MINISTRY OF TRADE AND INDUSTRY, FINLAND (KTM)

GROWTH Project GRD2-2000-30112 "ARCOP"

LEGAL AND ADMINISTRATIVE ISSUES OF ARCTIC TRANSPORTATION

WP6: WORKSHOP ACTIVITY

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Legal and Administrative Issues of Arctic Transportation

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DELIVERABLE SUMMARY SHEET

Short Description
The workshop 5 report consists of the presentation abstracts and slides, a record of the discussions as well as the conclusions and recommendations.

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PREFACE

The oil and gas resources of the Arctic regions in Russia are the world's biggest energy reserve outside the OPEC countries. Due to their geographical location they are an important source in meeting the energy need in Europe.

There are a number of alternative routes for conveying oil and gas: direct pipelines, shipments across the Baltic Sea and direct carriage by ships along the Western part of the Northern Sea Route. All of these alternatives must be further developed to increase security of supply and cost-efficiency. The ARCOP project aims to develop an alternative that will make use of the Northern Sea Route.

Arctic Operational Platform ARCOP is a research and development project co-funded by the Directorate General Energy and Transport of the European Commission under the 5th Framework Programme for Research and Technological Development. The project coordinator is Kvaerner Masa-Yards. The project consists of six parts:

- Development of collection methods for ice information and ice forecasts in view of choosing transport routes (WP1)
- Assessment of the rules and regulations on transport by sea and of insurance and payment systems (WP2)
- Development of an integrated transport system for Arctic oil and gas transport (WP3).
- Development of the environmental impact assessment method and the environmental hazard management system (WP4)
- Trial in practice of the solutions developed and recommendations given during an actual transport assignment (WP5)
- Organisation of expert meetings between industry, authorities and representatives of technology to direct the project, to assess the results and to give recommendations (WP6)

The ARCOP project organises three workshops during every year of activity (2003-2005). Representatives of industries, authorities and scientifical organisations are invited to discuss the topical issues of Arctic transportation. The workshops give guidelines for the project and also evaluate the results. During 2004, 102 participants, representing 55 organisations from all over the world, attended them. The workshops are arranged by the Ministry of Trade and Industry of Finland.

The fifth workshop of ARCOP, Legal and Administrative Issues of Arctic Transportation, was held in Helsinki in September 2004. The first day of the workshop focused on ice regulations and fee policy and the development around these topics globally. The second day focused on the legal aspects of Arctic transportation, insurance issues and border formalities.

The report consists of the presentation abstracts and slides, a record of the discussions during the event as well as the conclusions and recommendations. The conclusions and recommendations have been compiled by the project coordinator and the workshop organisers based on the presentations and the discussions heard during the workshop. The recommendations of workshops 4-6 have been written concurrently after the three midterm workshops in order to include all the views and guidelines presented by the workshop participants.

We wish to thank the chairmen, speakers and commentators for their valuable input to the successful and interesting fifth ARCOP workshop.

In Helsinki, 3.1.2005
Liisa Laiho
Piia Rahikainen
Kimmo Juurmaa

WORKSHOP 5: ADMINISTRATIVE ISSUES OF ARCTIC TRANSPORTATION

CONTENTS

EXECUTIVE SUMMARY

One of the main tasks of ARCOP is to assess the rules and regulations of transport by sea as well as the insurance and payment systems. The theme is topical: the fifth workshop was participated by 45 representatives from 25 organisations from all over the world.

The meeting was opened by a representative of the European Commission Directorate-General Energy and Transport. Among the goals of ARCOP project he emphasized the importance of environmental safety of arctic oil transportation. The investments to improve training of navigation in ice-infested areas might play a key role in achieving this goal.

The Russian government expects the cargo volumes of the NSR to grow considerably during the coming years (up to 92 million tonnes of oil, 5 million tonnes of liquefied natural gas by 2015). The government sees the safety of sail as a priority in the development and wishes to keep the route open also for international traffic. This is also a priority within the ARCOP project.

The first subject that was brought into discussion was the regulations along which a ship is allowed to sail. In some areas the regulations include discretionary clauses which always leaves room for arbitrariness at the cost of transparency of the regulations. The workshop participants saw this kind of development as a precarious one, since the general rule of navigation allows freedom of sail in all of the worlds seas.

Classification societies, ship owners and authorities criticized the unclear situation of the rules. The breakthrough of the Polar Classes (PC), that are the result of the harmonization work joined by several classification societies, is yet to be seen. The total abandoning of equivalencies between the Polar Classes and the other two established ice rules systems, the Finnish-Swedish and the Russian LU rules, surprised some of the workshop participants. It was stated that since the propulsion power has been left out of the Polar Classes, the one-way equivalency would also be quite problematic. Therefore it seems that there are now two completely separate ice rules. Interest groups have different needs concerning the rules: the ship operators require performance and the insurance companies safety of sail. The question is: do the new Polar Classes provide both of these groups with adequate information?

According to the Northern Sea Route accident statistics the insurance risk should be low. The example of the Baltic Sea, however, is alarming since the statistics indicate that increasing traffic seems to lead to increasing probability of ship damage.

The new fee system for the NSR, that the Russians are proposing, is dominated by the costs of icebreaking assistance. At present the fee of icebreaker assistance varies depending on type of cargo. Fee for liquid cargo is at the moment 16 USD/ton. Central Marine Research and Design Institute CNIIMF estimates that by 2010–2012, the volume of oil transported from the Kara Sea may reach 10–20 m tonnes, whereby the fee may go down to 11–12 USD/ton and even below.

The fairway due in Finland, if calculated per ton of cargo transported to and from Finland by sea, equals 2 €/ton of which the icebreaker assistance costs take about a half. The dues are based on the ships ice class, which encourages investing in better ice class ships. The comparison between these two fee systems was found interesting.

The overall legislative framework of transportation in the Arctic is not quite evident at the moment. The question of EU law coverage in these issues remains so far unanswered.

PROGRAM **September 7th Legal and Administrative Issues of Arctic Transportation**	
Chairman: V.I. Peresypkin, Central Marine Research and Design Institute	
Opening remarks	EU / DG TREN, Arnaud Revel
Opening address: Industry interests in Legal and Administrative Issues	Kvaerner Masa-Yards, Kimmo Juurmaa
Keynote address: NSR rule development	RF Ministry of Transport, Alexander Olshevsky
Consistency of NSR rules with other national and international rules	Central Marine Research and Design Institute, Loly Tsoy *Comment: Transport Canada,* *Victor Santos-Pedro*
IACS harmonized requirements	Lloyd's Register, Robert Bridges *Comment: Bergesen, Øyvind Solem*
Project of new RS requirements for propulsion machinery of ice going vessels and icebreakers	Russian Maritime Register of Shipping; Alexander Andryushin
Problems of equivalency between different ice rules	Arctic and Antarctic Research Institute, Igor Stepanov
HELCOM's recommendations for safe winter navigation	Swedish Maritime Administration Roy Jaan *Comment: WWF Finland,* *Anita Mäkinen*
September 8th Legal and Administrative Issues of Arctic Transportation	
Chairman: Arild Moe, The Fridtjof Nansen Institute	
The EU Acquis on Trade in Shipping Services and the Russian Arctic Marine Oil and Gas Export to EU Ports	The Fridtjof Nansen Institute, Edgar Gold
Immigration and customs procedures	Fortum Shipping, Erkki Kotiranta
Marine Insurance Coverage for Oil and LNG Tankers on the Northern Sea Route: An Update on Insurance Market Interest	The Fridtjof Nansen Institute, Edgar Gold *Comment: Swedish Association of Marine Underwriters, Sten Göthberg*
Consequences of different fee systems	Central Marine Research and Design Institute, V.I. Peresypkin *Comment: Finnish Maritime Administration,* *Markku Mylly*

1. INDUSTRY INTERESTS IN LEGAL AND ADMINISTRATIVE ISSUES

Kimmo Juurmaa, Arctic Technology Center, Kvaerner Masa-Yards Inc.

Abstract

I have often been asked, why the ship designers should bother them selves with any legal or administrative issues. We do have lawyers and authorities for that. My personal opinion is, that the lawyers and the authorities are to serve the industry to do their business in steady, predictable and reasonable conditions. What these conditions should be, that should be defined by the industry. We have competent authorities, which can actually make the rules, but we also need continuous discussion between the industry and these authorities to make sure that we really achieve a positive and healthy business environment.

Regarding the use of the Northern Sea Route or the Arctic navigation more widely there are several issues to be discussed. The first is the whole legal basis of the operation. What laws are actually applicable and what agreements are valid and binding all the parties involved in the different parts of the Arctic? Without clear common understanding of this no business is possible. Within this workshop we will bring some additional light on this subject and hopefully make one additional step toward this understanding.

In addition to the legal basis there are several other issues that will influence the economics of the transportation. One of these is the border crossing. It is a bit surprising that even in the Baltic harbours the vessels may spend more time for the formalities than they actually need for loading the cargo. So there is room for development also in more Southern areas, but in the Arctic where there is no supporting infrastructure the challenge will be even bigger. It is not only question about developing the practices, but obviously investments into infrastructure will be needed. Some practical experiences will be presented in this workshop and some ideas or wishes regarding the future development will be brought up.

Marine transportation in the Arctic includes risks. Someone must carry these risks and this means considerable costs. What these costs will actually be is not quite clear today. And this is mainly because of the lack of data of risks. Russian statistics suggest that this risk is relatively low. Today the marine transportation in the Arctic is carried with care. The ships used are specially controlled and operated with by qualified personnel. The result is low accident rate. This again should lead to lower insurance fees. The situation is similar to the marine transportation of LNG. Due to the severe consequences of any accident the risks in LNG trade are minimized through quality control of ships and operations resulting in low accident rate. Thus the P&I premiums are 25% lower compared to conventional oil transportation. On the other, the accident rates published from the Baltic indicate that one out ten sailings in ice leads to ice damage. If this will be the future in the Arctic, the insurance fees will probably endanger the whole economics of the transportation.

An additional feature in the Northern Sea Route is the nuclear icebreaker fleet. It is a well-known fact that this fleet is also included in the future transportation strategy of Russia. Technically this is justified since the use of nuclear power brings considerable advantages in the Arctic. It is however not quite clear how the liabilities are handled in case of a nuclear accident especially if the commercial vessel is involved in the accident. We often hear Western oil companies to declare that they will not accept the use of nuclear power in connection with the Arctic oil transportation since the risk level is already high. It would be interesting to hear facts and opinions also around this issue within ARCOP.

The icebreaker service, which is normally provided by the host country government, is a cost factor as such. There are different ways to carry this cost. In Finland the cost is carried by the whole marine transportation sector. So also vessels visiting Finnish ports during the summer time will have to share this cost, although they will never use the service. In Russia only those vessels that use the service carry the costs. Both methods can be justified, but they have completely different impact on the traffic development. And in both countries it is still not clear how will be treated those vessels that can operate safely without any need for icebreakers. Hopefully his workshop and ARCOP will bring light also to this question.

The question regarding the icebreaker fees is to some extent interconnected with the ice classes and related rules. The number one issue in the rules is the safety. But it is also normal that the governments try to attract ship owners to invest in higher ice class vessels by giving some bonuses in the icebreaker fees. The idea is that the higher ice class vessels need less icebreaker assistance and thus actually cause less costs. Within this workshop we will have a number of presentations dealing with ice rules and I hope there will be good discussion on this topic. I would just like mention that the latest analyses from the tanker traffic within the Baltic indicate that in practise there is no clear difference between the need neither of icebreaker assistance nor in the speed that is used during the assistance between the vessels in different ice classes. This means that the principle that the higher ice class vessels would cause less costs does not work in practise today.

The examples given above show that there are several items in the legal and administrative frame work that need development. For the industry it is important that there is a clear direction to which to develop the technology when optimizing the costs of the transportation and that the legal and administrative framework really supports this development.

I hope this workshop will initiate good and constructive discussion and that the discussion will continue throughout the ARCOP.

2. KEYNOTE ADDRESS: PRINCIPAL TRENDS OF THE DEVELOPMENT OF THE NORTHERN SEA ROUTE REGULATIONS

A.N. Olshevsky, Ministry of Transport of Russia

Abstract

The Transport Ministry of Russia expresses deep satisfaction in the successful process of the international scientific and technical cooperation on project ARCOP – oil and gas transportation from fields of the Russian Arctic using the Northern Sea Route.

