Introduction of the Recycling program for Nuclear materials

Jae Beom Park, Byung Woo Shin, Jae Whan Park, Soo Jin Park

Korea Institute of Nuclear Nonproliferation and Control (KINAC)
Division of Nuclear Safeguards Implementation, Office: +82-42-866-9768, E-mail: jbpark@kinac.re.kr

1. Introduction

The LOF is the abbreviation of Location outside Facilities using in safeguards. IAEA want to control the location using the small nuclear material over the world. The depleted uranium used in Industrial field should be controlled by the Government according to the agreement between the IAEA and the ROK. From 2006, The ROK is managing the locations in the LOF. The detail article governing the locations is on the Location attachment agreed between two bodies. As of end of 2007, The LOF was consisting of 64 locations. Now, A number of Locations are increasing up to 75. The KINAC(Korea Institute of Nuclear Nonproliferation and Control) is controlling the data about the amount of nuclear material in LOF. The KINAC is trying to upgrade the efficiency and accuracy about the data.

The KINAC will make a storage house at the underground of head office from 2009. The purpose of the storage system in KINAC is gathering the nuclear material, which is difficult to control by the industries, especially the nuclear material involved in LOF. The final goal for gathering the nuclear materials are recycling to new another machine. I would like to introduce the handling case of the Depleted uranium in their countries. On this paper, I will show 4 countries case briefly.

2. Handling Case of foreign country for Depleted Uranium

2.1 Finland

The basis of safeguards in Finland is comprised of the Finnish Nuclear Energy Act and Decree. By virtue of the Act, STUK issues detailed regulations that apply to the safe use of nuclear energy. The main guides related to safeguards are:

. Control of nuclear fuel and other nuclear materials required in the operation of nuclear power plants
. The national system of accounting for and control of nuclear materials
. Reports to be submitted on nuclear materials

Finland was the first state where the INFCIRC/153-type safeguards agreement with the IAEA entered into force (INFCIRC/155, February 9, 1972). This agreement was suspended after Finland joined to the European Union and the agreement between the non-nuclear weapon States of the EU, the European Atomic Energy Community (Euratom) and the IAEA (INFCIRC/193) entered into force in Finland on October 1, 1995.

2.1.1 Minor nuclear material holders in Finland

The locations outside facilities are STUK (WFRS), the Laboratory of Radiochemistry at Helsinki University (WHEL) and OMG Kokkola Chemicals(WKK0). The amounts of nuclear materials in the end of 2006 are presented in Table 1.

<Table 1. Amount of nuclear material at minor nuclear material holders in Finland.>

Company	Nuclear material (kg)						MBA + use of NM
	U-dep	U-nat	U-Leu	U-Heu	Pu	Th	
Geological Survey of Finland (GTK)	–	–	–	0.001174	–	–	SF 0293 CA, Minor NM activities
Finnair Engineering	15.5	–	–	–	–	–	SF 0302 CA, DU radiation shielding
Rautaruukki, Raahe Works	163	–	–	–	–	–	SF 0303 CA, DU radiation shielding
Inspecta	304	–	–	–	–	–	SF 0304 CA, DU radiation shielding
Outokumpu Stainless	100.98	–	–	–	–	–	W0KU, DU radiation shielding
Centre for Technical Training, Metal and Machinery	15	–	–	–	–	–	DU radiation shielding
Polartest	163.2	–	–	–	–	–	WF1P, DU radiation shielding
MAP Medical Technologies	55	–	–	–	–	–	SF 0325 CA, DU radiation shielding
Metorex International	–	0.0105	–	–	–	–	U-nat standards
University of Jyväskylä, Dept. of Physics	–	0.003	–	~0	~0	0.134	WDPJ, Basic research

STUK's nuclear activities are mainly storing of nuclear materials. STUK has the Central Interim Storage for Small-User Radioactive Waste (" Small-Waste Storage") located in the NPP waste cave in Olkiluoto and the small radionuclide storage at STUK. At moment the Laboratory of Radiochemistry of Helsinki University has no nuclear activities excluding store of minor amount of nuclear material.

2.2 Sweden

All Swedish spent nuclear fuel is to be directly disposed in a final repository

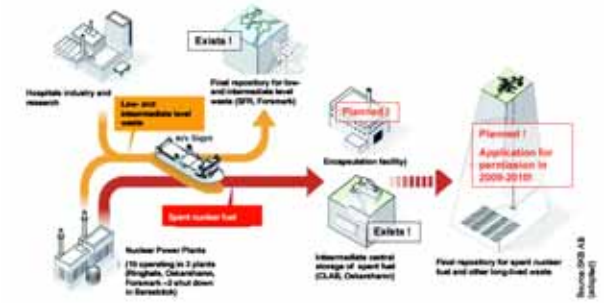
The nuclear industry has for 30 years been developing the KBS method for final disposal of spent nuclear fuel. The industry's nuclear waste company, SKB AB, is responsible for this work.

The KBS method was originally chosen in a different environmental era – "bury and disperse", "out of sight - out of mind".

The progress of the development of the KBS method and the repository siting work has been regularly reviewed by the regulatory authorities and the Government but a "lock-in" process is very evident – operation of nuclear power plants requires that the waste problem "is solved".

The environmental movement in Sweden has since the 1970s been deeply critical to the development of

methods for nuclear waste management – both with regard to choice of method and the siting process.



< Picture 1. Management of Nuclear Waste in Sweden>

2.3 United Kingdom

Radioactive isotopes are used in a wide range of industries in United Kingdom from construction, chemicals and manufacturing through to education, health and government bodies. The company ACB is committed to protecting the earth's natural environment for future generations by minimizing the impact of radioactive material, which can be in gas, liquid or solid form. The company responsibly and effectively manage the disposal of all types of radioactive material.

With radioactive material disposal practices having changed substantially over the years, designs for new disposal facilities and disposal methods must meet environmental protection and pollution prevention standards that are stricter than were foreseen at the beginning of the atomic age. Like above process, The UK is trying to reduce the nuclear material used in industries by recycling.

2.4 USA

The USA is taking the treatment fee for the depleted uranium used in their works. The USA has the repository site for all kind of nuclear material in own land. The treatment fee is about 800$ per each radioisotope camera. The situation between the USA and ROK is different. But, final goal is same to prevent the material from the public. The States has the nuclear weapon from the World War II. The states are not interesting in the depleted uranium like high enriched uranium and plutonium. But, due to the chemical and radioisotope properties, the depleted uranium should be controlled. The Depleted uranium must be the nuclear material to be controlled even in the states.

4. Conclusion

We should establish the system for all kinds of nuclear material in terms of data control and managing the nuclear material. The KINAC is managing the data for industries through the computerized system located in KINAC. It is difficult to control the data without special storage system in Republic of Korea. The KINAC has a plan to build the storage room for the depleted uranium in their building. Long term treatment for nuclear material may be different by each country. But, The Republic of Korea, facing the new approach for the storing the nuclear material, have to prepare the standard and guideline fitting our situation. To make the various managing skill for nuclear material is essential to strength will for their non proliferation. It can be help to strengthen business activities.

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