REQUIREMENTS FOR THE DESIGN, EQUIPMENT AND SUPPLIES OF VESSELS NAVIGATING THE NORTHERN SEA ROUTE

The present Requirement" take into account the especially difficult and dangerous conditions of navigation along the Northern Sea Route and are intended to ensure safety of navigation and to prevent pollution of the marine environment and northern coast of Russia which is especially vulnerable area, where it is prohibited to dispose of any amount of oil products and other harmful substances and their mixtures containing such substances in amounts that exceed the established standards, in accordance with the legislation.

These Requirements have been developed in accordance with the Statute of the Administration of the Northern Sea Route approved by Resolution No. 683 of 16 September 1971 of the Council of Ministers of' the USSR (Collection of Resolution of the Council of Ministers of the USSR. 1971. No. 07 art. 124) and the Regulations for Navigation on the Seaways of the Northern Sea Route (rule 1. par. 1.5 and rule 4) approved by the Minister of the Merchant Marine on 14 September, 1990.

1. Definitions

1.1. *''Administration":* Administration of the Northern Sea Route.

1.2. *"Headquarters":* Marine Operations Headquarters: special navigation services of the Murmansk and Far East shipping companies directly responsible for sea operations on the Northern Sea Route, overall coordination of the work of which is the responsibility of the Administration.

1.3. *"Requirements":* Requirement for the design, equipment and supplies of vessels navigating the Northern Sea Route.

1.4. *"NSR":* Northern Sea Route.

1.5. *"Inspector":* Chief state inspector, or state inspector of the Administration, or a person authorized by it.

1.6. *"Petroleum Products":* Petroleum products of any type, including crude oil, refined petroleum products, liquid fuel, oil, their waste products, residue and mixtures with other substances.

1.7. *"Harmful Substances":* Any substance which, if disposed of in the sea, may present a danger to living resources, marine flora and fauna, or the health of human being, interfere with activities in the sea, including fishing. and worsen the quality of sea water with respect to the different ways of its utilization.

1.8. *"Rules of the Russian Federation Registry":* Rules of classification and construction of sea going vessels of the Russian Federation Registry.

1.9. *"Regulation for Navigation":* Regulations for Navigation on the Seaways of the Northern Sea Route.

1.10. *"Guide to Navigating* ": Guide to navigating through the Northern Sea Route.

1.11. *"Vessel owner":* Person or organization which owns a vessel.

1.12. *"Self-propelled vessel":* Vessel with a mechanical engine intended to propel a vessel.

1.13. *"Non-self-propelled vessel* ": Vessel having no mechanical engine for propulsion,

1.14. *"Icebreaker":* a special vessel intended for guiding, icebreaking and towing vessels and carrying out rescue and other operations in ice.

1.15. *"Ice conditions":* Distribution of ice of different characteristics in an area of navigation.

1.16. *"Favorable Ice Conditions":* Presence of ice of compaction up to 3 points.

1.17. *"Unfavorable Ice Conditions* ": Presence of ice of compaction 7 points or higher, and of landfast ice.

1.18. *"FCS":* Foreign classification society

2. General provisions

2.1. Unless otherwise stated, the present Requirements cover all vessels with gross tonnage of 300 t (registered), or greater that travel along the NSR. Possibility of navigation of vessel with less tonnage is the matter of special consideration of the Administration.

2.2. Besides the present Requirements vessels that travel along the NSR must also satisfy the applicable Rules of the Russian Federation Registry for vessels containing the following literal designations of ice resistance categories as part of the symbol of their class: Arc4 (LU4), Arc5 (LU5) or Arc6 (LU6). or the literal designations of the equivalent ice

categories used by other classifying organizations. and must also satisfy the requirements of applicable international convention and the Code of the International Maritime Organization.

If the Administration (Headquarters) so decrees, a vessel belonging to ice resistance category Arc4 (LU4) of the Russian Federation Registry, or to equivalent ice resistance categories used by other classifying organizations. may be permitted to travel, while under the control of icebreakers, along sections of the Western (up to 125°E) area of the NSR and along individual sections of the Eastern area of the NSR during the summer navigation period, if the navigation conditions are favorable.

