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ANALYSIS OF THE OPERABILITY OF THE VVER-1000 NUCLEAR REACTOR BASED ON A THORIUM-PLUTONIUM COMPOSITE

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The results of the evaluation of the theoretical model of the VVER-1000 nuclear reactor using an alternative fuel composition consisting of a mixture of thorium and plutonium dioxide are presented in the work.Due to the limited nature of already known energy resources, a search is being made for new ones, including thorium-plutonium fuel. To analyze it's workability, computational studies of the neutron-physical and thermophysical parameters of the cell under consideration were carried out using the WIMS program code. This code is based on the application of the integral-differential Boltzmann equation.The calculation takes place in a group approximation and with given boundary conditions. The results show not only the workability of such fuel, but also it's efficiency. The amount of spent fuel will decrease, and more secondary fuel will be formed, which indicates a greater rationality of use. The thermophysical calculation showed that the maximum temperature in the fuel will be 400K less compared to uranium fuel, which will reduce the load on the reactor.

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