BALTIC ICEBREAKING MANAGEMENT

Baltic Sea Icebreaking Report 2006-2007

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FOREWORD

The winter navigation faces new challenges with the increasing vessel traffic and especially transportation of oil products in the Baltic Sea. Demands for better icebreaking services increase especially during severe winters and in difficult ice conditions. The industry and the ship owners want to keep the vessels in schedule also during winter. It is a must if you will survive in competition.

The member authorities of the Baltic Icebreaking Management (BIM) have observed that the capability of vessels to navigate in ice has constantly improved due to the technological development, while there seems to be a lack of relevant experience and know-how among the ship crews. The risk of accident during winter time can avoid by well trained and experienced ship crew.

In the beginning of the year 2007 the BIM produced and distributed two new ”products”: for the first “the Baltic Sea Icebreaking Web site” www.baltice.org, which gives daily updated information about icebreakers, forecast and ice situation etc and second the Ice training movie: ”Ice Navigation an Baltic Ice Conditions”. I hope that our information gives a good base for those, who start to navigate in ice and I also will thank all who contributed that we could realize the projects and created something new and permanent.

The work continues by advancing the safety and efficiency of winter navigation in the Baltic Sea. We have to keep in mind more and more the environmental part and add the co-operation also with HELCOM, together with join forces we get better results in the future.

Arendal, 25 September 2007

Ilmari Aro
Chairman of BIM

1. Short history of the Baltic Icebreaking Management

Baltic Icebreaking Management, **BIM** is an organisation with members from all Baltic Sea states. BIM is a development of the annual meeting between Baltic Sea States icebreaking authorities which have assembled more than 20 years. The member countries of BIM are Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Norway, Poland, Russia and Sweden.

After the difficult winter navigation season of 2002/2003 a project was started up within the framework of HELCOM, aiming at improving the safety of winter navigation in the Baltic Sea. **The Helcom – recommendation on the safety of Winter Navigation in the Baltic Sea Area was adopted in March 2004.**

Within the EU concept Motorways of the Sea, which is one priority project in the trans-European network, the Baltic Sea countries established a working group with the aim of creating more efficient winter navigation by cooperation between the Baltic Sea countries. The icebreaking authorities around the Baltic Sea decided in Helsinki meeting 2004 that this work shall continue within the framework of BIM, were also non EU-member states are taking part. BIM should function all year round and that its strategy should be to develop safe, reliable and efficient winter navigation between the Baltic Sea countries. The overall objective of BIM is to assure a well functioning maritime transport system in the Baltic Sea all year round by enhancing the strategic and operational cooperation between the Baltic Sea countries within the area of assistance to winter navigation.

Joint Baltic web service on winter navigation www.baltice.org launched January 10th 2007, see appendix 1. Training in ice navigation for seafarers the video on DVD launched April 11th 2007, see appendix 2.

One important task of BIM is to inform stakeholders in the maritime sector and policy makers about winter navigation and icebreaking. There is a need for information about winter navigation and icebreaking that covers the whole Baltic Sea region. Several Baltic Sea countries prepare information about the winter navigation and icebreaking in their respective national waters. There has been a need to coordinate this country-specific information, improve the information and to distribute it to a wider target group. This "Joint Annual Baltic Icebreaking Report" is the second of its kind.

This report aims to give an overview of the winter navigation season **2006/2007** for the Baltic Sea area. National reports can be found on www.baltice.org. The report will also describe organisational changes in the icebreaking authorities or changes in icebreaking resources and provide a progress report of the Baltic Sea Icebreaking cooperation and the development of BIM.

2. Overview of the icebreaking season (2006-2007) and its effect on the maritime transport system in the Baltic Sea region

The Baltic Sea ice season of 2006-2007 could be classified as a mild one. The maximum ice extent reached 139,000 km² (33% of the Baltic Sea was ice covered) in 23 February.

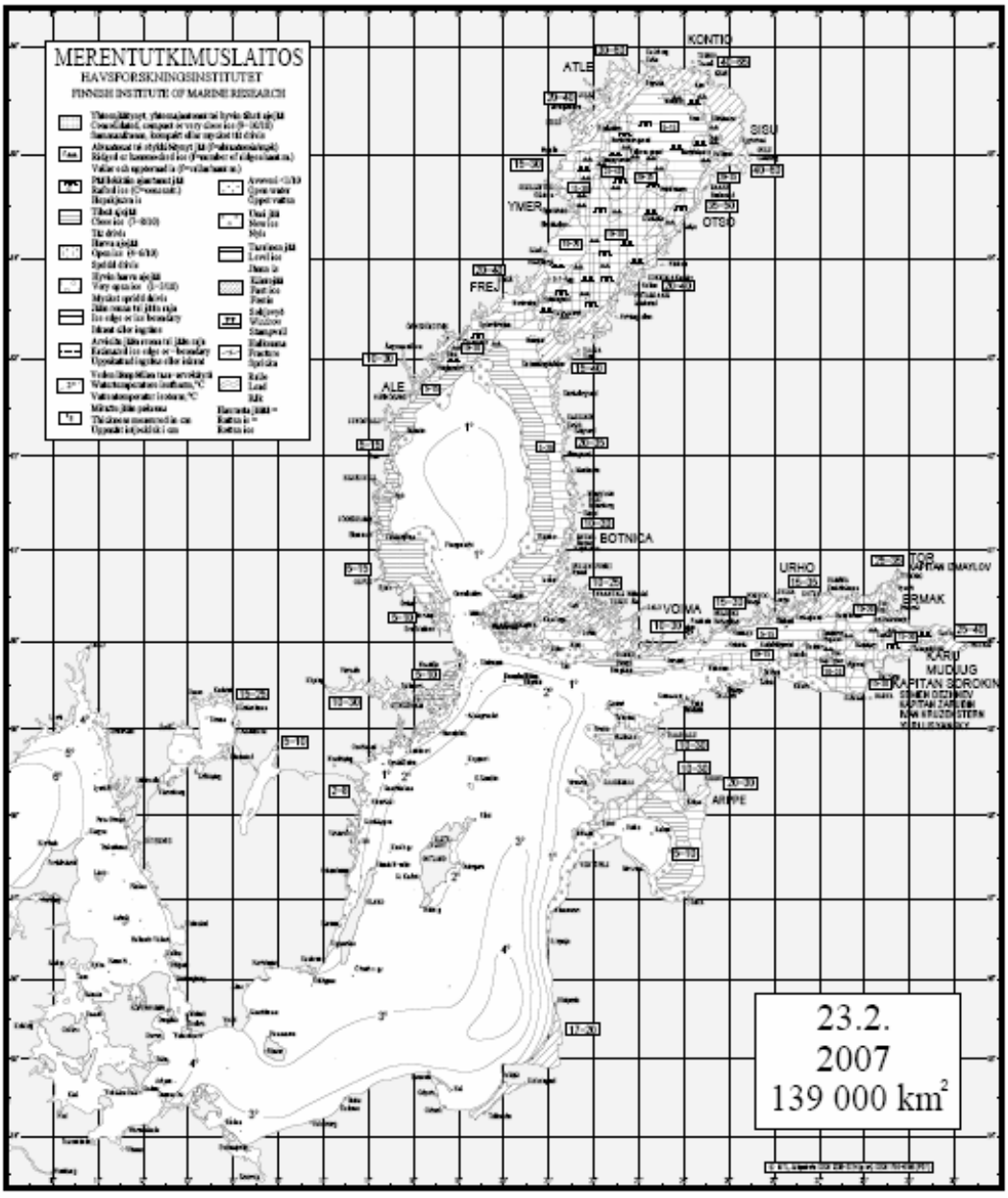


Figure 1. The maximum ice extent in ice season of 2006-2007.

