

## **Safeguards approach for the nuclear waste at KAERI**

**Hyun-Sook Kim**

Korea Atomic Energy Research Institute, 150-1 Duckjin-dong, Yuseong-gu, Daejeon, 305-353

[hskim77@kaeri.re.kr](mailto:hskim77@kaeri.re.kr)

### **1. Introduction**

There are 11 nuclear facilities at KAERI and some of them (R&D facility and Location Outside Facilities) consist of a number of laboratories. Experiments using small quantities of nuclear material are carried out in these laboratories and the nuclear waste produced from these laboratories has been increasing. On the other hand, nuclear waste including a nuclear material is under IAEA safeguards even if it includes small quantities of a nuclear material.

This paper describes the status and the safeguards approach to the small quantities of nuclear waste produced from the laboratories at KAERI.

### **2. Scenarios and Evaluation**

#### **1) Safeguards approach for the liquid waste of a nuclear material**

Liquid waste of a nuclear material produced from the R&D laboratories is not solidified and is stored in each laboratory, while the liquid waste of a non nuclear material collected from all the laboratories is solidified annually to asphalt after a evaporation in the Radwaste Treatment Facility. As it has been increasing, it is difficult to store and manage it in the laboratories due to the lack of the storage space and a possibility of a container corrosion. So, KAERI discussed a safeguards approach for it with the IAEA. As a result of discussion, it will be possible for a liquid waste to be terminated from safeguards on a nuclear material if it is solidified. The follow-up measures for the safeguards termination of a liquid waste of a nuclear material are required as follows;

- a) Manufacture the tank for the liquid waste
- b) Designate a KMP for the tank
- c) Collect different kinds of the liquid waste from the laboratories to the tank
- d) Report it to IAEA. as TW (Transfer to retained waste)
- e) Report it to IAEA. as FW (Re-transfer from retained waste) before solidifying the liquid waste
- f) Send notification of the solidification plan of the liquid waste to IAEA
- g) Solidify the liquid waste to asphalt

In the case of the irradiated liquid waste, it is produced by a burn-up measurement using spent fuel. It is also possible to be terminated from safeguards on a nuclear material if it is solidified by absorbing it in bentonite.

#### **2) Safeguards approach for the solid waste of a nuclear material**

Solid waste of a nuclear material from R&D laboratories is classified according to the nuclear material type, form and enrichment, then it is stored in each laboratory. As it has been increasing, the items for IAEA inspection are increasing and it is difficult to manage and control them in the laboratories. KAERI discussed a safeguards approach for it with IAEA. As a result of the discussion, the solid waste of a nuclear material from an experiment or process will be stored together regardless of the nuclear material type, form and enrichment from now on. In this case, it is possible to indicate the inventory of nuclear material using the continuation code in the nuclear material accounting reports.

### 3. Conclusion

The safeguards approach for small quantities of a nuclear waste from the laboratories at KAERI. was reviewed in this report. Liquid waste of a nuclear material can be terminated from safeguards on a nuclear material if it is solidified. In the case of the solid waste, it will be stored together regardless of the nuclear material type, form and enrichment from now on if its inventory is well maintained in the nuclear material accounting reports. Therefore, the volume of the nuclear waste will be reduced and the items for IAEA inspection will be decreased. It will make a significant progress in the terms of a management and control on nuclear wastes.