Partnership North Calotte

EU INTERREG III A PROJECT

MariTerm AB

BREAKING THE ICE IN THE BALTIC

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1 Summary and conclusions

Finland and Sweden have organised the Maritime Administrations as commercial Administrations. The result of this is that the Administrations finance the whole administration and the investments by dues from the ships call the ports and in Sweden also from the cargo. The total budget for the Administration in each country is about MEUR 155 - 175. This cover mainly the running costs of the operation, the pilots and the inspection. When it comes to infrastructure investments they are very limited in normal cases. Larger infrastructure investments must be financed in some other way. As the sea transport infrastructure is not a part of National budgets for infrastructure, there are no reservations for sea transports in the National budget for infrastructure investments and hence is it not included in the long term infrastructure planning. Sea transports become and an outsider in the transport-planning program, although the whole industry is depending on the sea transports and it is of a vital national concern.

The cost of icebreaking is estimated at about 20 % of the budget of each Administration. In the year 2002 the total sum for icebreaking cost in Finland (MEUR 37) and Sweden (MEUR 24,4) was about MEUR 60. The annual cost varies more in Sweden than in Finland because of the weather, winds and the geography. Finland needs to use all their icebreakers in the winter season while the use of icebreakers in Sweden depends very much on the extension of ice in and around the Swedish coast.

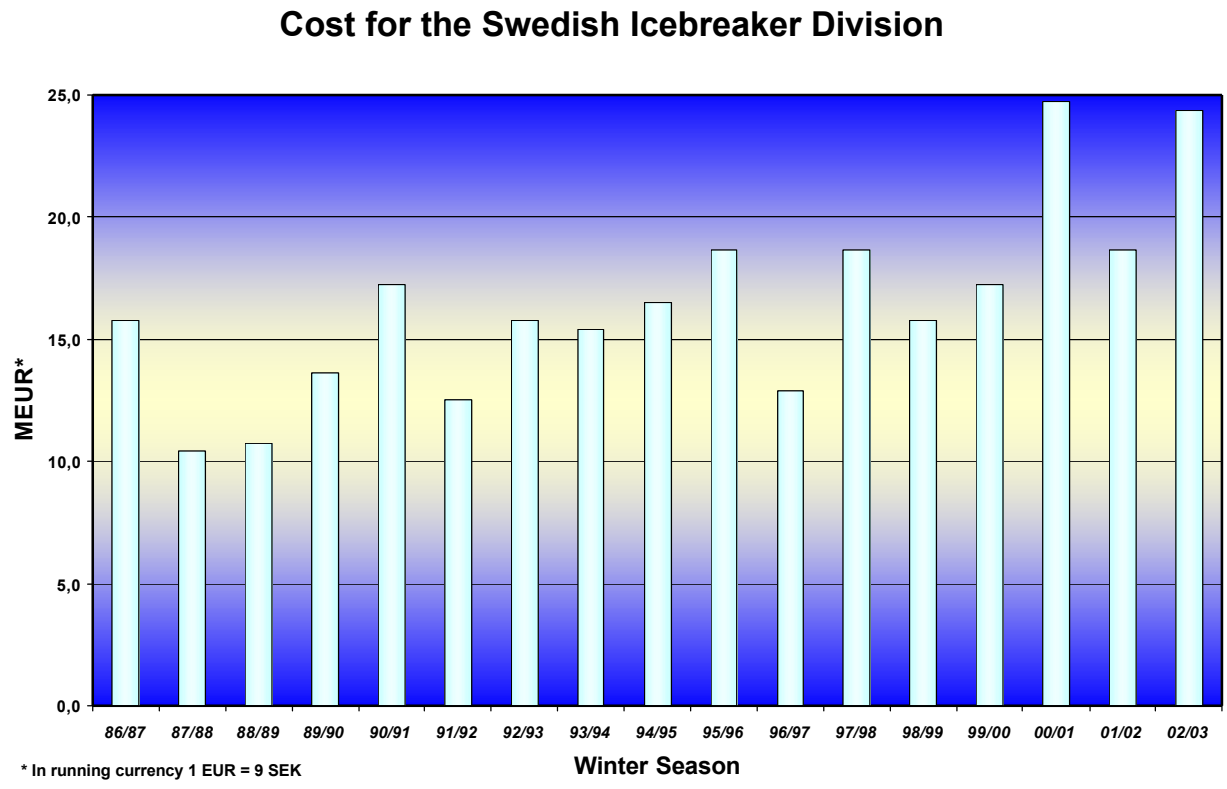

Figure 1 There is a wide fluctuation in costs between winter seasons in Sweden

The icebreaking resource is today a National resource of special concern as it is a prerequisite for an all year industry operation/production in Finland and in northern Sweden.

Sweden and Finland have a close cooperation based on a Scandinavian agreement on how to use the resources to ensure all year access to the ports, especially in the Gulf of Bothnia.

The icebreakers represent a powerful resource not only for breaking the ice but also for rescue services, towing and other services that can assist in protecting the environment and increase the safety in sea transport. Most of the icebreakers are not in service between May and December. The recently built icebreakers are multipurpose vessels that have powerful towing performance, can assist in anchor handling and be used as supply ships. All icebreakers could be used as standby ships or participate in environmental/safety operations in the Baltic during the off-season.

The sea traffic has increased in the Baltic, especially the operation of larger tankers. The Russian port Primorsk is exporting a volume of 1 million tons crude oil per month and in a few years this will come up to 5 million tons per month. If considering only large tankers of abt 100 000 tons it will be almost two calls (fours passages) per day of tankers to this destination in the Baltic. Smaller tankers gives increase in number of trips. This implies a significant increase of risk, which has to be supplemented by measures of safety and have resources and to be alert in case of incidents. The risk increases because of the equally considerable consequence arising, if a ship in distress causes oil pollution. These must be readily available resources capable of handling the situation. The icebreaker fleet can be a powerful resource and play an important role at a marginal cost.

Finland, Sweden and other countries in EU have become more and more dependant on the supplies from the Baltic countries and Russia. In the winters the Baltic States have not enough resources to assist the ships to and from their ports during a normal winter. The same applies to Poland and in severe winters also to Germany, although there is an agreement between Sweden and Germany on how to use the resources best. The icebreaking resources in Denmark are as well not powerful enough or of such size that they can assist a 100 000 tons tanker stuck in the ice.

This report aims to present the icebreaker asset as an area resource in the Baltic rather than a National resource. It could be administered under the EU by a common EU budget to be used where required all year round giving the best priority to all countries to ensure a safe trading and all year mobility in the whole Baltic Sea Region.

