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#7-67 Enhancing history management of Low and Intermediate Level Radioactive Waste: Systems and Future Direction

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KAERI(Korea Atomic Energy Research Institute) includes diverse R&D environments, such as a research reactor, a nuclear fuel cycle facility, and a radioisotope production facility. These facilities generate low and intermediate level radioactive waste during operational and decommissioning phases. To ensure effective radioactive waste management, we oversee storage and processing facilities that support robust history management across the radioactive waste lifecycle. A centralized database in the intranet enables to manage from waste generation to disposal, allowing for comprehensive oversight. Additionally, KAERI has implemented a full-cycle history management system for waste drums, developed in compliance with the Republic of Korea's the radioactive Waste Acceptance Criteria (WAC) and the radioactive Waste Certification Program (WCP). However, the database system has several limitations, such as processing large volumes of text data and the need for supplementary information. To overcome these issues, the system has been designed to provide data analysis and visualization. This study proposes a framework for radioactive waste management system and linked analysis system, detailing specific procedures at each step with the application of traditional radiation detectors. The preceding steps in the radioactive waste management process are to receive waste history from the waste generators. These include an application for a specified container, pre-inspection, and management request. Next, the succeeding steps consist of repackaging, treatment, characterization, and evaluating the suitability of disposal, for a process to manage radioactive wastes transparently. A unique identification (ID) number is assigned to each package, linking it to the centralized database that manages all radioactive waste activities throughout its life-cycle. The major nuclides and contamination routes are evaluated during pre-inspection to verify the classification as radioactive waste.

During transportation between facilities, the surface dose rate and contamination level are measured and used as variables to make the handling plan(e.g., loading position) within the radioactive waste storage facility. The system is enhanced to manage dynamic information, including the profiles of radioactive waste stream throughout the treatment and repackaging processes. In conclusion, we focus on the necessity and direction of an integrated system for safely and efficiently managing radioactive waste, focusing on the linkage between the operational system that manages the full-cycle history database and the data analysis system.

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