The ice season started very mild with record high air temperatures in December. Only February become colder than average in the northern and central parts of the Baltic Sea. The southern part stayed warmer than average for the whole season.

Freezing started in the northern Bay of Bothnia in late November, but in large as late as late January – early February. The maximum ice extent took place in 23 February (Fig. 1). According to statistical information, the ice extension exceeded that of mild ice season (Fig. 3). March and April were mild months (Fig. 2). Gulf of Finland and Sea of Bothnia were ice free in early April. The Quark was ice-free in late April. In mid-May the ice disappeared from the northern Bay of Bothnia around the normal time. The southern part of the Baltic Sea was ice-free during the season.

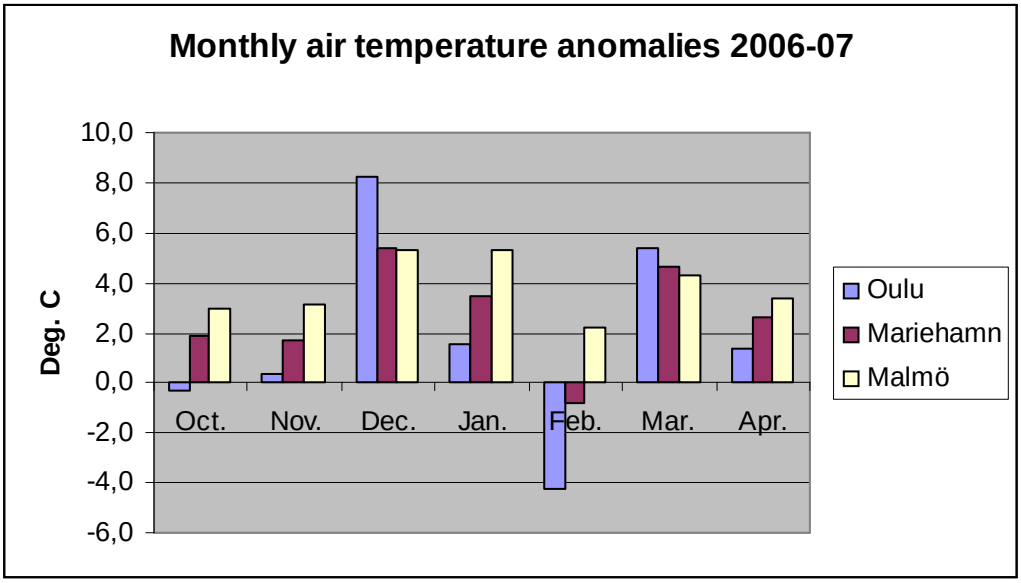


Figure 2. Air temperature anomalies in the Bay of Bothnia (Oulu), the southern Sea of Bothnia (Mariehamn) and the Southwestern Baltic Sea (Malmö).

During the last 30 years there have been 12 severer and 14 milder seasons. One way to express the severity of the ice season is to compare the maximum ice extent. The maximum ice extent of 2007 was just below the limit to be classified as an average season.

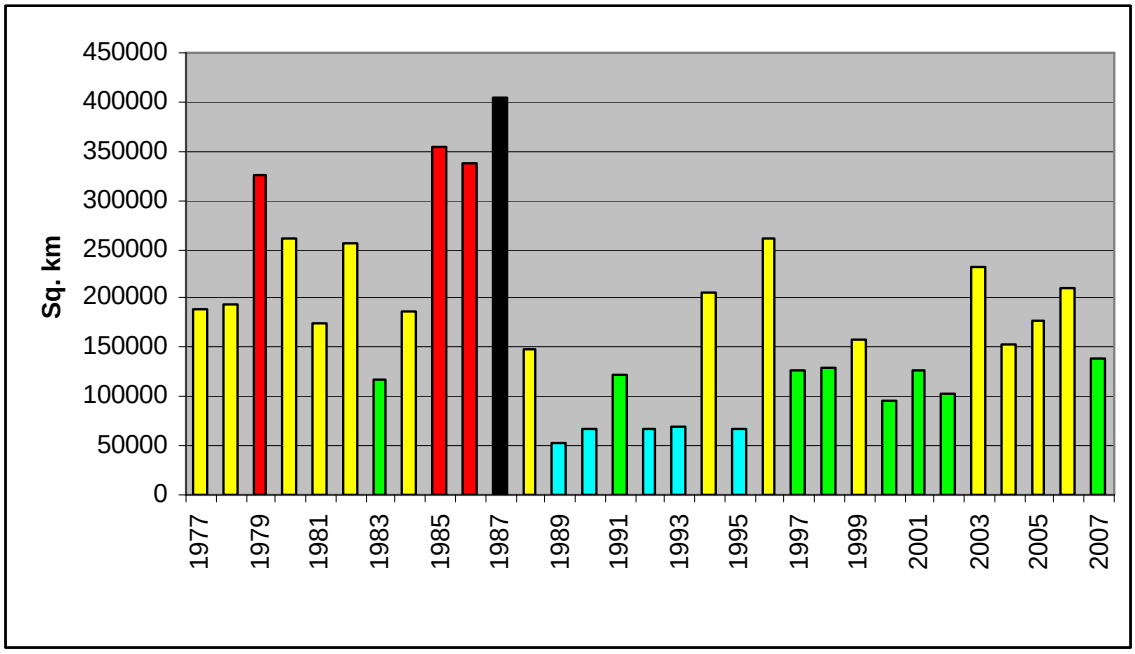


Figure 3. Maximum ice coverage in ice seasons 1977-2007. Average of 1977-2006 was 179 000 km². Light blue = extremely mild seasons, green = mild seasons, yellow = average seasons, red = severe seasons, and black = extremely severe season.

The most important factors for winter navigation are ice extension and wind direction/force. The ice conditions can be very difficult when strong wind creates pressure and ridges in the ice field. In conditions when a large number of vessels require towing assistance by icebreakers, long delays occur.

Figure 4. Ice ridge builds up against shore

Only vessels with ice class are offered assistance from icebreakers when traffic restrictions are issued. Traffic restrictions are necessary for safe and efficient winter navigation. A vessel must have a strong hull that can withstand strain and stress from the sea ice. Sufficient engine power and ability to navigate independently in broken or light ice is important to avoid long delays.

