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Nuclear risks in Russian Arctic during the war in Ukraine

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Nuclear activities in Russian Arctic over last 70 years:

Nuclear explosions:

- 132 nuclear test at Novaya Zemlya test site
- over 12 Civilian nuclear explosions in Arctic region

Nuclear submarines and ships:

>130 were build in Severodvinsk

>100 were in service at the Northern Fleet

Civilian nuclear infrastructure:

- 14 Nuclear icebreakers (8 in service in 2025)
- 3 Nuclear power plants in operation

A lot of accidents and radioactive waste and spend nuclear fuel storage sites

The accumulated nuclear problems after the collapse of the Soviet Union formed the so-called Nuclear Legacy

The map is outdated and for example purposes only!

Nuclear legacy. Examples of solved problems

The war in Ukraine has stopped 20 years of international cooperation. Before the war it was financed by US and several EU countries in amount of more than 2,5 bln. euro total.

Saida Bay. Solved

Lepse service ship. Solved

Andreyeva Bay.
Partly solved

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Sunken nuclear objects. Unsolved problem

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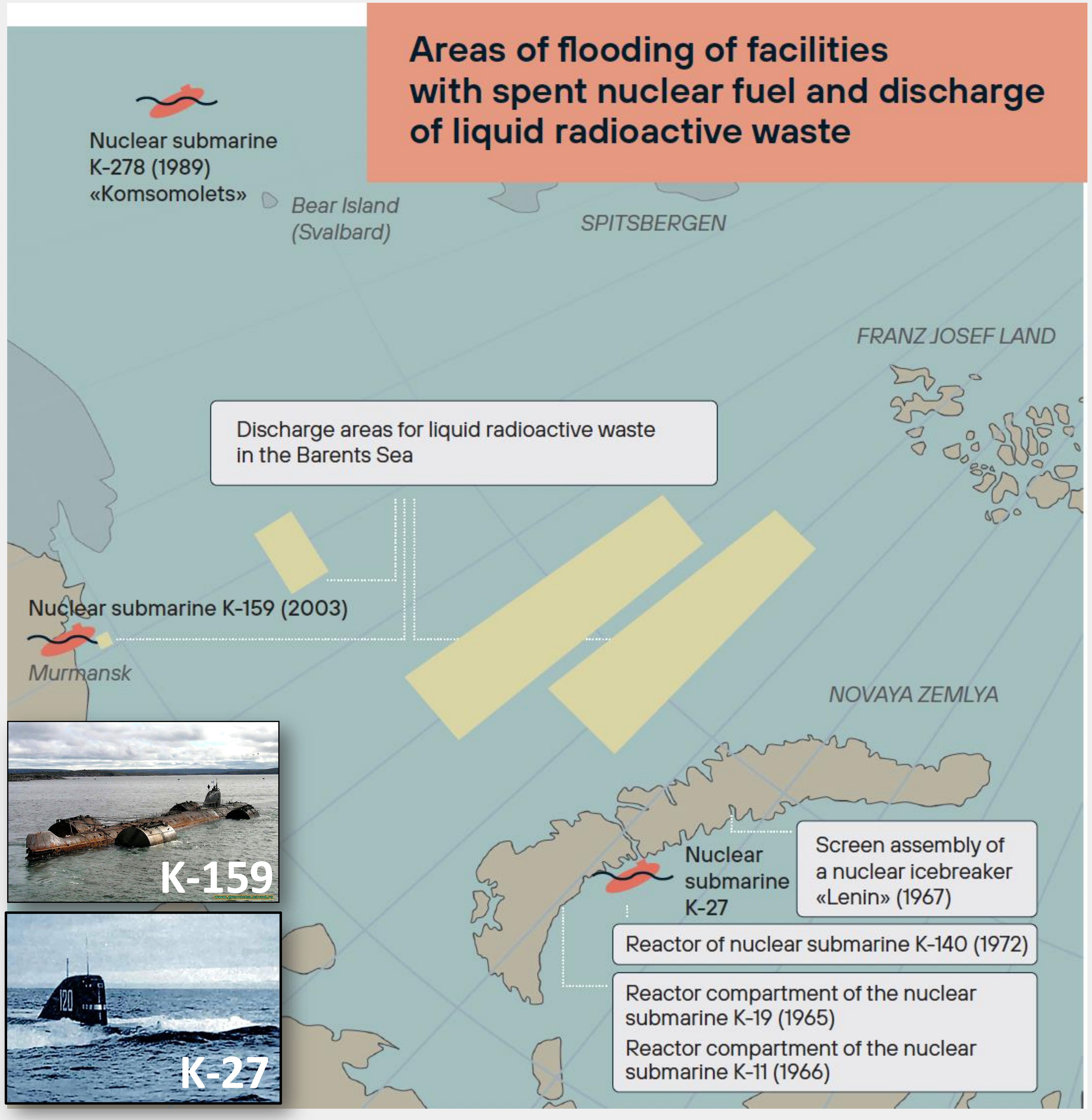