2.3. Icebreakers are permitted to navigate along the NSR under ice conditions that correspond to the designation of their respective ice resistance category. Operation of an icebreaker under more severe ice conditions than these envisaged by its ice resistance category is permitted in each individual case upon decision of the Administration (Headquarters) following a review of the appropriate documentation provided by the owner of the icebreaker confirming that the state of the hull, machinery and systems of тe particular icebreaker is such as to ensure the necessary navigation safety in the NSR area, as well as preclude a possibility of pollution of the sea.

2.4. Operation of vessels of ice resistance category Ice3 (LU3) may be permitted as an exception, upon special decision of the Administration (Headquarters), in the summer navigation period in. the Western area of the NSR under favorable navigation conditions and favorable forecasts of navigation conditions. Operation in ice of vessels belonging to ice resistance category Ice3 (LU3) in the Eastern area of the NSR is not permitted.

2.5. As an exception, transport vessels belonging to ice resistance categories Ice3 (LU3) or Ice2 (LU2), that are currently in service and assigned to Arctic ports at the time of publication of the present Requirements, may be permitted to travel along the NSR exclusively during the period of summer navigation under favorable ice conditions within coastal polyn'yas in Arctic seas.

Such vessels may travel in the specified above area only during the, summer period upon a special decision of the Administration (Headquarters) subject to the technical state of the vessel and the particular ice conditions.

2.6 Inland vessel (classes of the Register of river shipping M-SP /Sea-Mixed Navigation/, M-pr /Sea-coastal/, O-pr /Lake-coastal putting to sea may be admitted to navigation through the NSR in the areas and within the periods of time set for them by inland legislation) and the ice condition in these areas should not be more difficult than those established for the vessels of appropriate classes in the requirements of the Register of river shipping.

2.7. Vessels of inland and mixed navigation by their transportation in the summer period of navigation may be admitted to the seaways of the NSR only for once-only transition. Possibility, conditions and ensurance of the transitions of inland and mixed navigation vessels along the seaways of the NSR are determined in each concrete case by the Administration (the Headquarters) with the account of the actual ice conditions on the seaways, ice class of the vessel (ice strengthening category), technical state of its hull, machinery and systems provided the owner of the vessel has submitted substantiations and measures taken to ensure transition safety and to prevent marine environment pollution.

2.8. Once-only leadings of the ships and vessels of the Navy along the seaways of the NSR are carried out by a special permission of the Administration (the Headquarters) after consideration and coordination of additional fitting project ensuring safety of leading and prevention of marine environment pollution.

2.9. Non-self-propelled vessels may be permitted to navigate along the NSR under the condition that they fulfill parts 3 and 6 of the present Requirements and that the towing method has been approved by the Administration (Headquartersгs). Administration (Headquarters) determines in each individual case, whether other parts of the present Requirements have to be fulfilled.

2.10. The master (owner) of a vessel that is to travel along the NSR must transmit to the Administration (Headquarters) an application for passing through the NSR that confirms the degree to which the vessel fulfills the present Requirements.

2.11. Inspection of the vessel to verify compliance with the present Requirements is performed at the expense of the owner of the vessel and can be carried out in the ports of Murmansk, Nakhodka, Vladivostok or Provideniya,. as well as in any other port convenient to the owner of the vessel.

2.12. Vessels, which make trips along the NSR. may be exempted by the Administration

(Headquarters) from the responsibility of fulfilling certain parts of the present Requirements if, following an inspection, it is found that the vessel is in sufficient compliance with the requirements for navigation safety and prevention of pollution of the environment for making a trip under the given ice conditions.

2.13. Inspections are carried out by an inspector in accordance with the instructing materials on supervision of vessels' compliance with the present Requirements. The Administration may assign the task of carrying out the inspection to warranted inspectors, or to organizations recognized by the Administration.

2.14. A place for carrying out a check inspection (harbor, harbor station, roadstead, etc.), which is done in accordance with Part б of the Regulations for Navigation, is established by the Administration (Headquarters) depending on the particular route which the vessel is to follow.

2.15. In the course of a vessel inspection. the master (owner of the vessel) is required to provide the Inspector with all necessary information, indicating which parts of the Requirements the vessel does not comply with, together with all vessel's documents, including the certificate of Seaworthiness of the vessel, if it is provided for by the national requirements, a Certificate of Classification, and' international certificates that confirm that requirements of the Convention on the Safety of Life at Sea (SOLAS – 74/78), Convention on the Prevention of Pollution from Ships (MARPOL - 73/78), Convention on Load Line (1966), as well as of IMO Codes on safety, design and equipment for special types of vessels (nuclear-powered vessels, chemical carriers, gas carries and so forth) have been satisfied.