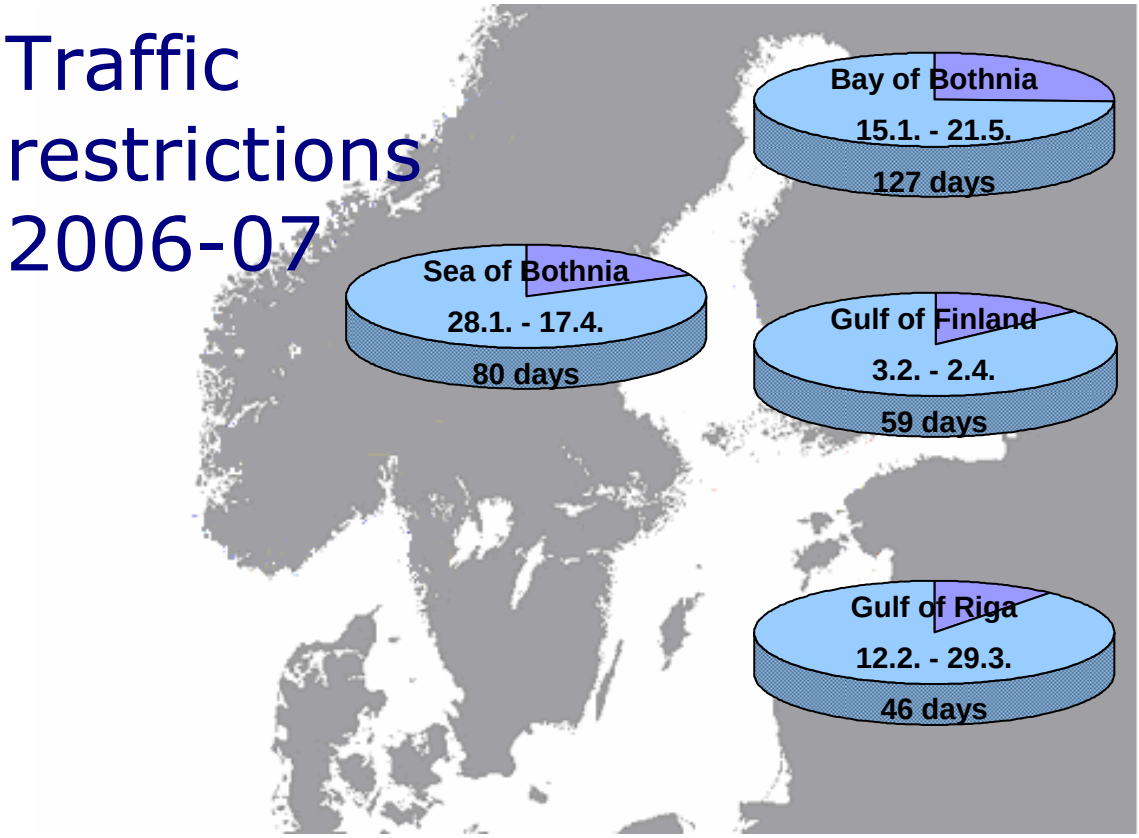


Figure 5. Days of the year when traffic restrictions were in force in the different areas.

For safety reasons, the Baltic Sea countries have within HELCOM agreed on a joint policy when traffic restrictions shall be issued. For efficiency reasons, the icebreaking authorities can demand a lowest limit on vessels' engine power as well.

The traffic restrictions should be set as follows:

When the thickness of level ice is in the range of 10-15 cm, and the weather forecast predicts continuing low temperature, a minimum ice class LU1 or equivalent should be required for ships entering the ports of a Contracting Party.

When the thickness of level ice is in the range of 15-30 cm, and the weather forecast predicts continuing low temperature, a minimum ice class IC or LU2 or equivalent should be required for ships entering the ports of a Contracting Party.

When the thickness of level ice is in the range of 30-50 cm, a minimum ice class IB or LU3 or equivalent should be required for ships entering the ports of a Contracting Party.

When the thickness of level ice exceeds 50 cm, a minimum ice class IA or LU4 or equivalent should be required for ships entering the ports of a Contracting Party.

Figure 6. HELCOM recommendations for traffic restrictions.

Annex. Approximate correspondence between Ice Classes of the Finnish-Swedish Ice Class Rules (Baltic Ice Classes) and the Ice Classes of other Classification Societies

Classification Society	Ice Class				
Finnish-Swedish Ice Class Rules	**IA Super**	**IA**	**IB**	**IC**	**Category II**
Russian Maritime Register of Shipping (Rules 1995)	UL	L1	L2	L3	L4
Russian Maritime Register of Shipping (Rules 1999)	LU5	LU4	LU3	LU2	LU1
American Bureau of Shipping	IAA	IA	IB	IC	D0
Bureau Veritas	IA SUPER	IA	IB	IC	ID
CASPPR, 1972	A	B	C	D	E
China Classification Society	Ice Class B1*	Ice Class B1	Ice Class B2	Ice Class B3	Ice Class B
Det Norske Veritas	ICE-1A*	ICE-1A	ICE-1B	ICE-1C	ICE-C
Germanischer Lloyd	E4	E3	E2	E1	E
Korean Register of Shipping	ISS	IS1	IS2	IS3	IS4
Lloyd's Register of Shipping	1AS	1A	1B	1C	1D
Nippon Kaiji Kyokai	*IA Super*	*IA*	*IB*	*IC*	*ID*
Registro Italiano Navale	IAS	IA	IB	IC	ID

Figure 7. Table for corresponding ice classes.

Smaller vessels like buoy tenders and tugs with strong engines and hull are used as port icebreakers and for icebreaking mission in waters protected from drifting sea ice. In open sea areas that are affected by drifting sea ice with ridges and ice pressure, big sea icebreaker are required.

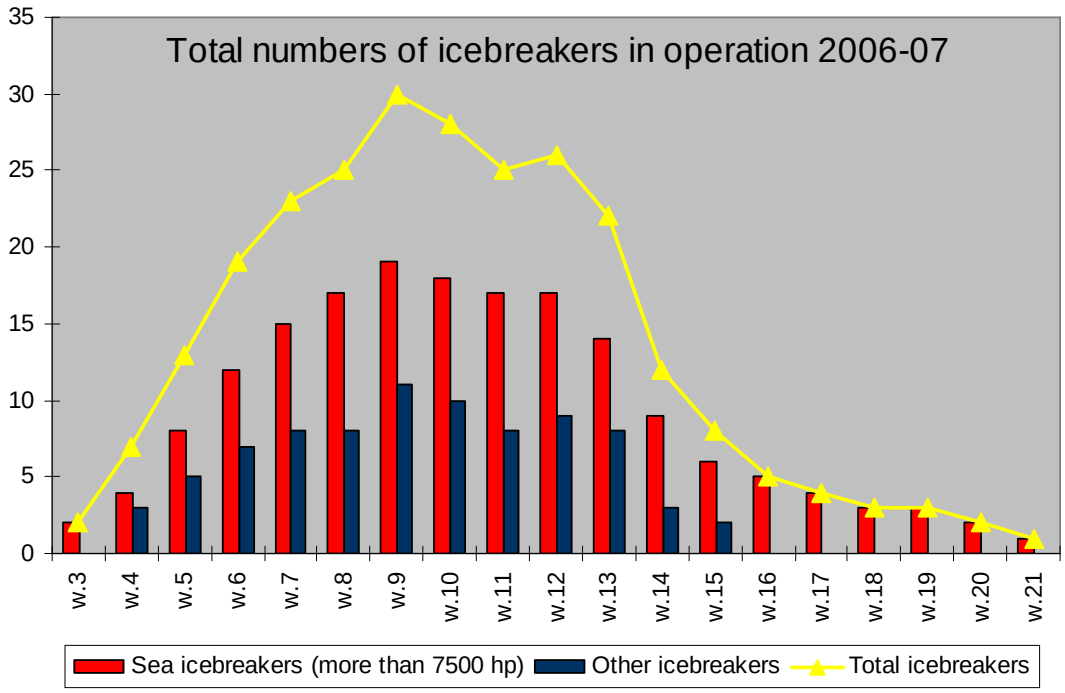


Figure 8. The total number of icebreakers in operation each week in the Baltic Sea during the season 2006/2007.

According to statistics from the Baltic Sea icebreaking authorities, 4327 vessels received assistance from icebreakers this season.

