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# THERMOHYDRAULIC TESTS IN JUSTIFICATION OF DESIGN CHARACTERISTICS OF THE BREST-OD-300 RP STEAM GENERATOR

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In order to substantiate the design characteristics of the steam generator of the BREST-OD-300 reactor plant (RP) developed at NIKIET JSC, IPPE JSC carried out thermohydraulic tests of various models of the lead-heated steam generator. Initially, to confirm the design characteristics and thermal-hydraulic stability at the parameters of the nominal, partial and start-up modes, a model of a twisted steam generator was tested, consisting of two three-tube modules with a longitudinal lead flow around a bundle of heat transfer tubes. The influence of operating parameters on thermohydraulic characteristics and hydrodynamic stability is shown in the case of operation of one module, as well as in the joint operation of two models in the investigated range of operating parameters.

At the second stage, tests of the standard model of the BREST-OD-300 RP steam generator were carried out with lead flowing around 18 heat exchange tubes. The model consisted of two collectors, each of which included a bundle of nine heat transfer tubes. Data were obtained on the hydrodynamic stability of steam generating tubes and the entire model as a whole when operating in the entire range of change in operating parameters, necessary for creating a databank and further verification of calculation codes describing the ongoing thermohydraulic processes. The boundary of thermohydraulic stability has been experimentally confirmed.

The tests of the standard model, as well as the model of a steam generator with a longitudinal flow of a lead coolant, were carried out in a wide range of changes in operating parameters. The feed water pressure varied from 16.5 to 18.7 MPa (on the model with longitudinal media flow, tests were carried out at a supercritical pressure of 24.3 to 25.7 MPa), the water flow through the heat transfer tube varied from 10 to 120% of the nominal value. The feed water temperature varied from 340 to 350 ℃, the lead temperature at the model inlet varied from 390 to 536 ℃, and the lead consumption varied from 10 to 100% of the nominal value.

A series of works devoted to the study of heat transfer from the lead coolant with a transverse flow around a package of heat transfer tubes has been completed. A model with a transverse lead flow around the steam-generating tubes has been created, on which studies were carried out on the effect of the oxygen concentration in lead on heat transfer in normal heat transfer modes.

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