Both preliminary investigations on project ARCOP and the results of study of previous international projects INSROP (1993-1998) and ARCDEV (1997-1998) have shown the substantial advantage of the seaborne export of oil and gas in comparison with other modes of transportation as far as investments, land-utilization and protection of the environment are concerned. Besides, the seaborne export ensures flexibility (variance) of operation with potential users of oil and gas in the foreign market.

According to the assessment of the Central Marine Research and Design Institute with the participation of Russian oil companies and arctic subjects of the Russian Federation, it is anticipated that by 2015 the large-scale export of oil from the Russian arctic fields will reach the following volumes:

- Timano-Pechora (terminal Varandey) – 15 m. t;
- Prirazlomnoye (marine ice resistant platform) – 7 m. t;
- Ob-Side (terminal Yamburg) – 3 m. t;
- Nizhne-Yenisei (terminal Dickson) – 17 m. t;
- Western Siberia (terminal Indiga in the Cheshskaya Bay of the Barents Sea) – 25 m. t for ports of Europe and 25 m. t for ports of the USA.

Export of liquefied natural gas from the Yamal fields (terminal Kharasavey) will amount to 5 million tons.

For servicing the mass export of oil and gas the infrastructure of the Northern Sea Route is being developed.

A problem is posed by the marine doctrine of the Russian Federation up to 2020 to ensure leadership in the construction and operation of nuclear icebreakers.

The State is developing federal property nuclear and diesel linear icebreakers and shipping safety systems in that way keeping the Northern Sea Route as national single transport communication of Russia in the Arctic.

On the Northern Sea Route, taking into account the delivery of icebreakers of the new generation, not less than 6 nuclear and 4 diesel linear icebreakers will be in operation.
Commercial enterprises exploring natural resources of the Arctic are building diesel icebreakers as a version of supply vessels (not less than 4 units) and jointly with shipping companies are developing the tanker fleet and oil/gas transhipment terminals at their own cost and using attracted funds.

Simultaneously, the Northern Sea Route control systems and their legal bases are being improved. Today's workshop is dedicated to the discussion of this problem.

Status and functions of the Northern Sea Route Administration are being more accurately defined and intensified within the new structure of federal executive power bodies of the Russian Federation.

On the initiative of the “Partnership for the coordination of use of the Northern Sea Route” established in 2001 the Draft Federal Law “On the Northern Sea Route” has been developed and will be submitted to the State Duma.

New “Regulations of the navigation on seaways of the Northern Sea Route” are being prepared for publication. In accordance with the Federal Law “On inland sea waters, territorial sea and adjoining zone of the Russian Federation” (1998) new “Regulations” should be approved by the Government of the Russian Federation. The Sea Transport Ministry of the USSR approved the ”Regulations” now in force in 1990.

The new “Regulations” will be developed in the following way:

- scope of the “Regulations” will be extended;
- “The requirements for structure, equipment and supply of ships” are being reviewed with the purpose of ensuring unconditional safety of navigation and protection of the environment. At the same time, recommendations of the international “Guide for the ships navigating in the arctic ice infested waters” published by IMO in 2002 are taken into consideration;
- ships of all states enjoy equal conditions of the admission to seaways of the Northern Sea Route and of the order of navigation thereon as well as the responsibility is the same for damage from the pollution of the marine environment;
- system of fees for payment of the icebreaker fleet services on seaways of the Northern Sea Route is being improved.

Russia is interested in raising competitiveness of the cargo transportation along the Northern Sea Route. We hope that the NSR will become a continuously operating thoroughfare connecting in the shortest way ports of Europe with those of the USA, Canada and of the Asia-Pacific region.

As a whole, I think that stated principal trends of the development of the Northern Sea Route will help You in the consideration of legal aspects of the arctic transport.

Discussion

Mr. Olshevsky emphasized the future importance of the Northern Sea Route to the Russian industries. The Ministry of Transport expects the cargo volumes of the NSR to grow considerably during the nearest years (up to 92 m ton of oil, 5 m ton of liquefied natural gas).

The competitiveness of the Northern Sea Route is, among other things, depending on the fee policy. The icebreaker tariffs for the Northern Sea Route are set by RF Ministry of Trade and Economic development.

The Ministry of Transport sees the safety of sail as a priority in the development and wishes to keep the route open also for international traffic. This is also a priority within the ARCOP project.

During the last years there has been discussion about how far west the NSR is considered to reach. Mr Olshevsky reminded that the NSR is still considered to start from the Kara Gate.

3. CONSISTENCY OF THE NORTHERN SEA ROUTE REGULATIONS WITH OTHER NATIONAL AND INTERNATIONAL RULES

Loly G. Tsoy and Anatoly N. Yakovlev, Central Marine Research & Design Institute (CNIIMF)

Abstract

Short analysis was made of the existing Rules in Russia, Canada, USA, Norway and Denmark regulating shipping in the Arctic basin. Consideration is given to the compliance of the Regulations of the navigation on the Northern Sea Route with the U.N.O. Law of the Sea Convention and IMO Guidelines for the ships navigating in the ice infested arctic waters. Principal additions are presented to the Requirements for the structure, equipment and supply of the ships proceeding along the Northern Sea Route being prepared for re-edition. Proposals for further improvement of the IMO Guidelines are given.

1. Consistency of the Northern Sea Route Regulations with other national rules

In Russia, new editions of the Northern Sea Route (NSR) Regulations currently in force (table 1.1) and of the Federal Law “On the Northern Sea Route” are being prepared.

Table 1.1. Russian rules for the Northern Sea Route

No.	Rules	Date of promulgation
1	Guide to Navigation through the Northern Sea Route	1996
2	Regulations for Navigation on the Seaways of the Northern Sea Route	1991
3	Regulations for Icebreaker-Assisted Pilotage of Vessels on the Northern Sea Route	1996
4	Requirements for Design, Equipment, and Supply of Vessels Navigating the Northern Sea Route	1996
5	Regulations for Marine Operations Headquarters on the Seaways of the Northern Sea Route	1976
6	Tariffs for Icebreaking Fleet Services on the Seaways of the Northern Sea Route	2004

In the Draft of new “Regulations for navigation on the seaways of the NSR” it is legislatively stated that the Northern Sea Route is historically established national integrated transport communication of Russia in the Arctic.

The new “Regulations” take into account Russian normative legal documents of late years, experience of the shipping control over the NSR as well as rules of navigation on national seaways in straits and channels of other states.

Geographical sphere of action of the “Regulations” extends to adjacent ice-covered areas of the Barents and Bering Seas.

The NSR shipping control is affected on the nondiscrimination basis for ships of all states. Purpose of the control is to ensure safety of navigation and to prevent pollution of the marine environment from ships.

Ship's application for the icebreaker support on the NSR is complied with under condition that ship meets the "Requirements" and has a certificate of the appropriate financial provision of the civil liability of ship-owner for damage from the pollution of the marine environment.

The fee for the NSR icebreaker and pilotage services, navigational and hydrometeorological support of ships is to be collected by the tariffs fixed by the Russian legislation.

The "Regulations", according to the Federal Law "On internal sea waters, territorial sea and adjoining zone of the Russian Federation" (1998), are approved by the Government of the Russian Federation. In this way the legal position of the "Regulations" is raised and at the governmental level the safety of navigation of ships of all states along the NSR is guaranteed.

In addition to the new "Regulations" the following documents are to be published:

- "Regulations for icebreaker-assisted pilotage of vessels on the NSR";
- "Requirements for design, equipment and supply of vessels navigating the NSR";
- "Regulations for marine operations headquarters on the seaways of the NSR".

"Guide for the through navigation of ships along the NSR" is also to be republished. This is stipulated by the publication for open use of sailing directions for all arctic seas.

Canada negatively reacting to the unendorsed navigation of American ships through Canadian straits has adopted retaliatory legislative acts (table 1.2, fig.1.1):

- "Arctic Waters Pollution Prevention Act of 1970";
- in addition to this Act, "Arctic Shipping Pollution Regulations of 1972" were put into effect;
- by the decree of the governor-general of Canada, 16 sections of the safety control were announced within the 100 mile coastal zone (1972);
- straight basic lines were drawn along the outer perimeter of the Canadian Arctic Archipelago (1986) incorporating waters of all Canadian straits into their internal waters.

In accordance with the above Act and normative documents, in the Canadian part of the North-Western Passage the permissive order of the transit of ships is in force. The ships are admitted for navigation in the presence of a certificate aboard on the compliance with the requirements for ice class ships as well as of a certificate about the paying capacity in the form of insurance or guarantee in the amount sufficient for the reimbursement of the maximum limit of liability for the probable damage from the marine environment pollution (up to $14.7 M).

Violation of rules entails the imposition of fines. Ship and cargo suspected of the pollution of the marine environment may be sequestrated. The ship in distress with the discharge of polluting waste may be annihilated or removed.

Civil liability for the damage from the pollution caused by the discharge of waste from ship is to be imposed on ship-owner and owner (or owners) of cargo. They bear all expenses for the elimination of pollution.

The icebreaker assistance is provided in all zones of control. Escorting of ships by icebreakers of the Coast Guard in the "northern delivery" and cargo supply to objects of the defensive system NORAD are to be performed free of charge. The use of icebreakers of private oil companies to escort ships is made on the contract basis.

Control over the fulfillment of Law and Regulations is affected by the Canadian Coast Guard.

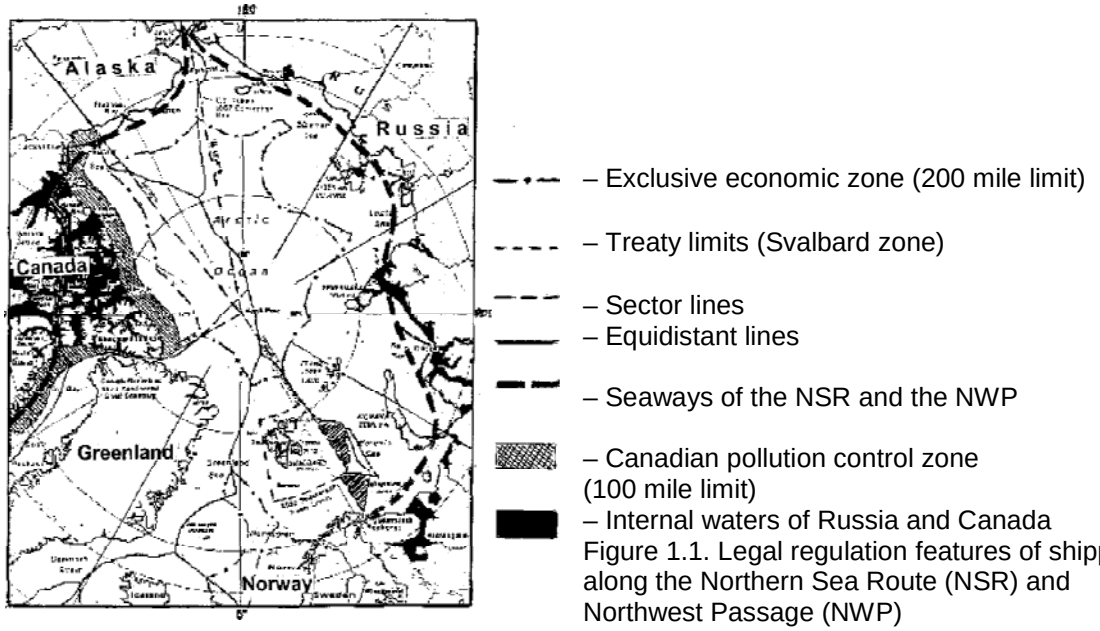

Figure 1.1. Legal regulation features of shipping along the Northern Sea Route (NSR) and Northwest Passage (NWP)

Table.1.2. Legal characteristics of Seaways in the Arctic

Characteristics of seaways	**Russia**	**Canada**	**USA (Alaska)**	**Norway (Svalbard)**	**Denmark (Greenland)**
Length of Arctic seaways (nautical miles)	3500 (the NSR: Murmansk–Bering strait)	2910 (Canadian part of the NWP)	750 (American part of the NWP)	930(Seaway “Indreleia”); 540(Tromsø–Svalbard)	1680 (Denmark-Greenland)
Legislative acts for regulation	Guide and Regulations for navigation on the NSR	Law and Regulations on pollution prevention of Arctic waters from ships	Oil pollution act of 1990	Treaty on Svalbard, 1920	None
Legal status	Internal and territorial waters and economic zone	Internal waters	Territorial waters	Internal waters (“Indreleia”) and economic zone	Territorial waters and economic zone
International projects	INSROP ARCDEV ARCOP	INSROP ARCOP	INSROP	INSROP ARCDEV ARCOP	None
Sailing of foreign ships	Regular sailing	Single sailing	Single sailing	Regular sailing	Regular sailing

USA, being advocate of the freedom of navigation in sea areas of the Arctic basin assert the right of the “peaceful passage” through the Canadian and Russian straits encompassing internal waters (Figure 1.1).

