

New regime and regulations on Northern Sea Route



In December 2018, the State Duma in Russia transferred the powers of operator of the Northern Sea Route to Rosatom. Changes in regulations are currently taking place and Alexey Shtrek at Aker Arctic is following what will change and how this will impact design work.

The main regulatory documents that concern new high-ice-class vessels or existing low-ice-class transport in the Arctic are the: Rules of Classification and Construction of Sea-going Ships by the Russian Maritime Register of Shipping (RS); and Rules for Navigation in the Water Area of the Northern Sea Route by the Northern Sea Route Administration (NSRA).

Risk-based approach

A new challenge for designers is the recently introduced change to the Rules for the Classification and Construction of Sea-Going Ships.

Previously, there were very descriptive RS rules for ships intended for operation in Arctic seas, containing detailed information on the possibilities and limitations for different ice classes. Following the basic ideology and approach of the international Polar Code, RS removed tables that contained information on allowable areas of navigation and ice conditions, and permissible speeds at corresponding operating modes (independent or icebreaker assisted) for ships, depending on their ice classes.

The new version of the rules, available on the RS website (rs-class.org), now contains only one table with reference descriptions of ice classes of the Register. According to RS, the determination of the permissible ice class, based on the specific ice conditions in the area of operation, is the prerogative of the Harbour Master, the NSRA, or the ship operator. Additionally, the choice of the ice class of the designed ship should be justified by its owner or designer.

“Designers will now have to define the risks themselves, depending on the area of navigation or tasks,” says Development Manager Alexey Shtrek.

Ice class	Description
Arc9	In summer/autumn navigation – voyage in all areas of the World Ocean. In winter/spring navigation in Arctic – voyage in very close floating ice and in compact multi-year ice of up to 3.5 m thickness and in freezing non-arctic seas without restrictions.
Arc8	In summer/autumn navigation – voyage in all areas of the World Ocean. In winter/spring navigation in Arctic – voyage in close floating second-year ice up to 2.1 m thickness and in freezing non-arctic seas without restrictions.
Arc7	In summer/autumn navigation – voyage in all areas of the World Ocean. In winter/spring navigation in Arctic – voyage in close floating first-year ice up to 1.4 m thickness and in freezing non-arctic seas without restrictions.
Arc6	In summer/autumn navigation in Arctic – voyage in open floating first-year ice up to 1.3 m thickness. In winter/spring navigation in Arctic – voyage in open floating first-year ice up to 1.1 m thickness. Year-round voyage in freezing non-arctic seas.
Arc5	In summer/autumn navigation in Arctic – voyage in open floating first-year ice up to 1.0 m thickness. In winter/spring navigation in Arctic – voyage in open floating first-year ice up to 0.8 m thickness. Year-round voyage in freezing non-arctic seas.
Arc4	In summer/autumn navigation in Arctic – voyage in open floating first-year ice up to 0.8 m thickness. In winter/spring navigation in Arctic – voyage in open floating first-year ice up to 0.6 m thickness. Year-round voyage in freezing non-arctic seas in light ice conditions.

Recent changes to the section on the Rules for the Classification and Construction of Sea-going Vessels of the Russian Register.

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Polar Code ideology

In general, these changes are within the framework of the Polar Code ideology, and aimed at unifying ice class descriptions. They should allow designers and operators greater choice when deciding on the most appropriate level of strengthening to the hull, propulsion parameters and other required vessel characteristics.

"At the same time, it is important to maintain a correct understanding of how a vessel in the design stage will comply with the operating conditions," Shtrek highlights. "From the new table, it can be concluded that RS has tightened the limitations for its own Arctic ice classes. The mode of icebreaking assistance is now moved beyond the scope of classification and is entrusted to the designer's or operator's decision."

"Therefore, it is essential that the Polar Ship Certificate issued by a classification society, in accordance with the requirements of the Polar Code, should clearly indicate the actual operational limitations when navigating in ice for a specific ship design. It is also valuable to have the designer involved in the operational assessment."

Rules for Navigation

Ship designers will need to study the navigation rules even more carefully for those areas in which the polar-class vessel is intended, that is, the Rules for Navigation in the Water Area of the Northern Sea Route available on NSRA's website (nsra.ru), which are also being prepared for changes.

The draft of these changes has been submitted for discussion to all interested parties and is currently in the approval process of the Russian Government.

"From the published materials it seems, especially, to ease the requirements for the admission of vessels of ice classes Arc4 and Arc5 when operating under icebreaking assistance," Shtrek continues.

These proposals are based on the experience gained from the operation of powerful nuclear icebreakers assisting relatively small vessels, in particular using close towing in the most severe ice conditions.

"This method is unacceptable for large cargo vessels requiring special methods when escorted by icebreakers," Shtrek says.