2.16. From the results of the inspection, the Inspector completes a vessel inspection report and determines, whether the vessel may travel along the NSR and under what conditions, and issues the corresponding permission.

3. Hull of vessel

3.1. All vessels must have a double-bottom floor throughout the entire width of a vessel and over the entire length between the forepeak anda afterpeak bulkheads. The height of the double-bottom floor must correspond to the rules of the classifying organizations.

On vessels with an icebreaker stem and short forepeak the double-bottom floor need not extend to the forepeak bulkhead in the area of the raked stem under the condition that the watertight compartments situated between the forepeak bulkhead and the bulkhead in the areaa of the joint between the stem and the keel line are used’ exclusively for storage of non-polluting substances.

Tanks in a double bottom and double-sides may not be used for storage of petroleum products or other harmful substances. The use of double-bottom and double-side tanks on vessel in service at the time of publication of the present Requirements is permitted for storage of fuel and lubricants.

Use of double-bottom tanks, if they are positioned within the length of aft machinery space, is permitted for storage of fuel and lubricants when the volume of any tank does not exceed 20m^3.

3.2. The cargo tanks of tankers with deadweight greater than 5000 *t* used to transport petroleum products, as well as the cargo tanks of chemical carriers and gas carriers. must be situated at a distance of not less than 0.76 m from the outer sheathing of the vessel hull. Tanks in the double-bottom floor and the double sides of tankers may be used as tanks for isolated ballast, or must be kept empty.

3.3. The shape of the hull of vessels intended for use on the NSR must be adapted for navigation under the ice conditions of the Arctic Basin. If hull shapes different from these recommended by the Rules of the Russian Federation Registry are used, operation of such vessels on the NSR must be approved by the Administration (Headquarters). Navigation of vessels with bulb-like bow lines is not permitted.

3.4. Ice resistance and design of the hull of vessels intended for navigation along the NSR must satisfy the requirements set forth in the Rules of the Russian Federation Registry for vessels of the ice resistance categories Arc6 (LU6), Arc5 (LU5) and Arc4 (LU4), or the equivalent requirements of other classifying organizations.

3.5. To ensures safe navigation on the NSR. from the standpoint of the strength of the vessel hull, it is recommended that vessels carry onboard the vessels Ice Certificate, or, if the latter is lacking. Temporary Recommendations on Safe Speeds When Traveling through Ice. This will allow the mariners to determine the safe speed of the vessel in ice as a function of the region and seasonal ice conditions along the route, as well as the technical state of the hull.

3.6. In deciding whether domestic vessels (headquarters) in accordance with the Rules of the USSR Re

3.7. To ensure a possibility of vessel's close towing by an icebreaker additional supports to the sheathing and framing must be provided in the bow part of the vessel hull. It must also be possible to fasten a tow line to the tip of the bow. If necessary, devices should be provided for removal and stowing of the anchors onboard the vessel.

4. Machinery plants

4.1, Machinery plants must satisfy the requirements set forth in the Rules of the Russian Federation Registry, or equivalent rules or foreign classifying organizations for vessels of the corresponding categories.

4.2. The time it takes to reverse the main propulsion engine (in maneuver mode), or to switch the blades of the controllable-pitch propeller from "full speed ahead" to "full speed astern" must not exceed 45 seconds.

4.3. When operating in reverse, the main propulsion engines must develop at least 70% of the rate of revolution of the forward running mode.

4.4. The propellers must have at least four blades and must be produced from stainless steel or high-strength bronze. It is recommended that propellers with detachable blades be used.

4.5. The propeller shaft tunnels must have watertight closings with local and remote control. On vessels that entered into service prior to publication of the present Requirements, the presence of only a local drive is permitted.

4.6. On all vessels one of the Kingston boxes must be of special "ice" construction with devices for heating and blast cleaning.

5. Systems and devices

5.1. All vessels must be equipped with a closed waste water system that includes a device for biological cleaning or physicochemical treatment and sterilization of waste water. The efficiency of the device must be sufficient to ensure simultaneous treatment of both sewage and domestic water. A collecting tank with capacity sufficient for 30-day navigation must be provided in order to collect wastes (slurry) from the device.

If no device is provided for treatment of the waste water, a system with a collecting tank is required, of a capacity sufficient for storage of the waste water onboard the vessel whenever the vessel is in regions where it is forbidden to discharge waste water.

