

ROSATOM SUSTAINABLE PRACTICE

COMMISSIONING OF THE FIRST FLOATING NUCLEAR POWER PLANT IN THE WORLD

The case is prepared by Rosenergoatom, JSC in collaboration with Atomtechenergo, JSC, Atomenergoremont, JSC

PARTICIPANTS FROM THE INDUSTRY

- Rosenergoatom (Moscow)
- Atomtechenergo (Moscow)
- Atomenergoremont (Moscow)

GEOGRAPHY

- Pevek, Chukotka Autonomous Area

STAKEHOLDERS

- Russian and foreign companies interested in new technology for providing remote regions with low-carbon electricity
- Local population and manufacturer

DESCRIPTION

The construction of the first floating nuclear power plant (FNPP) “Akademik Lomonosov” was terminated in April, 2018. In September, 2019 after fuel loading and testing the plant concluded its voyage from Murmansk to Chukotka. Connection to the grid took place in December, 2019 while in May, 2020 “Akademik Lomonosov” was fully commissioned. The plant is situated in the town of Pevek of Chukotka Autonomous Area and is the northernmost one in the world.

The FNPP consists of a floating power unit “Akademik Lomonosov” (FPU) and coastal infrastructure. FPU is a flush-decked non-self-propelled ship with two light water reactor installations of ice-breaking type KLT-40C. Each reactor has electric capacity of up to 35 MW, heat capacity – 140 MW, heat output to the heating system up to 50 Gcal/h. Its operational life span is 40 years. This capacity will be sufficient for a town with population of 100 000 inhabitants which is twice as much as the number of inhabitants living in the whole Chukotka Autonomous Area today. Engineering support of the commissioned FNPP is provided by Atomtechenergo, JSC, maintenance and plant monitoring is carried out by Atomenergoremont, JSC.

Considering that Chukotka has no road and rail communication with the rest of Russia and the local energy system is not connected to the general mainland system, one of the key goals of FNPP is to provide with low carbon electricity the surroundings of Pevek as well as major mining companies situated in western Chukotka in Chaun-Bilibino energy center, a large mining cluster, and gold mining companies and projects related to the development of Baim ore zone.

The FNPP functioning also contributes to the development of the Northern Sea Route and all-year icebreaker support. Pevek is one of the key ports of the Northern Sea Route. In the long run the plant will replace generating capacities of the technologically outdated Bilibino NPP (capacity of 36 MW) and the coal Chaun TPP (capacity of 36 MW). Decommissioning of the Chaun TPP and its substitution for the FNPP will result in annual greenhouse gas emission reduction by 180 thousand tones of CO₂ equivalent.



For the first year of operation “Akademik Lomonosov” has already provided 50% of demand of Chaun-Bilibino energy center while in early September, 2022 the whole Pevek was switched to a closed heat supply system from the FNPP.

The realization of innovative energy facility ensures an accelerated social and economic development of the Area. Above all, it is a new important infrastructure facility that creates work places and attracts people to the region. Currently 510 people work at the FNPP including rotation personnel in Pevek and divisions in Moscow and Saint Petersburg.

Nuclear processes at the floating nuclear power plant meet all the IAEA requirements. The FNPP Safety Concept is based on the defense-in-depth principle. The nuclear power facility ensures an adequate combination of passive and active safety systems, inherent safety features are strengthened.

The FNPP fuel cycle is designed for 4 years of continuous operation. Core refueling and spent fuel storage (SF) are carried out on the board of FNPP that excludes SF storage on the coastal facility.

Besides, the FNPP has a potential for sea water desalination and clean water supply for regions in need.

The plant is also a facility of long-term interest and attracts investments that help to develop the region: realizing cultural and educational projects, providing for Pevek hospitals, improving nursery schools and playgrounds.