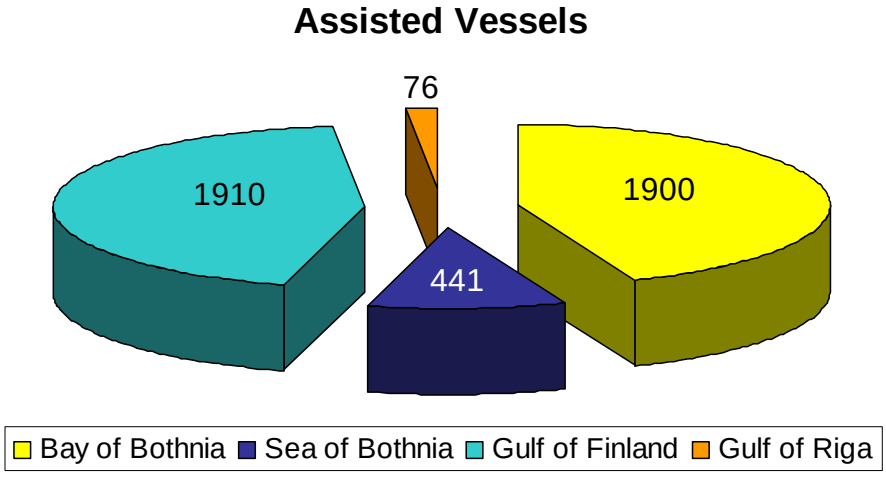


Figure 9. A total of 4327 vessels where assisted by icebreakers during the icebreaking season in the Baltic Sea.

The longest sailing distance in sea ice is to the northernmost ports in the Bay of Bothnia. But due to the big number of vessels in the shorter fairway to the easternmost ports in the Gulf of Finland, the traffic is more affected by sea ice in this area, especially during periods with strong westerly winds when the icebreakers must tow many vessels one by one.

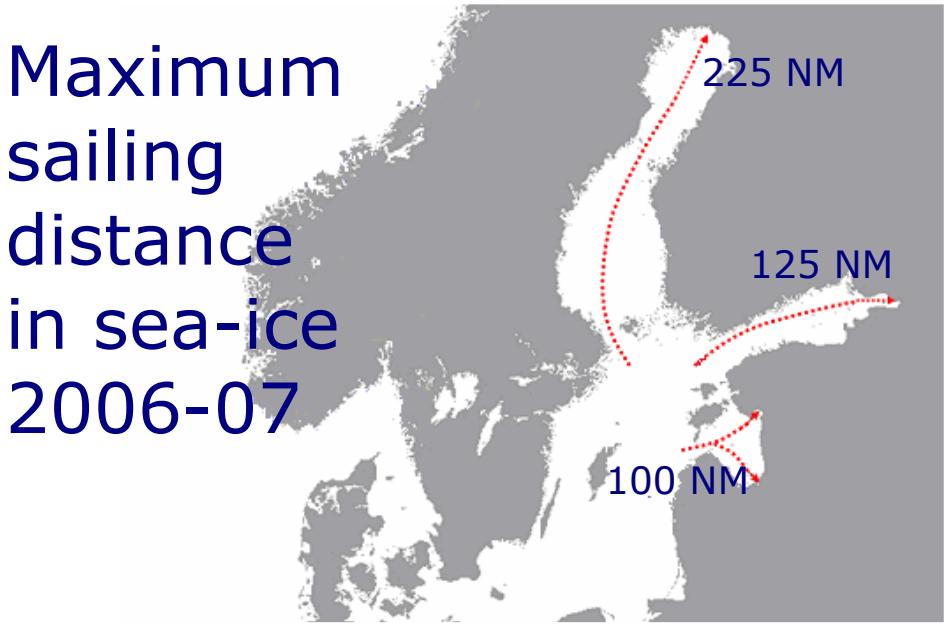


Figure 10. Sailing distance from ice edge during maximum ice extension, 23 February 2007. Kemi 225 nautical miles, St. Petersburg 125 nautical miles, Pärnu/Riga 100 nautical miles.

Crude carriers of aframax size (100 000 dwt) navigate in the Baltic Sea all year round. In severe ice conditions these large vessels require at least two sea icebreakers due to the wide beam. To support these big vessels the Russian icebreaking service is prepared to send an icebreaker to the Danish Great Belt if required during severe winters.

3. Accidents and incidents in sea ice

The Technical University of Helsinki collects information on accidents related to navigation in ice. Shipowners and others within winter navigation are requested to report accidents, incidents and damages that are ice-related to icedamage@tkk.fi or to:

Ice Damage Database
Helsinki University of Technology
Ship Laboratory
PL 5300
02151 TKK
FINLAND

Only some minor damages occurred to merchant vessels during assistance of the icebreakers. In comparison, about 100 vessels reported damages due to the severe ice conditions in the year 2003. Reports of accidents are difficult to get because often damages won't appear until during the next dry docking.

4. Costs of icebreaking services in the Baltic Sea

Winter conditions cause various costs for vessel traffic in the Baltic Sea. The vessels' fuel costs increase since speed is reduced by even half on average due to ice barriers when proceeding in ice at full effect, and approaching the quay can take hours. The harbour costs also increase, since the basin must be kept open by a harbour tug in order for the vessels to reach the quay.

Moreover, heating to keep equipment in working order despite outdoor temperatures below -20 ºC adds to the costs. Since it is difficult to estimate other costs, this report comprises only those related to icebreakers.

Finland

In Finland the costs 2006 – 2007 for the stand-by period amount to approximately 14 million EUR, additional operational costs to approximately 7,5 million EUR, and fuel costs to 5 million EUR. The FMA has also contracts with private tugboat companies for minor operations. The cost of the Finnish icebreaking services varies from 24 to 32 million euros depending on the winters' degree.

Sweden

In Sweden the costs for the stand-by period amount to approximately 10 million EUR, additional operational costs to approximately 4 million EUR, and fuel costs to 2.5-9 million EUR. The cost of the Swedish icebreaking services varies from 15 to 34 million euros depending on the winters' degree.

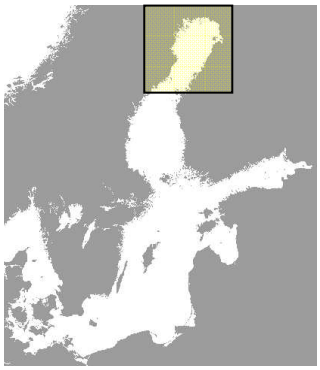
Estonia

In Estonia, the total cost of icebreaking in the 2006-2007 season amounted to approximately 1.6 million EUR, with about 0.8 million EUR accounting for the costs in the Pärnu Bay and 0,8 million for the Gulf of Finland. In the Pärnu Bay, the fuel costs during the icebreaking season of 2006-2007 were about 0.1 million EUR and operational costs

about 0.7 million EUR, whereas the respective figures for the Gulf of Finland were 0.05 million EUR and 0.75 million EUR. In total, the fuel costs amounted to about 0.15 million EUR and operational costs 1.45 million EUR.

5. Winter navigation in the different parts of the Baltic Sea

5.1. Bay of Bothnia

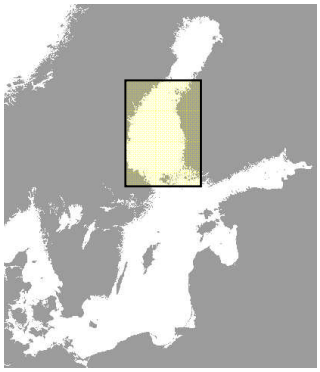


The first traffic restrictions were initiated 15 January and reached their highest level, IA 4000 dwt, in 23 February. The first icebreaker Kontio started the icebreaking operations on 16 January December.

