

The study of necessity for establishment of the Bank of small quantity nuclear materials

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1. Introduction

Nuclear materials are found in many fields including the civil and military activities. These activities are concerned with the medical, industrial and research fields. The well known applications of the depleted uranium are radiation shielding material using in radiological-camera device, holding radiation from radioactive sources used in the medical and industrial fields. Industrial gamma radiography using sealed radioactive sources of tens of gigabecquerels of iridium 192 or cobalt 60 is the main field of use of Depleted Uranium in ROK. Telegammatherapy devices containing sealed sources of cobalt 60 with activities of tera-beququerels include radiological shielding materials, collimation systems made of DU. Some low dose rate and high dose rate brachytherapy equipment also use DU as shielding material. The second field where large quantity of DU is used is as the catalyst in chemical process. Moreover, DU is used as oil-well drilling in the form of sinker bars. Besides using the Depleted Uranium in above fields, Du is using in many industries. Our focus is on the depleted uranium in this industry.

ROK has developed the management system for depleted uranium from 2003, and achieved some results in this study including management software and management skills. ROK established the KO-X, which is the virtual Material Balance Area(MBA), to control the small quantity nuclear materials in ROK. The problem which was found during perform the project is various. But, the most distinguished issue was discarded depleted uranium, which was used in radiological-camera device for its life. Everything including nuclear material has the price in the market. But, the discarded depleted uranium shield does not have some value as a material any more. And the company could not maintain the activity for ever. Anybody does not want to keep the discarded device for free. Even though some nations have the skill to reuse the material, ROK does not have the system. Up to now, ROK neglected management of the discarded depleted uranium shield. Through our experience in managing the depleted uranium last 4 years, we found some solutions to settle the issue. On this paper, I would like to introduce the bank of the small quantity nuclear material, which will be the unique solution to solve the management problem.

2. Regulatory system for small quantity nuclear

materials

The ROK regulatory system related to small quantity nuclear material is based on roughly regulations, taking into account in a specific way for users of small quantity nuclear materials. The ROK amended MOST notices at 2004 and it involve the small quantity nuclear material management in MOST notice 2004-5. The notice has not penalty system for the users like nuclear law. It also controls all kinds of nuclear materials in the announcement. It is difficult to apply the penalty article the users, who use the small quantity nuclear material. That field is the poor business and the users can not afford the penalty article. Generally, there are three regulatory regimes in nuclear materials. That is the licensing, declaration and exemption. There is a limitation for the licensing of the nuclear material in the Atomic Energy Law. The 300g of the nuclear material is the minimum weight of the licensing. That means ordinary radiological-camera device should take a license from government for their uses. And according to the MOST announcements, the users should declare the amount of the nuclear material and index usage every year. The government should report the result to the IAEA. After that, the user should manage the material. After government asking of the exemption from the safeguards, IAEA can issue the exemption confirmation.

A declaration must be established by the users every year, before the last day of March. Declarations are sent to KINAC(Korea Institute of Nuclear Non-proliferation And Control), acting as technical support body of the national authority. The KINAC gathers and centralize the data within the national Location outside Facilities(LOF) in ROK. The declaration contains the following data:

- for the initial declaration and after each modification of the declarant status :
 - . Identification data and the name of its owner and operator who are legally responsible
 - . Type of activities concerned about the nuclear material
- in each annual declaration:
 - . Inventory of nuclear materials held at 31 March of every year
 - . Inventory change occurred during the previous year, including the identification of shippers and receivers;

. the inventory changes of nuclear materials expected in the present year

improve health of Korean and strengthen the world-wide trust for the nuclear transparency of ROK.

3. The role of the bank for nuclear material

As abovementioned, declarants have to send an annual declaration of their stock and inventory changes of nuclear materials related to those in the previous year. Data are processed into the centralized national accounting database, which is managed by the KINAC. Declarants are identified in this centralized database by a unique ID. KINAC can support the company, which would be anxious about making problem in managing the nuclear materials. Actually, radiological-camera device will be abandoned due to mechanical life cycle. The main reason of the discarded is the long use and rupture of the S-tube in the device. The damage of the S-tube will give radioactive contamination to operator. Enforcement of the declaration regime requirements is also ensured by on-site inspections, carried out by accredited inspectors under the authority of the MOST. KINAC can give a notice to deposit the useless depleted uranium shield. In case of close their business for many reasons, the company should report the fact and deliver all nuclear material including discarded depleted uranium shield to the government or other company. But, until now, we don't have sufficient system to collect discarded depleted uranium shield. Experience feedback shows that this information is an essential element in the prevention breaches in the state system of accountancy control for the nuclear material.

I would like to suggest the establishment of the bank for the small quantity nuclear material in KINAC. KINAC will gather all discarded depleted uranium shield and prepare the process method like abandon, re-export to manufacturer country. There is no doubt that opposite opinion about bank for the small nuclear material can be. And there are so many problems to fix. Even if the nuclear materials held by declarants are of low sensitivity as far as proliferation is concerned, a total absence of regulations on the small quantities concerned might lead to an increased attractiveness for unauthorized uses. The bank will fill the role of prevent to neglect all kinds of nuclear material including the small quantity nuclear material in ROK. It will lead the culture of the control for all nuclear materials. The bank would give to nuclear field in ROK a different view point about the managing the nuclear materials.

4. Conclusion

The government should give efforts to establish the bank for small quantity nuclear materials results. If ROK do not make any system to prevent the breach the small quantity nuclear materials, it will give bad influence to the SSAC. So, the establishment of the bank will help to

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