

Current Issues and Improvement Plans of Small Quantity Nuclear Material Management System in Korea

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1. Introduction

At present, small quantity nuclear material is subject to the IAEA Safeguards Agreement and Additional Protocols, but are excluded from the scope of the use permit subject material. Therefore, systematic management is difficult. Small quantity nuclear material is less risk of exposure, but they may cause unnecessary anxiety when exposed to people's lives, so systematic management is necessary. Therefore, we analyze the system and status of small quantity nuclear material in Korea and propose a system improvement plan for management.

2. Current Issues and Improvement Plans

2.1 Definition of small quantity nuclear material

Small quantity nuclear material is a term that is not a legally defined term but refers to a nuclear material that does not require a permit or notification under the Nuclear Safety Act.

Although small quantity nuclear material is excluded from permitting and notification subject the current national law, Korea is required to submit information on the amount, use and location of such nuclear materials in accordance with Article 98 of the Nuclear Safety Act and the Additional Protocol to the IAEA Safeguards Agreement.

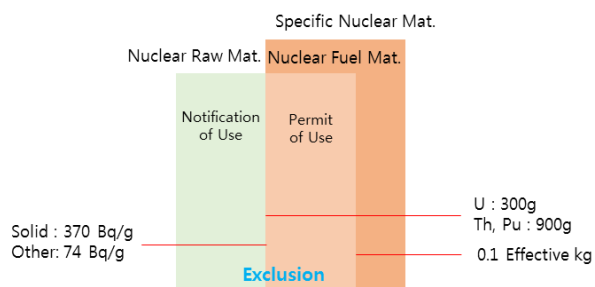


Fig. 1. Nuclear material use permit and notification level

Small quantity nuclear material is mostly occupied by radiation shielding depleted for radiation projector. In addition, they are used in a wide variety of forms such as chemical samples, tracers, and standard sources, and their usage is continuously increasing.

2.2 Small quantity nuclear material management system and status

The nuclear material in Korea is managed by the Nuclear Safety and Security Commission (NSSC). And there are regulatory agency Korea Institute of Nuclear Safety (KINS) and Korea Institute of Nuclear Nonproliferation And Control (KINAC). KINS is in charge of licensing and safety inspections of nuclear materials in terms of safety, KINAC is responsible for the management of quantities of nuclear materials, import and export management, etc. based on the Additional Protocol to the ROK-IAEA Safeguards Agreement.

Small quantity nuclear material are managed by KINAC, and KINAC operates an on-line web site to manage small quantities nuclear material. More than 130 institutions and private company now report inventory changes to KINAC through this system.

2.3 Current issue of small quantity nuclear material management

2.3.1 Lack of relevant laws and regulations

The term of small quantity nuclear material is not a legally defined term. Therefore, the object, scope, and standards of small quantity nuclear material can not be legally defined. As a result, there is a general lack of regulation, such as lack of awareness of users, insufficient understanding of current status.

Especially when conduct the accounting management of small quantity nuclear materials, voluntary cooperation should be sought for each institution due to such lack of regulatory. If there is an institution that does not cooperate with the accounting reporting, there is no legal ground for it and it is difficult to manage it properly. In addition, even accounting reporting that are currently being voluntarily can not guarantee the continuity because the possibility of users' defaults or closure.

2.3.2 Dualization of management system

KINS and KINAC are the institutions responsible for regulating nuclear materials in Korea. Each regulatory body has different regulatory objectives and, in some cases, there is a possibility of double regulatory and regulatory blind spots.

In the case of a radiation projector, the shielding part made of depleted uranium is classified as a small quantity nuclear material and that is subject to KINAC notification, radioactive isotopes entering the interior is subject to KINS permitting and there is a possibility of double regulation. In addition, information related to

nuclear fuel materials is separately collected and managed according to the needs of each regulatory agency, resulting in inefficient use of information.

2.3.3 *Absence of small quantity nuclear material treatment and disposal procedure*

Some small quantity nuclear material users are not willing to use small quantities nuclear material because of the resignation of the person in charge or the termination of the project. Currently, however, there is no way to dispose of such small quantities of nuclear material. Therefore, it is often the case that the user owns the equipment and carries the burden of management, which causes the unauthorized disposal of the nuclear material. In addition, there are no legal grounds or procedures for disposing of nuclear material when unauthorized discovery or notification is made due to unauthorized disposal.

2.4 *Improvement plan of small quantity nuclear material management system*

2.4.1 *Amendment of related laws such as current Nuclear Safety Act and Notice*

In order to fundamentally manage small quantities of nuclear material, it is necessary to revise the relevant provisions of the Nuclear Safety Act. Through this, even when using the nuclear fuel material to be exempted from permit for use, it is also obligatory to report inventory change reports for accounting management.

To this end, the notifications on international regulatory material reporting should be amended as follows.

Table I: Amendments to the provisions on accounting report

Existing provision	Amended provision
<p>Article 5 (Report) The users of specific nuclear material shall report to the NSSC, in accordance with the provisions of Articles 6 to 17, matters pertaining to their work by each establishment.</p> <p>However, the NSSC shall, in cases where specific nuclear materials used or possessed by users of specified nuclear materials are less than 0.1 effective kilograms for the purpose of non-nuclear use, from Articles 6 to 9. Article 13 Article 16. The report set forth in Article 17 and Article 23 may be omitted.</p>	<p>Article 5 (Report) ① Among the users of specific nuclear materials, permitted nuclear fuel material users shall report to the NSSC, in accordance with the provisions of Articles 6 to 17, matters pertaining to their work by each establishment.</p> <p>② Anyone who does not fall under Section 1 of a specific nuclear material user, shall report to the NSSC pursuant to the provisions of Articles 7, 10, 11, 12 and 15. At this time, the reporting method follows the reporting method using the network of the institution designated by the committee.</p>

2.4.2 *Establishment of information sharing system between regulatory agencies*

If both KINS and KINAC establish an information sharing system, the problems caused by the dualization of the management system will be reduced.

In the case of a company using radiation projector, KINAC, which manages the shielding parts, and KINS, which manages the radioactive isotopes, collect necessary information from each company. At this time, redundant information such as information of the supplier and the location of the material exists.

Therefore, if information sharing system is established, it will reduce the possibility of double regulation and increase efficiency of information utilization.

2.4.3 *Establishment of small quantity nuclear material treatment and disposal procedure*

It is necessary for the government to establish procedures for accepting and transferring nuclear material to minimize confusion in the event of accidental nuclear material acquisition. And if the government collects unused nuclear material and manages it in one place, it can improve management efficiency and safety.

3. Conclusions

So far, we have discussed the current management system of small quantity nuclear materials and the ways to improve them. For fundamental improvement, it is necessary to revise the relevant provisions of the Nuclear Safety Act. In addition, in order to improve the efficiency of management, it is necessary to consider not only the amendment of laws, but also the sharing of information between regulatory agencies and the disposal of small quantity nuclear materials.

REFERENCES

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