Contribution ID: **209** Type: **ORAL**

DISTINCTIVE FEATURES OF THE BN-800 CORE IN THE COURSE OF TRANSITION TO COMPLETE MOX-FUEL LOADING

Friday 22 April 2022 11:42 (12 minutes)

To solve problems of BN-800 transition from the hybrid core consisting of FSAs with pellet-type uranium oxide fuel and FSAs with pellet-type and vibropacked MOX-fuel to the core loaded completely with pellet-type MOX-fuel, it is necessary to develop and implement a proper core design.
In the developed design it is provided that the transition is performed by replacement of hybrid core spent FSAs with fresh FSAs with pellet-type MOX-fuel. The FSAs shall be replaced during three sequential refuelings (eighth, ninth, and tenth refuelings of the core).
The paper compares layouts of the hybrid core and the full MOX-fuel core and shows change of the core composition at transition to complete loading with MOX-fuel.
The transition period is characterized by step-wise increase of neutron flux density in the core caused by nuclear distinctive features of plutonium relative to uranium-235. Nevertheless, corresponding increase of linear power of fuel pins of hybrid core FSAs operated in the transition period is compensated by fissile isotope content decrease in the course of fuel burnup.
The transition period has also some distinctive features concerning hydraulic characteristics. Change of ratio of quantities of FSAs of different types with different hydraulic resistance leads to correspondent redistribution of sodium flowrates through them and to change of the total hydraulic resistance of the core.
The paper presents data on sodium pressure drop over the core and on the temperature state of FSAs during transition period. The paper shows that FSA operation parameters do not exceed the justified values. No reactor power limitation is required during reactor operation in the transition period.

Country/Int. organization

Russian Federation

Authors: BELOV, Sergey; VASILYEV, Boris (JSC "Afrikantov OKBM"); KUZNETSOV, Artem (JSC "Afrikantov OKBM"); Mr MUMRENKOV , Evgenii (JSC "Afrikantov OKBM"); Mr FARAKSHIN , Mansur (JSC "Afrikantov OKBM")

Presenter: BELOV, Sergey

Session Classification: 6.5 Integrated Analysis and Digitalization

Track Classification: Track 6. Modelling, Simulations, and Digitilization