NFLA Policy Briefing
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Subject: Recent concerns over Russian nuclear safety in the Arctic

1. Introduction

This NFLA briefing concerns the recent activities in the Arctic Ocean of the nuclear-powered freighter, Sevmorput, and the floating nuclear power plant, Akademik Alexander Lomonosov, both owned and operated by ROSATOM, Russia’s State Atomic Energy Corporation.

Normally, nuclear powered sea-going vessels in seaworthy condition would be a little outside our remit. However, the lack of transparency over the activities and the cargo being transported by the Sevmorput, the plight of the Akademik Alexander Lomonosov, and the unexplained and ongoing isolated geographical position in which the Sevmorput finds itself at the end of these events roused our interest.

Please note that this paper covers a scenario that is regularly changing, and the conclusion contains the details of websites that can be monitored for updates.

Most of the information provided within this briefing comes with the kind permission of Tim Deere-Jones (BSc Hons. Marine Studies, Cardiff University) who has been working as an independent and non-aligned marine radioactivity and pollution researcher and consultant since 1983, and the Nuclear Consulting Group to whom the NFLA expresses its deep appreciation.

2. The Sevmorput and the Akademik Alexander Lomonosov

In February 1956 at the 20th Congress of the Communist Party of the Soviet Union, a plan was initiated to build and employ powerful icebreakers to escort cargo ships navigating the Russian Arctic and so open up the Northern Sea Route, freeing access to the vast natural resources of the northern regions of Russia.

In 1957, the Soviet Union began construction of the world’s first nuclear-powered icebreaker, Lenin. Commissioned in 1959, it remained in service for 30 years, before being converted into a museum ship at Murmansk. Its history was chequered with two serious accidents involving coolant failures in 1965 and 1967. Heedless of the environmental consequences, to bring the ship back into service, the Soviet authorities chose as an expedient to off-load radioactive fuel and three defective reactors into the sea off Novaya Zemlya.

Despite these setbacks, from the 1970’s more nuclear-powered icebreakers were built. ROSATOM now operates an ever-growing fleet tasked with keeping the Arctic open.

Although the United States, Germany, and Japan each built nuclear-powered merchant ships, these were demonstration projects rather than viable cargo carriers, and only the Soviet Union, faced with the hostile climatic conditions in the Arctic, chose to develop nuclear-powered freighters.

The Russian owned and flagged, nuclear-powered, ice classed Sevmorput was ordered in 1978 and was completed more than a decade later. With a maximum seasonal displacement of 62,000 tons and 260 metres in length, the ship is powered by a single 135 MWt reactor at a maximum speed of 21 knots. With an ice-breaking capacity, the ship can pass through 1 metre thick ice at a speed of 2 knots.
Operated by the Murmansk Shipping Company for her first twenty years of service, the *Sevmorput* was transferred to ATOMFLOT, Rosatom’s mercantile marine subsidiary, in 2008.

Although there were originally four such vessels, the *Sevmorput* is now the only Russian nuclear-powered freighter to remain in service.

The *Akademik Alexander Lomonosov* is a floating nuclear power plant located on a stationary barge. Named after an eighteenth-century Russian polymath, scientist and writer, the vessel took eleven years to build and was only completed in 2018. With a length of 144 metres and displacement of 21,500 tons, the barge hosts a power plant, consisting of two nuclear reactors producing 70 MWt of electricity or 300 MWt of heat, which is operated by ROSATOM.

In September 2019, the *Lomonosov* arrived on station in the Pevek in the remote Chukotka region in Russia’s Far East, a place far closer to Canada and the USA than European Russia. In December of that year she began to generate electricity for the first time. Pevek is the East Siberian location of a gold and copper extraction and refining development (part owned by Russian oligarch Roman Abramovitch), and the *Lomonosov* is the principal energy source for the development.

Although ROSATOM had ambitious plans to develop six more plants by 2015 for deployment to the Arctic North, to date none of these have materialised, and consequently the *Lomonosov* currently remains the only one of its kind in service.

### Recent Activities

In early November 2021 the *Sevmorput* set sail from western Russia to Vladivostok, via the Arctic Northern Sea Route with a cargo of reactor parts, intended for transshipment to another vessel for onward transport to the Rooppur nuclear project in Bangladesh.