2 Introduction

The Interreg IIIA project, “Partnership North Calotte”, contracted in 2002 a study to investigate the hindrance for deeper cooperation in sea transports in the Bothnia Bay area. The result of the project was presented in a report “Cooperation for Sea Transports in Bothnia Bay” in May 2003. The report highlighted the high national dues on port calls in Finland and Sweden as one of the reasons for a limited joint use of shipping services between the countries. Joint operation is mainly found within each country.

The question of cost for the icebreaking came up as one of the reasons for high National dues and by this high cost for shipping by sea. A thorough study has thus been carried out in this area and the reason for Finnish and Swedish industry to take on and cover the cost for making the waters accessible in the BSR has been questioned.

The aim of this study is to assess the use of icebreaking organisations in the Baltic, to discuss the added value of employing the resources on a wider range. The idea is also to see the resources from the EU perspective the and in the conjunction with the other safety tasks that can be performed by powerful vessels like the icebreakers. There is a common EU demand for a function, TEN-T, which also includes the sea routes. The importance of the Northern Baltic Sea routes was demonstrated in the presented report. It is a deep National concern for all Baltic countries as well as for the trading partners in EU that the accessibility of the sea routes is maintained all year round.

The Baltic Sea trade is rapidly growing. For the Northern region this has meant that a great deal of the imported supplies for the paper and metal industry now comes from countries that previously formed a part of the relatively closed eastern block. The infrastructure has been an issue for regional politics within Europe. Sometimes it is difficult to make priorities when costly investment in one region is to be compared to the needs of other regions. At the same time, the transports and the infrastructure must be seen from an international perspective.

Some means of transport, as sea transports and airfreight, have always operated on commercial conditions and have covered the costs for its infrastructure such as terminals, fairways and service. The competition is mainly within the transport mode. The society has invested in facilities of social importance. It was natural to make way for sea transports, increase the capacity of fairways and extend the ports when heavy goods only could be transported on ships. The important thing was to strengthen industries and facilitate for their development.

Today the accessibility is almost an eliminated issue because of the wide expansion of the road- and railroad network. A new phase is now starting. Today the topic is how to control the total flow to maintain the mobility in the future. In this picture it is important to use all available means of transport. The means of control will grow in importance and it can give effects in many different ways. Most important is that it will result in a long-term sustainable development.

In the BSR the bulk cargo in different forms is the main commodity transported by sea. In frequency it is of course the ferries that dominates. However, most of the ferries are very powerful and do not need assistance from icebreakers unless there are severe conditions. This arrangement is necessary as the ferries can never be dependant on icebreaking service for its operation. Ferries that need assistance from icebreakers are not recommended to leave the port until notice is given from the ice office. Most of the distributions of break bulk products from the forest industry and the steel industry in semi-fabricated to finished products are shipped by sea in a regular systems traffic. These operations are historically known as leaders in the development of sea transport concepts and are of high ice class to ensure all year mobility.

Bulk cargo varies substantially by character. Break bulk can normally be carried in containers or as break stowage on Ro/Ro-ships. The ships are more or less designed for a single or a few types of products. However, the ports are expected to give service to all types of ships using suitable handling equipment, relevant competence and terminal capacity to give the sea transport the service that is demanded in an efficient and productive way. The port will cease to exist if there are no commodities shipped from the port. Some claims that there are too many ports in Scandinavia. This type of statement is rather to protection of own interests than stating a logistic fact as the port activities fully commercially operated activities. Ports are built where there is demand for sea transport. Sweden and Finland have a relatively high number of ports, which must be considered as an extremely valuable infrastructure resource. Sea transportation is especially important to the industries that import raw material and those that export products in bulk where the low cost product demand rational and cost effective handling and low transportation cost. For these types of industries that have a large turnover, the level of transport costs can be decisive for where the industry is located. Industries of this type exist in the whole Baltic area today.

To load the cargo on a ship as close as possible to the industry reduces road- and railroad traffic. Sea transport reduces road congestion and the risk of life and limb in road accidents. Furthermore, fairways and waterways are not exposed to wear and tear. However, it is important for a sustainable society to have good accessibility to the ports from road, rail and sea. What decide the capacity of the sea transport is the demand and the ship parameters like; length, width and depth.

Ships are designed to carry different types of products as efficiently as possible. Sea transport has in general an economy of scale. The larger the quantity per shipment, the lower the cost per ton. Bulk products, which are mostly shipped by sea, are normally a low value cargo, which is why the cost of warehousing can be overlooked in comparison to the transport cost. The time of a transport is therefore only of interest to be considered for very high valued products.

Table 1 below shows that the major goods flow is in international traffic. Sea transports in the Bothnia Bay is by this very important for Northern Sweden and Finland. The domestic transports are relatively well balanced. Forest and steel products in large outgoing quantities dominated the exports. Much less supplies and consumables is imported as return cargo.

Table 1 Port turnover in the Bothnia Bay

Port/customer area, 1000 ton	Unloaded foreign	Loaded foreign	Unloaded domestic	Loaded domestic	Total
Torneå	311	270	164	14	759
Kemi	946	1 254	417	0	2 618
Oulu, Oulu	810	743	527	3	2 084
Kalajoki, Rahja	41	283	0	0	324
Raahe, Brahestad	4 507	929	380	372	6 188
Kokkola	1 197	1 750	461	107	3 516
Pietarsaari, Jakobstad	399	619	80	20	1 118
Bothnia bay, Finland	8 211	5 848	2 029	516	16 607
Haparandas customer area (Karlsborg)	58	46	0	0	104
Luleå	1 881	2 946	625	1 334	6 786
Piteå och Haraholmen	733	697	0	25	1 455
Skellefteå hamnar	622	834	80	134	1 670
Bothnia Bay, Sweden	3 294	4 523	705	1 493	10 015
Bothnia Bay, Total	**11 505**	**10 372**	**2 735**	**2 010**	**26 622**

2.1 Fairway dues

Sweden and Finland are unique in Europe to have National Dues on sea transports. In both the countries the fairway dues on the ships and the cargo cover all the cost for the Administrations and infrastructures and it should also cover for an interest on the invested capital.

The dues on sea transports acts as a means of control that shift transports to another transport mode. The strength of the sea transports are the low cost per ton kilometre and the environmental friendliness in land use/land take, barrier effects, noise, congestion, use of energy, low maintenance etc. Service that is included in dues for a land transport mode, such as traffic control (pilots), is costs that have to be paid by the ship in sea transports.

The governmental dues per ton of goods transported in domestic traffic in Sweden, for a 500 kilometres long transport, are 7 times higher per ton for a sea transport than for rail transport and almost twice as high as for road transport.

