



TR0700372

**NEUTRONIC AND THERMAL HYDRAULIC ASSESSMENT OF FAST REACTOR COOLING BY WATER OF SUPER CRITICAL PARAMETERS**

Yu.D.Baranaev\*, A.P.Glebov\*, V.F.Ukrainitsev\*\*, V.V.Kolesov\*\*

\*- Institute of Physics and Power Engineering (FEI), Obninsk, Russia

\*\* Obninsk Technical University for Nuclear Power Engineering (IATE), Obninsk, Russia

E-mail:

**ABSTRACT**

Necessity of essential improvement of competitiveness for reactors on light water determines development of new generation power reactors on water of super critical parameters.

The main objective of these projects is reaching of high efficiency coefficients while decreasing of investment to NPP and simplification of thermal scheme and high safety level. International programme of IV generation in which super critical reactors present is already started.

In the frame of this concept specific Super Critical Fast Reactor with tight lattice of pitch is developing by collaboration of the FEI and IATE.

In present article neutronic and thermal hydraulic assessment of fast reactor with plutonium MOX fuel and a core with a double-path of super critical water cooling is presented (SCFR-2X). The scheme of double path of coolant via the core in which the core is divided by radius on central and periphery parts with approximately equal number of fuel assemblies is suggested. Periferia part is cooling while downcoming coolant movement. At the down part of core into the mix chamber flows from the periphery assemblies joining and come to the inlet of the central part which is cooling by upcoming flow.

Eight zone of different content of MOX fuel are used (4 in downcoming and 4 in upcoming) sub zones. Calculation of fuel burn-up and approximate scheme of refueling is evaluated.

Calculation results are presented and discussed.