This exercise was very much a Russian nuclear industry venture since management of the Arctic Northern Sea Route is now in the hands of ROSATOM, which only operates ice-breakers, the *Sevmorput*, and the *Lomonosov* in the region, and is also in the process of building the Rooppur reactors.

The ROSATOM/ATOMFLOT PR exercise at the start of the voyage to Vladivostok made much of the *Sevmorput*s ice breaking capability and the capability of its nuclear power sources which could keep it running for many months without refueling.

During the voyage ice conditions in the East Siberian Sea unexpectedly became more extreme and a significant number of vessels whilst transiting the Northern Sea Route became frozen fast and had to be rescued by ROSATOM’s nuclear ice breakers. The released vessels were forced to return to the warmer waters of Western Russia; amongst them were ships carrying supplies to the Pevek development and undefined spare parts and equipment for the *Lomonosov*.

The *Sevmorput* managed to reach less testing ice conditions and its destination at Vladivostok under its own power, and it was announced that despite the set-back to the other vessels all would be well because the *Sevmorput* would hasten back to Murmansk, collect the supplies for Pevek and deliver them by early January.

This never happened as, for unexplained reasons, the *Sevmorput* remained moored and immobile at Nakohodka at an isolated, offshore site around 85 kms away from Vladivostok from late November to early January.

Instead ROSATOM’s newest and largest nuclear-powered icebreaker, *Arktica*, supported a convoy of 3 ships to transport the overdue cargo to Pevek and the *Lomonosov* in the first week of January 2022.

Around this time, *Sevmorput* finally move closer to Vladivostok, and the ship is now anchored in an offshore ‘dry cargo holding area’ about 10kms away from the Russian naval base.
Here from 14 January, she has been attended to by another mysterious Russian vessel, identified only as 'SPK-44150', which has moored alongside the freightervii. ‘SPK-44140’ is poorly designated, being described as "other type" and "on sea trials" and appears to be about 25 to 30 metres long and may possibly be a tug, supply, or repairs vessel.

However, most unusually SPK-44150 does not have any other name or an IMO number and is not listed in the IMO/UN funded global shipping lists, something that appears contrary to the requirements of international law.

Vladivostok is a naval port and the base for Russia’s extensive nuclear-powered Pacific fleet including nuclear powered and armed submarines and nuclear powered surface vessels, and in the past the Sevmorput has carried nuclear materials on behalf of the Russian military to various destinations in the Arctic and sub-Arctic.

The immobility of the Sevmorput away from the busy port of Vladivostok raises concerns, especially as ROSATOM have offered no explanation. She is the last surviving nuclear powered merchant ship with a chequered history of mechanical and engineering breakdowns and failures since her launch 33 years ago in 1988. Instead of being decommissioned and scrapped in 2012, the vessel was instead refurbished and reentered service in 2016, but several of her recent voyages have still been interrupted by shipboard malfunctions.viii, ix

Does the isolation of the vessel signify an onboard nuclear accident or some equipment failure that seriously compromises nuclear safety on the ship?

4. Relevant Websites

Nuclear Consulting Group https://www.nuclearconsult.com/
Barents News https://thebarentsobserver.com/en
World Nuclear News https://www.world-nuclear-news.org/

Richard Outram, NFLA Secretary 17.1.22

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v Rosatom Flot – Atomic lighter ‘Sevmorput’

vi Power Technology - Akademik Lomonosov Floating Nuclear Co-Generation Plant – 24 May 2021

vii World Nuclear News - Russia connects floating plant to grid – 19 December 2019
https://www.world-nuclear-news.org/Articles/Russia-connects-floating-plant-to-grid

viii World Nuclear News - Bangladesh plans another nuclear power plant – 11.10.21
https://www.world-nuclear-news.org/Articles/Bangladesh-plans-another-nuclear-power-plant

ix World Nuclear News - Nuclear ship carries Rooppur components – 3.11.21
https://www.world-nuclear-news.org/Articles/Nuclear-ship-carry-Rooppur-components

x The Barents Observer - This year's last transit shipment on Northern Sea Route is underway – 14.12.21

xi Marintraffic.com – SPK 44150 -

xii Robin de Bois – “Sevmorput” in breakdown off coast of Africa – 19.11.20
https://robindesbois.org/en/sevmorput-en-avaries-au-large-de-lafrique/

xiii The Barents Observer – “Sevmorput” returns to Arctic after troublesome year –10.8.21