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COMPARATIVE ANALYSIS OF CALCULATIONAL AND EXPERIMENTAL DIFFERENCES OF THE NEUTRON-PHYSICAL CHARACTERISTICS OF THE BN-800 REACTOR

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During the operation of the BN-800 reactor, a large amount of experimental data has been accumulated on critical states, the effectiveness of the control system, etc. It should be noted that the loading of the hybrid core in the initial period was constantly changing: different ratios of fuel assemblies with uranium fuel and MOX fuel, as well as the number of fuel assemblies in the intermediate and highly enrichment zone. On the eve of the transfer of the core to the full load of MOX fuel, it is necessary to make sure that the neutronic characteristics are adequately reproduced by all calculation codes.
The aim of this work is to calculate the neutronic characteristics of the BN-800 core with a hybrid fuel load and compare them with the available experimental data.
The work on the analysis of the methods of computational support of the operation of the BN-800 reactor has been performed. The calculations were performed using the MMKK and MMKC codes, in which the Monte Carlo method is implemented, as well as with JARFR and GEFEST800 in the diffusion approximation. Comparison of the calculation results for all involved codes with the measurement results made it possible to estimate the methodological error in calculations of the main neutron-physical characteristics.
The calculations were performed for the first seven micro-campaigns of the BN-800 reactor.
The analysis of such neutronic characteristics as:
- the value of the reactivity margin in the conditions at the beginning and end of the reactor micro-campaigns;
- the values of the subcriticality levels of the reactor during refueling and after the withdrawal of the safety rods;
- efficiency of single control rods and control rod groups;
- the temperature-power effect of reactivity;
- the reactivity loss rate during micro-campaign.

Country/Int. organization

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