
Contribution ID: **303** Type: **POSTER**

# Improving inherent safety BN-800 by the use of fuel assembly with (U, Pu)C microfuel.

*Tuesday 27 June 2017 17:30 (1h 30m)*

The task undertaken in the report is to increase inherent safety of the fast reactor with a sodium coolant of type BN-800 due to considering the possibility of using an innovation fuel assemblies with mixed uranium-plutonium carbide fuel in form of coated particles. Fuel assemblies with pellet MOX fuel and fuel rods are directly replaced by microspherical mixed (U,Pu)C-fuel. Calculation evaluations of characteristics of fuel assemblies with microspherical fuel are realized.
A calculation comparison of neutron physics and thermal hydraulics characteristics of the innovation fuel assemblies with microspherical mixed (U,Pu)C-fuel and the traditional fuel assemblies with pellet MOX fuel and fuel rods was conducted.
The chosen calculation model was BN-800 reactor core with MOX fuel, where a three-zone radial power density field flattening due to plutonium content change in fuel was used.
Thanks to microspherical carbide fuel, inherent safety of the reactor increases in accidents with loss of coolant flow and introduction of positive reactivity because the coated particles have developed heat-exchange surface and their coats are able to keep fission products at higher temperatures than the steel cladding of traditional fuel rods.

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**Session Classification:** Poster Session 1

**Track Classification:** Track 1. Innovative Fast Reactor Designs