Towards the end of January, the weather turned colder which required engagement from more icebreakers. In late February, when the maximum ice extension was reached, a total of 8 sea icebreakers and 2 tugboats were engaged in accordance with the joint icebreaking plan.

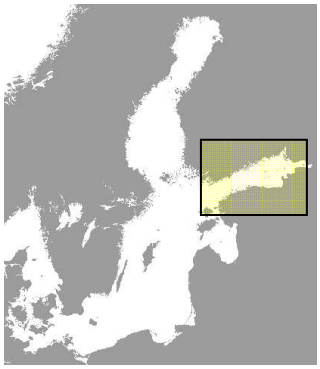
The icebreakers in the Bay of Bothnia assisted 1900 merchant vessels and 312 towing operations were conducted. The average waiting time was 3 hours and 25 minutes. 68% of all the vessels did not have to wait for icebreaker assistance but 9% of the vessels had more than 4 hours waiting time (the so-called long waiting). The icebreaking season in the Bay of Bothnia ended on 21 May.

5.2. Sea of Bothnia



Due to mild weather ice formation started about one month later than usual in the Sea of Bothnia. The first traffic restrictions were initiated on 28 January. The traffic met no longer delays and the icebreaking season ended on 23 April.

5.3. Gulf of Finland



The winter began very mild and ice formation started approximately one month later than average. The Estonian Meteorological and Hydrological Institute assessed winter 2006/2007 as mild.

The first traffic restrictions were initiated 1 February in St. Petersburg. The strictest traffic restrictions were initiated 3 March in Loviisa, Kotka and Hamina being IA, IB 2000 dwt. The last traffic restrictions were cancelled 6 April.
All of the vessels which needed icebreaker assistance 1774 were bound for Russian ports, 132 for Finnish ports and 4 for Estonian ports. During the largest ice cover the Russian had six sea icebreakers and four minor icebreakers in use, Finland had 2 sea icebreakers in use and Estonia had one sea icebreaker in use.

The icebreaking season lasted from 23 January to 13 April in the Russian territorial water, from 8 February to 20 March in the Finland territorial water and from 23 February to 29 March in the Estonian territorial water.

Ice conditions in the eastern part of the Gulf of Finland in 2006-2007

Ice distribution during the winter was developing according to a mild winter scenario, slightly approaching moderate type by 3rd decade of February and 1st decade of March only. Maximum ice coverage area during the winter was about 60 percent of the average. Very warm weather during all winter but February lead to ice formation anomalies.

November

In November some very short ice formation was present in coastal shallows. It started along the coast of Nevskaya Guba on November 13th and lasted for 3 days. At the top point of the Gulf of Vyborg ice was noticed from November 06th and lasted till November 16th.

December

During the largest part of the month there was no ice formation in the Gulf. First shuga was noticed coming from Ladoga lake down Neva river on 27th of December only. Steady ice formation firstly appeared in the Gulf of Vyborg on December 29th.

At some control points around the Gulf of Finland ice formation started later than extremely late deadlines. So such deadlines were crossed in Lenport, Kronshtadt, Zelenogorsk, Ust-Luga, Ozerki, Primorsk and light houses Tolbukhin and Shepelevskiy control points. As to steady ice formation some deadline exceeding was noted in Lisiy Nos, Zelenogorsk, Ozerki, Primorsk, Vyborg and Tolbukhin light house control points.

January

During the first two decades there was actually no ice formation in the Gulf of Finland. Shuga was noticed in Nevskaya Guba coming from Petrokrepost Bay at Ladoga lake. At the top point of the Gulf of Vyborg there was nilas present, remaining since December. Such mild ice situation by the end of the second decade of January for 100 year history of ice observation, including air temperature data since 1871 was noted only once in January of 1930.

Real ice formation started on January 21st and during the following days its coming was steady and quite intensive. Steady ice was noted in Ust-Luga on January 22nd and in Bjorke Sund sound on January 26th. That happened about a month/month and a half later than usual.

By the end of the month there was steady ice field formed in Nevskaya Guba of about 15-25 cm thick. Further to west until Shepelevskiy light house there was also consolidated ice of 10-20 cm thick, and further to Seskar Island dark nilas and other primary ice forms. There was fast ice formed of about 20 cm thick in the Gulf of Vyborg, but there was still dark nilas and some primary ice forms in Bjorke Sund as well as in Luga and Kopor Gubas.

February

During the month further ice formation in the gulf was steady and quite intensive. By the 01st of February some fast ice was formed in Nevskaya Guba area which is a month and a half later than usual.

By the middle of third decade ice situation in the Gulf of Finland reached its maximum for the winter. The fast ice area moved west until Tolbukhin light house longitude. Ice thickness in Nevskaya Guba reached 30-45 cm which is less than average by about 20 cm. Starting from Tolbukhin light house and until Rodsher Island there was consolidated ice mainly, partly hummocked and drifting of about 15-35 cm thick. Further to west there was drifting ice of 10-20 cm thickness until Prangli Island longitude which is could be

determined as somewhere between mild and moderate situation covering about 60 percent of an average ice area.

March

Starting from the first days of the month and further during the month some steady ice destruction was noted. Fast ice in Nevskaya Guba was partly broken on Mach 11th which is three weeks earlier than average. By the end of the month it was completely broken. Ice thickness was diminishing everywhere until 15-25 cm. Starting from St.Petersburg and westwardly till Shepelevskiy light house longitude there was still ice present on various stages of development. Further westward until Gogland Island there was still some drifting ice present only in northern part of the Gulf.

The fairway leading to Ust-Luga was completely clear of ice on March 22nd, and the Luga Guba was completely clear on March 28th.

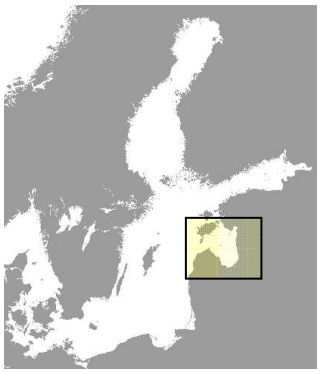
April

During the first part of the month ice destruction in the Gulf was speeding up and by the April 09th there was Gulf of Vyborg cleared including its approaches. By April 12th port Primorsk area and Bjorke Sund were cleared. Nevskaya Guba area was clear of ice on April 4th which is 20 days earlier than average. Ice was quickly disappearing from St.Petersburg fairway as well. By April 09th some consolidated ice of 9-10 and 15-25 cm thick was present only in the area between Kotlin Island and westward to Krasnaya Gorka light house. By April 16th the area was completely clear of ice which is two weeks earlier than average.

The Gulf was completely clear of ice by April 19th with some remnants melting in the area of Sestroretsk shallows.
From the point of view of ice breakers, assistance to ships during the winter was very favorable due to following reasons:

a) heavy ice period was relatively short compared to previous winters. Steady ice formation started very late at the end of January and stopped by the end of February;
b) ice thickness was much less than average;
c) during the maximum ice field expansion there was almost no windy days typically characterized by compressions.

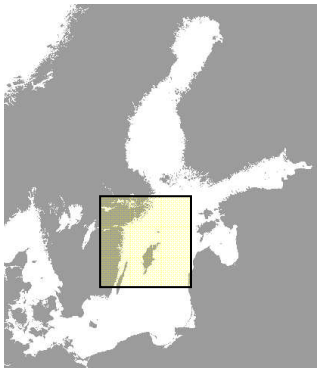
5.4. Gulf of Riga



The Estonian Meteorological and Hydrological Institute assessed the winter of 2006/2007 as moderate. The traffic restrictions were initiated 12 February being IC- 1600 kW in Pärnu and were cancelled 29 March. The icebreaking season lasted from 6 February to 29 March and 76 ships were assisted.

