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DETERMINATION OF OUT-CORE FUEL BURNUP IN TRIGA PUSPATI REACTOR

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The investigation is made of the out-core neutron flux and burn-up at irradiated fuel stored in TRIGA PUSPATI research reactor tank. This is required to examine whether the thermal and/or fast neutron flux can influence burn-up of the irradiated fuel stored in the same vicinity of the reactor core, the fuel rack being located 1 m above the core. MCNPX code was used to simulate fast and thermal neutron flux for the reactor operating at 750 kW. In this work, the computational model was created using MCNPX version 2.7 with the evaluated nuclear data file for thermal neutron scattering law data (ENDF7) cross-section data library and using a 10 cm 10 cm 10 cm mesh model. The results show the axial distribution for thermal neutrons occurred at energy lower than 1 10-6 MeV. Thermal neutron travels at the maximum distance of 78 cm due to thermalization by moderator. Based on the maximum distance travels by the thermal neutron, the thermal neutron does not reach the storage rack located 1 m from the core, hence there is no burn-up occurring at the irradiated fuel since burn- up can only occur in the thermal neutron region. For fast neutron, the axial distribution energy is higher than 1 106 MeV and travels more than 158 cm. The reaction time for the fast neutron is too short to result in burn-up due to its fast travel.

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Primary authors: Dr HASHIM, Suhairul (Universiti Teknologi Malaysia); Mr HUSAIN, Mohamad Annuar Assadat (Atomic Energy Licensing Board); Dr RABIR, Mohamad Hairie (Malaysian Nuclear Agency); Dr ZAKARIA, Norasalwa (Malaysia Nuclear Agency); Dr MOHAMED ZIN, Muhammad Rawi (Malaysia Nuclear Agency)

Presenter: Dr HASHIM, Suhairul (Universiti Teknologi Malaysia)

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