After the liquidation of the disastrous effects of the wreck of supertanker “Exxon Valdez” in March 1989 related to the stone grounding in the Gulf of Prince William near the shore of Alaska and the emergency spill of 100 000 t of oil the USA adopted in 1990 the Oil Pollution Act. The Act is valid in the territorial waters of the USA.

For the ships carrying oil or noxious substances in the territorial waters of the USA a limit of liability has been established for the damage from pollution (up to $10 M). According to provisions of the Act each ships should have confirmation of the financial liability (insurance certificate, letter of credit, letter of guarantee etc.) to the amount of the limit of liability.

Tankers with a capacity exceeding 5000 t should have double hull.

With respect to the ships failing to comply with the Act requirements such sanctions are imposed as the refusal in custom clearance, non-admittance to the territorial waters of the USA, detention or arrest of the ship. A ban was also put on the admission of ships to the waters of the USA depending on age (over 20 years).

All the expenses in connection with the liquidation of oil spill are to be borne by ship-owner or owner of cargo.

Control over the fulfillment of the Act is affected by the US Coast Guard.

Table 1.3. Consistency of NSR rules with other national rules

No.	Legal characteristics of Seaways	Russian NSR	Canadian part of NWP	American part of NWP	Norwegian «Indreleia»	Denmark-Greenland
1	Legislative acts for regulation	-	+ +	+	-	-
2	Guide and Regulations	+ +	+ +	-	-	-
3	Spreading of the sovereign rights on Seaways	+	+ +	-	+ +	-
4	Preventing of pollution	+	+ +	+	-	-
5	International navigation	+ +	-	-	-	+
6	Authorities for regulation	+	+ +	+ +	+ +	+ +
7	Consistency with international rules	+	+ +	+ +	+	+

(+ +) - essentially consistent (+) - partly consistent (-) - not consistent

Work on further concordance of the NSR Regulations with the Russian legislation and taking into account national rules of other states is affected by items indicated in table 1.3:

- Draft Federal Law “On the Northern Sea Route” - at the stage of coordination (item 1);
- geographical sphere of action of the “Regulations for navigation on the seaways of the NSR” extends to the adjoining ice-covered areas of the Barents and Bering Seas (item 3);
- the legislation of Canada and that of the USA on the prevention of pollution of the marine environment from ships are taken into consideration (item 4);

- consideration is given to legal, organizational and regulating functions of the Northern Sea Route Administration taking, as analogue, functions of the Coast Guard of arctic states (item 6).

2. Consistency of the Northern Sea Route Regulations with international rules

The new Draft of the NSR Regulations complies with the 1982 UN Convention on the Law of the Sea.

In accordance with the Convention (article 234 “Ice-covered areas”), Russia, exercising the right of a coastal state is preparing for publication the above Law and new regulations ensuring safety of navigation along the NSR and prevention of pollution of the marine environment from ships.

Draft of the new “Regulations” for the NSR takes also into account “International Convention about the civil liability for damage from oil pollution, 1992”.

In this connection and taking into account requirements of the Russian “Merchant Shipping Code”, 1991, (chapter 21), it is stated in the new Regulations that any ship when proceeding along the NSR should have aboard a certificate of the appropriate financial provision of the civil liability of ship-owner for the damage from the pollution of the marine environment at the rate of not less than the restricting liability limit set up by the Russian legislation.

Draft of the new “Requirements for design, equipment and supply of vessels navigating the NSR” has much in common with the “IMO Guidelines for ships navigating in the arctic ice-covered waters”, 2002.

The “Guidelines”, in addition to the “SOLAS Convention”, with due regard for the risk of navigation in ice divide ships into polar classes, give recommendations for their construction and equipment, education of crew, ship damage monitoring and protection of the marine environment according to the “Shipboard Oil Pollution Emergency Plan” (SOPEP) meeting requirements of the MARPOL Convention.

As there is no experience of the practical use of the IMO Guidelines and bearing in mind that the Russian Requirements to structure, equipment and supply of vessels navigating the NSR are being now prepared for revision and new publication, it is so far not possible to make more detailed comparative analysis of the IMO and NSRA rules.

3. Draft of the new edition of the Requirements to structure, equipment and supply of ships navigating the Northern Sea Route

To have idea about the extent of the intended renewal of the existing NSRA Requirements, principal supplements introduced into the new edition and concerning icebreaking capability of icebreakers and power of transport ships admitted for the navigation on the seaways of the NSR are given below.

3.1. Icebreakers

Icebreakers are admitted for the navigation along the NSR under the ice conditions corresponding to symbols of their ice categories.

For the assessment of required icebreaking capability of icebreakers depending on the area and season of navigation in the Arctic it is recommended to use statistical data shown in fig. 3.1. The data are based on the long-standing experience on the duration of navigation, supported by icebreakers of different icebreaking capability and having the traditional icebreaking forward end lines.

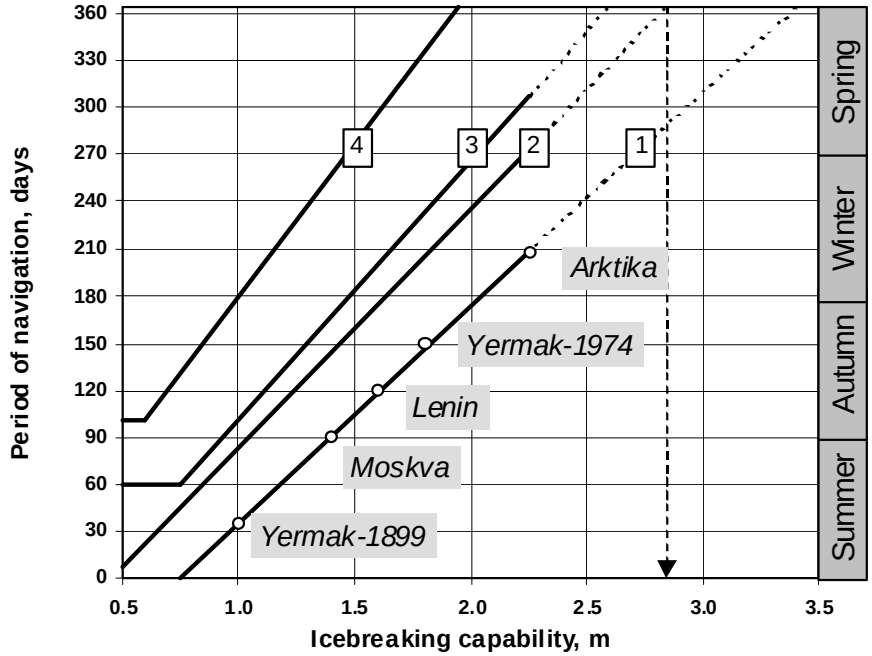

Figure 3.1 Duration of the navigation period in the Arctic versus icebreaking capability:

1 – in transit navigation along the NSR and in the East Arctic region,
2 – in the West Arctic region,
3 – in the western part of the Kara Sea,
4 – in the southeastern part of the Barents Sea (Pechora Sea)

If icebreaking capability of the icebreaker in question is not known, it can be obtained by the experimental and empirical formula presented below which takes into account characteristics of hull shape and state of the shell plating, power (propeller thrust), dimensions and displacement of ship.

The formula for icebreaking capability $\mathbf{h}_i$ of icebreakers with traditional type hull lines:

$$\mathbf{h_i} = \frac{\mathbf{0{,}07}\cos^{\frac{3}{2}}\varphi \sin^{\frac{1}{2}}\left(\dfrac{\alpha_0 + \beta_0 + \beta_2}{3}\right)}{\sqrt[2,6]{\mathbf{f_d}}\sqrt[5]{\mathbf{L/B}}\sin^{\frac{3}{2}}\left(90^\circ - \beta_{10}\right)}\sqrt{\mathbf{P_e/B}}\sqrt[6]{\mathbf{D}} \quad ,\text{m} \tag{3.1}$$

where

φ - stem angle, deg

α_0 - entrance angle of design water line, deg

β_0 - flare angle of frameline No.0 (in the Russian practice the frame line No.0 is assumed to be at the fore perpendicular and not at the after one as it is the case abroad), deg

β_2 - flare angle of frameline No.2, deg

β_{10} - flare angle amidships, deg
L - vessel's length on DWL, m
B - vessel's breadth on DWL, m
P_e - total propeller thrust, t
D - vessel's designed displacement, t
f_d - coefficient of the dynamic ice/ship's hull friction. Recommended values of f_d parameter:

- for stainless steel - 0.065
- for Inerta-160 coating - 0.072
- for typical shipbuilding steel - 0.080

Values used for parameters speed and snow thickness in formula n:o 3.1 are 2 knots and 20-25 cm respectively.

Total propeller thrust needed for the calculation of the icebreaking capability under conditions close to the bollard pull mode of operation may be calculated by the formula based on the experience of design of Russian icebreakers:

$$P_e = k_p (d N_p)^{2/3}, \text{ kN} \qquad (3.2)$$

where

N_p - total shaft power, kW
d - propeller diameter, m

k_p - coefficient taking into account geometric characteristics of propellers, their number and interaction with the ship's hull; depending on the number of propellers this coefficient takes the following values:

- for triple-shaft ship – 1.12
- for twin-shaft ship – 0.98
- for single-shaft ship – 0.78.

3.2. Transport arctic ships

Mechanical mechanisms of the ships admitted for the navigation on the NSR should, depending on ice class, meet the requirements of the Rules of the Russian Maritime Register of Shipping or equivalent requirements of the Rules of foreign classification societies for ships of respective categories. Table 3.1 may be used for the identification of ice classes.

Table 3.1. Approximate correspondence between class symbol of ice strengthening of the Russian Maritime Register of Shipping and other classification societies

Classification Society	**Ice Class**				
Russian Maritime Register of Shipping (Rules 1995)	ULA	UL	L1	L2	L3
Russian Maritime Register of Shipping (Rules 2003)	LU7	LU5	LU4	LU3	LU2
Lloyd's Register	AC1	1AS	1A	1B	1C
Germanischer Lloyd	Arc1	E4	E3	E2	E1
Bureau Veritas	-	1A Super	1A	1B	1C
Det Norske Veritas	ICE 10	ICE-1A*	ICE-1A	ICE-1B	ICE-1C
Finnish-Swedish Ice Rules	-	1A Super	1A	1B	1C
CASPPR, 1972	2	A	B	C	D
American Bureau of Shipping	A1	1AA	1A	1B	1C
Registro Italiano Navale	-	1AS	1A	1B	1C
Nippon Kaiji Kyokai	-	1A Super	1A	1B	1C
Korean Register of Shipping	-	ISS	IS1	IS2	IS3
China Classification Society	-	Ice Class B1*	Ice Class B1	Ice Class B2	Ice Class B3

Admissible shaft power of transport ships operating in the Arctic under the escort of icebreakers may be estimated by the formula given below. Formula for the determination of minimum admissible shaft power $\mathbf{N}_{min}$ of arctic transport ships:

$$N_{min} = k_{\varphi}\, k_s \frac{T}{d}\, b^{2,7}\, P_0 \quad , \text{MW} \qquad (3.3)$$

$\mathbf{k_{\varphi}}$ – coefficient taking into account ship's hull lines

$$k_{\varphi} = \begin{cases} \left(\frac{\varphi}{25}\right) & \text{- for ships of LU7 and LU8 classes} \\ \left(\frac{\varphi}{30}\right)^{1,5} & \text{- for ships of class LU5(UL)} \\ \left(\frac{\varphi}{40}\right)^{2,2} & \text{- for ships of class LU4(L1)} \end{cases}$$

φ – stem angle, deg.
$\mathbf{k_s}$ – coefficient taking into account number of propeller shafts

$$k_s = \begin{cases} 1.0 & \text{- single-shaft plant} \\ 0.71 & \text{- twin-shaft plant} \\ 0.58 & \text{- triple-shaft plant} \end{cases}$$

T – ship's draft at DWL, m
d – propeller diameter, m
b – relative breadth of ship

$$\mathbf{b} = \frac{\mathbf{B_{sh}}}{\mathbf{B_{ib}}}$$

$\mathbf{B_{sh}}$ – transport ship's breadth at DWL, m
$\mathbf{B_{ib}}$ – breadth of icebreaker at DWL, m
$\mathbf{P_0}$ – basic power, MW

$$P_0 = \begin{cases} 16.1 & \text{- LU8 class ships} \\ 8.8 & \text{- LU7 (ULA) class ships} \\ 4.9 & \text{- LU5 (UL) class ships} \\ 3.5 & \text{- LU4 (L1) class ships} \end{cases}$$

Irrespective of the results of power determination by the formula, minimum power (MW) should be not less than:

10.0 - LU8 class ships
5.0 - LU7 (ULA) class ships
2.6 - LU5 (UL) class ships
1.0 - LU4 (L1) class ships

Fig. 3.2 shows the dependence of minimum power on ship/icebreaker breadth ratio with optimum shape of the ship's forward end and a single-shaft propeller plant.