Ice class	Mode of ice navigation	South-west part of Kara sea			
		DRAFT of new edition		Current edition	
		winter	summer	winter	summer
		H M E O	H M E O	H M E	H M E
Arc4	Independent	- - + +	- + + +	- - +	- + +
	IB escorted	+ +	+ + + +	+	+ + +
Arc5	Independent	- - + +	+ + + +	- - +	+ + +
	IB escorted	+ +	+ + + +	+	+ + +
Arc6	Independent	- + +	+ + + +	- +	+ + +
	IB escorted	+ + +	+ + + +	+ +	+ + +
Arc7	Independent	+ + + +	+ + + +	+ + +	+ + +
	IB escorted	+ + + +	+ + + +	+ + +	+ + +

'+' – navigation is allowed; '-' – navigation prohibited
 - more easy requirement; - more strict requirement

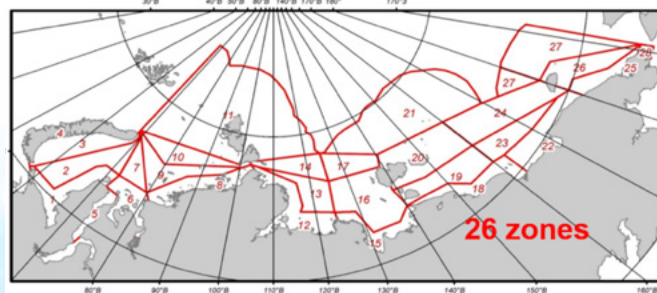
Types of ice conditions: H – heavy; M – medium; E – easy; O – open water

Comparison of the changes to the Rules for Navigation on the Northern Sea Route that are currently being prepared.

More navigating zones

Another important change in the draft of the new rules is an increase in the number of Northern Sea Route zones for assessing the severity of ice conditions.

Currently, there are seven zones, each defined according to specific ice conditions. In the future, the number of zones will increase to 26, each with its own type of ice conditions and limitations on passage. This will allow the use of low ice-class vessels in more areas and assist in optimising logistic schemes.



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Responsibilities

Rosatom is now responsible for developing the infrastructure, the creation of a fleet, icebreaker assistance or certain services, structure development, as well as traffic control services.

Two state organisations are subordinate to Rosatom through the Directorate of the Northern Sea Route: Atomflot and Hydrographic Enterprise.

Atomflot traditionally operates an icebreaking fleet, provides navigation on the NSR, and is responsible for the building of new icebreakers. Last year, Atomflot's



Example of modern arctic cargo fleet: Polar Class 3 module carriers Audax and Pugnax began in 2016 to deliver construction modules to Sabetta. Photo by Red Box Energy Services Ltd.

fleet was extended with its first non-nuclear icebreaker *Ob*, a port icebreaker based on the Aker ARC 124 design and intended for operation in the Sabetta LNG terminal.

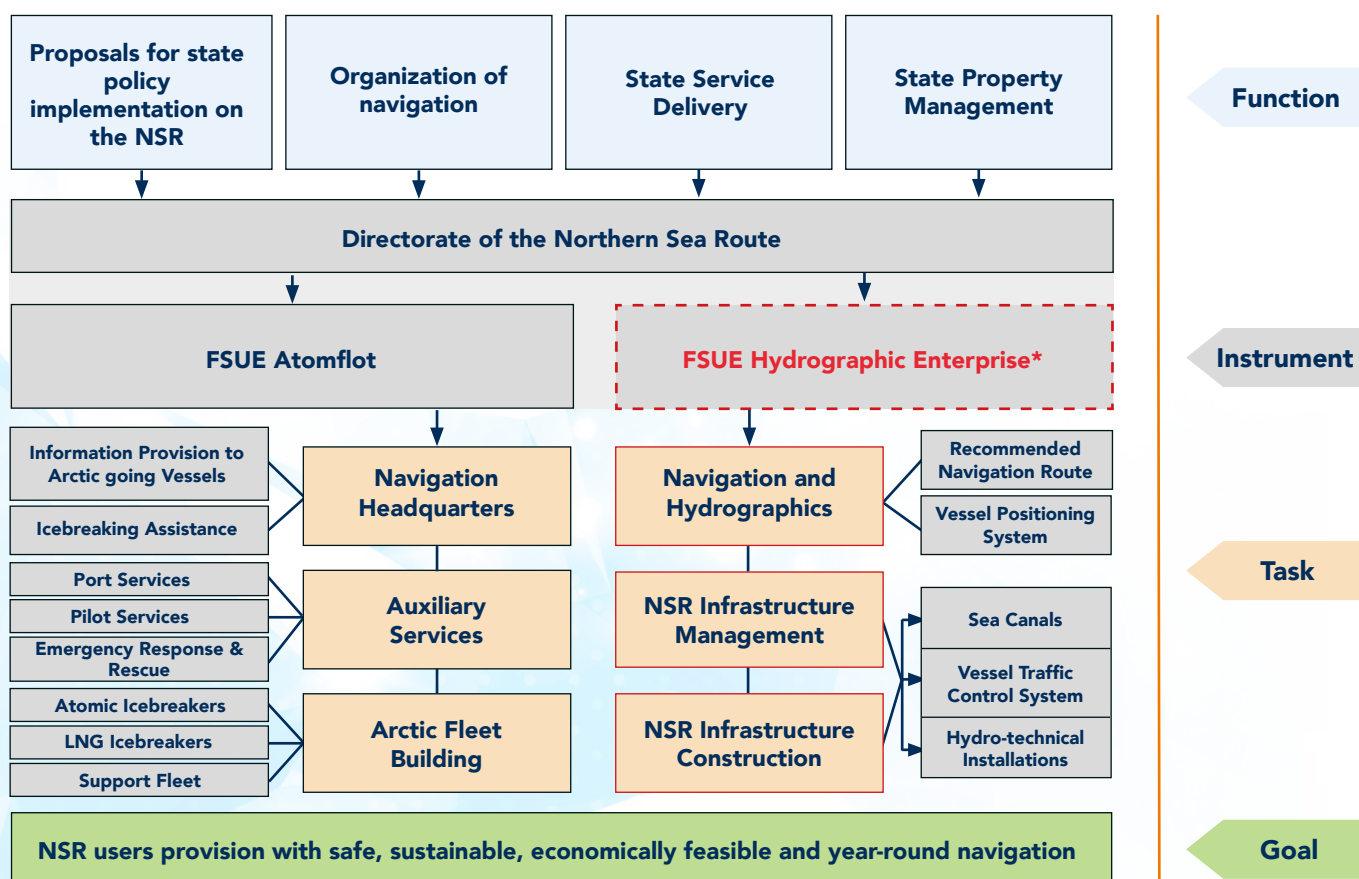
Hydrographic Enterprise provides navigational and hydrographic support, and is responsible for the appropriate infrastructure. It performs water depth surveys on the navigation routes on the NSR, owning a fleet of specialised hydrographic vessels.

