

Annex 2

Summary of Open Seminar - Radioactive Waste Management in Nuclear Facilities -

5th October 2016,

Institute of Nuclear Physics, the Republic of Kazakhstan

1) Lecture 1.1: Current Status and Conception of Radwaste Management in the Republic of Kazakhstan (Dr Alexander Klepikov, Acting Deputy Director General, Nuclear Technology Safety Center of the Republic of Kazakhstan)

Policy on radioactive waste management in the Republic of Kazakhstan in accordance with the Law of RK "On the Use of Atomic Energy" and "Environmental Code" RK, is that all waste produced on the territory of the Republic of Kazakhstan, shall be disposed of under condition of radiation protection of population and environment for the entire period during which they can present a potential hazard. A huge amount of waste from various sources is accumulated and continues to form in Kazakhstan. For effective waste management, primarily need is their precise classification, aimed at the final disposal of radioactive waste. The proposed classification system recommended by the IAEA and implemented in the countries of Western Europe, is the categorization of radioactive waste in accordance with the future way of disposal. The solution of the existing problems in the field of radioactive waste management is possible through the systematic implementation of the state policy in the field of radioactive waste management through the development and implementation of long-term strategy for radioactive waste management. Kazakhstan has not yet a generally accepted formal strategy for radioactive waste management. Currently, the Republic of Kazakhstan held the necessary work to bring the regulatory framework and practices for the management of radioactive waste in accordance with the requirements of the "Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. "Today, after years of researches, designing and industrial use we can confidently say that safe technological solutions for RW management exist. However, radioactive waste disposal is no longer a matter concerning only scientists and technologists, but requires their cooperation with politicians, regulatory authorities, and the general public. The sole goal: to protect human health and the environment on a global scale from possible short-term and long-term exposures of radioactive substances on natural objects. Dialogue and cooperation between the various groups in society can lead to the development of appropriate solutions.

2) Lecture 1.2: Current Situation and Challenges in Radioactive Residues that Resulted from the Uranium Mining (Prof Toshiso Kosako, the University of Tokyo, Japan)

The history and present residue of Ningyo-toge uranium mine was reviewed. After the discovery of uranium in Ningyo-toge 1955, the mining activity continued from 1960's to 1980's. The activities stopped in 1987. After that the remediation of the mill tailings continued. The remediation strategy consisted of two steps: Upstream and Downstream. Both steps include (1) site characterization and design, (2) capping, and (3) monitoring. Each step were shown by the photos and explained.

To operate the repository site, the application of radiation protection principle is inevitable. But the direct application of "normal situation" principles to this kind of residue is difficult due to the natural origin radioactivity and sheer volume. This is a "gray area" where the concept of "existing situation" can be applied. The dose range from 1mSv to 10 or 20mSv can possibly be applied to this kind of "situation". However the actual application of this concept in a real uranium repository site will require public agreement of the design, referred to as "stakeholder involvement in decision making procedure".

3) Lecture 2: Current International Status of Radiation Safety and Radioactive Waste Management

● Bangladesh (Dr M. Moinul Islam, Bangladesh Atomic Energy Commission (BAEC), Bangladesh)

Presentation highlighted the ongoing program relating to radiation safety and Radioactive Waste Management in the country. Sealed Radioactive sources generated from the use of radioactive sources (RSs) in various activities which were safely stored inside the shielding containers at Central Waste Processing & Storage Facility (CWPSF), the presentation provided the details of conditioning work of Disused Sealed Radioactive Source (DSRS) for a number of radionuclides e.g., ^{60}Co , ^{137}Cs , ^{90}Sr , ^{192}Ir , ^{55}Fe , Am-Be, ^{241}Am , ^{252}Cf , etc. Evaluation of dose based on computer code for constructing a disposal site also reported in the presentation.

● Thailand (Ms Nanthavan Ya-anant, Thailand Institute of Nuclear Technology (TINT), Thailand)

Ms Ya-anant presented on the international status of radioactive waste management technology. She gave the information of radioactive waste treatment technology for liquid and solid radioactive wastes respectively. She talked about the technology of chemical precipitation, filtration, ion exchange, evaporation, vacuum drying, membrane technologies, and centrifugation for the aqueous liquid waste. She also gave the information of several technologies for the treatment of organic liquid waste, such as absorption, vacuum distillation and incineration. Brief descriptions of thermal technologies are provided to differentiate among the technical aspects. The technologies for solid

waste treatment given include incineration, metal melting and plasma. The compaction technology of solid waste are also described.

4) Human Resources Development Program Implemented by Japanese Government (Ms Ayako Tanida, Nuclear Safety Research Association, Japan)

The Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT) has been sponsoring a number of human resources development programs in the field of peaceful use of nuclear technology for a long time. Nuclear Researchers Exchange Program (NREP) is one of those program conducted by the Nuclear Safety Research Association (NSRA). This program has accepted a total of 1673 researchers from Asian countries since 1985, and is currently accepting 20 researchers, who passed strict screening of qualifications every year. A number of different research themes are suggested by nearly 20 universities and institutes all over Japan, and applicants can select one theme which is most suitable for their occupation or major. Detailed information can be found on the website.