In the same way the governmental dues in Finland are very high for ships without the strongest ice classes. The reason for such high dues in both the countries is the same. In both countries the administration of sea transport infrastructure is run by commercial administrations, while for the land transport the administrations are financed from the state budget. Even if the ship fairway dues are not as high in Sweden as in Finland the total fee for the industry shipping from the region will be almost twice as high for Swedish systems than for Finnish. The reason for this is that dues are charged on shipped cargo as well and these dues also applies to domestic traffic. The dues act as means of control that in Finland works in favour for ships with high ice class (see Figure 2) and the for ships with good environmental performance in Sweden, see Figure 3.

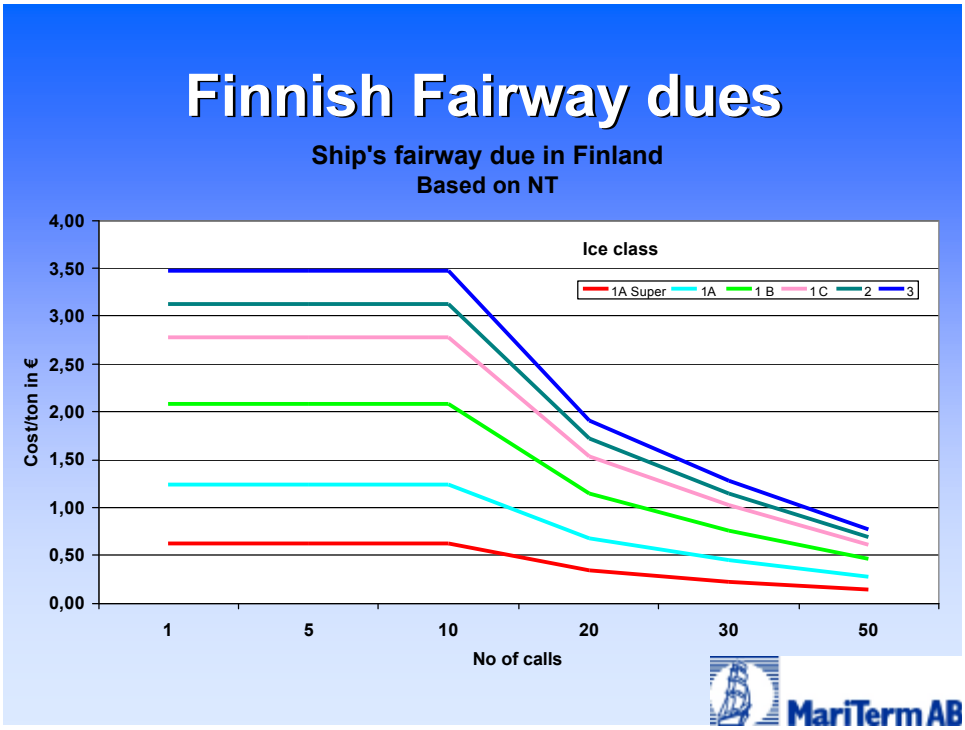

Figure 2 **The Finnish fairway dues are solely built up on the Ice Class of the ship the figure show an example of the cost of dues for a 10 000 ton ship in charter on Finland**

The effect is that the only high frequent shipments for the steel industry in the region, which are shipping low value bulk goods, operate in both countries. The other shipping systems are strictly separated in each country.

The high rate of dues are of significance for the use of sea transports in areas as the Gulf of Bothnia where a joint shipping operation can be a natural possibility to rationalise the operation and cut costs. Today the industry shipping systems found in the Baltic area for one or a few industries are either Swedish or Finnish.

As Sweden and Finland are the two only counties in the EU to have national dues on sea transports, the dues act as a toll for ships passing over the border between the two countries. It also acts as a toll when ships that call other countries on route between two Finnish or Swedish ports as they are “coming from another country” when calling the port and thus they are obliged to pay new dues. In this way the borders between the countries in EU still exist for sea transports. The result is an increase in cost for a sea transport, as dues must be paid for a service that call on both countries in the same voyage.

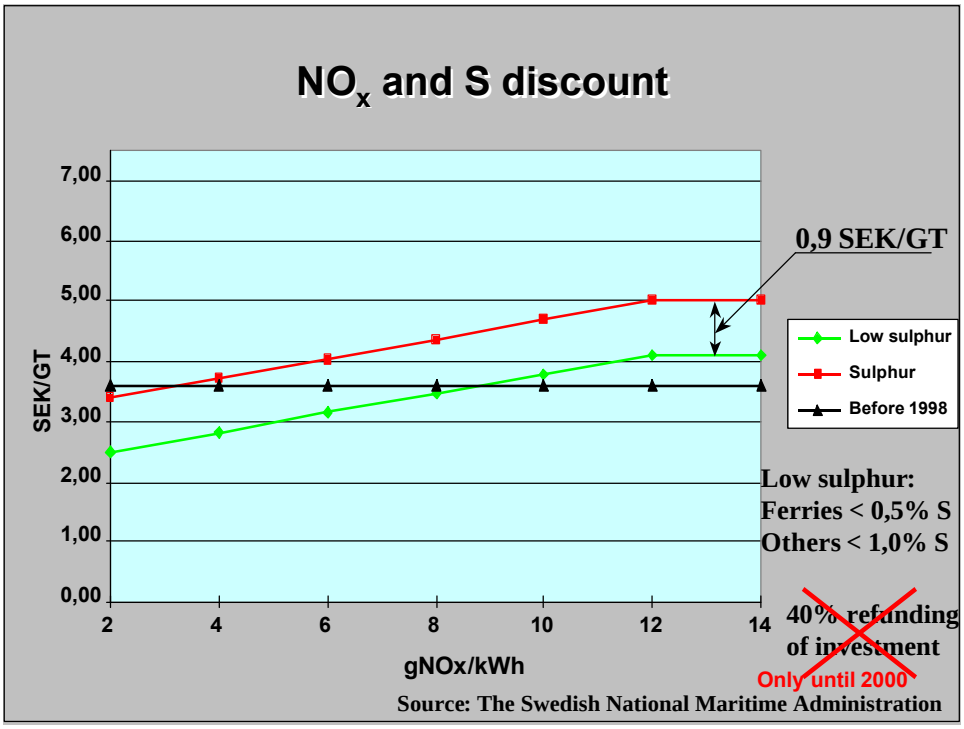

Figure 3 The Swedish fairway dues on ships, in addition comes SEK 3.6 on every ton cargo

The industry claims, when prompted, that fairway dues and the differences in the systems between the countries are the main reasons for no cooperation in sea transportation over the border.

The total cost for the icebreaking system is a substantial part of the maritime administrative costs. The Swedish Maritime Administrations presents a break-up that shows about 18 % of the total budget as the cost of icebreakers.

