

The Improvement of Small Quantity NM Management System in ROK

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1. Introduction

Nuclear materials use in medical, industrial, and research continues to increase. And these nuclear materials require that the state effectively protect, regulate and control it under the comprehensive safeguards agreement and the additional protocol. Small quantity of nuclear material (SQNM) is prescribed to be less than specified minimum quantities of nuclear material in a facility. SQNM is used at the locations called locations outside facilities (LOFs). Holders of SQNM don't need to require a license for use or possession of Uranium or Thorium exclusively for non-nuclear activities, or neither reports them to the System of Accounting for and Control of nuclear material (SSAC) under specified quantities according to the Atomic Safety Law. The national LOFs need to be managed meticulously in order to keep track of nuclear materials with regard to both nuclear safety and safeguards in parallel with well-defined national safeguards laws. This paper suggests the improvement to manage SQNM within the System of Accounting for and Control of nuclear material (SSAC).

2. Improvement of Small Quantity NM Management System

2.1 The stats of Small Quantity NM Management System

LOFs are defined in the additional protocol as "any installation or location which is not a facility, where nuclear material is customarily used in amounts of one effective kilogram or less." Facility means "any location where nuclear material in amounts greater than one effective kilogram is customarily used." National LOFs are composed of the virtual groups to control small amount of nuclear materials. They are covered by one facility attachment with a single MBA with different KMPs for such a location in Korea. Managing LOF started after the ROK-IAEA joint review meeting held in 1998 substantially. National LOF management system is regularized to a full-scale since the additional protocol ratified in 2004. Currently national LOFs are composed of 3 KMPs; total of 110 LOFs -- 75 NDA industrial uses (KMP A), 33 research and academia (KMP B) and 2 others (KMP C).

Holders of SQNM declare their inventory changes and exempted NM information to the KINAC via Web-

based 'National LOF management system' shown in Figure 1.



National LOF Management System

FIG 1. National LOF management system

However it is difficult to fully implement the management of SQNM under international standards via Web-based 'National LOF management system'

2.2 The problem of small quantity nuclear material management system

SQNM is no exception at all because all nuclear material is under IAEA safeguards according to 'The agreement between the ROK and the IAEA for the application on safeguard'. However SQNM is no need to be licensed or noticed material to the government of the R.O.K under 'The Nuclear Safety Act'. As SQNM is excluded from the license and notification of government, the obligation and the penalty of SQNM holders are unclear. And it is a great concern about the negligence of nuclear material management.

Especially, because most non-destructive testing companies that handle the majority of SQNM are very small, they are likely to default and close down. And this is the greatest risk factor for the systematic management of SQNM. Therefore, even in the case of the reporting through the 'National LOF management system', which is carried out autonomously by the SQNM holders, there is a problem that the nuclear material management cannot be secured in case of the bankruptcy or closure of the SQNM holders. In addition, the Korea Institute of Nuclear Nonproliferation and Control, which is in charge of the SQNM management, needs to seek cooperation with the SQNM holders

every time. Even greater problem is that the possibility to dispose of the SQNM holders without any notification. This is a problem that must be improved because the SQNM holders can lose SQNM such as radiation irradiators or dispose of them without sanction.

2.3 Improvement of SQNM management system

The Korea Institute of Nuclear Nonproliferation and Control continues to conduct policy research including the overseas case studies and the SQNM holders' surveys to improve the management of small quantities of nuclear materials. As a result, this paper proposes three improvement measures as follows.

First, SQNM holders must be given legal obligations that include the following essentials for systematic national control of SQNM.

1. The duty of SQNM accounting and reporting
2. The duty of attending to training about SQNM accounting
3. The prohibition of transfer and disposition without notification.

If the SQNM holders are included in the license policy of the 'Nuclear Safety Act' in order to legally grant the above obligations, the relevant regulations are overly excessive. However, if they are included in the notification policy of the 'Nuclear Safety Act', there is a lack of regulation. Therefore this paper proposes a "SQNM registration system" including the above mentioned obligations on the 'Nuclear Safety Act'. And it is necessary to amend the 'Nuclear Safety Act' to enforce reporting obligations to SQNM holders.

Next, In order to manage SQNM, disposal methods of unused SQNM should be prepared. Storing SQNM not used by holders or individuals for long periods is not desirable from a management standpoint. It is necessary to improve the system and legislation so that it can be delivered to KORAD (KOREA Radioactive Waste Agency) as radioactive waste.

Lastly, it is necessary to make a contribution for the SQNM management. If nuclear material that does not have an administrator due to bankruptcy or closure has found, there is no way to transfer to another institution or the KORAD. The bigger problem is that no resources are available to solve it. In order to solve this problem, it is necessary to make a contribution for the management of SQNM by making some contributions to the initial equipment purchase costs. It is expected that it will be possible to contribute to the establishment of a systematic system for the management of SQNM through stable financial resources and to establish a system.

3. Conclusions

In this paper, we review various problems for national management of SQNM and suggest the necessary improvement measures accordingly. SQNM have been difficult to systematically and efficiently manage because of the lack of institutional support, despite the need for national management. First of all, it is essential to improve the national management system through amendment of the law. And the Government support and SQNM holders' cooperation are necessary for this. KINAC will continue to conduct this study and will suggest reasonable improvements as soon as possible. This will ensure an efficient national nuclear material management system

REFERENCES

- [1] INTERNATIONAL ATOMIC ENERGY AGENCY, Preventive and Protective Measures against Insider Threats, IAEA Nuclear Security Series No. 8, Vienna (2014).
- [2] Nuclear Safety Act, Article 45 (License of Use, etc. of Nuclear Fuel Material), 2014
- [3] Enforcement Regulation of the Nuclear Safety Act, Article 71, 2014
- [4] NSSC Notice, 2014-40 (Types and Quantities of Nuclear Fuel Material not Subject to License for Use), Article 1, 2014.
- [5] NSSC Notice, 2014-70 "Reporting of Special Nuclear Material Accounting", Article 5, 2014.