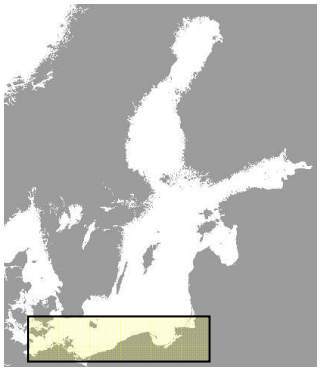
The Latvian icebreaker Varma was on stand-by at Riga during this ice season.

5.5. Central Baltic



There was no ice in the Central Baltic in this ice season.

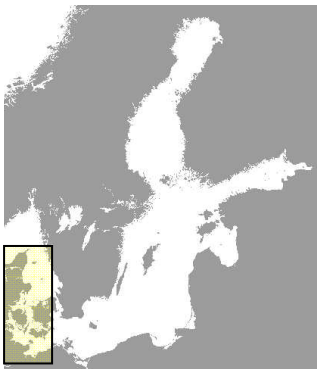
5.6. South Baltic Coastline



The ice season on the Baltic Sea South coast did not cause difficulties to merchant shipping. In Germany, local restrictions were set only in sheltered inner waters, but there were no restrictions for seagoing vessels. The icebreaking service was in force only for a small period of time.

The winter 2006/2007 in the region of Polish Coast was very gentle. Air and sea water temperatures during the season were higher than average and there was no ice formation on the approaches to the ports and in the port waters as well.

5.7. Western Baltic, Danish waters



The winter 2006 – 2007 was very mild. The average water temperature in the Danish waters was 2 degrees above the average for the past 35 years. In spite of the mild temperatures, ice in the Danish did occur. This was on the 24 and 25 January in three separate locations inshore. The reported ice was only Nilas although in one location navigation conditions was reported as difficult or dangerous for wooden vessels without ice sheathing

6. Description of organisations and icebreakers engaged during the season 2006/2007

6.1. Sweden

Icebreaking operations are managed by the Icebreaking Division of the Swedish Maritime Administration in Gothenburg and are based on the Swedish icebreaking regulation (2000:1149). It allocates icebreakers to work areas, issues traffic restrictions, monitors the operational situation and informs the shipping stakeholders of ice conditions and the traffic situation. Sweden controls eight icebreakers, of which the Swedish Maritime Administration owns five and has three on long-term charter from a private shipowner. All icebreakers are manned by a private shipping management company.

Sweden and Finland use a jointly developed IT based on-line system, IB-Net (IceBreaker Net) for coordination of the joint icebreaking operations. IBNet contains information about the weather, ice conditions and traffic situation, and transmits the information between the different connected units (icebreakers, coordination centres, VTS etc.)

In addition to the icebreakers, ice strengthened buoy tenders of the Swedish Maritime Administration and private tugboats are also engaged in the icebreaking service. Helicopters are chartered and used for ice reconnaissance and personnel transport in order to reduce time expenditure for icebreakers. Cooperation with the tugboats in ports is common around the coastline.

The governmental fairway dues cover the costs for the icebreaking operations and no vessel that receives assistance from icebreaker is charged.

Icebreakers engaged by the Swedish icebreaking service 2006/2007:

Name	Type	Engine power
ALE	Icebreaker	3500 KW
ATLE	Icebreaker	18400 KW
FREJ	Icebreaker	18400 KW
YMER	Icebreaker	18400 KW
TOR VIKING II	Icebreaker	13500 KW
VISCARIA	Tug	2600 KW
KÄMPE	Tug	1900 KW
AITIK	Tug	1800 KW
BULL	Tug	1800 KW
STARKODDER	Tug	700 KW

6.2. Finland

The Finnish Maritime Administration (FMA) is the national authority responsible for the assistance of winter navigation, its coordination, development and management nation-wide. The actual icebreaking services have been contracted out.

The FMA develops Finland's icebreaking policy, taking into account the requirements of its clients (mainly the Finnish industry). Essential for the industry are as short waiting times as possible for traffic. The FMA decides on the length of the assistance period, exemptions and traffic restrictions. On inland waterways, the authority and the right to arrange services have been delegated to the FMA Gulf of Finland Traffic Division.

The traffic restrictions are normally made more stringent at a faster pace than the minimum HELCOM safety recommendations, as the objective is to assure an efficient maritime traffic flow. Only vessels fulfilling the criteria of daily traffic restrictions are given assistance.

In 2004 the icebreaking services were purchased from the Finnish State Shipping Enterprise (Finstaship) based on a contract. During a three-year transition period, the FMA has started opening up competition in the field, which will be completely free by the end of the year 2006.

Finstaship is responsible for the management and daily operation of the icebreaking services to all 23 winter ports. The demands as to the standard of service are included in the freight contract. The main requirement is that vessels should not have to wait for an icebreaker for more than 4 hours on an average. Another goal for the Finnish icebreaker

service standard is that 90% to 95% of vessels navigating in the ice field could get through without delay.

In Finland no special fee is collected for the icebreaker service. All ships pay fairway fees based on ship size and ice class. The fairway dues are used to cover the costs of fairway maintenance and icebreaking services.

Icebreakers engaged by the Finnish Maritime Administration 2006/2007:

Name	Type	Engine power
BOTNICA	Icebreaker	15000 KW
FENNICA	Icebreaker	21000 KW
FREJ	Icebreaker	18400 KW
KONTIO	Icebreaker	21800 KW
NORDICA	Icebreaker	21000 KW
OTSO	Icebreaker	21800 KW
SISU	Icebreaker	18400 KW
URHO	Icebreaker	18400 KW
VOIMA	Icebreaker	12800 KW

Icebreaker Frej was in joint chartering with Swedish Icebreaking Service and Nordica was in off-shore operation in the North Sea due to mild winter.

6.3. Russia

The icebreaker assistance in the eastern part of the Gulf of Finland is regulated by the Harbour Master of the Port of St. Petersburg (according to Direction of Ministry of Transport BP-113-p, 30.11.2001). The Harbour Master of the Port of St. Petersburg has the power to impose any shipping restrictions in the area for the traffic bound to or from Russian ports, based on actual ice conditions (according to article Nos. 74 & 76, Russian Federal Law No. 81-FZ, Russian Merchant Marine Code, 30.04.1999).

The ice navigation assistance is conducted by the state-owned or state-chartered icebreakers and covers the ports of St. Petersburg (including merchant cargo-handling areas in Kronstadt, Lomonosov and Vasileostrovsky cargo area), Primorsk, Vyborg, Vysotsk and Ust-Luga. The state-owned icebreakers assist the inland transit navigation via Symens canal both ways.

The ice-breaker fleet consists of the following ice-breakers:

Name	Type	Engine power
CAPTAIN SOROKIN	Icebreaker	18300 KW
ERMAK	Icebreaker	30400 KW
SEMEN DEZHNEV	Icebreaker	4000 KW
IVAN KRUZENSTERN	Icebreaker	4000 KW
CAPITAN IZMAILOV	Icebreaker	3940 KW
CAPTAIN ZARUBIN	Icebreaker	4650 KW
CAPTAIN DRANITSIN	Icebreaker	16200 KW
MUDJUK	Icebreaker	9100 KW
KARU	Icebreaker	6450KW
TOR	Icebreaker	10000KW
YURI LISYANSKY	Icebreaker	4000 KW
CAPTAIN PLAKHIN	Icebreaker	4650 KW

The icebreaker assistance, as a rule, is conducted as follows:

1. Individual icebreaker assistance behind an icebreaker;
2. Icebreaker assistance in a convoy;
3. Independent ice navigation following icebreaker recommendations and strictly under her supervision.

