

Development of Safeguards Approach for the Disposal of Low and Intermediate Level Radioactive Waste Containing Uranium

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1. Introduction

KNF has established a waste transport plan that includes uranium in 2017 in accordance with the plan to dispose of low and intermediate level radioactive waste agreed with Daejeon city. However, due to the absence of the IAEA safeguards standards for the waste, the transportation was difficult. The ROK and the IAEA have established safeguards approach to uranium waste and disposal facility to transfer the wastes generated from the nuclear fuel processing facility to the low and intermediate level radioactive waste storage facility.

In this paper, we describe the development process of the safeguards approach for the disposal of low and intermediate level radioactive waste containing uranium

2. Process of Establishing Safeguards Approach

2.1 Termination of Safeguards for Waste

The ROK and the IAEA discussed the safeguards approach to uranium waste through minutes and official letter exchange through the 18th, 19th Safeguards Implementation Working Group Meeting. The following three points were derived.[1]

- Identification of regulatory requirements for uranium waste through an analysis of the ROK-IAEA comprehensive safeguards

agreement and additional protocol obligations

- In order to transfer the uranium waste to the low and intermediate level radioactive waste storage facility, consult with the IAEA department in advance to obtain a positive answer.
- In case the uranium waste is transported to the low and intermediate level radioactive waste storage facility and stored in the underground storage room, the inspectors cannot access it. Therefore, the ROK consults with the IAEA in establishing procedures that do not require further verification.

2.2 Follow-up action

The IAEA carried out inspection for enrichment measurement of uranium waste to be transported solidified in cement in KNF (2017.5.26. 2017.8.1~17.). The KINAC provided technical support for inspection of uranium waste.

Through the ongoing consultation with the IAEA, the ROK reviewed and approved the regulation on the management of special nuclear material for the low and intermediate level radioactive waste storage facility.

Based on the results of the IAEA consultation, the ROK has consulted with KORAD to minimize the burden on the IAEA inspection and to incorporate the facility into a safeguards facility.

2.3 Preliminary assessment

The IAEA, by measuring the enrichment of cement solidified uranium waste, confirmed the consistency with the previously reported values and concluded that the IAEA internal standards are met based on the quantitative measurement results. This completes the IAEA preliminary assessment of the adequacy of the uranium sequestration method in waste.

- In the case of uranium waste, when the deviation between the inspection result and existing declared concentration is less than 15%, it is satisfied with IAEA standard

3. Safeguards Approach

The ROK has agreed with the IAEA to designate a low and intermediate level radioactive waste storage facility as a facility to be safeguarded and to exclude uranium waste in the facility from being subject to IAEA inspection.[2]

Table 1. Standard Application

Nuclear material waste	Uranium waste (Retained waste)
Periodic IAEA inspection of No nuclear material waste Report every change in CA inventory Report results after annual inventory taking	Periodic IAEA inspection (implement DIV, Report only on receipt of nuclear material waste No annual inventory taking

4. Conclusion

The ROK actively and proactively established safeguards approach to the disposal of nuclear material waste in consultation with the operators and

the IAEA. This will ensure that IAEA safeguards are implemented in accordance with safeguards agreement, while minimizing the burden of reporting IAEA inspection and quantitative controls on disposal facility.

The establishment of such safeguards approach will be useful in establishing safeguards approach to the disposal of low and intermediate level radioactive waste storage facility of nuclear material waste generated in other nuclear facilities, not nuclear fuel processing facility. It can also be used to develop safeguards approach to future nuclear facilities related to nuclear material waste such as permanent disposal facilities.

REFERENCES

- [1] 18th, 19th IMWG Meeting Minutes, 2017.
- [2] Comprehensive Safeguards Agreement(1975) & Additional Protocol(2004), ROK-IAEA.