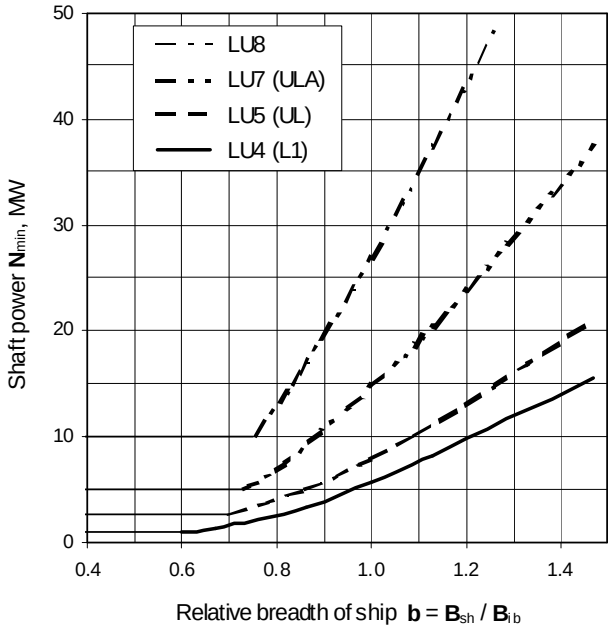

Figure 3.2. Dependence of the required power of transport ship on relative breadth

The suggested estimation of minimum admissible power of arctic ships is based on the following original prerequisites:

1. In complicated ice conditions, principal mode of the navigation of transport ships (including those of the highest ULA class) is the navigation under the escort of

icebreakers. Therefore ship should have adequate power to move in the channel made by the icebreaker through ice of thickness maximum for each class.

2. Speed of the movement of ship in the channel behind icebreaker should be at least 4-5 knots to ensure minimum steady running under conditions of ice compacting of numbers 1-2 at a speed of about 2 knots. Such speed margin is required when moving in old channels and to provide for a sufficient ship's maneuverability.

3. Design thickness of equivalent ice through which the channel is being made, taking into account hummocking, is taken as follows:
   - 3.4 m (multi-year ice) for ships of LU8 class and higher;
   - 2.8 m (second-year ice) for ships of ULA (LU7) class;
   - 1.9 m (first-year thick ice) for ships of UL (LU5) class;
   - 1.3 m (first-year ice of medium thickness) for ships of L1 (LU4) class.

The methodology adopted for the calculation of speeds of ships in the channel behind icebreaker takes account of relative breadth of ship, forward end lines, draft, propeller diameter and number of propeller shafts. These factors seem to be principal ones upon which the propulsion of ship in ice channels depends.

4. Proposals on the further improvement of the IMO Guidelines for ships operating in arctic ice-covered waters

The essence of comments and proposals on the improvement of the IMO Guidelines lies in the following:

4.1 Regarding the classification of arctic ships (Chapter 1. General) and requirements to their structure and ice strength (Chapter 2. Structures), as well as requirements to machinery plants (Chapter 7. Main machinery) it is intended to use in the Guidelines the Unified requirements for polar ships proposed by the IACS. These requirements have been developed since 1993, but up to the present they are not ready. Apparently in the present situation it would be well for IMO to consider a question of separately bringing the Guidelines to necessary perfection and thus make it independent of the requirements of other non-governmental organizations.

4.2. In accordance with paragraph G-1.5, classes 1A Super and 1A of the Finnish-Swedish Rules are taken in the Guidelines as reference analogues of two lowest polar classes PC6 and PC7. However, as one can see from the IACS classification table 1.1, the Guidelines allow the operation of PC6 and PC7 ships in ice conditions heavier than those in the Baltic Sea including the old multi-year ice. As to hydrometeorological conditions, there is no multi-year ice in the Baltic Sea. Accordingly, ships of Baltic classes 1A Super and 1A are not designed for the operation in old ice and there is no evidence confirming the possibility of the admission of these ships to sail under more hazardous conditions. It is necessary to introduce corrections as to the admissible navigational conditions for ships of PC6 and PC7 classes.

Bearing in mind the above stated it is suggested to formulate the last two positions of Table 1.1 of the IMO Guidelines in the following way:

Polar class	General description of navigational conditions	
	existing	proposed
PC6	Summer/autumn operation in medium first-year ice which may include old ice inclusions	Summer/autumn operation in open floating residual and young ice
PC7	Summer/autumn operation in thin first-year ice with which may include old ice inclusions	Summer operation in open floating residual ice cake

4.3. The Guidelines do not specify conditions when a cargo ship can safely operate independently and when it has to be escorted by an icebreaker. Without such recommendations a ship sailing independently in the Arctic may be held captive in ice, swept aground by drifting ice and under extreme conditions be damaged or crushed by ice. Icebreaker escorting, as to Russian experience, allows not only to considerably improve the safety, but also to substantially extend limits of the safe use of cargo ships both seasonally and by the area of navigation in the Arctic

4.4. The Guidelines do not contain any requirements for such important operational characteristic of arctic ships as ice propulsion. Such operational characteristic should be a value related to power. It is necessary to fix admissible numerical values of the ice propulsion criteria.

Taking into account the above stated it is suggested to include into the Guidelines the requirement to the icebreaking capability completing the classification table with admissible values of the icebreaking capability for ships of each class:

Polar class	**PC1**	**PC2**	**PC3**	**PC4**	**PC5**	**PC6**	**PC7**
Minimum level of the icebreaking capability, m	3.0	2.4	1.8	1.3	0.9	0.6	0.4

The indicated values of the icebreaking capability are based on the experience of the successful operation of icebreakers and icebreaking transport ships of the Russian fleet. Examples of domestic ships designed and built for the Arctic in accordance with the Rules of the Russian MRS are presented in table 4.1.

As one can see from the table, the classification of ice ships adopted in the IMO Guidelines is fairly well consistent with the Russian experience.

Table 4.1. Examples of modern Russian polar ships

Polar class	General description of operational conditions	Minimum level of the icebreaking capability, m	Name of ship	Ice class of RMRS, 1995
PC1	Year-round in all polar areas of the world ocean	3.0	Design of the *icebreaker-leader* with a power of 110 MW	LL1
PC2	Year-round in moderate multi-year ice	2.4	Nuclear icebreaker *Arktika,* Design of the new generation icebreaker with a power of 60 MW	LL1 LL1
PC3	Year-round predominantly in second-year ice	1.8	Icebreaker *Yermak*, Nuclear icebreaker *Taimyr*	LL2 LL2
PC4	Year-round predominantly in first-year thick ice	1.3	Icebreaker *Moskva,* Icebreaker Kapitan Sorokin, Barge carrier *Sevmorput*	LL3 LL3 ULA
PC5	Year-round predominantly in first-year medium ice	0.9	Icebreaker *Mudyug,* M/s Norilsk, Electrically driven m/s *Vitus Bering,* M/s Ivan Papanin	LL4 ULA ULA ULA
PC6	Summer/autumn operation in open floating residual and young ice	0.6	M/s Dmitry Donskoy, M/t Samotlor, M/t Ventspils	UL UL UL
PC7	Summer operation in open floating residual ice cake	0.4	M/s Pioner, M/s Volgoles	L1 L1

The use of the icebreaking capability values as criteria of ships' propulsion in ice will permit, taking into consideration the accumulated experience of the exploration of the Northern Sea Route, to assess with a sufficient reliability the capability of one or another ship of autonomous sailing in dependence on area and season of operation in the Arctic. Fig. 4.1 shows statistical data of the relationship between the duration of the autonomous navigation of ships, their icebreaking capability and area of operation. When the icebreaking capability is not sufficient for the year-round independent work in a given area of the Arctic, that is during the period with heavier, as to the icebreaking capability, conditions than admissible ones, ship will need icebreaker assistance. Graphically this is shown in fig. 4.1 as applied to transit voyages along the NSR of ship with an icebreaking capability of 2.4 m.

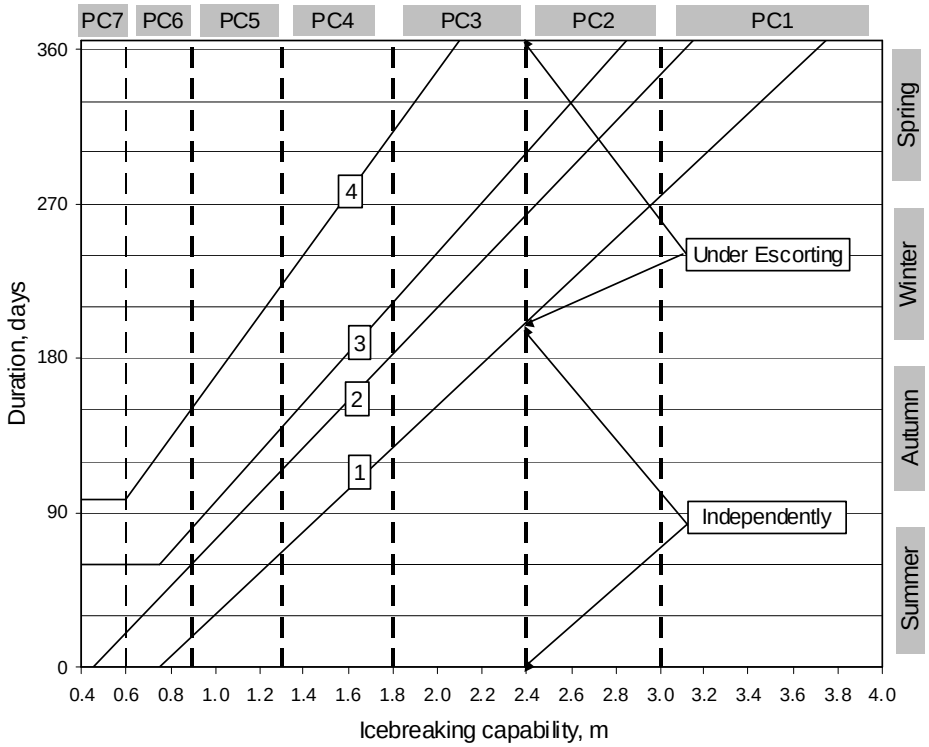

Figure 4.1. Duration of the independent navigation of cargo ships in the Arctic versus their icebreaking capability:

1 – in transit navigation along the NSR and in the East Arctic region,
2 – in the West Arctic region,
3 – in the western part of the Kara Sea,
4 – in the southeastern part of the Barents Sea (Pechora Sea)

Thus the suggested evaluation of the icebreaking capability of transport arctic ships allows, taking into account data of fig.4.1, to substantially facilitate the procedure of the assessment of their capability of independent sailing in the Arctic basin. Accordingly, the need in icebreaker assistance of ships of different ice classes can be determined.

As the Russian experience shows, the above comments and proposals directed towards further improvement of the IMO Guidelines will raise reliability and safety of the operation of ships in the Arctic.

Discussion

Professor Tsoy's presentation included detailed information that sparked discussion.

Professor Tsoy reviewed the situation of the new NSR regulation development. The new regulations for Northern Sea Route are being prepared by CNIIMF and the plan is to publish them during 2005. They have been put to the IMO maritime safety committee and the committee is kept informed about all updates.

Professor Tsoy presented the calculations on whether a ship is to sail under escort or able to sail independently. Professor Tsoy described that the calculations were based on 70 years of experimental data and that in the new rules both performance and environmental safety of a vessel is taken into account.

