

Progress report on the development of a new neutron source at FLNP

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Two alternative concepts of DNS-IV were considered in 2019: the pulsed neutron reactor IBR-3 with Np-237 core and the accelerator-driven spallation neutron source with PuO₂ core providing neutron multiplication factor of about 20-50. Both options have been under the feasibility study in N.A. Dollezhal Research and Development Institute of Power Engineering (NIKIET, Moscow). The final recommendation is based on such criteria as achievable neutron characteristics, nuclear safety, engineering complexity, timeline and expected costs. It was found that the engineering complexity of 2nd option makes its realization rather uncertain, both in time and costs. Therefore, the pulsed neutron reactor IBR-3 with NpN fuel currently became the working project with the planned start of the DNS-IV operation is 2036-2037.

First meetings with the specialists from A. A. Bochvar All-Russian Scientific Research Institute for Inorganic Materials (VNIINM) held in January 2020 starts JINR-VNIINM cooperation aimed to the development of the roadmap for NpN reactor fuel fabrication detailed Roadmap of the DNS-IV implementation was presented at previous PAC meeting. Also, first contact with the potential manufacturer of the NpN fuel took place on June 29, 2020. Further activity on reactor fuel is planned.

At present we have contract with NIKIET on development of the Technical Proposal of the IBR-3 reactor with completion in 2021. The progress in reactor design since January 2020 will be reported.

Working group on the IBR-2 neutron backgrounds investigations is formed. The status of this activity will be reported.