAPC launched Tokai-1 decommissioning in December 2001 after the submission of the notification of decommissioning plan to the competent authority. This is the first instance of the decommissioning of a commercial nuclear power plant in Japan.

JAPC's strategy on Tokai-1 decommissioning project is that the Tokai-1 plant would be dismantled continuously through phase (stage) 1 to 3 and the land will be a green field for future nuclear power generation. The reactor area, i.e. reactor and biological shield envelope, will be stored in safe condition for 10 years to reduce radioactivity.

Prior to the reactor dismantling, conventional facilities outside the reactor area are to be removed for the purpose of securing a transportation route for reactor dismantling wastes, and also to get the space for waste conditioning facilities. These conventional facilities dismantling work would balance the workload through the 17 years long term decommissioning project. The project program is divided into three phases.

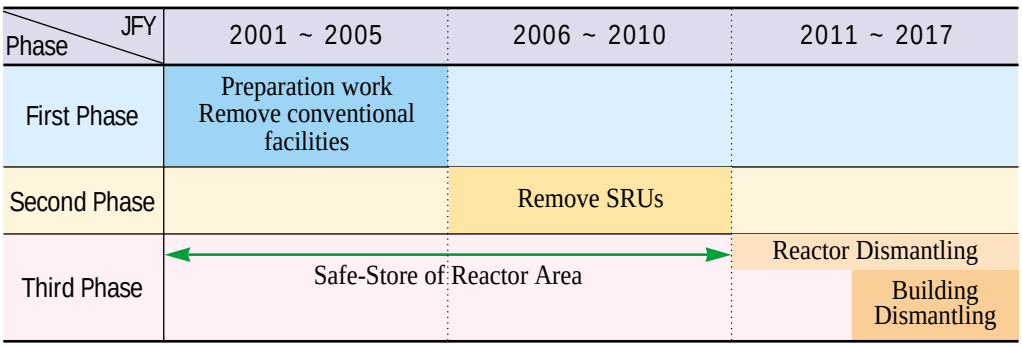
The amount of wastes arising from Tokai-1 decommissioning is estimated at 177kt in total, and about 10% of them are estimated as radioactive wastes. All radioactive wastes from the Tokai-1 decommissioning besides spent fuel reprocessing wastes are classified as the Low Level radioactive Waste (LLW) in Japan. The burial disposal facility is expecting to be constructed before the commencement of third phase (reactor dismantling); the majority of wastes will arise in this phase.

The total cost of the Tokai-1 decommissioning project is estimated at 89 billion yen (740M$) as of year 2001, in which about 35 billion-yen (290M$) is for dismantling cost and 54 billion yen (450M$) is for radioactive waste treatment and disposal cost.

It is very important for saving the decommissioning expense to reduce the radioactive waste volume and to reduce the cost of construction and operation of burial facility.

Tokai-1 decommissioning project has an important role for demonstrating that the decommissioning of commercial nuclear power plant can be executed safely and economically, and for establishing the key technologies for future LWR decommissioning in Japan.

<Decommissioning Project Schedule>



Conditioning & Packaging of Low Level Solid Waste-An Australian Approach

Mr. Lubi Dimitrirski
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ANSTO

Australia

To accommodate the strict requirements of conditioning and packaging of radioactive wastes, relevant to Australia's National Radioactive Waste Repository, ANSTO has opted for cement-based technologies, consistent with international practice. To this end ANSTO is installing a cementation plant in its newly completed Waste Treatment and Packaging Facility.

LLSW drums held in storage for Cement Conditioning

The Cementation Plant will have the capacity to condition and treat both homogeneous and heterogeneous waste types, stored on the ANSTO site since the early 1960s. The Plant design was conceptualised by ANSTO staff, with the contract being awarded to a local manufacturer, having expertise in the area of industrial plant design and construction. ANSTO has approximately 5600 LLSW drum held in storage. It is anticipated that all of these drums, with a few exceptions, will be suitable for disposal in the Australian National Radioactive Waste repository after conditioning.

Cement-based conditioning and treatment technologies for radioactive waste disposal must meet strict requirements for acceptance by the contractors of the Australian National Waste Repository. For instance one criteria for the treated waste is that the structural stability of the waste form must be maintained for a period of 300 years. To accommodate this strict criterion, a cement-based composite has been formulated by ANSTO, and will be routinely produced by the plant. Batch quality of the cement-composite will be analysed to ensure compliance with strict quality standards, including leaching and decomposition testing.

Automation was considered to be a key design feature for the plant to accommodate both ALARA principles relating radiological exposure to workers and reduce manning requirements. The turnkey operation will dispense measured quantities of sand, cement, water and other important additives into a shear-mixer, dependent upon the size of the batch to be processed. The plant is designed to accommodate ANSTO's requirements in treating and conditioning all of its historical and newly generated radioactive wastes.