5.2. A bilge water separator intended for maintaining. the content of petroleum in the effluent below 1/15 000 000 must be installed on every vessel, and storage tanks must be provided for storage of bilge, rinse, and ballast water that has become contaminated with petroleum products, including that from the bilge way when transporting toxic loads, all of which it is forbidden to discharge along the NSR. The volume of the storage tanks must be sufficient for 30-day navigation of the vessel.

5.3. Each vessel must be provided with a device for collection and destruction (incineration) of refuse and wastes that have become contaminated with petroleum products (wastes from separation and filtration of fuel, oil, rinse water, etc) or a tank for storage of these wastes that is of sufficient volume for 30-day navigation.

5.4. The tanks specified in paragraphs 5.1 and 5.2 must be supplied with a pipeline laid out on the deck and leading to both sides of the vessel, together with suitable pumping equipment for pumping out polluted water to a floating collector or a collector on a wharf.

5.5. The ballast tanks, which are adjacent to the outer side above the load waterline, including the tank in vessel double side, must be supplied with a heating system.

6. Stability and unsinkability

6.1. Stability of vessel in the undamaged state must satisfy the requirements set forth by the Russian Federation Registry or applicable international requirements provided for in international conventions, codes, and other documents of the IMO.

6.2. Stability of vessel must be verified with account of the potential ice accretion on the vessel. In this verification, the quantity of ice per square meter of area of the total horizontal projection of the open decks must be taken to be at least 30 kg; similarly, the quantity of ice per square meter of area of the lateral surface must be at least 15 kg.

6.3. Division into compartments and stability of a vessel in the damaged state must

correspond to the requirements set forth in the Rules of the Russian Federation Registry or in international regulations set forth in the SOLAS-74/78 and MARPOL-73/78 Conventions and other documents developed by the IMO for different types of vessels.

6.4. Regardless of the requirements set forth in Paragraph 6.3, all vessels must meet the requirements set forth in Paragraph 6.5 in the case of ice-induced damage described in Paragraph 6.6. The hypothetical ice-induced damage for oil-.carrying vessels, chemical carries, gas carriers, category Arc6 (LU6) of dry-cargo vessels, and drilling and passenger vessels may occur at any point within the zone of ice-induced damage; for category Arc5 (LU5) and category Arc4 (LU4) of dry-cargo vessels, including ro-ro-type vessels, these may occur between the watertight bulkheads, platforms, and decks. The requirements in Paragraph 6.5 do not extend to the case when the engine compartment is flooded if the letter is situation in the afterbody on vessels belonging to category Arc5 (LU5) measuring less than 90 m in length, or on vessels belonging to category Arc4 (LU4) measuring less than 125 m in length.

6.5. The requirements stipulated for draft and stability of a damaged vessel are considered to have been fulfilled if the following conditions are satisfied:

6.5.1. Following righting of the vessel and, in cases in which no attempt is made to right the vessel, after flooding, the emergency waterline passes below the bulkhead deck.

6.5.2. The initial metacentric height of the vessel in the final stage of flooding, assuming the vessel is not in a tilted position, determined by the constant displacement method, prior to taking measures to increase this height must not be less than 0,05 m.

6.5.3. The bank angle in the case of nonsymmetric flooding must not exceed 20° (for passenger vessels 15°), and after measures have been taken to right the vessel. 12°.

6.5.4. The static stability curve of a damaged vessel in the final stage of flooding must have an area of at least 0.0175 m/rad. the span of the section from the positive arms must be at least 20°, and the maximum arm at least 0.1 m within this span.

6.6. Calculations of the emergency stability must assume the following dimensions of the ice-induced damage in the zone where the damage occurs extending from the main line to the level 1.2 a_i within the length L_i:

- Lengthwise space 0.045 L_i if the middle of the hole is at a distance of 0.4 L_i from the fore perpendicular and 0.015 L_i if the hole is in any other part of the vessel;
- depth of damage, measured along the normal to the outer sheathing at any point of the area of the calculated damage. 0,75 m;
- vertical dimension. 0.2 a_i;

Here L_i is the length of the vessel measured along the waterline corresponding to a draft to the upper boundary of the ice belt.