Name	Reactors / spent nuclear fuel (SNF)	Year of sinking	Depth (m)	Decision
Nuclear Submarines:				
K-278 «Komsomolets»	1 reactor with SNF (+2 nuclear torpedoes)	1989	1027	No decision
K-27	**2 reactors with SNF**	**1981**	**20**	**Raise**
K-159	**2 reactors with SNF**	**2003**	**170**	**Raise**
Reactor Compartments:				
K-11	2 reactors with SNF	1966	20	Leave and observe
K-19	2 reactors with SNF	1965	20	
Nuclear Reactors **K-140**	1 reactor with SNF	1972	300	Leave and observe
Fuel assembly Of **nuclear icebreaker «Lenin»**	SNF	1967	40	Leave and observe

Source: Bellona Report «The nuclear legacy of the Russian Arctic», 2023. https://etc.bellona.org/publication/nuclear-legacy-arctic-2/

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Increase of nuclear military activity in Arctic

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History:

> 130 nuclear submarines were built in Russian Arctic (in Severodvinsk)

>100 nuclear submarines were operated in the Russian Northern Fleet

>120 reactor compartments of decommissioned nuclear submarines placed in Saida Bay

>24000 SNF assemblies were placed in Andreyeva Bay

Present:

- About 30 nuclear ships and submarines in the Northern Fleet as of 2025
- The Navy is the main operator of nuclear reactors in the Russian Arctic – more than 40 in comparison with 25 civilians (NPPs and icebreakers)
- About 300 nuclear warheads on combat duty
- Russia spends more than $10 bln. annually on nuclear weapons (incl new submarines and new types of weapons)

