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EXPERIENCE AND APPLICABILITY OF HIGH DENSE METAL URANIUM IN ADVANCED BN-REACTORS

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To guarantee an inherent safety in advanced BN-reactors the breeding ratio of its active core (BRC) must have the meaning of $BRC \geq 1.0$. It could be reached in heterogeneous oxide-metal cores of various types in use of metal uranium as the fertile components in the proportion of MOX:U \approx 2:1.

We obtained the experience of manufacturing the fertile columns of various types from the metal uranium, the experience of manufacturing and irradiation in fast reactors BOR-60 and BN-350 of full-size elements (FE) and fuel assemblies (FA) that have such columns (4010 elements in part of 108 fuel assemblies).

Besides the obtaining of the inherent safety in advanced BN-reactors with the heterogeneous oxide-metal cores of various types (by FA-heterogenization of the core, IFAH –by intra FA-heterogenization, IFEH –by intra fuel elements heterogenization) we could achieve considerable additional economic and ecological preferences. Among them there are the increase of the admissible average burnup of MOX-fuel by \approx 20%, the decrease of the mass of manufactured and consumable Pu-containing MOX-fuel by \approx 30%, the decrease of consumable Pu-containing FE or Pu-containing FA by \approx 30%, etc.

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