

Nuclear Material Accountability System in DUPIC Facility(I)

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Abstract

KAERI(Korea Atomic Energy Research Institute) has developed a nuclear material accountability system for DUPIC(Direct Use of Spent PWR Fuel in CANDU) fuel cycle process. The software development for the material accountability started with a general model software, so-called CoreMAS(Core Material Accountability System), at the beginning of 1998. The development efforts have been focused on the DUPIC safeguards system, and in addition, improved to meet Korean safeguards requirements under domestic laws and regulations. The software being developed as a local area network-based accountability system with multi-user environment is able to track and control nuclear material flow within a facility and inter-facility. In addition, it could be operated in a near-real time manner and also able to generate records and reports as necessary for facility operator and domestic and international inspector. This paper addresses DMAS(DUPIC Material Accountability System) being developed by KAERI and simulation in a small-scale DUPIC process for the verification of the software performance and for seeking further works.

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A Feasibility Study on Improvement of Storage Density Through a Modification of Shielding Material in the CANDU Concrete Canister

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Abstract

The depleted uranium(DU) was used for increasing storage capacity in spent fuel dry storage. It was investigated that the storage capacity of canister would be improved by almost two times compared with the previous one through increasing the shielding capability against the dose rate. In this study, the material such as the DU was only treated to increase the storage density of canister. It would be better to improve the efficiency of dry storage facilities that the shape of canister is considered together with the kind of material. The shielding analyses were performed with MCNP-4/B Monte-Carlo code. There are several reasons available and useful to use the DU as the shielding material. The density of DU is very higher than any material. In addition, the use of the DU is a side of recycling waste.