Kostnader	1400 milj kronor	**EUR 154 Milj.**
Lotsning	410	
Sjötrafikinformation	55	
Isbrytning	250	**18 %**
Farledsutmärkning	200	
Sjökort	100	
Sjöfartsinspektion	110	
Sjöräddning	75	
Övrigt	200	

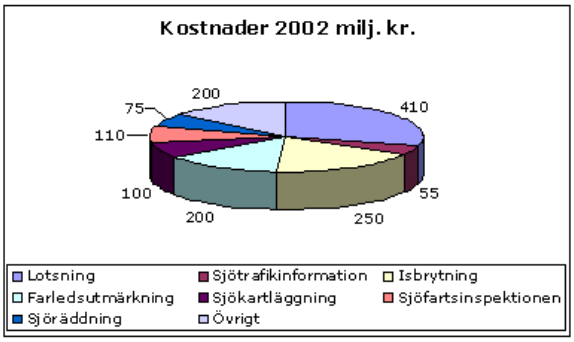

Figure 4 A split of the Swedish budget of the Maritime Administration

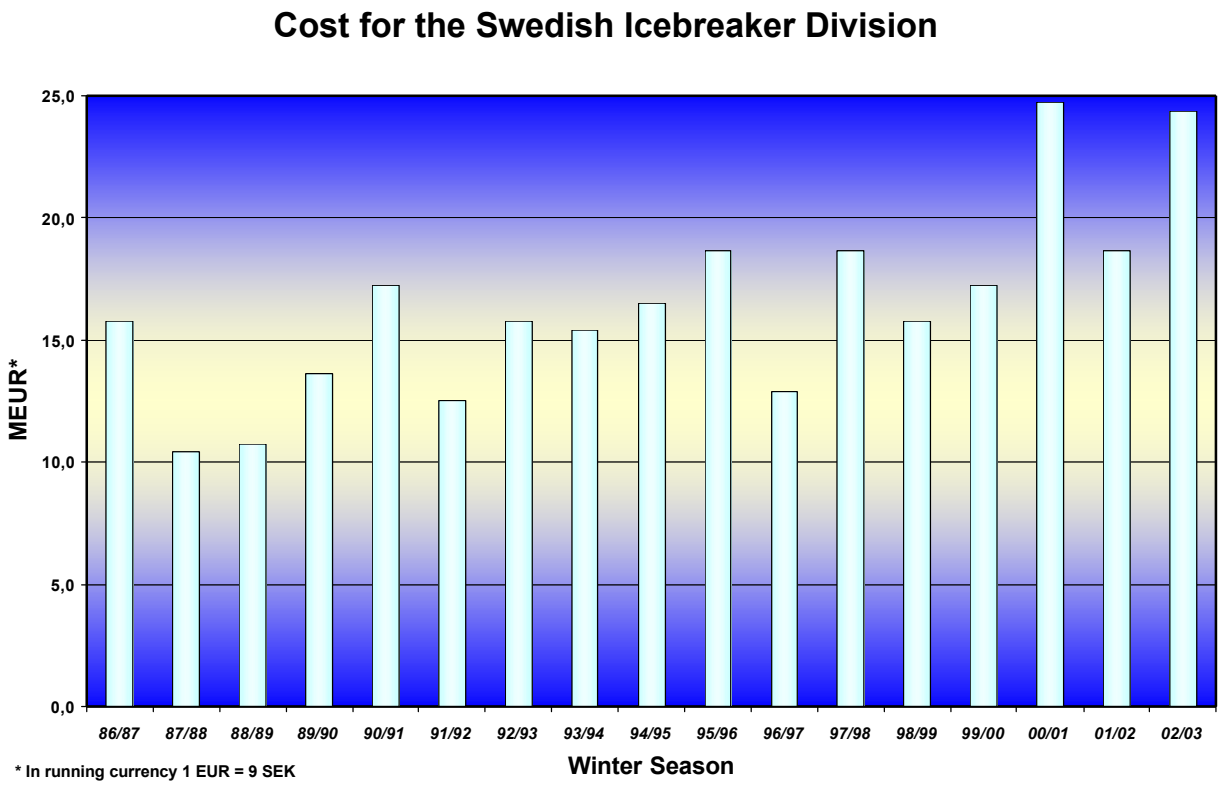

Figure 5 The annual cost for breaking the ice varies substantially beween the years

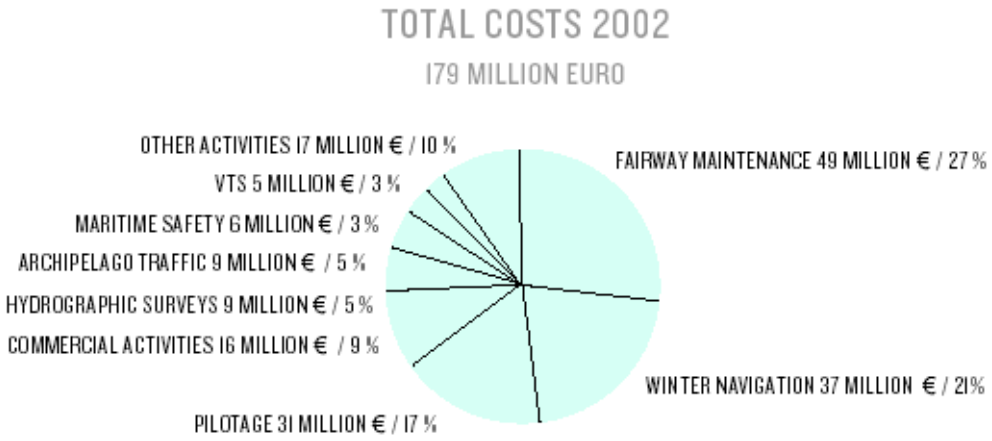

Figure 6 The budget of the Finnish Maritime Administration

In Figure 4, shows that the cost of icebreaking for the year 2002 in Sweden was abt 18 % (MEUR 20 – 25 per year) of the total budget of BSEK 1,4 (EUR 155 550 million). The cost for the Finnish is totally about MEUR 37 but will be reduced when the capital cost is depreciated for the latest icebreakers. In the Figure 6, only the cost for the winter navigation is around 21 % of the budget.

The ice season is because of the winds and waters normally somewhat longer in Finland and the Administration is always using all the icebreakers.

