

The Study on the analysis and improvement of SSAC

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1. Introduction

Since 1997, ROK has maintained stringent State System for Accounting and Control of nuclear Materials(SSAC) and adopted national inspection system for the special nuclear materials. After the Traditional Safeguards(TS) and Additional Protocol(AP) regime, IAEA is applying the Integrated Safeguards(IS) to ROK currently. ROK also has changed its own SSAC in step with IAEA regime. We have been studying the way to increase efficiency and effectiveness for SSAC. We have made the draft of the revised government notification and national inspection procedures according to the IAEA regime. This study analyzed the current structure of SSAC and the national inspection system. Also we proposed improvement direction as a rudimentary stage.

2. The safeguards rule on special nuclear materials for the facility.

2.1 The issue of the regulation on guideline to formulate the safeguards rule on special NM

The Regulation on guideline to formulate the safeguards rule on special nuclear materials was enacted based on the IAEA DIQ format in 1997. Since the regulation was enacted, there has been no significant change except for minor revisions.

In case of facility where revises DIQ frequently, the burden of operator is on the rise due to the structure of the safeguards rule. The operator should revise their regulation simultaneously with IAEA DIQ revision.

In most cases of DIQs revision, the safeguards rule of the facility should be revised. So if the number of DIQs revision is increased, it becomes an administrative burden to the operator.

The regulation should lead the effectiveness of dealing with nuclear material, as the operator should follow the safeguards rule when the nuclear material is produced, carried, shipped, stored and wasted. However, the current regulation lacks effectiveness contents for the implementation of national safeguards.

Table 2.1 is the structure of the safeguards rule on special nuclear materials. The table shows that the most articles are related to the design information.

Therefore, the improvement of the structure of the safeguards rule on special NM is deemed necessary in order to separate design information and add the realistic contents.

2.2 The proposal for the regulation on guideline to formulate the safeguards rule on special NM

I would like to suggest two options to make the realistic regulation and to separate design information from the regulation.

One is to make new **Design Information Report** that should be approved at Nuclear Safety & Security Commission (NSSC). This option is the alternative way to separate design information from the regulation. However, it could increase the operator's burden that new documents should be made. Also the contents of Design Information Report are problem of duplication with IAEA DIQ.

Table 2.1 Structure of the safeguards rule on special nuclear materials

Article of the safeguards rule on special NM	Related to Design Information
Name of the facility	○
Location and Address	○
Owner	○
Operator	○
Purpose	○
Responsibility and Duty	○
Quantity of Permitted material	○
Organization	○
MBA Code	○
the Date of FA into force	○
Lay out of the facility	○
General material description	○
Quantity of material in normal operation	○
Essential Equipment	○
Key Measurement Point	○
Material description code	○
Containment and Surveillance	○
Description of the receipt and shipment system	X
Waste and MUF	X
Material Accounting System	X
Recode and Report	X
Training	X
Preparation of Inspection	X

The other is to change the structure of the regulation. In detail, the articles related to design information is put in the new chapter (Design Information) on the regulation. The operator can put the reference number of IAEA DIQ instead of putting specific contents on the safeguards rule. This is alternative way to decrease the operator's burden and to separate the design information from the regulation. However, it should be

considered whether the format of the regulation is suitable or not.

So it is needed to make further studies for suitable solution.

3. National Inspection System

3.1 The status of the national inspection

National inspection system was changed in step with IAEA inspection regime. Since IS regime, apart from IAEA inspection, the separate national inspection has been started.

The separate national inspection is implemented at the facilities where the number of IAEA inspection was reduced in order to recover periodic inspection. Also it follows IS procedure for Agency.

Table 3.1 shows the status of inspection activities of national and IAEA at LWRs. As you can see in the table, the current procedure of the separate national inspection is same with Agency procedure except few activities.

Under traditional safeguards regime, IAEA inspection was notified in advance at least 3 month ago. So in case of the national inspection with IAEA at the same time, the preparation and planning of the national inspection were performed sufficiently. However, in case of IS, IAEA safeguards regimes are based on the short notice inspection. So the preparation and planning of the national inspection are not able to be performed properly.

Table 3.1 Status of inspection activities at LWRs

Inspection Activities	Agency Inspection	Separate National Inspection
General Ledger	○	○
Storage Map	○	○
ICR	○	○
Power Histogram	○	○
Burn-Up Data	○	○
Operation Declaration Sheet	○	○
Excore Power Chart	○	○
S/G Steam Flow Chart	○	○
Confirmation of stored DIQ and Operators' Understanding DIQ	○	X
Management and Observance of the stored safeguards rule on special NM	X	○
Verification of Spent Fuels	○	○
Verification of Non-Fuel Items	○	○
Verification of Seals	○	○
Verification of Fresh Fuels (Storage)	○	○

Table 3.2 shows the notification time of IAEA inspection under the IS.

Therefore, it should be considered whether the current national inspection system is suitable for

leading the realistic and effective accounting system of facility.

Table 3.2 Notification Time

IAEA Inspection	Advance Notification Time
PIV	7 Days
DIV	7 Days
RII	2 or 24 hours
SNRI	2 hours

3.2 The proposal for the improvement of national inspection system

I would like to suggest making new inspection guideline that is a subordinate concept of government notification. Now we have our own inspection guideline, however they have made based on IAEA's safeguards manual and is not approved at the NSSC. So we need new authenticated inspection guideline that is independent from IAEA's.

Also I would like to suggest changing the form of the national inspection. As I noted above, the current national inspection form is similar in IAEA's except few things. It is necessary that the national inspection should be implemented as separate way with IAEA because each inspection has own purpose.

So the new guideline should contain the contents for the realistic management of the special NM. Also the new way of national inspection should be proposed in the new guideline that has independent frequency and suitable activities.

4. Conclusions

In this paper, we analyzed the structure of SSAC and proposed improvement direction as a basic step.

For the improvement of SSAC, we need to make further studies and develop the detailed way.

This can be helpful to establish the identity of SSAC and make the national inspection system realistic and effective.

REFERENCES

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- [3] Regulation on guideline to formulate the safeguards rule on special nuclear materials (2012-78), NSSC, January 20, 2012