

DEVELOPMENT OF THE TECHNICAL APPROACH FOR RESEARCH OF THE SODIUM COOLANT CURRENT IN THE INTEGRAL TYPE REACTOR

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The paper presents the results of the end-to-end mathematical modeling of the BN reactor with integral equipment layout. The developed approach permits to validate RP characteristics and to study the process of the transfer of the predecessor of the delayed neutrons with the primary circuit coolant in the conditions of stratified current.

The approach includes a complex of specially developed models:

- turbulent heat transfer model, permitting to consider the specific character of the liquid metallic sodium coolant in the codes of the computational fluid dynamics;
- model of the transfer of the predecessor of the delayed neutrons, going out from FAs with leaking fuel rods, and considering their radioactive decay.

The results of verification and validation of the technical approach are provided including validation the possibility of modeling of the heat exchanging equipment and the core with simplified structures of these elements. The developed approach allows solving problems, which are significantly important for validation of the service life and increase of safety of the sodium cooled fast neutron reactors.

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