The heart of the cementation plant is the shear mixer, capable of producing 300 L of motar (mixture of cement, sand and water) in 3 minutes. The mixed product is then discharged to a 600 L agitated holding tank, from which it can be used to encapsulate or infill radioactive waste drums. The plant has an in drum mixing facility that can be used to produce homogeneous waste forms, suitable for conditioning spent ion exchange resins and liquid wastes. The Cementation Plant will be operated by ANSTO staff with radioactive waste management expertise, and in compliance with ISO 9000:2000 certified Quality Assurance system. The plant is scheduled to be fully operational by September 2003, in light of the pending commissioning of the Australian National Radioactive Waste Repository anticipated to occur in late 2004.

Philippines Host NSRA Expert in Radioactive Waste Management

Eulinia M. Valdezco
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Head, Radiation Proection Services
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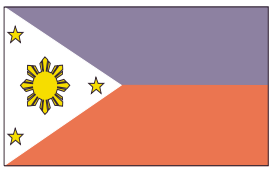

The Philippines

Mr. Yutaka Kawakami, presently a Technical Consultant of the Japan Nuclear Safety Research Association (NSRA) is in the Philippines for a 5-week technical exchange program starting in February 2003 with experts from the Philippine Nuclear Research Institute (PNRI). He is expected to provide technical service to the PNRI in the area of radiation safety and radioactive waste management. The PNRI has established, with technical assistance from the IAEA, and is currently operating a centralized radioactive waste treatment and storage facility. The PNRI, through the Radiation Protection Services, is also implementing a project on the Site Selection and Conceptual Design of a Near Surface Disposal Facility, which is funded by the International Atomic Energy Agency under its technical assistance program. A number of activities related to the TC project are being pursued in accordance with a national work plan developed by the counterpart staff, headed by Ms. Eulinia M. Valdezco of the PNRI. Among these on-going activities are the review and approval of the proposed waste classification scheme and categorization of radiation sources, including the development of the waste acceptance criteria and radiological safety assessment methodologies, among others. The exchange of technical information with local experts will be focused on these areas.

Mr. Kawakami's professional experience started with the Radioisotope Center at the Japan Atomic Energy Research Institute (JAERI). In 1981, he was appointed as Reviewer of Nuclear Safety Bureau at the Science and Technology Agency and three years later, its Chief Reviewer for Nuclear Safety Review. He went back to the JAERI as Deputy Director of the Department of Decommissioning and Waste Management from 1995 a position he held until the middle of 1998. Mr. Kawakami then became the Executive Managing Director of the Radioactive Waste Management and Nuclear Facility Decommissioning Technology Center, popularly known as RANDEC where he retired after four years of work. He has been an active participant in a number of expert advisory and consultancy meetings at the IAEA, which has resulted in a number of technical documents published by the IAEA for distribution to Member States. He has likewise presented a number of papers in several international conferences on radioactive waste management and waste safety held in many countries.

The Nuclear Safety Research Association (NSRA) was established in 1964 at about the same time that nuclear safety research is starting in Japan. It is a non-profit organization and is expected to render scientific viewpoints on any relevant issues it is called upon to review and to make recommendations. The NSRA dispatches Japanese experts in a number of fields of specialization, e.g. research reactor, nuclear regulations, licensing of nuclear facilities and others. Among the many activities it is involved with at present is in Radiation Emergency Medicine, specifically the training/education of doctors and nurses near Nuclear Power Plant Sites. The President of NSRA is Dr. Kazuo Sato, who was the Former Chairman of Japan's Nuclear Safety Commission.

The Regional Co-ordination Seminar for the Decision Makers for the Implementation of Radiation Protection

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The Regional Co-ordination Seminar for the Decision Makers for the Implementation of Radiation Protection, 3-5 February 2003 in connection with Regional Seminar for Senior Staff of Regulatory Agencies on Approaches for the Effective Regulation of Radiation Protection and Safety of Radiation Source, 6-7 February 2003, Bangkok, Thailand.

The combined events are held by the International Atomic Energy Agency(IAEA) with the collaboration of the Office of Atoms for Peace (OAP) as the host country in accordance with the planned activities to harmonize the radiation protection regional activities of the Model Projects and of the Regional Cooperative Agreement (RCA) in East Asia and the Pacific. The Model Project on Upgrading of Radiation Protection Infrastructure was designed to help develop radiation protection infrastructure of selected developing countries, with national program on peaceful use of atomic energy, to be in-line with the internationally accepted Basic Safety Standards (BSS). Participation will include high ranking officials, at the decision making level, and the projects counterparts of the participating Member States namely; Bangladesh, China, India, Indonesia, Republic of Korea, Malaysia, Myanmar, Pakistan, Philippines, Singapore, Sri Lanka, Thailand and Viet Nam with the total of 31 (25 from abroad and 6 from Thailand).

