

# A Study on the Safeguards of Nuclear Facility During Whole-life

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## 1. Introduction

Generally, a nuclear facility is built and operated through plan stage, construction stage, operation stage, and dismantling stage. Safeguards activities should be carried out from plan stage to dismantling stage. After dismantling stage, IAEA informs that the dismantled facility will be excluded from safeguards.

In the safeguards aspect, the status of facility function and nuclear material is the most important components. Recent issues in domestic nuclear fields are related to the decommissioning and dismantling of nuclear facilities. But safeguards activities during dismantling stage are only a part of safeguards during whole-life of facility.

In this paper, safeguards implementation activities under legal basis are investigated during the whole-life of nuclear facility including the decommissioning and dismantling stage.

## 2. Legal aspects of Safeguards

Originally safeguards concept was initiated from NPT and established from IAEA, hence safeguards should be implemented to meet the requirements of IAEA safeguards.

In the international legal aspects, ROK(Republic of Korea) should implement safeguards under the Agreement between ROK and IAEA for the Application of Safeguards and Additional Protocol.

In the domestic legal aspects, safeguards

obligations are regulated on the law of nuclear safety and security. Basically most of safeguards in the law is to support the implementation of IAEA safeguards practically. Therefore, the main stream related to the decommissioning and dismantling is almost the same to IAEA safeguards.

## 3. Whole-life Safeguards

### 3.1 Planed Stage

According to the need on nuclear facility, government/organization makes a plan to construct a nuclear facility including cost, location, and others. From the planed stage, safeguards obligations occur as follows;

First, Preliminary Design Information should be provided to IAEA based on the authorization /decision of construction.

Second, Further Design Information should be provided to IAEA based on the developed design.

Third, completed DIQ should be provided to IAEA based on the preliminary construction plans.

Fourth, completed DIQ should be provided to IAEA based on "as built" design.

Because of no nuclear material during the planed stage in facility, actual nuclear material accounting is not necessary.

### 3.2 Operation Stage

Main content of the Agreement between ROK and IAEA is to confirm that there is no undeclared nuclear material as well as nuclear activity. For this, safeguards activities should be implemented as follows;

First, DIQ(Design Information Questionnaire) including information on nuclear material and facility should be updated and provided to IAEA.

Second, NMCR(Nuclear Material Accounting Reports such as ICR, PIL and MBR) should be provided to IAEA monthly.

Third, based on the DIQ and NNCR, IAEA inspection is carried out for the confirmation of facility declaration that facility activity is described in the DIQ and nuclear materials are kept in the declared location.

Fourth, except for the illegal activity and nuclear material, unexpected cases happening during the operation of facility should be solved based on the discussion with IAEA.

### *3.3 Decommissioning & dismantling Stage*

There is normal procedure for the decommissioning and dismantling as follows;

First, nuclear material kept in the MBA should be removed. For example, spent fuel should be moved to other MBAs.

Second, DIQ for decommissioning and dismantling should be provided to IAEA step by step. Normally DIQ includes the decommissioning and dismantling schedule.

### *3.4 Termination from Safeguards*

Based on the DIQ for the decommissioning and dismantling from facility, IAEA decides to terminate the nuclear facility from safeguards after the review

on remained nuclear material in the MBA, possibility on the reoperation, facility declared information, and others. Especially, facility side should be careful not to find nuclear material later.

## **4. Results**

Overall safeguards activities were reviewed to be carried out during whole-life of nuclear facility. This study is applicable to most of nuclear facilities such as reactors, fuel fabrication plant, and others. Though some kind of facilities can be discussed with IAEA additionally, the above explained safeguards activities should be carried out in the legal basis.

Above all, before the safeguards termination of the facility, it is the most important to make no nuclear material state in the facility.

## **REFERENCES**

- [1] “Agreement between ROK and IAEA for the Application of Safeguards in connection with the treaty on the non-proliferation of nuclear weapons, Oct. 31, 1975.
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