Permissions as before

NSRA, being under the Ministry of Transport, is responsible for legal regulation of shipping, fulfilment of international obligations of Russia, as well as state port supervision of ships and fees. It continues to issue permissions for vessels entering the NSR water area, as before.

According to a previous agreement with Rosatom, the Ministry of Transport of the Russian Federation approves rules for navigation on the NSR, compulsory regulations in seaports at the NSR, a list of port fees and decisions on opening sea ports, among others.

"It is assumed that, in the future, Rosatom and the Ministry of Transport will work according to the so-called two-key approach: complementing each other in their functions and responsibilities in order to ensure the necessary level of safety and efficiency of the Northern Sea Route as a sustainably-developed transport corridor," Shtrek explains.



NSR organizational chart

Two Arc7 gas condensate tankers were delivered in 2018 and 2019.



Safe shipping in the Arctic

The development of oil and gas projects in the Russian Arctic basin has led to the creation of principally new types of large Arctic cargo vessels for ice navigation, significantly surpassing traditional icebreaking transport vessels in their operational capabilities.



Example of modern arctic cargo fleet: Two Arc6 shuttle tankers of Kirill Lavrov type were delivered in 2010



Five Arc7 container carriers for Norilskiy Nickel were delivered in 2006–2009.

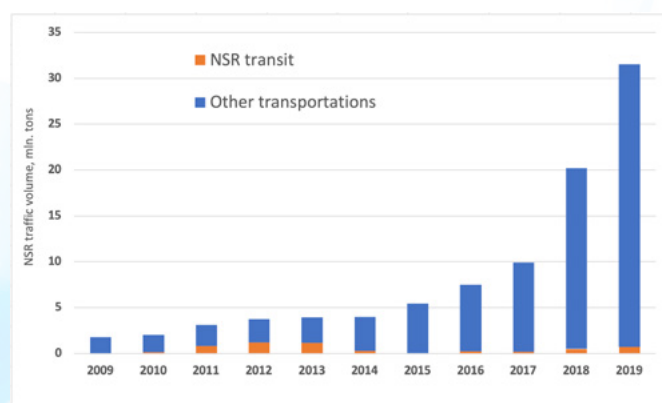
Further increases in export volumes, new plans for organising year-round eastward navigation along the Northern Sea Route, as well as new environmental requirements, all pose designers with new challenges to create cargo vessels capable of providing reliable, cost-effective and safe shipping in the Arctic.

Optimal design path

The selection of optimal parameters and the further design of future Arctic cargo vessels should be based on the results of a comprehensive feasibility study, tailored for each specific shipping project.

It should cover the detailed assessment of ice and navigation conditions in the areas of operation, the estimated traffic volumes and the use of different possible transportation schemes, the availability and capabilities of icebreakers, and all the issues related to operating a vessel in ice.

“In accordance with the ideology of Aker Arctic, we prefer to be involved in Arctic projects from the earliest stages. Then we can understand all the challenges that may arise in the process of designing icebreaking vessels for our clients and come up with the most optimal and effective design solutions,” Shtrek underlines.



Cargo volumes on the Northern Sea Route are expected to grow up to 80 million tons in the future, mainly related to new hydrocarbon export projects. Transit volumes remain more or less the same, as these are still occasional voyages and not scheduled. ■