

Passport

International Center for Neutron Research

(“PIK Neutron Research Facility”)

Location: NRC "Kurchatov Institute" - PNPI, Gatchina, Leningradskaya oblast

Initiating organization: NRC "Kurchatov Institute"

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Project web-site: <http://www.pnpi.spb.ru/>

Period of project implementation: 2011-2022

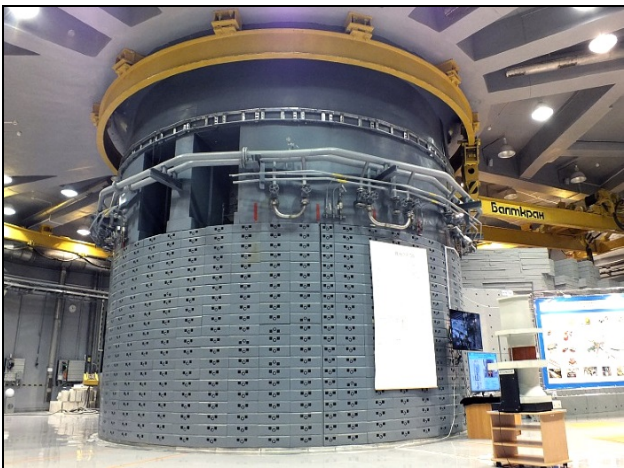
Cost of the mega-science project. Overall cost of construction of the PIK reactor amounts to approximately 60 billion rubles in prices of the year 2015. The cost of the infrastructure for scientific research is estimated to be around 15 billion rubles. The cost connected with the operation of the reactor and its scientific infrastructure amounts to approximately 1 billion rubles per year.

Brief description, the primary purpose of the construction. The project "International Center for Neutron Research based on a high-flux research reactor PIK" (hereinafter referred to as PIK Neutron Research Facility) focuses on conducting fundamental and applied research in various domains of science and technology.

PIK Neutron Research Facility is to become a multi-disciplinary science and technology center for collective use. Its versatility consists in the ability to use it for complementary experiments in physics, chemistry, biology, Earth science, materials science as well as for the in-process product control, activities on the development of technologies of micro- and nano-electronics, isotope production, elemental analysis of samples and products, medicine.

Unique character (main advantages)

The PIK reactor is a powerful neutron source. The neutrons are decelerated to necessary energies, come out of the reactor via special channels and are transported by means of the neutron-guide system to the experimental set-ups to be used in experiments. In terms of the design parameters and experimental capabilities, the PIK reactor outperforms all existing research reactors, including its only analogue existing in the world - the reactor HFR at the Institute of Laue-Langevin (ILL, Grenoble, France).



High-flux research reactor PIK

Scientific and practical importance.

The experiments carried out in **the PIK Neutron Research Facility** will ensure:

- obtaining new knowledge on the structure and dynamics of hard, soft and life matter, as well as on the methods for their synthesis, including technological development;
- obtaining new knowledge on atomic nuclei and fundamental interactions;
- carrying out a wide range of applied and practical activities from isotope production to the use of neutrons in industrial processes.

Current state. A road map has been prepared to bring the PIK reactor to a designed capacity at the end of 2018. The project "Reconstruction of a PIK facility of NRC "Kurchatov Institute" - PNPI 2-nd and 3-rd start-up complexes" has been completed. On 24 December 2015 the federal service for ecological, technological and nuclear supervision Rostekhnadzor has reported on the conformity of these 2-nd and 3-rd start-up complexes with the technical rules (norms and regulations), other legal acts, including project documentation.

Two more investment projects are being implemented for the purpose of preparation for the power start-up of the PIK reactor:

- modernization of engineering and technical systems ensuring the trouble-free operation of the PIK reactor as well as operation of its scientific stations. Commissioning date is in 2018. The deliverable consists in providing conditions for a successful power start-up of the PIK reactor with the power production of 50000 MW*h per year.

- construction of the laboratory campus at the PIK neutron research facility. The deliverable consists in the completion of the office building together with the Data Processing Center (commissioning deadline in 2017); in the completion of the neutron guide building equipped with the cold neutron source and neutron guides as well as about 10 first-day instruments (commissioning deadline in 2019).

Future status. The PIK Neutron Research Facility (PIK NRF) is to be a user-oriented international center, where the neutron beam time is allocated to users through the proposal system. The proposals are gathered and reviewed by an Expert Committee on the regular basis twice per year. To make the PIK NRF international in its literal sense, it will be organized, as a legal body, in the form of

the association – a non-profit limited liability company under law of Russian Federation that has international shareholders. The shareholders have rights to organize the Collaborative Research Groups with an intention to build and to own the neutron stations which are of the interest for the whole association PIK NRF.