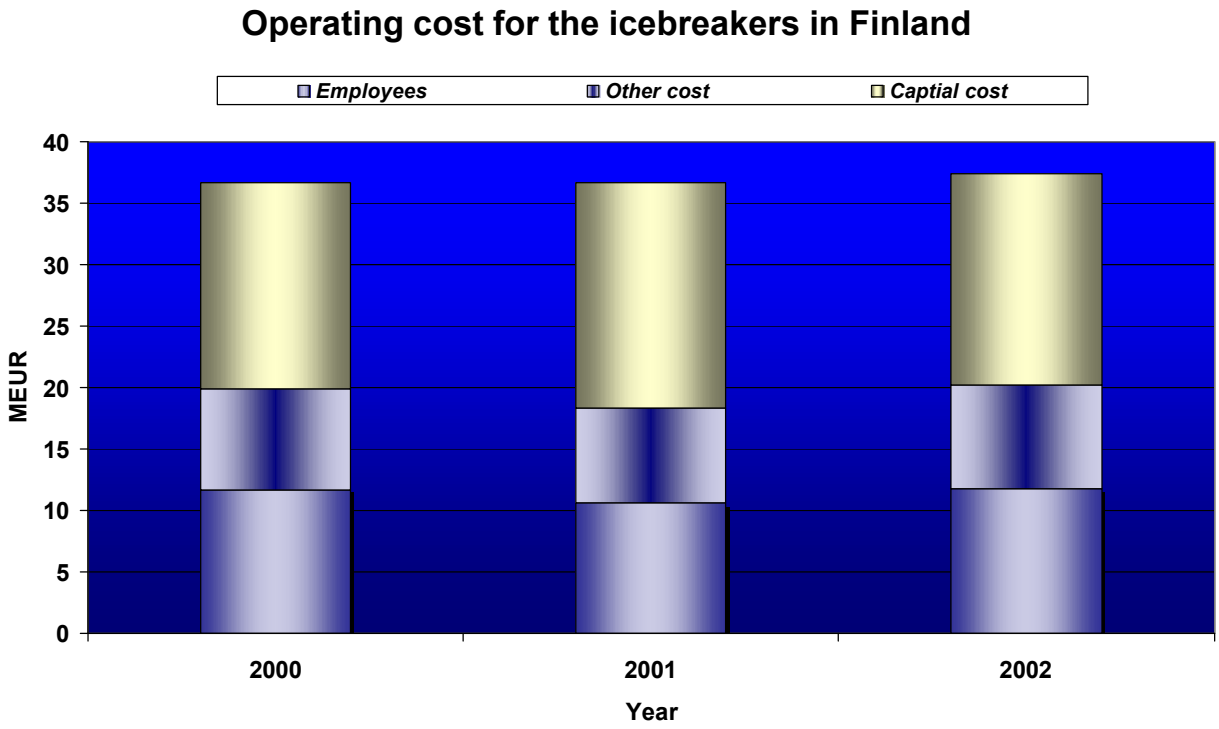

Figure 7 The Finnish operating cost for icebreakers

The total cost of the icebreaking system is substantial as the total Swedish and Finnish cost for the icebreaking sums up at a figure of around MEUR 60 annually. However, more important than the cost is the safety and the responsibility/concern of the area.

2.2 Ice conditions

Winter shipping can be considered equivalent for both countries. The cooperation between the Finnish and Swedish icebreakers in the entire area is smooth. The industries cover the total costs caused by the ice conditions. These costs come in several forms, partly the added cost for higher standard of ships designed for the winter environment, partly the direct cost for the icebreaking service paid in ports, further assistance in secondary fairways, in ports to berth, increased bunker, increased insurance, damages to propeller and other parts of the ship etc. The costs of fairway dues and added cost for ships of high standard and other costs related to the ice conditions are to be covered by the shipper.

In Finland almost all ports are dependant on the icebreaking services. In Sweden it is mainly the ports in the Gulf of Bothnia that demand icebreaking services every year. The national fairway dues charged at in all ports and terminals (public and private) cover this cost. The ports on the south- and west coast are objecting to this arrangement. The added costs for the ice conditions in the Bothnia Sea, the Bothnia Bay and the Gulf of Finland is financed totally by Swedish and Finnish industry through the higher freight rates. It is not rational to put all the cost on industries mainly situated in an area that is already classified as an Objective 1 area because of low population and the increased urbanisation. It is proposed that EU entirely should carry the added cost caused by the climatic condition. A discreet measure considering:

- The area's importance for the raw material and semi-fabricated products it supplies within the EU

- Safety for ensuring the accessibility in the Gulf of Finland and for the Baltic states that will soon be EU-countries
- The policy taken by EU to secure the standard of road- and railroad traffic in Objective 1 and remote areas

The stimulation that will be achieved is beneficial for a region that today is weakened by increased urbanisation and closing of industries.

There is every reason to hope for the Finnish and Swedish politicians to look to the environmental and transport economy issues for the future and stimulate the use of sea transport instead of holding on to old principles. Today EU address high hopes that developed sea transport can discharge road and rail from congestion. Ships transport mainly bulk goods with a relatively low value that has no alternative way of transport. An increased use of sea transport, for a wider range of products from the industry, must come from using some kind of cargo carrier, rational handling systems and low rates for intermodal transports. Under such conditions ships offer a more realistic approach for carrying goods thus increasing their share in modes of transportation. This is fully in line with the policy that EU outlines in the White Paper; “European transport policy for 2010: time to decide”.

The ice condition in the BSR varies a lot between years. For the smooth operation of the industry it is very important that the ports can be open throughout the year. Thus the resources to keep the waters open and accessible, should function efficiently to provide the mobility and safety. The trading in the Baltic is lively and increases. An example is the bulk transport for the steel industry. The main iron pellet shipment is 2 million tons/year from Luleå to Raahe.

Here you find a frequent all year round operation between Poland, Finland and Sweden. Further Sweden and Finland import alloys from the Baltic States and Russia. From these countries scarp steel is also a common product.