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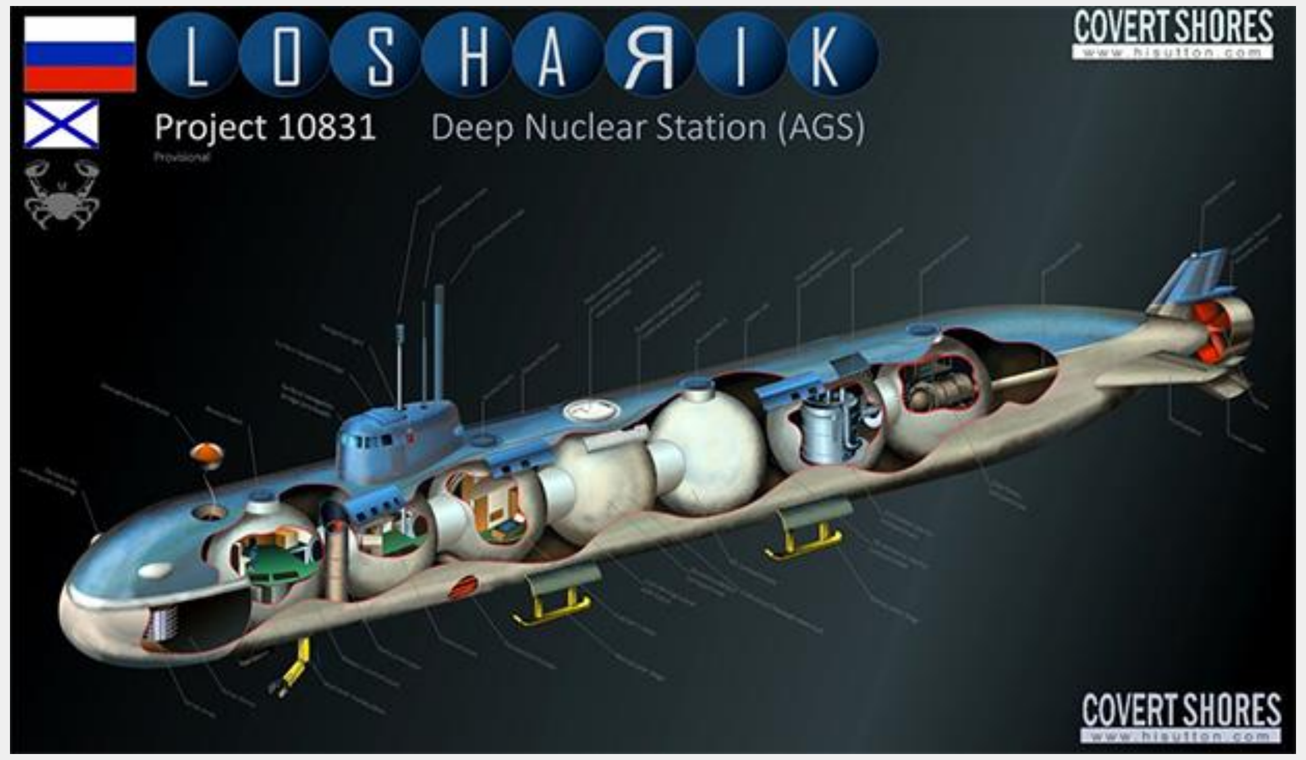
Accidents

Nuclear submarine Kursk
August 2000, Barents Sea
Accident and sinking during exercises
118 dead

Nuclear submarine K-159
August 2003, Kola Bay
Sunk while being towed
for disposal,9 dead



Deep Nuclear Station «Losharik»
July 2019, Kola Bay
Fire during a secret operation, 14 dead

Accident at the Nenoksa test site
August 2019, Arkhangelsk Region
Explosion during «Burevestnik» missile
testing. 7 dead, radiation release

Novaya Zemlya Test Site

Severny settlement and test site for underground tests

Pankovo (launch and testing site for Burevestnik)

Bellona infographics on the basis of Google Earth images

Putin's Nuclear Escalation last years:

- Revocation of ratification of the Comprehensive Nuclear-Test-Ban Treaty (CTBC)
- Suspension of the New START treaty
- Nuclear weapons placed in Belarus
- Change in the Russian Nuclear Doctrine
- Development of new types of nuclear weapons (Burevestnik, Poseidon, Oreshnik, etc.) and nuclear arms ace
- Maintaining the readiness of the Novaya Zemlya test site for nuclear testing

Possible next steps (before the start of nuclear war):

- Deployment of around 100 additional nuclear warheads on existing submarines in the Arctic after the expiration of the New START Treaty in February 2026.
- Underground nuclear tests at Novaya Zemlya in several years

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Nuclear icebreakers and Northern Sea Route