Icebreaker assistance is given to the ships which do not fall under the acting restrictions in the ports of their destination. Icebreaker assistance for the traffic coming from the sea is conducted from the point where the convoy is formed to the inner road of the port, and the ships leaving the port are assisted from the inner road to the area next to the convoy forming point (CFP).

All the ships coming from the sea are prohibited from entering the ice east of the convoy forming point (CFP) without permission of the icebreaker. The Masters of the ships sailing independently upon receiving the permission of the icebreaker are to report to the icebreaker while passing the established control points of the recommended route and inform of the ice situation in the area. If such a ship gets stuck, the icebreakers are to release them and correct their recommended route or get them in the convoy for further motion. The Masters of the ships are not recommended to rely on data regarding recommended routes received from other ships and not confirmed by the Master of the icebreaker.

When the ice thickness over the approach fairways leading to Russian ports in the eastern part of the Gulf of Finland becomes considerable, the Harbour Master of St. Petersburg

imposes restrictions on ships the ice class and the main engine capacity of which are not sufficient for navigation under prevailing circumstances.

The permission to enter the port or the icebreaker assistance to ships under restrictions due to their ice class is granted in exceptional cases, after detailed study of their ice certificates ("Ice passport" or "Provisional recommendations on ice safety") issued by a recognized institution. The permission to enter the port or icebreaker assistance to a ship under restrictions due to her main engine capacity may be granted in case her ice class meets the requirements. The ships whose age exceeds 20 years, as a rule, are not permitted entry in case they are under restrictions.

In case such permission is granted to a ship falling under one of the restrictions established, a particular icebreaker is allocated for her assistance and the Master of that icebreaker has the authority to determine the best way to render such assistance.

6.4. Estonia

The responsible organisation for icebreaking in Estonia is the Estonian Maritime Administration. The Director-General of the Estonian Maritime Administration decides on traffic restrictions and directives on winter navigation. The icebreaking coordination center consisted of 12 members in 2007, chaired by the Head of the Maritime Safety Division of the Maritime Administration, and acts as an advisory board for the Director-General in icebreaking issues.
Ports that are serviced by state ice-breakers are Muuga Harbour, harbours of Tallinn and Kopli Bay, Paldiski North Harbour, Paldiski South Harbour, Kunda Harbour, Sillamäe Harbour and Pärnu Harbour.

Currently, Estonia has one icebreaker, TARMO, to operate in the Gulf of Finland area, and the multi-purpose vessel EVA 316 to operate in the Pärnu Bay. Icebreaking to the port of Pärnu was carried out by multi-purpose vessel EVA 316 and tugboats from Finland.

Icebreakers engaged by the Estonian Maritime Administration 2006/2007:

Name	Type	Engine power
TARMO	Icebreaker	4x2530 KW
EVA 316	Multi-Purpose Vessel	3x1717 KW
ARPPE	Tug	2x1705 KW
PROTECTOR	Tug	2700 KW

6.5. Latvia

Latvia has three international sea ports: Riga, Ventspils and Liepaja. There is one icebreaker, the VARMA, which is owned and operated by the Port of Riga, for approximately 10 years. VARMA mainly operates in the Irbe Strait. The icebreaking in Ventspils and Liepaja is carried out by tugboats. There are plans to replace the VARMA with a new icebreaker.

The estuary to the Port of Riga is affected by silting and maintenance dredging is essential to keep the depth in the fairway. A combined icebreaker/dredger should be a good solution when such investment is useful every year.

Name	Type	Engine power
VARMA	Icebreaker	10165 KW

6.6. Lithuania

The port of Klaipeda is the northernmost ice-free port in the eastern Baltic coast. Klaipeda State Seaport Authority (KSSA) is the responsible organisation for icebreaking in Klaipeda harbour waters. The Lithuanian fairways are open all year round.
There are no demand and necessity for icebreaking service in the Lithuanian coastal waters, to the border to the port area or in Butinge Terminal. During severe winters, private tugboats carry out icebreaking. In total, 11 tugboats operate in the port of Klaipeda.

6.7. Poland

In Poland the access to main seaports is the responsibility of the Maritime Administration on behalf of the Minister of Maritime Economy.

The Polish coast is presently divided into three parts, and Directors of Maritime Offices in Gdynia, Szczecin and Slupsk respectively are responsible for keeping approaches to their ports navigable and safe, also in winter season.

Since Poland has no icebreakers in the State service, the icebreaking on the approaches, roads and anchorages of the main and selected smaller ports is carried out by strong port tugs contracted from commercial tug companies.

Harbour Masters of Gdynia and Szczecin and an especially designated officer from the Maritime Office in Slupsk are responsible for the operational level of the task. Before winter season come the Harbour Master's notes from the operators of tugs on their readiness to render icebreaking service. And during winter season they receive reports from harbours in their respective regions, and give orders to start or stop icebreaking.

The information on the ice situation can be reached on the page of the Meteorological Institute in Gdynia, www.imgw.pl, also in English. This information is also sent to a number of subscribers.

During severe winters small ports are not "protected" and their fishing vessels operate from the bigger ports.

Icebreaking in the ports is the responsibility of the harbour or terminal authorities. Icebreaking outside the approaches to the ports may be rendered on request, on a commercial basis.

6.8. Germany

In Germany the Ice Service is under the responsibility of the Waterways and Shipping Administration on behalf of the Ministry of Traffic, Building and Housing. The German Ice Service is divided into two parts, ice information and icebreaking.

The German hydrographical office BSH deals with ice observation and information service, and the Waterways and Shipping Directorate North organises the icebreaking service for the harbours, coastal and sea regions in the German part of the Baltic Sea.

The German ice service plan is set up annually by the responsible authority, listing all available vessels which are able to break ice, giving information on the respective areas of icebreaking service, the expected ice situation, etc.

For missions of icebreaking on the coastal and sea area different vessels are available:

Name	Type	Engine power
NEUWERK	Multi-Purpose Vessel	8400 KW
MELLUM	Multi-Purpose Vessel	6620 KW
ARKONA	Multi-Purpose Vessel	3700 KW
BÜLK	Emergency Tug	2320 KW

In addition to that, a number of smaller tugboats and river-icebreakers are available for the inner coastal waters and harbours.

Because the ice situation in Germany does not call for icebreaker assistance every year, the operation of multifunction vessels capable of icebreaking is most useful. With "Neuwerk", "Mellum" and the new multifunction vessel "Arkona", Germany has a good combination between effective environmental protection and icebreaking during the wintertime along the coast and the affected international waterways.

6.9. Denmark

The Danish Ice Service is the responsibility of the Minister of Defence. On behalf of the minister the Danish Ice Service is managed by the navy. The Ice service is divided into two parts, ice reporting and icebreaking.

One naval officer deals with ice matters on the operational level, supported during winter by Admiral Danish Fleet Operations centre, which takes care of reports from the ice observers. The ice reporting service consists of 110 observers along the Danish coastline and about 25 observers on board ferries. They report to the Admiral Danish Fleet whenever there is ice in their respective areas. The ice observations can be accessed on Admiral Danish Fleet homepage, and they are still sent by fax to a number of subscribers. The expense of the ice service is paid for by harbours inside the Skaw with a water depth larger than 5m and shipping calling on Danish ports during winter period, from 15 December to 31 March.

