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The lead-cooled fast reactor transition to equilibrium operating conditions

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Lead-cooled fast reactors are promising direction in the development of nuclear energy because of opportunities to ensure their safety and security. Efforts are underway to develop lead-cooled fast reactors BREST-OD-300 and BREST-1200 in Russia. Nitride fuel is expected to use at the core of these reactors. High density of this fuel gives an opportunity to create a core with the breeding ratio close to unity. This makes it possible to realize the equilibrium condition with feeding of regenerated fuel only depleted uranium. The reactivity change between the refueling does not exceed the effective fraction of delayed neutrons in this case. The use of earlier accumulated plutonium and newly emitted plutonium in the processing of thermal reactors irradiated fuel is assumed as initial core charge. In addition the initial charge of enriched uranium is considered. Stage reactor operating, in which the fuel composition of the transition from start-up to equilibrium may be accompanied by a number of problems associated, in particular, with the need to ensure a minimum change of the reactivity between the refueling. The report summarizes the features of work in the reactor at this stage. It is shown that the minimum time-to-equilibrium is achieved by using the initial charge of plutonium obtained from VVER reactor spent fuel.

Country/Int. Organization

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