Mr Santos-Pedro of Transport Canada brought up the Canadian ice rules and mentioned that in Canada the rules are based purely on environmental safety and not on performance of a vessel.

Professor Tsoy explained that the new Russian marine pollution regulations will incorporate CLC'92 as well as the North Sea Convention. No conflict between this and other, earlier legislation is expected. However, this would indicate that the Russian government has accepted the fact that the liability for damage claims arising from pollution incidents, is subject to the CLC'92 limits.

Today only Russian icebreakers are allowed to offer their services on the NSR. The future seems unclear since agreements on permitting foreign, commercial icebreakers to do so are yet to be signed. Mr Tsoy explained, that if the foreign icebreakers have the required condition and capability, according to national law it's possible for them to sail on the NSR.

ARCTIC SHIPPING RULES - THE CANADIAN EXPERIENCE

Commentary presentation by Victor Santos-Pedro, Transport Canada

After a very brief history of Arctic exploration to present day firsts, the presentation describes the Canadian pollution prevention regulatory regime for Arctic waters. The regulations, standards, and guidelines are listed along with the sustainable development approach underlying the legislation from which authority for the rules is derived. The Ice Regime System is explained as a risk management measure that introduces at once greater flexibility and more certainty in navigation control. Knowledge of operating conditions is stressed throughout. The presentation closes with a view on recent international rule developments and how harmonization of standards will affect in many ways the safety of ships and crew, the environment, and trade in ice-covered waters.

Discussion

Mr Santos-Pedro was questioned about the coverage of the ship regulations. He explained that all ancillary support is indeed covered by regulations for ships.

There are in all large development plans around the Canadian regulations, since several guidelines are at the moment out of date. For instance a number of stationary guidelines currently available are being brought together to establish an ISO standard for arctic offshore structures. This work will be ready next year and will include also escape and evacuation safety.

Mr Santos-Pedro showed the ice rules charts and timetables for Canadian seas. Since the borders drawn on the map were quite strict there was discussion on the borders' ability to restrict transportation. Mr Santos-Pedro explained that the charts were only recommendations and that the system is based on captain's and ship owner's decision. The captain decides the route and reports to the authorities. The authorities will not prevent a ship from entering except in extreme cases. Otherwise, the responsibility for all actions lies with the master.

The Canadian rules emphasize the shipmaster's decision but at the same time they give the authorities discretionary powers. Transparent and unambiguous rules and regulations and thus the reliability of the rules is very important to operators, cargo owners and ship-owners planning to start operations.

The Canadian icebreaking services are in evolution at the moment. Currently there are no icebreaking fees or fairway dues collected in the north. Canadian Coast Guard takes care of the icebreaker services. The agency works closely with the Canadian Ministry of Transport. The agency's costs are strongly related to icebreaking costs. Mr Santos-Pedro saw it possible that there would be an icebreaking fee in the future. Some of the biggest ship-owner companies providing marine transportations in Canada are already preparing for this by building vessels with better icebreaking capabilities.

4. IACS POLAR RULES – HARMONISATION OF ICE CLASS

Robert Bridges, Lloyd's Register

Abstract

The Arctic region is becoming increasingly viewed as a viable operational area for shipping and as such there is a need to protect the life, property and environment. There exist a plethora of ice class rules and regulations and an international effort has been made to harmonise these requirements. The process began in the early 1990's and is in the final stages of completion. The aim of which is to align the existing safety standards for marine operations in Polar waters.

A number of interested parties formed and developed a working group, resulting in the development of the IMO Guidelines for Ships Operating in Arctic Ice-Covered Waters, which was promulgated in December 2002 as a joint MSC/MEPC circular (MSC/Circ.1056, MEPC/Circ.399). The IMO Guidelines are divided into construction, equipment, operational and environmental protection sections. To maintain the delicate balance between organisations, the IMO Guidelines do not contain detail technical requirements. These have been developed by further inclusion in the working group to include members from industry, academic, research communities and representatives from Classification Societies. This formed the basis for the development of the IACS Unified Requirements for Polar Ships.

One working group was formed for structural requirements and one for machinery requirements. The resulting rules are divided into three sets of unified requirements; UR I1 (Polar Class Descriptions and Application); UR I2 (Structural Requirements for Polar Class Ships); UR I3 (Machinery Requirements for Polar Class Ships). UR I1 and UR I2 have been finalised and have been submitted to the IACS WPG. UR I1 defines seven ice classes to provide a range of vessels intended for the Arctic environment. UR I2 includes strength requirements based on a glancing impact with an ice floe to determine plating and framing structural requirements. Additionally, global hull girder longitudinal strength assessment is made based on an ice-ramming scenario. Furthermore, UR I2 contains material requirements, corrosion/abrasion allowances, direct calculations and welding requirements.

The IACS Polar rules provide a significant step in the harmonisation of rules and present a set of structural requirements to enable Polar class ships to operate safety in the Arctic region.

BERGESEN'S VIEWS

A commentary presentation by Øyvind Solem, Bergesen D.Y.

Introduction: About Bergesen and our FSO Belokamenka, located off Murmansk (see Power Point presentation).

As a consequence of our engagement with FSO Belokamenka Bergesen has been involved in some projects for developing new tanker tonnage for operation in Russian Arctic waters, and has faced some challenges underway.

This might very well come from the fact that this is a new type of trade for Bergesen, but the company strongly believes that the rules and regulations could have been clearer.

FSO Belokamenka

When bidding for a freight contract in connection with new tonnage Bergesen normally offers a freight rate in the form of USD per day, for transporting an agreed amount of cargo within an agreed period of time.

In order to be able to bid for freight contract the company calls for tenders from shipyards that are believed to be capable and interested. Those that are, will return a detailed specification and a price offer, enabling Bergesen to calculate our required freight rate.

For open water vessels both ship-owners and shipyards have long experience and the procedure is quite straightforward.

When it comes to transportation in ice-infested waters the situation becomes more complex:

- the ship-owner has to describe suitable ice class, and
- the shipyards have to estimate propulsive power.

Both factors have significant impact on costs, the former on the initial cost of the vessels and the latter on initial as well as operational costs.

Furthermore the propulsive power can hardly be estimated until model tests have been carried out, and due to the relatively high cost for such tests the shipyards will normally not conduct the testing until after they have been rewarded the building contract.

So selecting the best offer can be a tricky loop, and missing on these factors can be of vital importance for our success.
In connection with the projects Bergesen has been involved in, the challenges have mainly been related to uncertainty regarding selection of optimum choice of ice class; equivalency of different ice classes and regarding required propulsive power.

From this experience Bergesen is dreaming of a day when it is possible to just specify the intended trading route, the type, size, and speed of the vessels and then – only a mouse click away – the information is there;

- required ice class (for independent operation or with ice breaker assistance)
- required propulsive power.

Discussion

Representative of Transport Canada Mr Victor Santos-Pedro did not accept Mr Bridges remarks on equivalencies between the Polar Classes and Russian LU ice classes. Also the representative of Russian Maritime Register of Shipping questioned the table of equivalencies.

Mr Santos-Pedro explained that in Canada, the Polar Classes have no equivalencies. If a ship is classified according to some other classification system, it will be given the lowest possible class, not an equivalent one. There is an agreement with the Finnish and Swedish administrations that ships with a polar class will be accepted for Baltic operations and given a Baltic ice-class, but not the other way around. Therefore the equivalency is one-way only.

Mr Santos-Pedro also reminded that the equivalencies between PC and LU classes are not needed after the Russian Maritime Register has adopted the PC classes.

Mr Solem stated, that especially the ship-owners and –builders are confused about the different ice rules.

The costs of the ships depend on two factors: ice class and propulsion power. If a ship's ice class is upgraded by one class in the design phase, the construction costs may increase by 5%.

There are a lot of open questions related to all rule systems. The ship-owners have for a long time demanded clarification of the situation.

Mr Solem also called for estimations on how often icebreaker assistance will be needed in the northern seas. Mr Juurmaa explained that on the NSR you pay the fee and icebreaker assistance, when needed, is included in the fee.

Apart from the technical issues of the rules it was also suggested to add a chapter on crew training for winter navigation.

5. PROJECT OF NEW RS REQUIREMENTS FOR PROPULSION MACHINERY OF ICE-GOING VESSELS AND ICEBREAKERS

A. V. Andryushin, Russian Maritime Register of Shipping

Abstract

Guaranteeing propulsion system safety is one of the principal tasks in modern icebreaker construction. In the first place, this is due to a high level of ice loads applied to propulsion systems during service.

This problem becomes still more urgent in view of new propulsion systems being introduced. At present, active ice-going vessels are being equipped with FPP and CPP Azimuth thrusters (AT). The Kvaerner Masa-Yards are planning the construction of a double acting ice vessel to be equipped with an Azipod AT. Under ice conditions, an AT works as a bow propulsor. The current requirements for the strength of icebreaker propulsion systems are based on static strength and on experience gained from previous service. Ensuring the strength of modern propulsion systems goes beyond this experience. Besides, fatigue is to be considered when assigning the scantlings. Therefore, the existing requirements should be updated and new ones developed. Realizing the importance of the problem, the Register is continuously elaborating its normative basis by research work, analyzing the results of technical supervision, consultations and exchange of experience with the leading manufacturers.

By the present, the Register has developed draft requirements for the blade scantlings of icebreaker propellers proceeding from the fatigue and static strength. Ice loads are the determinative factor for assigning the scantlings. The ice load parameters for calculating the fatigue and static strength were determined on the basis of full-scale and model tests, and by calculation. Fatigue is the determinative factor for ensuring the strength of steel propellers. Bronze propeller scantlings are assigned proceeding from the condition of ensuring the static strength. The draft considers the machining of blade surface for improving the fatigue strength and reducing the scantlings. The draft makes it possible to prescribe and carry out the verification of propeller scantlings, bearing in mind the peculiar features of their operation in ice, among other things, the bow propeller installed in arctic ships of dual purpose.

At present, the Register has prepared draft requirements for the principal units of icebreaker propulsion systems (CPM units for CPP and principal AT units) proceeding from the condition of ensuring both the fatigue and pyramid strength.

When a propeller blade is broken, plastic deformations develop in the stress concentration areas of main units of the propulsion system. The plastic deformation resistance is the principal factor by which the pyramid strength of a structure is determined. In view of the above, draft requirements for strength in the areas of stress concentration due to elastoplastic deformations under blade-breaking loads have been prepared. The draft enables a scientifically substantiated assignment of the strength and viscoplastic characteristics of material in order to ensure strength proceeding from temperature.

The draft requirements that were developed were approbated in respect of all the major icebreakers. The design scantlings are in agreement with those of the propulsion systems that were operated satisfactorily under the ice conditions. Now, the newly developed draft requirements are being agreed with the leading manufacturers of propulsion systems for

icebreakers, and trial operation is being conducted for the purpose of checking and approving the technical documentation.

In view of the above, the Register has now acquired an up-to-date normative basis, research results and highly qualified staff, which, in the aggregate, makes it possible to ensure the reliability of modern propulsion systems for ice-going vessels and icebreakers in accordance with the up-to-date design and service requirements.

Discussion

Mr Andryushin’s presentation brought up the question of IACS instructions for propeller dimensioning. Many opinions were heard that implied that there isn’t consensus on the propeller loads and how they should be calculated. Researchers have found different results in their studies and are using different calculation methods. The situation needs to be improved in the near future.

6. PROBLEMS OF EQUIVALENCY BETWEEN DIFFERENT ICE RULES

Igor Stepanov, Arctic and Antarctic Research Institute (AARI)

Abstract

The principal source of requirements to marine vessels, including those intended for operations in ice-infested waters are rules issued by classification societies. As far as icebreakers and ice-strengthened vessels are concerned, capability of a ship to operate in ice is generally defined by her ice class. Correspondingly, the problem of equivalency between different rules in relation to icebreakers and ice-strengthened vessels could be considered as a problem of equivalency between ice classes awarded by different classification societies. The practical need to establish such an equivalency is arisen when ships classed by various societies meant for operations in ice-covered waters under the sole jurisdiction. An example of this kind is operation along the Northern Sea Route (NSR). The Russian maritime administration establishes minimum ice classes of various classification societies required for navigation along the NSR, assuming that vessels with equivalent ice classes have the same level of safety for operation in ice-covered waters.

