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Neutronic evaluation of a GFR of 100 MWt with reprocessed fuel and thorium using SCALE 6.0 and MCNPX

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A GFR core model with 100 MWt was evaluated using three different fuel compositions: conventional (U,Pu)C and two reprocessed fuels with transuranic (TRU) (Pu, Am, Np, Cm). One reprocessed by UREX+ technique and spiked with depleted uranium, (U,TRU)C, and the other reprocessed by the same technique but spiked with thorium, (Th,TRU)C. The reprocessed fuel came from a PWR standard fuel (33,000 MWd/T burned) with 3.1% of initial enrichment and left in the pool by 5 years. Some important nuclides were followed for burns and neutron absorption and kinf was evaluated 1400 days burning. Tests were also made for B4C absorber insertion and the temperature coefficient. The study concludes with an evaluation of power distribution in the core. The simulations were made comparing results of MCNPX and SCALE 6.0 programs. The goal is to validate the simulated model and evaluate the possibility to use TRU spiked with Th in a GFR conception.

Country/Int. Organization

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