

# International Conference on Management of Spent Fuel from Nuclear Power Reactors: An Integrated Approach to the Back End of the Fuel Cycle



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## MCNP MODEL FOR RESEARCH REACTOR (TRR-1/M1) FUEL STORAGE RACK CRITICALITY ANALYSIS

The spent fuel storage of TRIGA reactor (TRR-1/M1) was designed. Detailed criticality safety analysis was conducted according to the basic safety standard and within the framework of the regulatory aspect. The Monte Carlo computer code (MCNP) was used for the detailed geometry modeling. Two types of fuel elements were considered for the calculation including 8.5 wt% and 20 wt% fuel elements. The critical number of the fuel elements was determined. The dependence of multiplication factor ( $k_{eff}$ ) on the distance between the fuel elements in the rack (pitch) and the water density which varied from 0.01 g/cm<sup>3</sup> to 1 g/cm<sup>3</sup> were calculated. The MCNP results shown that the  $k_{eff}$  strongly depend on the lattice pitch, moderation effect and the water density. At present, there is limited experience in the safety management of spent fuel for research reactor. The strategy development and implementation of the integrated approach to management of the spent fuel from research reactor are important for the long term strategy of the ageing management program.

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