OPERATING CONDITIONS OF CONSTRUCTION MATERIALS OF PROSPECTIVE NUCLEAR FACILITIES

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The workability and reliability of structural materials are determined by the set of changes in the characteristics of the materials as a result of the entire complex of phenomena occurring in them in the field of irradiation in relation to the parameters that change and the operating conditions of the reactor.

The interaction of the characteristics of the materials on each other when working in the reactor is so great that most often, in special experiments, their exact values cannot be determined and their influence on the performance of the fuel is judged qualitatively by the final practical result.

A comparison of the operating conditions of fast neutron reactors that are being developed and successfully operated with the operating conditions of thermal neutron reactors shows that the operating conditions of these so-called fast reactors are much more severe than in any existing or prospective thermal neutron reactor.

An analysis of the operating conditions and main characteristics of promising nuclear power plants shows that the desire to maximize the efficiency of power plants involves a transition to increasingly high operating temperatures, which in turn leads to the development of new structural materials. The materials of promising nuclear power plants must meet the unique requirements dictated by the design of high-temperature systems, which involves taking into account the influence of radiation, the coolant, as well as static and dynamic stresses.