In theory, the most appropriate way of defining the equivalency seems to introduce a safety index and evaluate values of this index for the considered ice classes. Ice classes would be assumed equivalent if values of the index were equal (or close). Probability of vessel operation without any ice-induced damages/accidents throughout a predefined period of time while the vessel operates in ice could be assumed as such a safety index.

However, although this approach seems quite attractive based on general sense, its practical implementation meets enormous difficulties. In particular, even definition of damages/accidents to be considered is not completely clear. For example, a significant permanent set of the shell plating is damage but the only negative consequence of this damage is the cost of subsequent repair. On the other hand, a breach of the structure could result in vast environmental pollution and, very infrequently, could be even dangerous for human life.

The most likely, these two cases should be treated in different ways. Definition of which damages/accidents are assumed ice-induced is also not so straightforward. E.g. grounding of a vessel is not a kind of accident, which is specifically inherent to ice navigation. However, if grounding was an after-effect of a damage of the propeller or rudder due to ice action with subsequent drift of the vessel to a shallow water area this accident is likely ice-related.

Anyway, the major difficulties are associated with efforts to quantitatively evaluate the referred probability even when formal definition of ice-induced damages/accidents is established. This probability depends on operational scenarios, environmental conditions, vessel peculiarities, etc. It seems very unlikely that a formal procedure, adequate and reliable, for calculation of probability of the considered damages will be developed in the nearest future.

Alternative approach is based on direct comparison of structural strength of the hull and, in some cases, requirements to propulsion machinery (mainly, minimum engine power). This approach was used for preparing the present equivalence table issued by the International Association of Classification Societies (IACS). But even comparison of structural bearing capacity is not so simple. For example, ratio of bearing capacities of two

hull structures, designed in accordance with rules of two different classification societies, will be likely different depending of ice/structure contact area, ice pressure distribution within the area due to different ratios of shell plating thicknesses, longitudinal and transversal spacing, etc.

Introducing unified ice classes based on harmonized IACS rules will eliminate the problem of ice class equivalence for new ships. However, a new problem is to find out equivalence between the unified ice classes and ice classes of existing ships classed in accordance with present classification societies' rules. So, at present there are more questions then answers concerning the problem of equivalence between ice classes.

Discussion

Instead of continuing the debate around the problematic of equivalence Mr Stepanov introduced a safety index as a replacement for harmonisation process. The idea was greeted as a much-needed fresh start for the discussion on considering the industries' and the underwriters need to classify vessels and environmental conditions. At the end the question is: is the ship able to operate safely in certain conditions or not. There are many parameters that define the answer.

Mr Santos-Pedro explained that the PC rules are intended to be transparent and have as few steps between classes as possible. They are logical and easy for a ship designer to use. He reminded about the practicality of having only one clear classification, especially in cases when changes need to be implemented.

It was reminded, that the argument that has been dealt with during the workshop is an engineering argument, which will be decided by administration. When the matter is taken to IMO there will be also politicians involved. The IMO would decide to develop a global rule. The rule would then be assessed by classification societies. The new situation would require a long time to find its balance.

Insuring arctic ships is very different from anything else. Ships are structurally different and only limited statistics are available to describe the risks. Mr Stepanov projected very large insurance premiums for the beginning of the operations. The insurance premiums will, however, be even larger if there is no agreement on the ice rules.

7. HELCOM'S RECOMMENDATIONS FOR SAFE WINTER NAVIGATION

Roy Jaan, Swedish Maritime Administration

Abstract

The Helsinki Commission, HELCOM, works to protect the marine environment of the Baltic Sea from all sources of pollution through intergovernmental cooperation between: Finland, Russia, Estonia, Latvia, Lithuania, Poland, Germany, Denmark, Sweden and the European Community.

HELCOM is the governing body of the "Convention on the Protection of the Marine Environment of the Baltic Sea Area" - more usually known as the Helsinki Convention.

The winter 2002/2003 was according to the ice extension a normal winter. But some local areas had very severe ice-conditions. Strong west and northwesterly winds caused strong ice pressure that created heavy ice ridges against the coasts on the eastern side of the Baltic Sea. In Bay of Bothnia, two icebreakers were often required to assist single vessels to the Finnish ports during the most difficult period of the winter. In the Bay of Finland, hundreds of vessels were waiting in the ice for assistance from icebreakers. More then hundred vessels were damaged this winter.

The increasing number of big crude carriers navigating in the ice-infested fairways worried many people rounds the Baltic Sea. Within the HELCOM-cooperation an ice expert working group was put together to work out strategies and recommendations for safe winter navigation in the Baltic Sea. All participants agreed that cooperation would be beneficial for all Baltic Sea Countries. The cooperation went on very smoothly and resulted in a HELCOM recommendation that was adopted by HELCOM in March 2004.

The HELCOM-recommendations, Guidelines for the Safety of Winter Navigation in the Baltic Sea Areas, contains four major subjects:

Ice surveillance systems

Same kind of terms and symbols (WMO) should be used by all sea ice breaking services when giving information about the ice condition. Other relevant information e.g. traffic restriction, icebreakers operational area etc should be obtained from the ice services as well.

Equivalence of ice classification rules

A table showing the equivalence of the different Classification Societies ice classes is important when icebreaking authorities decide about traffic restrictions. The icebreaking expert working group prepared such a table, which was attached to the Recommendations.

Safety requirements

A common Baltic traffic restriction policy is of highest importance for cooperation within the winter navigation. Two ports that have the same ice conditions should have the same

traffic restriction and policy for exemptions. This paragraph also gives recommendations about at which ice thickness traffic restriction should apply.

Operational matters related to winter navigation

This item consist mainly of recommendation concerning instructions to ships from VTS, SRS icebreakers etc.

The adoption of the HELCOM guidelines for safety of Winter Navigation in the Baltic Sea area was an important step towards a further developed cooperation between the Baltic Sea countries, both those being member states of the European Union and Russia.

These HELCOM-guidelines are only for safety reasons and the next step is to agree about measures that can create the most efficient system for winter navigation in the Baltic Sea. Within the Motorways of the Sea concept of the trans-European transport network (TEN-T), a working group is preparing an action plan to achieve this.

The proposed actions today are:

- A joint daily updated Baltic ice web site containing ice chart, port information, traffic restrictions, icebreakers operating in each area, current and forecasted ice condition, etc published for free-of-charge use on Internet
- Estimation of current and future demand of icebreaking capacity and the level of service of assistance
- Work out a plan so existing Baltic Sea icebreakers can be utilized in all areas.
- Study on a Joint Baltic Icebreaking Service
- Model testing of a new large icebreaker, designed to assist ships of aframax size
- Study on how to motivate and support industries to build icebreaking vessels to serve high-frequent lines
- Research programme related to the Formal Safety Assessment of winter navigation in the Baltic Sea

THE ADEQUACY OF THE BALTIC SEA RULES

Commentary presentation by Anita Mäkinen, WWF Finland

WWF aims at halting the increasing degradation of our planet's biological diversity, thus creating a future where people can live in harmony with nature. WWF Finland is working towards this goal both in Finland and internationally.

WWF Finland works according to the targets and priorities set by WWF International, within the limits of available resources and adjustments made according to the characteristics of Finnish environment.

In 2001 – 2005 the conservation priorities are:

- the promotion of sustainable lifestyle
- marine conservation and
- forest conservation

Marine conservation focuses on improving the condition of the Baltic Sea, preserving the endangered species and habitats of the Baltic Sea region, and participating in the protection of tropical and arctic marine areas.

WWF has taken active part in the discussion related to oil transport at the Baltic Sea. WWF is concerned about the increasing oil transportation and has looked to find ways to reduce the risks.

Discussion

Mr Jaan was questioned about his opinion on ship owners' motivation to invest in ice-going ships. He answered that the interest is limited due to extra costs that have to be paid. That is why the maritime administrations should also be flexible and prepared to make changes to the requirements.

The Finnish Maritime Administration commented that the winter traffic in the Baltic Sea has a very tight schedule – deliveries have to be on time. That's why there is a need among the authorities to keep very stringent policies regarding ship's performance. If the policies were kept only for safety reasons, then the clients, the industry, wouldn't be satisfied.

Ms Mäkinen was questioned about the Stemnitsa criticism WWF joined during winter 2002-2003. She explained that when WWF joined the criticism it was because the authorities said the vessel didn't have the required finnish-swedish ice class. It was later proved that this was not the whole truth, since the vessel had some ice strengthening and never suffered any damage.

8. OPENING ADDRESS: THE EU ACQUIS ON TRADE IN SHIPPING SERVICES AND THE RUSSIAN ARCTIC MARINE OIL AND GAS EXPORT TO EU PORTS

Author: Peter Ørebech, Fridtjof Nansen Institute
Presentation given by: Professor Edgar Gold, Fridtjof Nansen Institute

Abstract

Is Russian shipping marine oil and gas export to EU under the realm of EU shipping acquis? Lacking WTO membership of Russia and agreements on Trade in Shipping Services the EU influence on Russian shipping boils down to the question of extraterritoriality. The analysis of this paper is based upon the Council Regulation (EEC) No 4055/86 of 22 December 1986 applying the principle of freedom to provide services to maritime transport between Member States and between Member States and third countries, read in the light of the Council Regulation (EC) of 22 November 1996 protecting against the effects of the extra-territorial application of legislation adopted by a third country, and actions based thereon or resulting therefrom. These provisions are compared with other relevant statutes and EU decisions.

Since “double standards” are out of question in international law the EU cannot condemn the USA extraterritorial practice as displayed in the 1996 regulation, and at the same time apply identical extraterritorial solutions to third states. The analysis of the 1996 regulation displays the EU understanding of the outer limits to the national state extraterritorial competency.

Provided that the extraterritorial application of EU law is legitimate under international law, the issue for discussion is the material content of vital shipping trade law issues like line-agreements, cabotage, the abandonment of national flag preferences, fleet subsidies, reflagging restrictions, ownership restrictions, fair competition and more indirectly on crewing requirements, domestic technical provisions, etc. The “bottom-line” for these provisions is to encourage equal and just competition, which fails if technical and manning provisions differ among shipping companies that compete for the charter-parties. The details will be revealed by drawing attention to the ratio decidendi of a wide range of case law decisions.

9. IMMIGRATION AND CUSTOMS PROCEDURES

Erkki Kotiranta, Fortum Shipping

Abstract

The terminals in the Russian ports operate well and efficiently. Authorities work as quickly as the system allows. Good dialogue between the authorities and shipping companies, with the objective of developing operations. Proper attention has been paid in ports and terminals to environmental issues, working safety and quality of operations.

Scope of improvement

The authorities and terminals should work closer together to make the ship's port call as efficient as possible. Customs clearance and other inspection routines after loading may considerably delay the departure of the ship compared to a situation where they are carried out during the loading process. The sampling process is slow and delays the start of loading.

A change of practices could avoid these delays. It can take up to two hours to sign the shipping documents (12 Bills of Lading á 25 copies). Moving the ship to the anchoring area does not solve the departing ship's problems.

Exchange of information between different authorities regarding the ship's arrival and departure is poor at times. The authorities and Control Rooms do not always pay attention to the winter conditions; ships cannot be too flexible during winter, therefore ports must be allowed more flexibility. The arrival and departure of the pilot may in winter cause long delays. Language problems – Russian is mostly used for communications (between the pilot and the VTS).

Maintenance of navigation marks during winter (navigation channels are not always properly marked) should be better looked after. Improvement of co-operation in icebreaking

e.g., along the lines of the model used between Sweden and Finland is needed. Minor Finnish ports are not familiar enough with Russian laws and regulations (e.g., with regard to travel documents).

Suggestions for improvement:

- Experienced Ship Masters should be exempted from having to use a pilot (guidance through the VTS).
- Ballast samples should be taken before arrival at the port
- Closer co-operation between different authorities
- Authorities, not ports, should decide the requirements regarding ice classification.
- The services and inspections by authorities should be timed with efficiency of visits aboard in mind
- The services of authorities should be harmonised with the EU

Discussion

The problems and challenges Mr Kotiranta discusses in his presentation apply to Baltic area. In the arctic there is also another problem: no infrastructure. Today all ships are cleared in Murmansk, before they go on to the NSR.

In terms of time the delays of shipments at the Baltic Sea are approximately 5-6 hours daily due to the listed problems. Mr Kotiranta reminded that this means a lot of wasted hours when a whole year is calculated. It seems that the border guard services and procedures are only going to be prolonged as the terrorist threat is now becoming more imminent.

It was commented, that at the moment the RF Ministry of Transport is not in place to coordinate the border formalities.

