
RIGIDITY ANALYSIS IN FUEL ASSEMBLIES FOR THE THIRD GENERATION VVER-440 REACTOR

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Abstract

In order to increase fuel lifetime by means of saving neutrons, an upgrade of fuel assemblies for the VVER-440 reactor design took place, which meant switching to a jacket-free angled reactor core. However, the developers introducing this design into fuel assemblies for high-energy VVER-1000 reactors ran into the problem of increased buckling in the fuel assemblies, leading to issues when removing the assemblies and inserting control rods of the control and protection system. Our study used the ANSYS APDL v 17.0 software package to analyse how various designs of a high-rigidity frame for a fuel assembly affect this buckling. The article lists recommendations for upgrading the reactor design.

Keywords

Burned-up assembly, rigidity, bearing tubes, buckling, radiation, fuel assembly, jacket, angle width

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