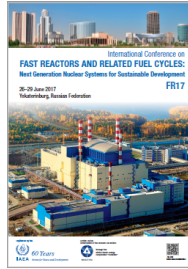


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Advanced Reactor PSA Methodologies for System Reliability Analysis and Source Term Assessment

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Beginning in 2015, a project was initiated to update and modernize the probabilistic safety assessment (PSA) of the GE-Hitachi PRISM sodium fast reactor. This project is a collaboration between GE-Hitachi and Argonne National Laboratory (Argonne), and funded in part by the U.S. Department of Energy. Specifically, the role of Argonne is to assess the reliability of passive safety systems, complete a mechanistic source term calculation, and provide component reliability estimates. The assessment of passive system reliability focused on the performance of the Reactor Vessel Auxiliary Cooling System (RVACS) and the inherent reactivity feedback mechanisms of the metal fuel core. The mechanistic source term assessment attempted to provide a sequence-specific source term evaluation to quantify offsite consequences. Lastly, the reliability assessment focused on components specific to the sodium fast reactor, including electromagnetic pumps, intermediate heat exchangers, the steam generator, and sodium valves and piping.

Country/Int. Organization

USA/Argonne National Laboratory

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