10. MARINE INSURANCE COVERAGE FOR OIL AND LNG TANKERS ON THE NORTHERN SEA ROUTE: AN UPDATE ON INSURANCE MARKET INTEREST

Edgar Gold, The Fridtjof Nansen Institute

Abstract

The principal purpose of ARCOP Sub-Project WP 2.4 is to provide an assessment on the viability and availability of adequate and appropriate risk coverage for vessels navigating the Northern Sea Route and Russian Barents Sea. Of particular interest is the availability of adequate marine insurance coverage for tank vessels carrying potential pollutants and hazardous and noxious substances. It is obvious that without adequate and appropriate risk coverage Northern Sea Route and Russian Barents Sea navigation would not be economically or environmentally viable. This paper will provide an update on recent developments in Northern Sea Route interest in the major marine insurance market based on research work carried out under ARCOP auspices.

The questions raised by this aspect of Northern Sea Route navigation were initially discussed under the International Northern Sea Route Programme (INSROP) during a six-year period, 1993-1998. At that stage it was determined that whilst limited Arctic commercial navigation had been taking place for many years in Russian and, to a lesser extent, Canadian Arctic waters, this trade had not resulted in the establishment of clearly discernable marine insurance market patterns. This was due to the fact that such existing shipping had either been very specialized or very limited. On the other hand, until recent times, the more vigorous Russian Arctic shipping sector had its marine insurance coverage underwritten by a variety of state-sponsored schemes that did not permit or were not designed to establish clear actuarial records of the various marine risks involved. In other words, the most important global marine insurance markets simply did not have access to the information for Arctic waters navigation that is normally required before the various marine risks may be covered. This also meant that risk coverage for Arctic waters and Russian Barents Sea navigation that was in operation would have to be underwritten on a case-by-case basis. This was a very expensive proposition and resulted, in certain instances, in ship-owners or charterers covering a large percentage of the risk themselves.

COMMENTARY PRESENTATION

by Sten Göthberg, Swedish Association of Marine Underwriters

The Swedish Insurance markets have grown steadily since mid 1990's. The market statistics show, that especially the cargo insurance premiums and claims grew until 2002. In 2002 the claims dropped by 50%. The Swedish insurance market is dominated by the two biggest companies If and Zürich, that hold over 70% of the market. In the recent years the broker's shares have grown while direct insuring has dropped.

Also the liability insurance market has grown. The hull insurance premiums on the other hand have dropped during the recent years.

The Nordic market figures show that the heavy ice conditions in 2002 lead to growth in claims and the loss ratios jumped radically in Finland and in Sweden. The overall picture of the loss ratios shows that they have been decreasing in the recent years.

Discussion

Mr Göthberg criticized the deficiency of liability insurance coverage of some of the ships operating in the Baltic Sea. It was noted that the Civil Liability Convention (CLC'92) which covers limited compensation for oil pollution damage from tankers, is required for all ships entering the Baltic region. This coverage is usually part of the ship's liability insurance. However, Mr Göthberg expressed the concern that hull and machinery insurance coverage is not a requirement for vessels operating in the region. Unless such coverage would be made compulsory, sub-standard vessels would continue to operate in the region with only the limited pollution liability coverage under CLC'92. Although Baltic Sea states can deny entry to its ports to uninsured vessels, they are not in a position to prevent the passage of such vessels to other ports in the region. For example, an uninsured vessel en route to or from Primorsk will be able to pass through the Gulf of Finland.

Speakers from the the Finnish maritime authority expressed the concern that they found it difficult to impose insurance requirements on vessels if the relevant international convention or national legislation do not contain such requirements. In such cases maritime authorities can do litlle except to enquire only if the vessel carries liability insurance, which is normally shown through the production of a CLC certificate.

Nevertheless, the number of sub-standard ships has decreased in the Baltic region as well as elsewhere. Much of this is due to increased flag state and port state controls, as well as the greater involvement of liability insurers, who underwrite CLC and other risks. Nevertheless, it is of concern that a number of uninsured vessels are still operating. In many cases such vessels are chartered to large and reputable shipping and oil receivers. On the other hand, the major oil companies, have very high environmental standards and investigate potential vessels to be chartered with great care. When a serious maritime accident occurs, which results in significant damage, it is essential that the various claims involved, be covered by adequate liability insurance. When substandard vessels are involved, this is often a problem.

Presentation materials can be found at www.arcop.fi (workshop 5)
or www.sjoass.se (in swedish)

11. CONSEQUENCES OF DIFFERENT FEE SYSTEMS

Vsevolod Peresypkin, Central Marine Research & Design Institute (CNIIMF)

Abstract

The Paper describes the past, present and future of the fee rates for ice-breaking fleet services on the Northern Sea Route (NSR).

In the past, the rates were determined by the amount of financial resources required to maintain the ice-breaking fleet. Before 1990, when the traffic volume was more than 3 M tonnes per year, the operation of the ice-breaking fleet was profitable and the fee rates for ice-breaking services were within the range from 3 to 4 USD per tonne. Later on, when the traffic volume was reduced down to 1.5-1.8 M tonnes per year, the operation of the ice-breaking fleet became unprofitable; the fee rates were increased up to 7.5 USD per tonne. Annually, the State granted additional subsidies to maintain the icebreakers.

At present, the fee rates for icebreaking services are determined by financial resources necessary to maintain the icebreakers and to extend their service life. According to the Decree issued by the Government of the Russian Federation, in 2003 subsidies for maintaining the icebreakers ceased to be granted. Current expenses for maintenance and modernization of the icebreakers are covered by the accordingly increased rates.

In the future, the fee rates will be determined by the amount of financial resources required for maintenance, advancement and disposal of the icebreakers. However, the level of the rates will be gradually reduced as the traffic volume on the NSR increases.

In the past, the rates of fees for ice-breaking services on the Northern Sea Route (NSR) were determined by the amount of resources required to finance the current running costs for maintaining the ice-breaking fleet.

The fee system for ice-breaking fleet services, which was then in use, included rates depending on the season and vessel leading area, ice class and vessel capacity. In all, up to 20 fee rates for ice-breaking fleet services were in use.

The dynamics of the averaged rate for the service provided by icebreakers in leading vessels through the NSR (tonnage due) depending on the traffic volume on the NSR over the period from 1985 to 2003 is shown in Fig.1. The averaged rate for ice-breaking services has been calculated with due regard for the volume of each kind of cargo carried.

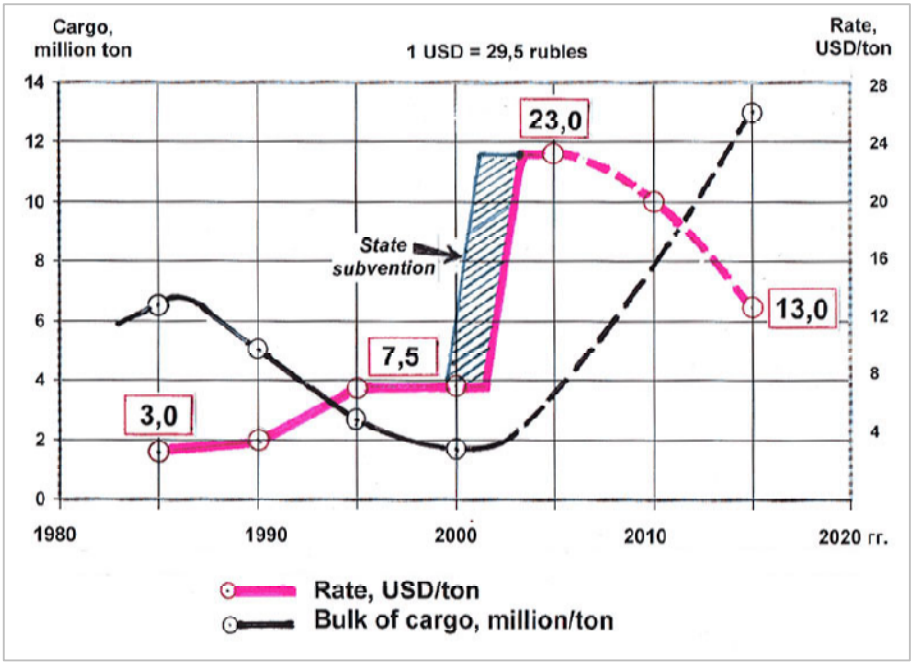

Fig. 1. Dynamics of rate for ice-breaking fleet services of the NSR

The maximum traffic volume on the NSR: 6.58 M tonnes was reached in 1987. The averaged rate (subsequently referred to as “the rate”) over the period up to 1990 was held in the range from 3 to 4 US Dollars per tonne. The operation of the ice-breaking fleet was profitable.

By 1995 the traffic volume was reduced down to 2–3 M tonnes. The operation of the ice-breaking fleet became unprofitable. In this connection, the level of the rates was raised up to 7.5 US Dollars per tonne.

In succeeding years, the traffic volume on the NSR decreased further and became stable at the level 1.5–1.8 M tonnes. Simultaneously with this, an additional traffic of goods made its appearance: transportation of oil from the oil fields situated on the coast of the Pechora and Kara Seas. This traffic volume increases from year to year and in 2003 it reached 0.8 M tonnes.

In view of considerable reduction in incomes gained by the ice-breaking fleet from the fees collected for leading vessels through the NSR, the State had to expressly allocate in the federal budget annual subsidies for maintaining the ice-breakers (from 2 M US Dollars in 1999 up to 14 M US Dollars in 2002).

At the same time, a question was raised regarding scientific study of the system of fees for leading vessels and the level of rates that ensure both the maintenance of the ice-breaking fleet and the performance of work aimed at extension of the service life of the diesel-driven and nuclear-powered linear ice-breakers.

The draft “Regulations on Fees for Services on the NSR Seaways” have been developed under the assignment of the RF Ministry of Transport and approved by the RF Ministry of Economy in 2000.

The main advantages of the proposed fees for leading vessels under the conditions of market relations are as follows:

- changeover from collection of the tonnage due from the cargo owners to fees for ice-breaking services paid by the ship owners at the declared rates. Such practice is widely used in international shipping (Suez and Panama Canals);
- variation of the basic fee rates depending on the vessel leading distance and season, ice class and vessel size;
- application of a special coefficient that makes it possible to account for and implement the accepted tariff rate policy for vessels leading, one of the factors of which may be the price of the cargo carried by the vessel;
- establishment of the payment procedure for inspection and pilotage of vessels at the approved rates in accordance with the laws in force.
- However, implementation of the proposed draft “Regulations on Fees for Services on the NRS Seaways” has been postponed until the Government of the RF approves the new ”Regulations for Navigation on the Seaways of the NSR”.

The proposals for raise of the basic rates for leading vessels, which would ensure maintenance of the ice-braking fleet and financing of work aimed at extension of the service life of ice-breakers were worked out by the Central Marine Research & Design Institute under assignment of the RF Ministry of Economical Development in 2002.

The new system of fees for leading vessels through the NSR accounting for the limited possibilities of the State for financial support to the maintenance, modernization and advancement of the ice-breaking fleet was established in accordance with the Decree of the RF Government (2002). According to the said Decree, since 2003 maintenance of the ice-breaking fleet ceased to be subsidized from the federal budget. The current running costs of maintenance of the ice-breaking fleet including measures to extend the service life of the ice-breakers are financed at the expense of funds obtained from the fees for ice-breaking fleet services at the rates regulated in accordance with the established procedure.

Released funds of the federal budget in the amount of 85 M US Dollars are allocated for completion of the nuclear icebreaker “50 let Pobedy” in 2003–2005.

In elaboration of the Decree of the RF Government, an Order No.6 “About Changing in Rates for Ice-Breaking Fleet Services on the NSR” of the RF Ministry of Economical Development and Trade was issued on 10 January 2003 (Appendix).

The new system of fees for the ice-breaking fleet services includes three groups of rates:

- rates for vessels leading services to ensure carriage of goods depending on the nomenclature of goods. This makes it possible to stabilize the income base of the ice-breaking fleet owing to more fair distribution of the rate load on the NSR users;
- rates for services in leading transport vessels in ballast, towing, technical auxiliary and other craft not intended for carriage of goods;
- rates for vessels leading services to ensure transportation of goods to the Far North areas, purchase and delivery of which is carried out at the expense of federal budget funds and regional funds of the State financial support of the advance products (commodities) delivery to the Far North areas (“the northern delivery”).