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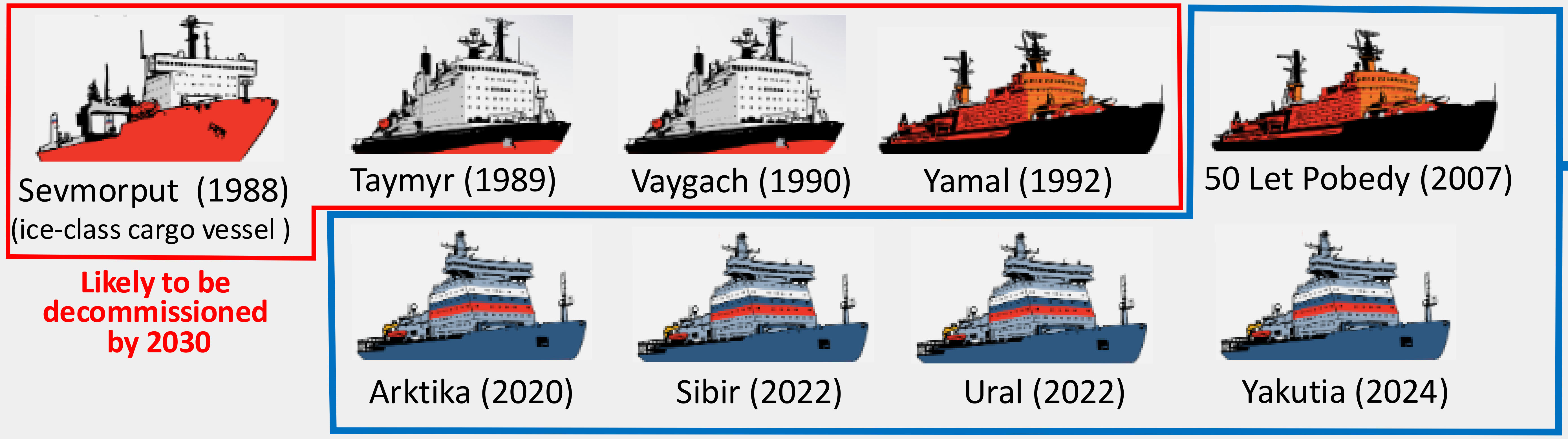
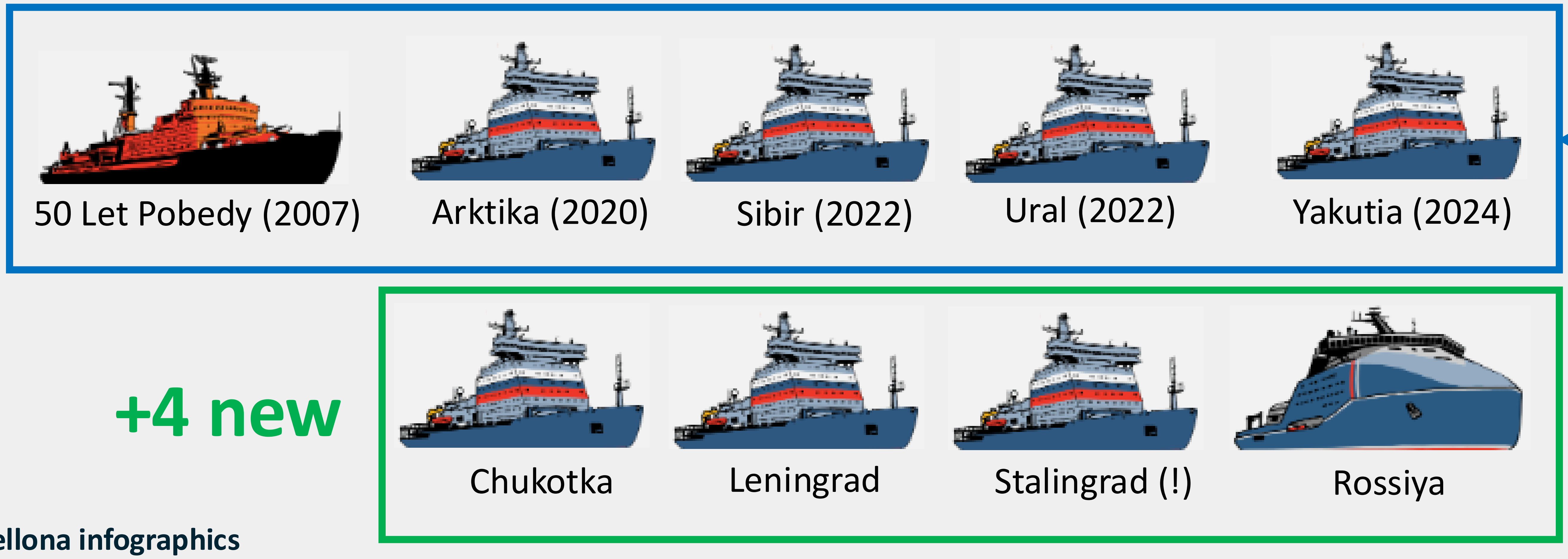
2025. 8 Icebreakers + cargo vessel:



