

# Suggestion of Safeguards Regulatory Framework for Decommissioning

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## 1. Introduction

In the field of decommissioning nuclear facilities, there is lack of discussions or studies on safeguards and nuclear nonproliferation. However, the government of ROK is regulated in the area of safeguards. Therefore, Korea needs to establish a regulation framework of safeguards for nuclear decommissioning.

This paper examines the decommissioning regulation and the cases of overseas cases from the perspective of IAEA safeguards, and discusses the safeguards in the decommissioning of nuclear power plants in Korea.

## 2. Safeguards for Decommissioning

### 2.1 Decommissioning Concept and requirements

In Nuclear Safety Act, "decommissioning" means all activities for exempt from the application of this Act by dismantling facilities and sites, or by removing radioactive contamination. Consequently, in order to complete the decommissioning of the facility, the facility or site concerned must not only secure radiological safety, but also be completely excluded from the obligation of safeguards such as the management and reporting of nuclear material and the inspection required by the Nuclear Safety Act. Therefore, if there are any undeclared production or process of nuclear materials in decommissioning

facility, it should be detected.

The IAEA provides verification of appropriate safeguards and security as one of the factors to consider in the transitional process from facility operation to decommissioning. [1]

### 2.2 Decommissioning phase in safeguards

From the standpoint of safeguards, dismantling is divided into two phase: Shutdown and Closed down. The shutdown phase means that the reactor has been shut down, but there is nuclear material in the facility and the reactor can re-start operation in a short period of time. The close down phase means that the reactor has been shut down and all nuclear material has been removed from the facility. From the safeguards point of view, when the facility enters the Decommissioning phase, the government of ROK needs to provide the IAEA with facility information to identify each phase. The range of information to be provided for each decommissioning phase is distinguished. [2]

## 3. Safeguards requirements

### 3.1 Provision of information

Based on the 'Agreement between ROK-IAEA for the application safeguards(INFCIRC/236)' article 8, The government of ROK already provided the Design Information Questionnaire (hereinafter

referred to as ‘DIQ’) to describe the feature of facilities and nuclear material relevant to the application of safeguards in sufficient details. And the DIQ need to be updated base on ‘the agreement’ article 45 when design information related safeguards is modified in advance including operation states likes decommissioning. The IAEA can be known the facility states by providing the updated DIQ. And the IAEA requests the modified DIQ including a decommissioning schedule and the essential equipment removal or inoperability schedule.

### *3.2 Concept of essential equipment and ending point of decommissioning*

The essential equipment is equipment to product a nuclear material at the reactor such as a reactor, a fuel handling machine, a control rod assembly, a reactor coolant pump, and etc. And the IAEA carries out periodic design information verifications(DIVs) to ascertain the physical condition of facilities and essential equipment. The status of removal or inoperability of essential equipment is used to support the evaluation of the decommissioned status of a facility for safeguards purposes.

Before a facility can be considered by the IAEA to be decommissioned, all nuclear material and a sufficient portion of the essential equipment must be removed from the facility such that re-activation of the facility would require an effort equivalent to or greater than the effort to build a new facility or retrofit other similar structures to reconstitute its former capabilities. When a sufficient portion of essential equipment is removed or rendered inoperable at a facility, the IAEA carries out a final DIV to verify the facility as decommissioned for safeguards purposes.

## **4. Conclusion**

In order to complete the decommissioning from the viewpoint of safety measures, it is necessary to plan appropriately the time and method of transfer of nuclear materials and essential equipment on site. Therefore, a safeguards regulatory framework for decommissioning facilities is required

In addition, cooperation between government, regulatory agencies, IAEA, and operators is essential for ensuring safeguards during the decommissioning period.

## **REFERENCES**

- [1] 1. IAEA, TRS 420 Transition from Operation to Decommissioning of Nuclear Installations, Austria: IAEA (2004).
- [2] IAEA, Safeguards During Decommissioning, IAEA (2017).