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SIMULATION OF THE FAST FLUX TEST FACILITY LOSS-OF-FLOW WITHOUT SCRAM ACCIDENT SCENARIO USING THE SAM COMPUTER CODE

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A major appeal of sodium fast reactors is their passive safety capabilities. To demonstrate this, the Fast Flux Test Facility (FFTF) conducted a series of Loss of Flow WithOut Scram (LOFWOS) tests at up to 50% power. Experimental results from this test were made available through an IAEA CRP for use in a code benchmarking activity. In this work, the System Analysis Module (SAM) was used to analyze the FFTF during the LOFWOS transient. Efforts were made first to develop a faithful steady state representation of the facility. In this model, flow rates and pump heads were matched to experimental values within 0.4% in each loop. Additionally, the core inlet temperature was matched within 0.02%. At this stage, the results of the transient experiment were not available to CRP participants, creating a blind simulation stage. During this blind stage, a point kinetics model SAM was used to predict the core power, as well as peak fuel temperatures, system flow rates, etc. throughout the LOFWOS transient. Simulation results were compared to experimental results at the end of the blind stage. Results show that the SAM model was able to capture the general trend of the transient, however, the magnitude of the results showed significant deviation from the experimental results. More recently, work has been ongoing to understand the cause of these deviations and improve the model to more accurately represent the transient results.

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