

A Plan to Build a Total Radwaste Management, STAR (Storage and Treatment of All Radwastes in KAERI) Facility

Jeong Guk Kim*, Jongjin Kim, Won Hyuk Jang, Hongrae Jeon, and Dae Seok Hong

Korea Atomic Energy Research Institute, 111, Daedeok-daero 989beon-gil, Yuseong-gu, Daejeon, Republic of Korea

*jungkim@kaeri.re.kr

1. Introduction

KAERI has a plan to build a total radioactive waste management facility, STAR (Storage and Treatment of All Radwastes in KAERI) by 2021, as an alternative for the present waste storage buildings and radwaste treatment facility. This new radwaste management facility will significantly contribute to reduce the radwaste inventory in KAERI site.

2. Radioactive Waste

2.1 Radwaste Inventory in KAERI

The inventory of low- and intermediate-level radwaste in KAERI site is about 20,000 drums (based on 200-liter drum), as of June, 2018, as shown in Table 1.

Table 1. Radwaste Inventory in KAERI Site

(Basis 200-liter drum, As of June, 2018)

	Storage (drum)	Storing ratio, % (storage/capacity)
Waste from R&D	8,848	55.2
Waste from Decommissioning	11,677	59.6
Total	20,525	

2.2 Waste Reduction Plan

KAERI is now trying to reduce the radwaste inventory, and has a plan to reduce the present inventory to a half by 2027. Considering an annual generation of about 500 drums, the amount of the treatment and the transportation to disposal site should be increased more than now. To achieve this goal, the STAR facility, which would have a store and treatment processes for radwaste, will significantly contribute to reduction.

3. Clearance Level Waste

Recently, the clearance level (literally self-disposable) waste [1] has been a hot potato. According to regulations, all things, whether waste or not, in radiation zone are limited from taking out freely. Therefore, a lot of potential radwastes are being accumulated in the radiation zone. Of cause there is a regulation [2] to dispose such clearance level waste, but the procedure to show its safety requires time and endeavor.

3.1 Estimated Inventory of Clearance Level Waste

The amount of clearance level waste was estimated about 900 tons, containing equipments, as of March, 2017. Most of these wastes are expected to be self-disposed after admission of NSSC (Nuclear Safety and Security Commission).

3.2 Plan to Manage Clearance Level Waste

Before treatment of clearance level waste, the essential step is a check for radioactive waste or not. So, a representative sampling, analysis, and confirming to radwaste are significantly important steps in management of clearance level waste. And then, the process to show harmlessness to environments is essentially proceeded. Therefore, some analytical equipments are also needed in the STAR facility.

4. Treatment Processes in STAR

4.1 Treatment Processes in STAR Facility

The STAR facility is now being designed for construction. This design includes writing and applying for licensing documents. The STAR facility will contain radioactive waste storage and some treatment processes such as pre-treatment, metal melting, compression, re-packing, and cement solidification. It also contains radionuclide sampling and analysis, and radiation dose measurement and evaluation room.



Fig. 1. A bird's eye view of the STAR facility.

5. Conclusion

The STAR (Storage and Treatment of All Radwaste in KAERI) facility, a total radwaste management facility, is now being designed and will be construct by 2021. The STAR facility, including a radwaste storage and some management processes, will contribute to reducing radwaste the present inventory by half.

REFERENCES

- [1] IAEA-TECDOC-855, "Clearance levels for radionuclides in solid materials", Application of exemption principles, International Atomic Energy Agency (1996).
- [2] Notice of Nuclear Safety and Security Commission No. 2014-003, "Regulations on the Classification and Self-disposal of Radioactive Waste", Sep. 15, 2014.