The Danish Navy presently operates 3 icebreakers, DANBJØRN (built 1965), ISBJØRN (built 1966) and THORBJØRN (built 1980). DANBJØRN and ISBJØRN are expected to be in service until 2015, while THORBJØRN is expected to be in service until 2010. Apart from its own icebreakers the Ice Service also makes use of tug boats which are hired on a case to case basis. For icebreaking on the Limfjorden west of Aalborg the Ice Service has an agreement with a Danish tug boat company who keeps a tug boat on 24-hour notice during the period from 15 December to 31 March. Each winter period, from 15 December to 31 March the navy's Icebreakers are kept on a 48-hour notice. Apart from a small maintenance crew they are not fully manned continuously. If they are activated they will be crewed by naval personnel from other services within the navy.

The Danish Ice Service current capacity of 3 icebreakers is widely recognised as being insufficient. Several inquiries have been made to look into the possibilities regarding organisation and capacity. The latest inquiry was made by a working group within the Danish Navy who issued a report concerning Danish icebreakers in the future. The report recommends having two icebreakers for shallow waters, with a draft of approximately 4.5 meters, and two larger icebreakers, with a draft of approximately 6.5-7 meters, capable of breaking a channel of approximately 20 meters.

It is not every year that the ice situation in Denmark calls for icebreaker assistance. So in order to have more effective vessels the working group has been looking into multifunction vessels capable of icebreaking, with environmental protection capability, and possibly more functions e.g. FIFI, towing etc. In the near future Denmark has to replace some of the environmental protection ships. Also for these a working group is considering if multifunction vessels are possible to use, to save money, but also to have the possibility of using the vessels more effectively in environmental protection and icebreaking or both at the same time. The time frame for the first shallow water vessel is recommended to be in the very near future, but no decisions have been made.

Name	Type	Engine power
DANBJOERN	Icebreaker	8700 KW
ISBJOERN	Icebreaker	8700 KW
THORBJOERN	Icebreaker	4700 KW

In accordance with the new MODUS OPERANDI for the Danish Ice service one Icebreaker (ISBJOERN) was on 48 hours notice while the two remaining Icebreakers (DANBJOERN and THORBJOERN) were on 5 days notice in the period from 15 December to 31 March. All the crews were on 48 hours notice during the same period. From 31 March to 15 December 2007 all three Icebreakers are laid up at the naval station Frederikshavn in the North of Jutland.

New developments

Crew shortages

Due to other commitments such as International operations etc the Danish Ice service is short of personnel for anything else than an Ice campaign in Danish waters. This means that the Danish Icebreakers as far as Admiral Danish Fleet is concerned are not available for service to other Baltic area Ice services.

Future Danish Ice service

The way the Danish Ice service is organized at the moment is not satisfactory for those who pay for its upkeep. As a result of this work has been begun to look at alternative ways to organize the Ice service. This work has only just begun so it is not possible to see what this will develop in to. The only thing that will be kept with the authorities is the Command control of Ice Breaking the rest is open for change.

7.0. Norway

In Norway the government, by Norwegian Coastal Administration, is responsible for icebreaking in open waters and in the main fairways along the coast. In the fjords and the approaches to the ports the harbour/port are responsible for the ice breaking.

The Norwegian Coastal Administration operates only 2 buoy tenders that can be used for minor ice breaking operations:

Name	Type	Engine power
VILLA	Motor Vessel	700 KW
HEKKINGEN	Motor Vessel	700 KW

The ports operate tugboats which are used as ice breaker in the harbour and their approaches. These tugs are old and we don't see any renewal of the ice breaking equipment.

The winter 2006/2007 was very mild and ice coverage less than normal. Only in the fjords some ice breaking was performed by the harbours. Norwegian Coastal Administration did not perform any ice breaking by own or hired ice breakers.

ANNEX 1

PRESS RELEASE
10.1.2007
For immediate release

Joint Baltic web service on winter navigation www.baltice.org launched

A joint web service on winter navigation in the Baltic Sea area has been launched on January 10th. The purpose of the web service is to provide seafarers and the whole shipping industry with information on winter navigation and the conditions prevailing in the Baltic Sea in winter. The capability of vessels to navigate in ice has constantly improved but, due to lack of experience, the know-how of ship's crews has decreased. Furthermore, traffic volumes have increased. The aim of the free website is to give the best conceivable information on winter conditions in the Baltic Sea in order to prevent accidents and damage to vessels and to enable vessels to manage as far as possible without icebreaker assistance. The information presented on the website was formerly difficult to access as it was scattered on the websites of various organisations.

The web service contains ice reports, an up-to-date ice chart, an ice thickness chart, reporting instructions for vessels, information on traffic restrictions, icebreaker operating areas and ice navigation courses for seafarers. Data is collected from the organisations responsible for winter navigation in the Baltic Sea area.

The idea to create an ice data portal originates from Baltic Icebreaking Management (BIM) and is part of the Baltic Sea Winter Motorways project, which is led by the Finnish Maritime Administration. BIM, which was founded in 2004, consists of the icebreaker managements of the Baltic Sea countries, i.e. Finland, Sweden, Denmark, Norway, Germany, Poland, Estonia, Latvia, Lithuania and Russia. The whole project was carried out in Finland and Finland will continue to coordinate it in the future. Moreover, Baltic Icebreaking Management will be chaired by the Finnish Maritime Administration for the next two years. The project has been financed by Finland, Sweden, Denmark, Estonia, Russia and the EU.

AffectoGenimap has been in charge of the technical implementation of the project. During the website's first year of existence, ice information will be provided by the Ice service of the Finnish Institute of Marine Research.

The address of the website is www.baltice.org.

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ANNEX 2

PRESS RELEASE
11.4.2007
For immediate release

Training in ice navigation for seafarers

The Baltic Sea states wish to enhance safety and the efficiency of vessel traffic also by means of instruction. The video guide "Ice Navigation and Baltic Ice Conditions", which has only just been released, is intended especially for those seafarers who lack experience in ice navigation.

Traffic in the Baltic is constantly increasing. Although ships' capability of navigating in ice has improved, know how on board has deteriorated owing to lack of experience. This is why it was felt that there was a need for a winter navigation guidance video. Training material of this kind has not been available before. The English language video deals with matters crucial to winter navigation: the ice situation and the various types of ice, ships' capability of navigating in ice, means of avoiding icing of ships and equipment, voyage planning and operation in ice. The video can be watched free-of-charge at www.baltice.org (Ice Training Movie).

The project has been financed by the Finnish Maritime Administration and the European Union, the Swedish and Estonian Maritime Administrations, the Danish Ministry of Defence and St. Petersburg Port Authority, which all distribute the video on DVD in their own countries. In Finland, copies of the DVD have been sent to the maritime colleges. The Finnish Maritime Administration has been responsible for the realization of the whole project.

Guidance for seafarers is also provided by the joint Baltic Sea web service www.baltice.org, which was launched in January this year. Both the web service and the video have been produced by Baltic Icebreaking Management (BIM), a board for various joint projects realized by the icebreaking authorities of the Baltic Sea states.

The web service and the video are part of a EU financed project called Baltic sea Winter Motorways. A third project included is the report 'Study on frequent lines – Differences in running costs between an icebreaking cargo vessel and a vessel that needs icebreaker assistance', which has been published by the Finnish Maritime Administration (Merenkulkulaitoksen julkaisuja 7/2006).

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