2030-2035. 11 Nuclear icebreakers:



War-related problems of icebreaker development:

- End of cooperation with Western suppliers, particularly from Finland
- Loss of Ukrainian supplier - NKMZ in Kramatorsk (formerly Rosatom's plant)
- Sabotage and disruption of supply chains (The Ursa Major vessel, carrying components for an icebreaker under construction in the Far East, sank last month near Spain)
- Reduced state funding necessitates finding extra resources for icebreakers
- The slowdown in the development of cargo traffic along the NSR due to sanctions and economic pressure on Russia

Bellona infographics

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Nuclear power plants in the Russian Arctic

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Bellona infographics based on open data, Rosatom plans, and the Russian general plan for the placement of energy facilities until 2042

Name	Kola NPP	Bilibino NPP	Akademik Lomonosov SMR
Reactors	4 VVER-440	4 LWGR-12 (1 closed)	2 KLT-40 (sum 70 MW)
In operation since	1973	1974	2020

Planned Nuclear Power Plants	Name	Kola-2 NPP	Norilsk SMR	Yakutsk SMR*	Baimsky SMR*	Chukotka SMR
	Reactors	2 VVER-600	Up to 3 RITM-400	Up to 2 RITM-200N	8 RITM-200S	Shelf-M
	Capacity	1200 MW	Up to 240 MW	Up to 110 MW	424 MW	10 MW
	Commissioning	2035-2036	2032-2036	2031	2028-2031	2031

*construction starts

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Conclusions

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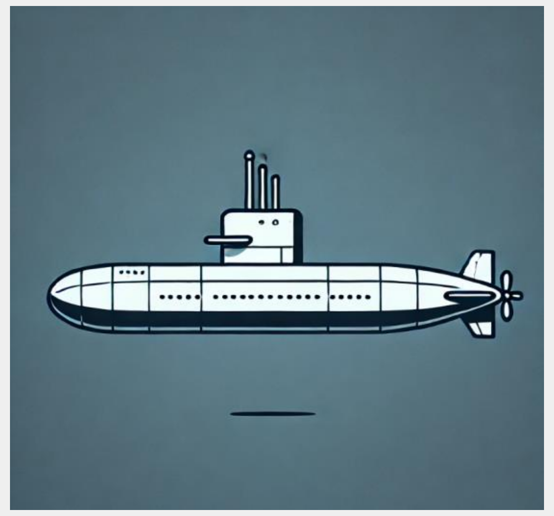
Nuclear legacy issues are still dangerous and unresolved.
In the current situation, nuclear cleanup projects may slow down or stop indefinitely.



New risks arise from regional militarization and secret nuclear installations, heightening accident risks.

The lack of reliable information from Russia and the Arctic increases the risk. Bellona works to improve access to independent information.

Sanctions and pressure on Russia are slowing its Arctic extraction projects. Russian Arctic resources should be banned from international markets.