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## Specific features of BN-1200 core in case of use of nitride or MOX fuel

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The core of a commercial reactor BN-1200 designed for operation with developed MOX-fuel or advanced nitride fuel. The common approach to the design of the specified cores was:

- reduction of the fuel rating, in comparison with BN-600 and BN-800, which permits to use larger fuel pins ( $\varnothing$  9.3 mm) to reduce their consumption and minimizing reactivity margin for fuel burn-up;
- use of the fuel with the same plutonium enrichment for all FA to ensure stability of the core power density during operation between refueling and simplification of the fuel fabrication;
- use of FA design with top sodium cavity and born absorption shield for minimizing sodium void reactivity effect;
- an annual interval of operation between refueling is accepted.

In view of difference of neutron physical characteristics of the nitride and MOX-fuel the specified variants of the core have differences in the design:

- in case of operation with nitride fuel the plutonium breeding rate in the core is self-sufficient, and in comparison with the MOX-fuel core, it has no frontal and lateral breeding zones. To reduce reactivity margin and additionally equalize power density for peripheral FA there are used larger diameter ( $\varnothing$  10.5 mm) fuel pins;
- configuration of the MOX-fuel core has axial breeding layer to reduce reactivity loss rate due to fuel burn-up and to ensure annual operating interval between refueling. Additional advantage of this configuration is the reduction of the accumulation rate of the damaging dose.

### Country/Int. Organization

Russia/JSC "Afrikantov OKBM"

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