Building Future Safeguards Capabilities
SYMPOSIUM
ON INTERNATIONAL SAFEGUARDS

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Feasibility Study Result of Advanced Solution Measurement and Monitoring Technology for Reprocessing Facility

The IAEA has proposed in its Research and Development plan (STR-385), the development of technology to enable real-time flow measurement of nuclear material as a part of an advanced approach to effective and efficient safeguards for reprocessing facilities. To address this, JAEA and JNFL has previously designed and developed a neutron coincidence based nondestructive assay system to monitor Pu in solution directly after a purification process. To enhance this technology for entire reprocessing facilities, as a feasibility study, JAEA has been tackling development of a new detector to enable monitoring of Pu in solutions with numerous FPs as a joint research program with U.S. DOE. In this study, High Active Liquid Waste (HALW) Storage Facility in Tokai Reprocessing Plant (TRP) was used as the test field.
The design information of HALW storage tank and radiation (type and intensity) were investigated to develop a Monte Carlo N-Particle Transport Code (MCNP) model. And then, dose rate distribution inside of the concrete cell where the HALW tank is located was measured to design new detectors and check integrity of MCNP model applicability. Using the newly designed detectors, gamma rays and neutron could be measured continuously at the outside / inside of the concrete cell to optimize detector position and the radiation characteristics.
The applicability for Pu monitoring technology was evaluated based on the simulation results and gamma-ray/neutron measurement results. We have found that there is possibility to monitor the change of Pu amount in solution by combination both of gamma ray and neutron measurement. The results of this study suggested the applicability and capability of the Pu motoring to enhance entire reprocessing facility which handles Pu with FP as a feasibility study. In this paper, summary of this project will be presented.

Which "Key Question" does your Abstract address?

NEW1.2

Which alternative "Key Question" does your Abstract address? (if any)

NEW1.6

Topics

NEW1

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