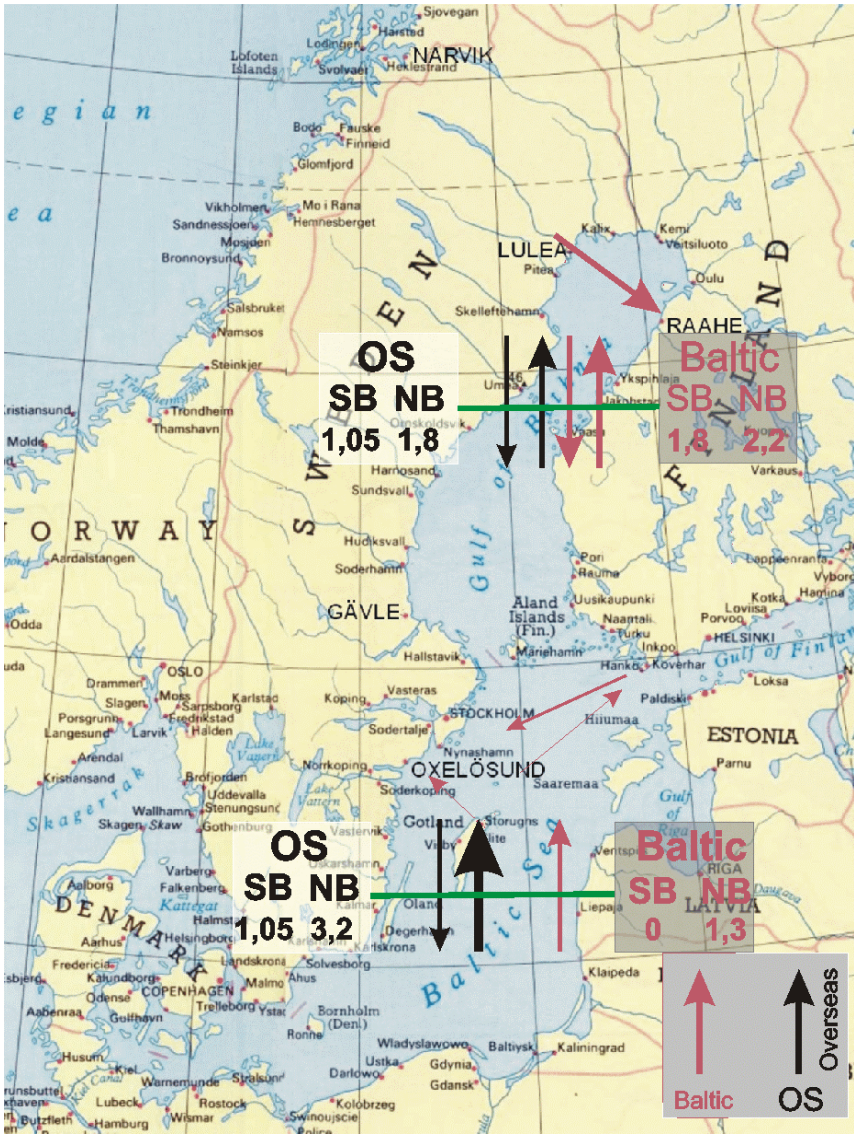

Figure 8 The bulk transports in the Baltic

The sea transports is lively across the Bothnia Bay, From Gotland to Oxelösund and Koverhar in Finland is lime stone transported. From Poland to Sweden and Finland is coal transported.

The tonnage involved in these transports is ice strengthened bulk ships or barge systems. The tonnage is specially designed for the Baltic area.

See also Chapter 3.2.

3 The role of the icebreaker

Over the history there have always been common Finnish and Swedish interests to cooperate in and have safe navigability during wintertime. Both countries have, as presented previously, a substantial shipping activity of metal and forest industry products in the whole Baltic area. The sea traffic is vivid and steadily increasing in the Baltic. The Finnish and Swedish industry is depending on raw material and supplies from the Baltic States and Russia. The coal transports from Poland is a part of the Finnish Swedish iron industry and there is a closed distribution system of raw bulk material and semi-fabricated iron products in the Baltic. See Figure 8.

In the Baltic area it has been a joint interest from the Finnish and Swedish sides to spare no resources to get the ships safely in and out of the ports in order to take out the exports and bring in the raw materials and the energy. In the 60-ties it was jointly decided that the fairways to all major ports in the Gulf of Bothnia should be kept open over the winter season. In the beginning of the 70-ties this could be fulfilled after having to make up with a number of large icebreakers of a size that actively could force the ice and lead the ships in convoys.

In the 60-ties (1961) a Nordic agreement was closed between Finland, Sweden, Denmark and Norway of co-operation in planning for the icebreaking and how to share the responsibilities in order to keep sea transports in force during the winter period. This became the base for a more formal co-operation and plans were made up for how to meet all types of ice conditions using the joint resources.

The management of the icebreaking resources have made use of Information Technology to manage the resources in an effective way. An IBNet has been set up, which is a communication system that makes use of AIS and displays on line all activities in the BSR to the Finnish and Swedish icebreaking offices. This is the first step of making use of the AIS system. It will be a powerful tool once it is in full force and installed on all ships.

As of today, all ships are announced to the icebreaking office when contracted and scheduled by the ship’s agent. In this way it is possible for the management to direct the ship to a suitable position when she arrives and to fit her in the convoys or provide other ways of support to ensure that she reaches her destination.

The present plans cover all types of ice conditions from very mild winters to winters where the whole area from Skagerrak to the Gulf of Bothnia is covered with ice.

Today there is a difference in the Swedish and Finnish rules on the distance to which the ships are assisted to the port. In Sweden the icebreaker assist until the ship is safe and well inside of the sheltered fairway to the port, while she is assisted all the way to the port area in Finland.

3.1 Special concerns about navigation in ice

The Finnish and Swedish Maritime administrations issue restrictions in demand of fulfilling a minimum ice class for vessels calling the ports in the ice regions in the ice season if the ship should count on icebreaker assistance. This is done with consideration to the actual situation and is announced weeks ahead of implementation. The grades of restrictions are continuously followed up over the season. Ships suitable for forcing the ice can expect assistance from icebreakers when entering the ice affected waters and assistance in guidance through to the port of destination and out of the ice area again. Ships not suitable for following the convoy in ice can be declared not suitable for ice conditions and cannot expect assistance from the icebreakers.

Larger ships (mainly it concerns ship's width) have to be assisted by two icebreakers to break a fairway big enough to keep the ship in motion without getting stuck in ice. The ice office is planning the assistance of ships in order to make the best use of the available resources. The result is that assistance is given to ships as they come in the queue. However, larger ships that demand two icebreakers may wait for this resource to be available and may be prioritised if two icebreakers are readily available. Assisting these vessels occupies a lot of resources. At least one of the icebreakers must divert from assisting other ships.

The problem is ships that cannot catch up with the convoy in the ice-fairway. It causes the convoy to halt and the icebreaker to turnaround to get the vessels out of the problems normally by couple her in tow to make her keep speed. The result causes delay and costs for all the other ships and their charters. Ships causing this kind of problems is noted and warned to not expect further assistance in future[1]. The ship will be assisted to the port of destination and out of the ice again. When leaving the area the warning will be given to the captain and a note will be sent to the ship owner and the shipping agent. The newly implemented ice rule has reduced this problem significantly.

Sweden and Finland has ratified an amendment to the ice class rules. The amendment is focusing on the ships hull and the parameters that have been found to affect the ships ability to navigate in ice.