In all, 16 fee rates for vessels leading services have been specified. Their level has been raised considerably as compared with the rates that were in use previously.

The fee rates depending on the nomenclature of the main goods carried through the NSR are shown in Fig.2. The averaged rate calculated on their basis is 23 US Dollars per tonne.

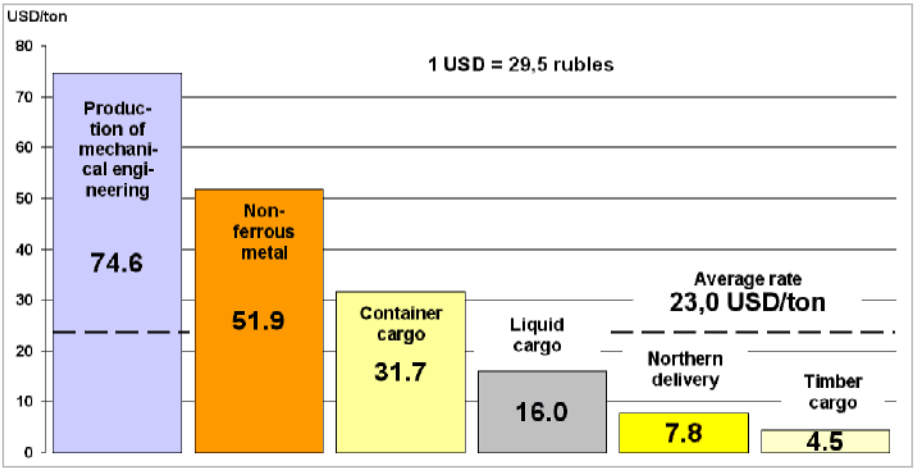

Figure 2. Rates for ice-breaking fleet services depending on cargo nomenclature, USD/ton

At present, the ”Norilsk Nickel” Company accounts for the main proportion of the fees for ice-braking services. The fee rate for the services provided by the icebreakers in leading vessels carrying non-ferrous metals produced by “Norilsk Nickel” is 51.9 US Dollars per tonne. This is three times higher than the rate for oil transportation (16.0 US Dollars per tonne).

The feasibility of reducing the rate pressure has been substantiated by the Central Marine Research and Design Institute.

The calculations show that as the traffic volumes increase, the construction of the ice-breaker “50 let Pobedy” is completed (in 2006), and the work aimed at extension of service life of the nuclear and diesel-driven ice-breakers is finished, the possibility exists of reducing gradually the fee rates for leading vessels through the NSR seaways. The averaged fee rate may be reduced from 23 US Dollars per tonne down to 13 US Dollars per tonne.

If the Arctic oil fields are actively developed, the rates for the ice-breaking fleet services to ensure export of oil by sea may be reduced.

By 2010–2012, the volume of oil transported from the Kara Sea (Vankor oil field in the Lower Yenisei basin with the use of loading terminal in the Port of Dikson) may reach 10–20 M tonnes, whereby the fee rates for services provided by the nuclear icebreakers may decrease down to 11–12 US Dollars per tonne.

Within the same period, the volume of oil transported from the ice-resistant stationary platform Prirazlomnaya and terminal Varandey of the Timano-Pechora oil province in the south-east part of the Barents Sea (Pechora Sea) is expected to be not less than 20 M tonnes. In this case and in view of the fact that the oil tankers are predominantly led by the diesel-driven icebreakers, reduction of the rates may be even more appreciable.

Thus, we are optimistically viewing the prospects for the large-scale sea transportation of oil and gas from the Arctic fields. A reasonable level of the rates for ice-breaking fleet services will be a contributory factor to these developments.

THE FINNISH FEE SYSTEM

Commentary presentation by Markku Mylly, Finnish Maritime Administration

The Finnish Maritime Administration is the authority responsible for maritime safety, winter traffic assistance, fairway maintenance, VTS and pilotage, hydrographical charting and the provision of ferry services to the archipelago communities. The Administration ensures that the basic operational conditions for merchant shipping and sea transport are maintained and continually improved, taking into account safety and economic aspects, as well as environmental consequences. The activities aim to ensure safe and efficient merchant shipping, meeting both society's and customers' needs.

The Finnish Maritime Administration purchases, either from the established state enterprises or other companies, the services needed to ensure unhindered shipping. The Administration also maintains its production related to fairways and nautical charts.

The Finnish Maritime Administration finances its services for merchant shipping by charging its customers fairway fees. It also conducts official and public services, which are financed out of the government budget. The Finnish Maritime Administration's annual budget is roughly 103 million euros, of which he fairway dues constitute 73-74 million euros.

As provided in the Act on Fairway Dues (708/2002), fairway dues are collected by the State to cover costs it incurs from the construction, maintenance and care of public fairways used for navigation, and safety devices required by waterborne traffic, and from assistance provided by icebreakers.

Fairway dues are collected by the customs authorities. The National Board of Customs may issue more detailed provisions on the procedure for collecting fairway dues.

Liability to pay

- Any party engaged in merchant shipping on a registered Finnish or foreign ship in Finnish waters is liable to pay fairway dues
- No fairway dues need be paid when a ship travels from one foreign port to another through Finnish waters but does not call at a port in Finland

Responsibility of payment

- The ship-owner and the party who reports the ship for inward clearance on behalf of the ship-owner or represents the ship-owner on voyages between Finnish ports are responsible for payment
- Parties liable to pay who do not reside in Finland and all foreign parties liable to pay shall have a representative who does reside in Finland and has been approved by a customs district to assume responsibility for the duties that this Act allots to the party liable to pay and for the consequences of their neglect

Fairway dues on international traffic

- The fairway dues on international traffic are collected as a single payment when a ship arrives in Finland from abroad
- The amount of the single payment is determined on the basis of the ship's net tonnage and ice class
- More detailed provisions on the amount of the single payment and, as needed, its maximum limit are issued by Government decree

Fairway dues on domestic traffic

- The fairway dues on domestic traffic are collected in the form of an annual payment for each calendar year. The amount of the annual payment is determined on the basis of the ship's net tonnage. More detailed provisions on the amount of the annual payment are issued by Government decree
- Domestic traffic means voyages between Finnish ports, except when during such voyage the ship calls at a foreign port to load or unload cargo or to pick up or leave passengers

Charging Principles: Net tonnage and Ice class

Subject to the provisions of subsection 2, the net tonnage declared in the ships tonnage certificate shall be used.

If the ship has no tonnage certificate, the tonnage declared in the certificate is not consistent with the ship's real tonnage, or the ship is not authorized to use the net tonnage declared in the tonnage certificate under current tonnage measurement regulations, the Finnish Maritime Administration shall decide the ship's net tonnage on the basis of said tonnage measurement regulations for the purpose of determining its fairway dues.

Ice class

Ships are assigned to ice classes as follows:

1) special ice class (IA Super)
2) ice class IA, AB or IC
3) ice class II
4) ice class III

Discussion

The current Russian fee system is based on tonnage.

In Russia also different routes and other decision affect the fees and they depend on the situation and conditions, and are thus actually tailor made for each voyage.

The Finnish Maritime Administration does not collect the icebreaker fees based on volume of cargo; the fees are collected according to ship's ice class. Last year the icebreaker fee would have been roughly 1€ per ton based on collected fees and volume of cargo.

In Finland, the pleasure boats have been granted freedom of fairway dues. Pleasure fairways are covered by budget funds and they only pay taxes in a form of fuel tax and other taxes. There has been discussion on pleasure boat fees, but it remains a political

question. There are so few fishing vessels in Finland and since they don’t use winter fairways they too are granted freedom.

There has been discussion going on among the authority to renew the act, but since these decisions have a big influence to the FMA budget all changes must be carefully calculated. Sweden has a system that is based on environmental and ton based fees and that could be a possibility for Finland as well. As said, one has to be careful. At the moment the Finnish system encourages the ship owners to invest in better ice class ships.

12. CONCLUSIONS AND RECOMMENDATIONS FOR WORKPACKAGE 2

WP 2.1 The legal status of the NSR in relation to petroleum transportation and shipping transport services

The presentation analyses the principals of different rules systems used in Canada, USA, Norway and Denmark to regulate the arctic transportation. New regulations for the NSR are currently being prepared, and the rules will cover the route from Barents Sea to the Bering Strait. The new rules are taking cognisance of relevant regulations and international conventions.

Any state that has accepted and implemented Civil Liability Convention ’92 has, at the same time, accepted the fact that this is a regime that has limited liability, which is strictly set out in the convention. In other words, Russia’s acceptance of CLC’92 indicates that unlimited, strict liability for damage to its waters is no longer enforceable. This would mean that there may well be a conflict between the new legislation and earlier laws. On the other hand, it is open to States to exclude certain geographical areas from the scope of such a regime. For example, Canada, which is a party to CLC’92, has not included Canadian Arctic regions in the convention’s coverage.

The experts concluded that the situation remains unclear and should be clarified within the remaining work.

It is recommended, that the workpackage leader be in close contact with the other workpackage participants and clarify the following:

- The Civil Liability Convention: what are the concrete implications if the new NSR regulations and the CLC are overlapping and/or conflicting
- The overall regulation framework: what is the overall regulation framework that is applied at the Northern Sea Route, what are the requirements and on what grounds do they apply. If the two conventions are conflicting, then which rules does the discretion procedure follow.

It is also recommended that the contribution of the Russian specialists be utilized as widely as possible.

WP 2.2 Rules and Regulations

Representatives of classification societies, ship owners and authorities criticized the unclear rule situation. The breakthrough of the Polar Classes (PC), that are the result of the harmonization work joined by several classification societies, is yet to be seen.

The total abandoning of equivalencies between the Polar Classes and the other two established ice rules systems, the Finnish-Swedish and the Russian LU rules, surprised some of the workshop participants. It was stated, that since the propulsion power has been left out of the Polar Classes, the one-way equivalency would also be quite problematic. Therefore it seems that there are now two completely separate ice rules. Interest groups have different needs concerning the rules: the ship operators require performance and the insurance companies safety of sail. The question is: do the new Polar Classes provide both of these groups with adequate information?

The IACS is progressing to ratify the Polar Classes despite the fact that the rules regarding the propellers are not complete.

The calculation methods regarding the propeller loads have not been decided upon.

It is recommended that workpackage 2 include the following in their future work:

- The future of Polar Classes and LU rules
- The content of the new NSR rules and their interrelation with the PC classes

WP 2.3 Immigration and customs procedures

From a ship-owners view the border formalities are too rigid and take too much time. They fear that the time that need to be allocated for each border crossing is growing due to the current terror threats.

Transparency and constancy are important when considering the fluency of the formalities. Surprises and changes in the rules cause unwanted delays.

It is recommended, that the current procedures be reported more precisely. International practices should be used as a basis for the recommendations for future development. The result should give adequate input for workpackage 3.5.

WP 2.4 Insurance

According to the Northern Sea Route accident statistics the insurance risk should be low. The example of the Baltic Sea, however, is alarming since the statistics indicate that increasing traffic seems to lead to increasing probability of ship damage.

The present work describes on a general level the expectations of the insurance companies that have been interviewed. It is recommended, that these interviews and the suggestions of the marine underwriters be documented in detail.

For the economic evaluation this workpackage must work closely with the rest of the WP 3 to ensure that the data developed will be adequate for getting reliable and representative estimate of the insurance costs.

WP 2.5 Fee policy

The new fee system for the NSR, that the Russians are proposing, is dominated by the costs of the icebreaker fleet and the overall cargo volume. At present the fee also varies depending on type of cargo. Fee for liquid cargo is at the moment 16 US dollars per ton. Central Marine Research and Design Institute CNIIMF estimates that by 2010–2012, the volume of oil transported from the Kara Sea may reach 10–20 m tonnes, whereby the fee may go down to 11–12 US dollars per ton and even below.

The fairway fee in Finland is based on ship's ice class and tonnage. The fees are collected from each vessel visiting Finland even during the summertime. The collected fees are used to cover the costs of the fairway maintenance and icebreaker fleet. If calculated per ton of cargo transported to and from Finland by sea, the fee equals 2 €/ton. The icebreaker costs take about a half of this. The vessels with higher ice class pay lower fees, which encourages investing in better ice class ships. The comparison between these two fee systems was found interesting.

It is recommended, that in the future the ARCOP workpackage 3.5 (Economics of the Transportation system) compare alternative fee systems and suggest a system that enables the maintenance and development of the icebreaker fleet and is still feasible and competitive for oil transport.