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On-site nuclear fuel cycle of “BREST” reactors

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Dynamic developing of modern nuclear industry demands meeting the following requirements: improved safety, reduced capital costs, radioactive waste management issues, independence of limited resources.

Efficiency of uranium resources used in “Brest” reactors based on a closed fuel cycle is about 160 times higher than for VVER, RBMK reactors, which allows to stop searching for new deposits and uranium mining.

The need for periodical fuel regeneration and fabrication in a closed cycle includes:

- Reproduction of plutonium in the core without the uranium containing screens. Breeding ratio is approximately 1,05, ensuring a high level of safety and support of the non-proliferation regime;
- Transmutation of the most dangerous long-lived actinides and high refining of radioactive waste, achieving the radiation balance of buried radioactive waste and extracted uranium ore.

The manufacturing is located directly at the NPP to avoid transportation of fissile materials. This approach provides economic efficiency of the entire complex.

Country/Int. Organization

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