Current Status of RWM on the Nuclear Energy Development in Vietnam

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Vietnam

In the year of 2002, there were extremely important activities in the field of nuclear energy development in Vietnam. The Ministry of Industry (MOI), the Ministry of Science and Technology (MOST) and Vietnam Atomic Energy Commission (VAEC) were entrusted to carry out projects: Pre-feasibility Project on Construction of the First Nuclear Power Plant in Vietnam, Project on Strategy on Nuclear Energy Development in Vietnam, and Studying to Elucidate the Seven Important Issues Related to the Development of Nuclear Power in Vietnam.

According to the contents of these projects, the issue of radioactive waste treatment and management allays is important matter. VAEC had carried out studying on clarifying major issue facing the world today relating to radioactive waste from NPPs and solving measures as well as Vietnams ability to treat and manage radioactive waste in future. In collaboration with Korea, VAEC is preparing a governments policy for treatment and management of radioactive waste.

In the end of the year 2001, the project VIE/9/07: Infrastructure for Treatment and Management of Radwaste had completed in Dalat Nuclear Research Institute (NRI). It formulated the national policy and legal framework and to establish a technical infrastructure for radioactive waste management, but the scale of this project only satisfied radioactive wastes that were generated from NRI and other institutions in the South of Vietnam. However the radioactive waste conditioning and storage facility in NRI is in a poor state and does not meet the present international standards. Therefore, in the years of 2002-2003, VAEC is carrying out the plan to treat and manage all radioactive waste, which was collected and accumulated from activities of institutions related to radioactive waste in the North of Vietnam, to establish a technical infrastructure for Phung interim storage to meet the demand of radioactive waste treatment and management in near future.

We hope that, with the experiences we learnt from other countries, especially Japan and Korea, we will have a suitable policy on radioactive waste management and good solve problems on radioactive waste management in future.

Engineered Barrier Test Facility for the Near Surface Disposal of Low and Intermediate-Level Radioactive Wastes

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Korea Hydro & Nuclear Power Co., Ltd (KHNP)

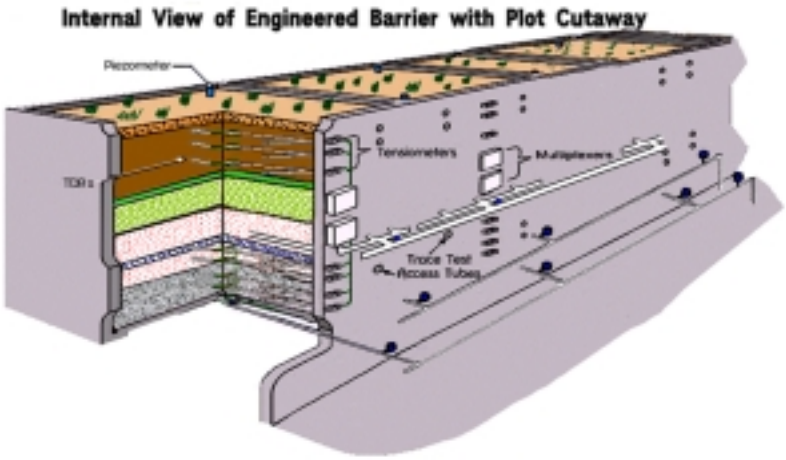
Korea

Dr. Chang-Lak Kim
Radwaste Disposal Research Group, Group Leader
Nuclear Environment Technology Institute
Korea Hydro & Nuclear Power Co., Ltd

Nuclear Environment Technology Institute (NETEC) of Korea Hydro & Nuclear Power Co., Ltd has made much efforts for several years to have disposal facility of low- and intermediate-level radioactive wastes. Four candidate sites of LILW disposal facility were announced by the government in February of this year.

The safety of a near-surface disposal facility is strongly dependent on the performance of engineered barriers such as disposal cover, backfill and concrete vault. The primary objective of engineered barrier and disposal cover system is to limit water infiltration and to prevent the waste packages from contact with water. A test facility of engineered barriers reflecting the conceptual design of disposal cover and vault system is now under construction at KHNP-NETEC (see Figure). The in situ experiments will be followed after in the test facility.

This research project is focused on evaluation and performance demonstration of the engineered barrier and cover system. In November of this year, the 2nd Workshop on Safety and Performance Validation of LILW Near Surface Disposal Facility is planned at KHNP-NETEC.



Bird's-eye View of the Korean Radioactive Waste Management Complex

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