

## **Development of technical standard for inspection and review of Nuclear Power Plant's physical protection status**

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### **1. Introduction**

All the nuclear power plants (NPP) should take a regular inspection on their physical protection status. The law for Physical Protection of Nuclear Material & Facility & Radiological Emergency Preparedness (LPPREP)<sup>1)</sup> which entered into force on Feb. 16, 2004 makes the NPP to take inspection every two years. The inspection has been carried out based on the order<sup>2,3)</sup>. The orders provide the guideline to prepare the security plan and contingency plan of the licensee. The items that should be included in the plan are well explained. Both review and inspection are conducted based on these items in a qualitative manner. However, the items designated in the orders are not so specific that more detailed standards including quantitative data are needed. In order to cope with increasing demand from both industries and competent authorities, KINAC (Korea Institute of Non-proliferation And Control) that has been performed review and inspection entrusted from the MOST has launched the program to develop more detailed technical standards in both quantitative and qualitative manner. This paper is written to introduce the activities of KINAC for developing the technical standards for review and inspection of the NPP. The results obtained from the study and future plan are explained.

### **2. Overview of the inspection and examination**

There are two kinds of activities, review and inspection, to check whether the physical protection system of the NPP is well established. A Review, in brief, is an activity to examine the written documents such as the security plan (including the contents of nuclear material during transport) and the contingency plan. The main purpose of the review is to scrutinize the NPP's physical protection measures and plan. The licensee should revise the document if insufficient measures are found in the written documents. Whether measures provided in the written plan are enough and proper to protect the facilities can be decided through the inspection activities. Therefore, inspection and review are mutual aid activities. All the NPP have to submit the plans for physical protection and achieve the permission for them before the operation. There are three types of inspection such as the first, special and periodic inspection. The first inspection is performed when nuclear power plants are newly constructed and the special inspection is carried out if there are some

problems in the physical security system or changes of physical security system occurred. The periodic inspection is a regular check and all the nuclear power plant should be inspected every two years.

### **3. Development of technical standard**

Review and inspection on the physical protection system are directly related to the security of the plant so that they should be performed based on reliable standard. Not only a quantitative but also a qualitative standard is required to enhance the credibility of examination and inspection process. As mentioned earlier, technical standards in terms of quantitative manner for the physical protection area are not fully set up. A specific plan to develop a technical standard has been made and the program is being progressed.

#### *3.1 Methodology to develop technical standards*

The technical standard especially, quantitative requirements in the field of physical protection can not be easily obtained. Determination of a specific quantitative value requires accumulated experiences and in certain case, a field test is needed. Therefore, development of the technical standard is a time consuming and very costly work. In order to save time and cost, we decided to get needed data from other country's related written documents. Especially, U.S. documents such as Regulatory Guide, Inspection Manual and Code of Federal Regulation were selected as main references. Since most of the equipment and instrument that are being used in the plant were manufactured according to the U.S technical standard, a great part of the standard used in the U.S can be adopted without field tests. However, some items that are not suitable to our system or should be rechecked for clarity need the field test. Those items are selected for the field test.

#### *3.2 Results*

There are many items to be considered in developing the technical standard of physical protection. They were classified into 12 broad categories to perform the work efficiently. The selected items reflect all the part of physical protection area. Four categories such as contingency plan, access control, protection during transportation and central alarm station had been studied

last year. Table 1 shows 12 classified categories and documents that were referred to.

- Contingency plan<sup>4,5]</sup> : The contingency plan is a document that provides guidance to licensee personnel and identifies procedures to accomplish specific, defined objectives in the event of threats or sabotage. In this study, technical standards for review and inspection on the nuclear plant and nuclear material during transport were derived.

- Access control<sup>6]</sup> : The access control is performed to protect the plant and nuclear material from the personnel who has a bad intent, vehicle, packages and explosives, etc.. Different access control is applied depending on the category of nuclear material to be protected.

- Protection during transport : Special nuclear material is easily targeted during transport so that more stringent protection measures should be given. As the same as the other items, physical protection measures are different in accordance with the category of nuclear material. The requirements on transportation planning, conditions, and communication, etc. which should be reviewed and inspected were derived

- Central Alarm Station (CAS) : The central alarm station is an installation which provides for the complete and continuous alarm monitoring, assessment and communications with guards, facility management and the response force. Since CAS controls all the activities related to nuclear security, it should be protected more strictly. That is the reason why so many requirements are needed. There are so many equipment and instruments in CAS that quantitative standards for review and inspection are more than those in other items.

### 3.3 Future plan

Quantitative and qualitative standards on four items were derived last year. Most of the derived requirements were proven and can be applied to our system. But some quantitative standards should be checked and if necessary, field test is required. The study on the technical standard of the remaining 8 items will be continued this year and the quantitative requirements derived that need field test will also be selected. There is no specific plan for field test yet but it is realized soon.

## 4. Conclusion

The technical standards for review and inspection are essentially needed to evaluate whether sufficient physical protection measures are taken to nuclear facilities and nuclear material. Our country has made its efforts to establish the implementation regime of

physical protection since the law was entered into force. Development of quantitative standard for review and inspection is one of those efforts. All the needed standards were classified into 12 broad categories and the technical standard on four items were derived last year. The field test on some items is scheduled to be performed. These efforts would contribute to improve the credibility on the physical protection system of nuclear plant.

Table 1. Item classification and reference

Items	Reference
<b>Contingency Plan</b>	- U.S.
<b>Access Control</b>	• Inspection Manual
<b>Protection during Transport</b>	• Regulatory Guide
<b>Central Alarm System</b>	• NUREG
Protected Area	• 10CFR73
Security Organization	• Atomic Energy Act
Education & Training	
Security facilities & instrument	- U.K.
Guards and Patrol	• Atomic Energy Law
Records and Reports	
Document & Data Control	- Japan.
Emergency Call System	• Atomic Energy Law

## REFERENCES

- [1] The law for “Physical Protection of Nuclear Material & Facility & Radiological Emergency Preparedness”
- [2] The Security’s Order No. 2004-9
- [3] The Security’s Order No. 2004-10
- [4] Regulatory Guide 5.54,”Standard format and content of safeguards contingency plans for nuclear power plants
- [5] Regulatory Guide 5.56,”Standard format and content of safeguards contingency plans for transportation”
- [6] NRC inspection manual (2003)