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EXPERIENCE OF COMMISSIONING OF THE SECTORAL MONITORING TIGHTNESS SYSTEM OF FUEL ELEMENTS CLADDINGS (SSKGO) OF RF BN-600, RF BN-800

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Sectoral monitoring tightness system of fuel elements claddings (SSKGO) is important for the reactor facility (RF) safety and designed for fuel cladding state and appearance and development of the «fuel-coolant contact» defects operational control. Developers of the system are: JSC «IPPE» and JSC «Afrikantov OKBM».

Modernized SSKGO system (3N safety class) of RF BN-600 and SSKGO system (3NU safety class) of RF BN-800 were put into trial operation at Beloyarsk NPP by IPPE specialists in conjunction with Beloyarsk NPP specialists from 2014 to 2015. SSKGO modernization is based on a new design of the detection blocks (DB), which include the supports with the ionization fission chambers and the use of modern measuring and computing facilities. As a result of modernization it was possible to increase the sensitivity of the measurement channels to the neutron flux density by more than 60%, and significantly reduce background from the core neutrons RF BN-800.

The certification of the neutron flux density models of SSKGO detection blocks that will significantly reduce the amount of work and measurement time on the reactor during neutron flux density certification from neutron sources, based in the in-house DB was conducted in IPPE in conjunction with specialists VNIIFTRI in 2013-2014. According to the results of certification the neutron spectrum shape impact on the measuring channels sensitivity has been studied. Programs and methods of periodic verification of regular neutron source have been developed.

Stability studies of technical and metrological characteristics of measuring channels SSKGO based on ionization fission chambers were carried out on the BN-600 and BN-800. When working at various power levels, the indications background according to reactor power was determined. SSKGO tests showed high reliability and immunity systems during commissioning at BN-600 and BN-800.

Currently SSKGO systems BN-600 and BN-800 are nominally operated on blocks 3 and 4 of Beloyarsk NPP.

Country/Int. Organization

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