

PASSPORT

International Center for Neutron Research («PIK Neutron Research Facility»)

Location: NRC “Kurchatov Institute” - PNPI, Gatchina, Leningradskaya oblast

Initiating organization: NRC “Kurchatov Institute”

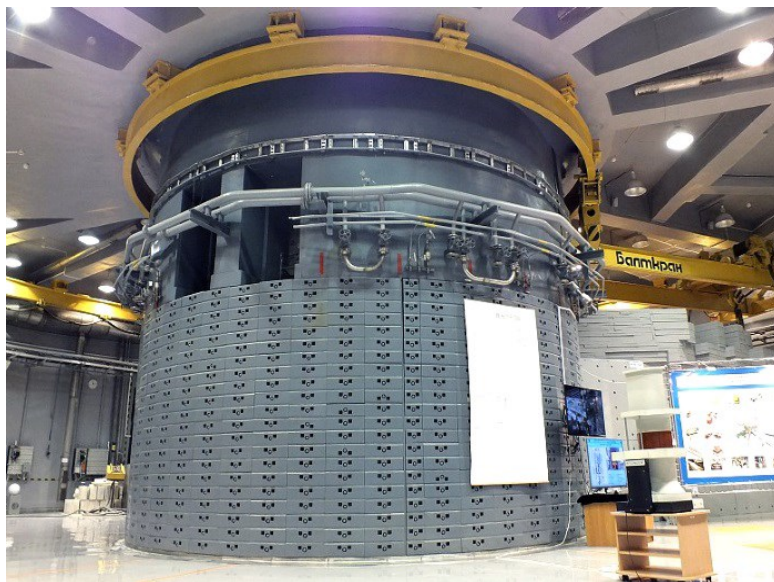
Contact: unu_pik@pnpi.nrcki.ru

Project web-site: <http://www.pnpi.nrcki.ru/en/facilities/reactor-pik>

Period of project implementation: 2011 - 2029

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.



High-flux research reactor PIK

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).

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.

The PIK reactor is currently licensed to operate at a capacity of up to 10 MW. Five neutron scattering stations were commissioned at the end of 2020.

Future status.

The commissioning of 20 research stations is being implemented as part of the investment project "Creation of an Instrumentation Facility for the PIK Reactor Complex" in Gatchina, Leningrad Region, by the B.P. Konstantinov Petersburg Institute of Nuclear Physics of the National Research Center "Kurchatov Institute."

The project is being implemented in two stages:

1. Stage 1 of the project involves commissioning 20 research stations and a cold neutron source. The deadline for Stage 1 is December 31, 2026.

2. Stage 2 of the project involves commissioning two neutron thermalization sources (an ultracold neutron source and a hot neutron source) and upgrading the PIK Reactor Complex's instrumentation facilities. The deadline for completion of stage 2 of the project is December 31, 2029.