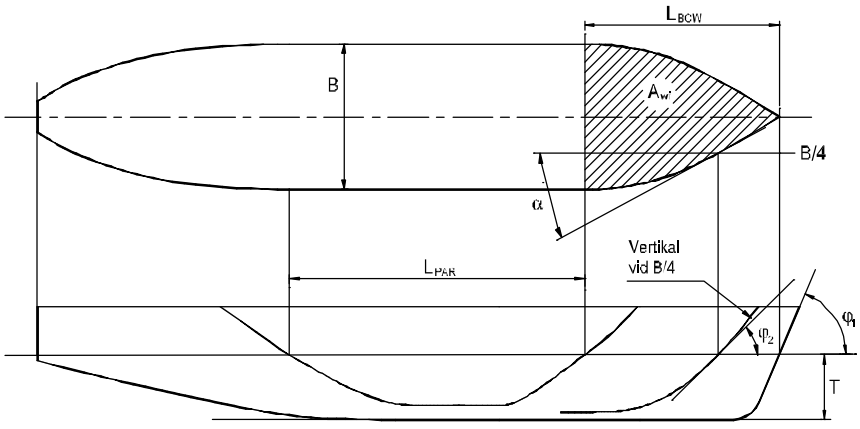

Figure 9 Ships parameters that affect the ability to force ice

[1] This unless there is a temporary accident or unexpected damage that has affected the vessels condition

The object is to as far as possible try to avoid ships not suitable for ice to operate in the ice affected areas. The new ice class rules focus on the form of the hull, described as functions of angles that will affect the ship's resistance in ice. Hence it gives the demand of power to be installed in the ship to get a certain ice class. As in all situations when rules are changed it will affect some ships and ship owners that have purpose built vessels for ice conditions. In Sweden and Finland the ships designed to operate on the lakes are the ones to be most affected. In order to carry as much cargo as possible these ships are designed to fill the locks. It gives quite high angles and a long parallel side of the ship. Hence the existing ships will not fulfil the ice class they once obtained. The effect of which can be very expensive for the ship owner.

3.2 Safety in ice navigation

Ships can never be left stuck in the ice. If the ice starts moving the ship may be forced aground without any way of saving it. The really dangerous situation is to have moving ice in hard winds. The ice masses represent a huge amount of force that can expose almost any type of ship that cannot head and force to danger.

The ice class has three major functions;

- the hull itself shall be able to take the ice pressure related to the ice class of the ship
- the propulsion and steering equipment are strong enough to work properly in ice
- the ship has enough power to force the ice and follow the icebreaker.

Most of the times it is not dangerous to navigate in firm thick ice. The dangerous situation is to come from the open sea in hard winds and pass the ice ridge. The waves and the grounding up when entering the fairway to the ports cause the ice to build up and fill up the full depth forming a barrier between the open sea and the sheltered waters. Only the most powerful ships can force their way through this barrier. Ships often get stuck having just the stem in the ice and the icebreaker has to get it in bit by bit to come in to waters that is calm enough to connect the ship to the towing winch of the icebreaker. The situation is a balance in keeping the ships in controlled course. It is time consuming and demands officers skilled enough not to loose control of the ship. To navigate an icebreaker safely and productively so that the convoy or the towed ship can follow requires skill and experience.

Moving ice is also a danger. Ice moves with the winds and once it has start moving it will only stop when the energy is absorbed in fixed formations. When the ice stop it is compressed and when it collides with the ice that has slowed down, ice drifts build up with 90 % of the ice under water. This creates ice ridges that float around with the ice. The most essential part of managing and directing ice breaking is to keep a track of the situation of the ice and where the conditions for navigation are most favourable and safe. Ships are directed to the ice channels that occur on the wind side of the sea. If the wind shifts and increases, the ships in these channels can be in danger. Actions have to be taken to make their way to safe positions and have as few ships as possible in danger. In such a situation they need to be assisted by the icebreakers to a safer position. To avoid this kind of situations the weather forecast and the planning of ships movements are very important and is one of the main tasks for the icebreaker office.

Ice ridges multiply during the wintertime as the wind shifts and the ice drifts in various directions the ridges will follow the ice until the sea is frozen. The result will be a fully covered area of firm ice with ridges. Coming this far the ice thickness is normally 20 –30 cm minimum but can be up to 1 m. The situation is better from an icebreaking point of view as the ice fairways now will stay in position and can be used by the icebreakers and ships with good ice going capacity. In this situation the icebreakers job is to lead convoys regularly up and down the coast. Normally the largest icebreaker is assigned to do this to be supported area wise by other icebreakers that assist the ships between the ports and the fairway.

The dangerous part for the navigation is the moving ice and ships that are locked in moving ice unable to manoeuvre. This risk becomes higher in scale in the South of the Baltic Sea as the ship traffic will continue to increase rapidly especially with regards to tankers. The Russian port Primorsk is exporting a volume of 1 million tons crude oil per month and in a few years this will come up to 5 million tons per month. If considering only large tankers of abt 100 000 tons it will be almost two calls (fours passages) per day of tankers to this destination in the Baltic. Smaller tankers gives increase in number of trips.

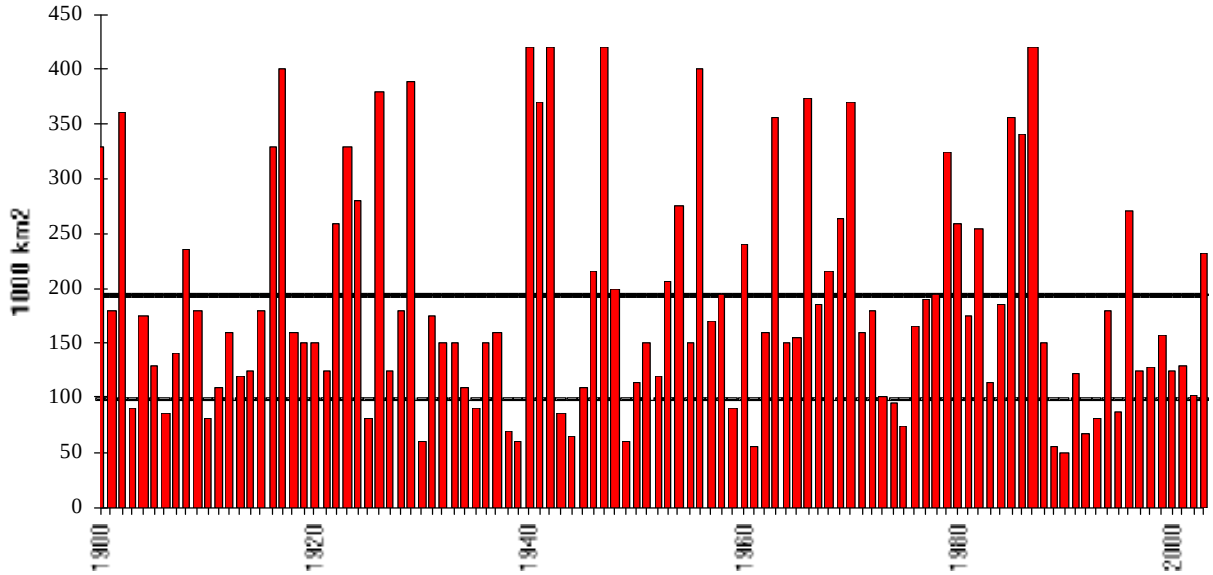

Figure 10 Ice area coverage in the Baltic over the years

In the winter season 2002-03 the ice coverage was a bit more than average but the ice situation in some parts of the Baltic was a bit worse than the coverage indicates. In the Bothnia Bay and in the Finnish Gulf the situation was harder as the wind and the temperature had shifted around the ice that froze and became difficult to force.

