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Norwegian Radiation Protection Authority

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# Floating nuclear power plant to be transported along the Norwegian coast

**During the spring of 2018 a floating Russian nuclear power plant (NPP) without nuclear fuel on board will be transported from St. Petersburg to Murmansk. In Murmansk the reactors will be loaded with fuel and tested before the NPP is transported to its destination, Pevek, in northeast Russia. The Norwegian Coastal Administration (NCA) and NRPA are in dialogue with Russian authorities and will stay up-to-date regarding the transport along the coast.**

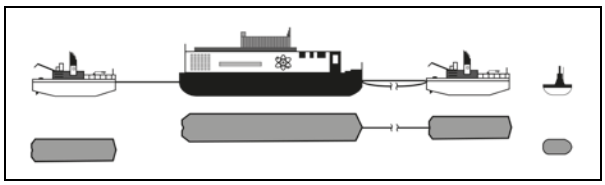

*Akademik Lomonosov under construction at the Baltic Shipyard in St. Petersburg. Photo: Shutterstock.com.*

## Akademik Lomonosov

Russian authorities began planning a floating nuclear power plant (NPP) already 25 years ago and their first such NPP, *Akademik Lomonosov*, was completed at the Baltic Shipyard in St. Petersburg. The purpose of the floating NPP is to produce electricity in remote Arctic areas. *Akademik Lomonosov* will be transported to Pevek in the north-eastern part of Siberia where it will replace *Bilibino* NPP, a land-based NPP that will be taken out of service in 2019. It will produce electricity for the town of Pevek and for the industry located in the area. *Akademik Lomonosov* weighs 22 500 tons, is 145 meters long and 30 meters wide. When in service, it will be capable of producing electricity for a town with more than 200 000 inhabitants.

## Will be transported without nuclear fuel

In the spring of 2018 *Akademik Lomonosov* will be transported from St. Petersburg, through the Baltic Sea and Skagerrak and along the coast of Norway to Murmansk. The transport will take approx. three weeks. *Akademik Lomonosov* is not self-propelled and will be towed by another ship. The towing operation will be led by an escort vessel and there will be additionally three Russian tugboats in the convoy in order to minimize the risk of an accident.



*Layout for the planned towing of Akademik Lomonosov along the coast of Norway. Illustration: NRPA.*

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It is now clear that the NPP will be transported from St. Petersburg to Murmansk without nuclear fuel on board. This means that there is low risk in connection with the transport in Norwegian waters. Scenarios with and without spent and new nuclear fuel on board have been proposed. A constructive dialogue between Russian and Norwegian authorities resulted in the decision to transport the nuclear fuel over land to Murmansk by train.

*Planned route from St. Petersburg to Murmansk.*

## Preparedness during the transport

This is the first time installation floating NPP will be towed along the coast of Norway. NCA is the responsible authority and Vardoe VTS will follow the ship from St. Petersburg to arrival in Murmansk. Norway has worked out sailing rules for such transport activities. These rules have been approved by IMO, the UN International Maritime Organization, and Norway has, in cooperation with Russia, established a reporting system for ships called Barents SRS. The transport will therefore use established traffic separation schemes in which the towing operation will take place away from the coast and the ship is obliged to report on *i.a*. its load and its ability to manoeuvre.

Vessels from the Norwegian towing preparedness fleet will follow the operation as long as the ship is in Norwegian waters. NRPA will also follow the transport in spite of the fact that Russian authorities have confirmed that there will not be nuclear fuel on board.

## Further transport from Murmansk to Pevek

After loading of reactor fuel and testing of the NPP it will be transported from Murmansk to Pevek. This operation is planned for the summer 2019. During this stage of the operation there will be nuclear fuel on board and the speed will be reduced to 3,5 knots.

An accident with a floating NPP loaded with reactor fuel might have serious consequences both for man and environment. Depending on the weather and the conditions at sea radioactive material could spread quickly and influence large areas for a long time after an incident.

Norwegian authorities will therefore also follow the transport from Murmansk to Pevek. NRPA will complete an impact assessment for potential scenarios that might influence Norwegian areas during this stage of the transport. Norway and Russia cooperate well with nuclear safety and have systems for mutual warning in case of unforeseen incidents.

*Plan of the floating NPP. Illustration: Colpan-shutterstock.*

## New reactor uses less enriched uranium

The NPP consists of two KLT-40S-reactors – a slightly changed version of a well-known reactor type used on nuclear icebreakers for more than 20 years. KLT-40S uses a fuel consisting of low-enriched uranium (LEU). Each reactor has a thermal capacity of 150 MW.

The reactors are expected to be able work for 3-4,5 year at a time with a total lifespan of 40 years. There will be facilities on board the floating NPP to store spent fuel and other radioactive waste. The design of the floating NPP includes containment structures to limit releases of radioactivity during an accident.