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## #7-93 The development of Smart Radioactive Waste Management System using new ICT technology

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The Radioactive Waste Information Management System (RAWINGS) for the safe management of low- and intermediate-level radioactive waste has been operated in Korea Atomic Energy Research Institute (KAERI) since 2021. From the operation of RAWINGS, KAERI can effectively manage the inventory and history of waste generated at research sites. The system generates information based on data manually input by radiation workers at waste-related sites. This system has the risk of entering incorrect information or missing information during the radioactive waste treatment process.

Recently, the Korea Nuclear Safety and Security Commission (NSSC) and the Korea Radioactive Waste Agency (KORAD) have been conducting pre-inspection before transportation of radioactive waste to final disposal site based on waste acceptance criteria (WAC). So, the smart open digital system using new ICT technology for the safety management of radioactive waste is needed to solve the problems of the current system and meet the acceptance criteria of the final disposal. Augmented reality (AR) technology is used to allow inspectors to check the contents of small packages of radioactive waste without opening drums after packing. Internet of Things (IoT) sensor has been developed to monitor the status of drums in radioactive waste storage facility. The basic data of the radioactive waste used in the AR is processed with RAWINGS including the small packaged waste and repackaged drums. In addition, real-time monitoring of the radioactive waste drums located in the radioactive waste storage facility where they will be stored until their final disposal, was accomplished by sending IoT sensor attached to the drums. IoT sensor signals attached to the drums are being transmitted to digital twin (DT) system.

From this project, it is possible to inspect the radioactive waste contained in the drum from the remote inspection of a digital twin, rather than from the on-site inspection of radioactive waste storage facility. This technology will be useful in verifying the compliance of radioactive waste drums with the acceptance criteria required by KORAD.

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