

Development of Decommissioning Waste Information Tracking System for the Life-Cycle of Decommissioning Nuclear Facilities

Sang Bum Hong*, In Hye Hahm, Jae Hyun Ha*, Kwan Seong Jeong, Seung Kook Park, and Dae Seo Koo,
Kook Nam Park, and Bum Kyoung Seo

Korea Atomic Energy Research Institute, 111, Daedeok-daero 989 beon-gil, Yuseong-gu, Daejeon, Republic of Korea
sbhong@kaeri.re.kr

1. Introduction

A large quantity of radioactive and nonradioactive waste is generated during the decommissioning nuclear facilities. The decommissioning waste is typically treated many times for minimization from the point of initial generation, sorting, decontamination until it is packaged and transported for final disposal.

The purpose of this study is to develop the waste treatment information tracking system using a waste inventory database structure of waste package and container with user-friendly interface for efficient management of waste treatment information for the life cycle of decommissioning nuclear facilities.

2. Project Management Platform

2.1 Data structure of decommissioning waste information system

The life cycle of radioactive waste consists of a number of steps such as pretreatment, treatment, conditioning, storage and disposal. The objective of radioactive treatment intended to improve safety or economy by changing the characteristics of waste such as volume reduction, decontamination and immobilization for safe disposal and clearance. Characterization of radioactive waste is an important aspect at every stage of waste management. The physical, chemical and radiological properties of the waste should be characterized and managed from generation to final disposal. [1] The waste

information tracking system was developed to improve decommissioning safety and minimization of decommissioning waste. The design requirements of the system support the design document and record using modified WBS(Work Breakdown Structure) for decommissioning from the design, construction and operation. The database of the system of decommissioning waste is managed based on the waste packages as a basic unit in the system. Waste container may contain one or more packages that can be tracked since the waste package record generated main packages and waste containers are managed separately. Waste package data are merged in the containers to provide general information for waste management such as the ID, location, reference data, mass, volume, surface contamination level, dose rate and radioactivity. The package information contain data that are uniquely associated with an individual waste package. The contaminant information tables identify the radioactive and non-radioactive contaminants in a package, which are used to determine waste classification.

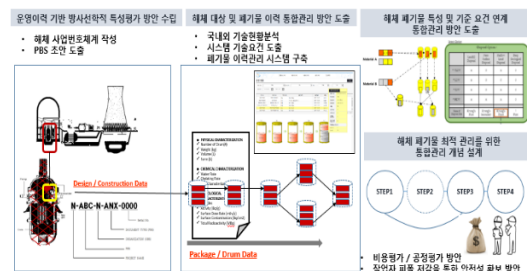


Fig. 1. Conceptual design of integrated management system for decommissioning waste.

2.2 Application of the developed system for decommissioning waste

The developed waste information tracking system was applied from the generated data of decommissioning project of KRR-1&2. Waste package and container data of decommission metal waste used for verification of the system. The waste generated data will be changed depending on the waste treatment process. The system was designed a various waste treatment such as sorting, decontamination, compaction and melting process for metal waste. Fig. 2 show the waste package and container information with waste treatment process.

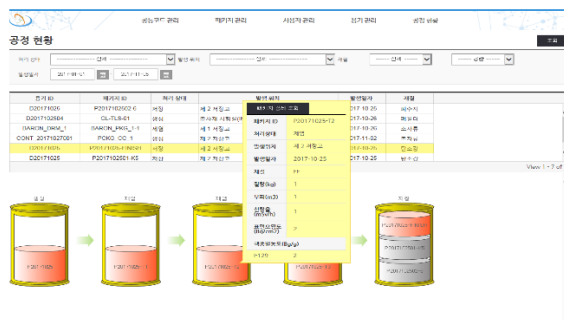


Fig. 2. Integrated information tracking system for waste treatment process.

The waste information tracing system will be expanded to develop the optimized waste treatment scenarios selection using expert algorithm by comparing various factors such as a primary and secondary waste volume, treatment cost and disposal cost etc.

3. Conclusion

The waste characterization system for the life-cycle of decommissioning nuclear facilities is designed for the integrated management and evaluation of the radiological characteristics of the various types of waste generated during decommissioning process. The developed waste

information tracking system for characterization of decommissioning waste from nuclear facilities will be applied and verified to prepare for the decommissioning nuclear power plant. We expected that the results can be improved the technology competitiveness and contributed to safety and optimized waste management in conducting decommissioning project.

REFERENCES

- [1] IAEA, "Innovative and Adaptive Technologies in Decommissioning of Nuclear Facilities, IAEA-TECDOC-1602 (2008).
- [2] IAEA, "Waste Inventory record keeping system (WIRKS) for the management and disposal of radioactive waste, IAEA-TECDOC-1222 (2001).