7. Navigation and communications equipment

7.1. All the radio, and navigation equipment and communications instruments installed onboard vessels must correspond, in terms of characteristics, to the requirements set forth in international conventions, Rules of the Russian Federation Registry, or the FCS, and navigation conditions in the Arctic Ocean. The equipment must be provided with all necessary spare parts as well as factory instructions on operation and repair of the equipment.

7.2. All vessels traveling along the NSR must be equipped with standard means of navigation together with the following additional instruments:

7.2.1. Gyroscopic compass with repeaters at all control stations, as well as a fathometer and a direction finder, must be installed on all vessels.

7.2.2. Vessels with gross tonnage of more than 1600 t (registered), as well as passenger vessels, must be provided with two radar sets that operate independently of each other, one of which is recommended to be a radar set with a wavelength of 10 cm. Vessels with lesser tonnage must be provided with a single radar set with wavelength of 3 cm.

7.2.3. All vessels must be equipped with a receiving display of a radio navigation or satellite navigation system that makes it possible to determine the position of the vessel to within at least 100 m at a 95% probability.

7.2.4. All vessels must be provided with a log for measurement of speed, It is recommended that a radio log or an acoustic log supplied with a system of transmitters and receivers protected from the possible strikes against ice be used.

7.3. In addition to ordinary means of radio communications, all vessels must be provided with the following equipment:

7.3. 1. Onboard ground station for satellite communications.

7.3.2. Navigational warnings receiver (NAVTEX).

7.3.3. Satellite emergency radio buoy.

7.3.4. Instrument for sound recording and reception of facsimiles, including receipt of maps of hydrometeorological information.

7.3.5. VHF station for communications with airplanes, helicopters, and vessels traveling in a convoy and operating at a frequency of 122.5 MHz.

8. Provisions and emergency facilities

8.1. Each vessel must be provided with a double store of fuel and lubricants at the start of a voyage along the NSR, calculated on the basis of the planned length of vessels route within the NSR. In case of transit navigation along the NSR, the stores of fuel and lubricants must be sufficient for 30 days. In calculating the fuel stores, the full speed in open water must be used as the rated speed. Stores of provisions and fresh water (taking into account replenishment from a distilling plant) and all other types of vessels provisions must be sufficient for at least 60 days.

8.2. Spare parts, instruments and fire-fighting equipment must be available onboard, the vessel, the range and quantity of which is determined by the corresponding requirements set forth in the Rules, of the Russian Federation Registry, or rules of other classifying organizations for vessels of the appropriate categories.

Besides, the set of spare parts must include a screw propeller or two spare blades for each propeller in the case of propellers with detachable blades.

8.3. All the vessels must be provided with emergency supplies the volume of which is determined by the Rules of the Russian Federation Registry, or the rules of other classifying organizations for vessels with unlimited cruising range, together with the additional equipment as specified in Table 1.

Additional equipment onboard	Characteristic	Quantity
1	2	3
1. Pulleys and notch blocks for raising a damaged detachable propeller, or damaged blades, to the deck.	Set	1
2. Portable gas-welding equipment for welding and cutting (not on tankers).	Set Weight around 30 kg	1
3. Searchlight with a set of spare bulbs for illuminating the channel.	At least 2 kW	1
4. Portable electric submersible pump with delivery 100 t/hr, including a set of hoses.		2
5. Sets of warm clothing		Number of crew members +3
6. Hydrothermal suite (recommended)		Number of crew and passenger

9. Crew of vessel

9.1. The size of' the crew for navigation in ice must be large enough to guarantee a three-shift watch, where this duty is required, at the vessel control and equipment stations

9.2 Vessel master, or a person substituting for him on a bridge watch, must possess the minimum level of knowledge of navigation in ice in accordance with the supplement to Rule 11. paragraph 2. of Convention on Training and Licensing of Seamen and Maintenance of Watches. 1978. and to have the experience of steering vessels under ice conditions along the NSR for not less than 15 days. In the absence of such experience taking onboard the vessel an ice pilot is compulsory (Regulations for Navigation. Part 4).

9.3. Vessel master, or a person substituting for him on a bridge watch. must know the signals that are employed by icebreakers during leading through ice and presented in the Guide to Navigating.

9.4 Radiomen should know the rules of radio communications in the Arctic.

9.5. The crew of the vessel must be forewarned concerning prohibitions against discharging polluting substances and rubbish on the NSR, as well as responsibility for any pollution of the sea and ice cover in accordance with the laws of the Russian Federation.