Another problem is that the ships calling Russia is of a width that requires two large icebreakers to assist it. It is also well known that the mass of a moving tanker (the energy of 130 –140 000 tons of 1 – 2 m/s cannot be stopped easily) will be a hazard to itself and in extreme condition also to the icebreakers if not controlled properly.

The question is how to ensure safe transport in the Baltic in wintertime as these potentially environmental bombs need assistance from the Skaw to Primorsk. The financial arrangement for such a set up is also to be considered.

A hard winter can be very dangerous considering the ice situation during the winters 1986-87 and 2002-03. As previously stated it is not the firm thick ice but moving ice complimented by the hard winds that is dangerous. In some respect the ice situation in the Finnish Gulf was just as hard 2003 as it was 1987 not because of the amount of ice but because of strong winds.

Considering the ice situation of 1987 and the state of traffic today, the tankers need efficient assistance through the Belt and in the southern part and the Baltic. They also need a safe place to anchor or wait if the situation in the Finnish Gulf is causing delay of the traffic. This should preferably be in open water or somewhere sheltered from moving ice. See

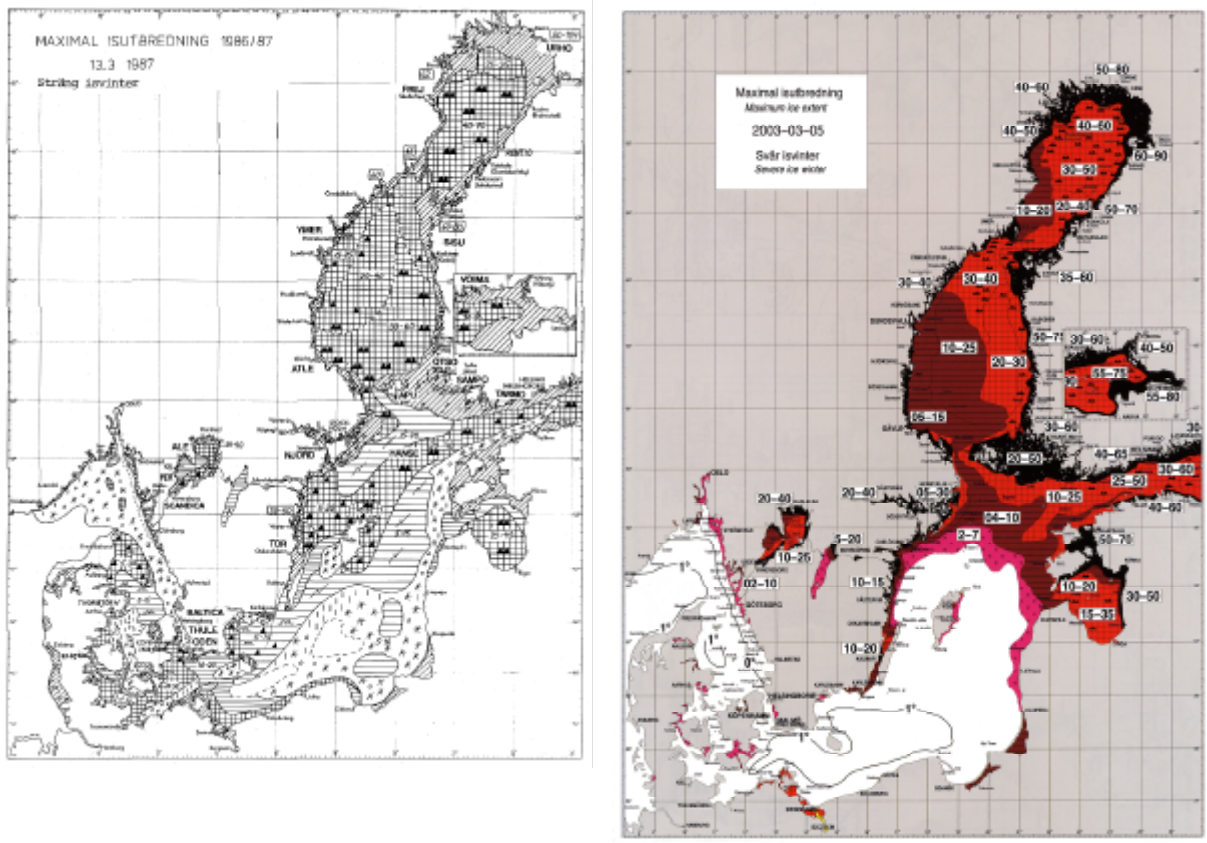

Figure 11 Ice maps from the years 1986-87 and 2002-03

The total picture explains the concern from the Finnish Authority when tanker ships of doubtful strength are navigating in the Finnish Gulf in communication by the IBNet system. From the maps the following conclusions can be drawn:

- With the increased traffic on the Baltic countries and Russia there must be resources made available to keep the waters open and safe
- As there are no regulations in Kategatt, the Sound and the Belt when there is ice almost all ships need assistance of icebreakers to pass ice ridges etc.

- Access to the Kiel Canal and the German and some Danish ports will also need assistance. In Denmark there are 3 icebreakers with military manning that can be regarded as able to give service to the ports. These are too small to assist 100 000 toners stuck in the Belt.
- Germany also has icebreaking ships that are capable of assisting ships in and out of ports. (Similar to the tugs in Scandinavia that assists from where the icebreaker turns to the quayside in port)
- The Baltic countries do not have own icebreakers capable of forcing strong ice and strong ice ridges. In the Bay of Riga a strong icebreaker is needed in wintertime when the extent of ice is normal or worse
- In hard winters most of the waters are unsafe for the ships to wait in strong winds
- The icebreaker's assistance to ports in the Finnish Gulf and ports North of Gotland is demanding
- Ports on The West Coast of Sweden need the assistance of icebreakers to help the ships in passing the ice ridges

In short the situation is difficult for sea transports and the costly for the industry and the risk is increasing as the tanker traffic is growing.

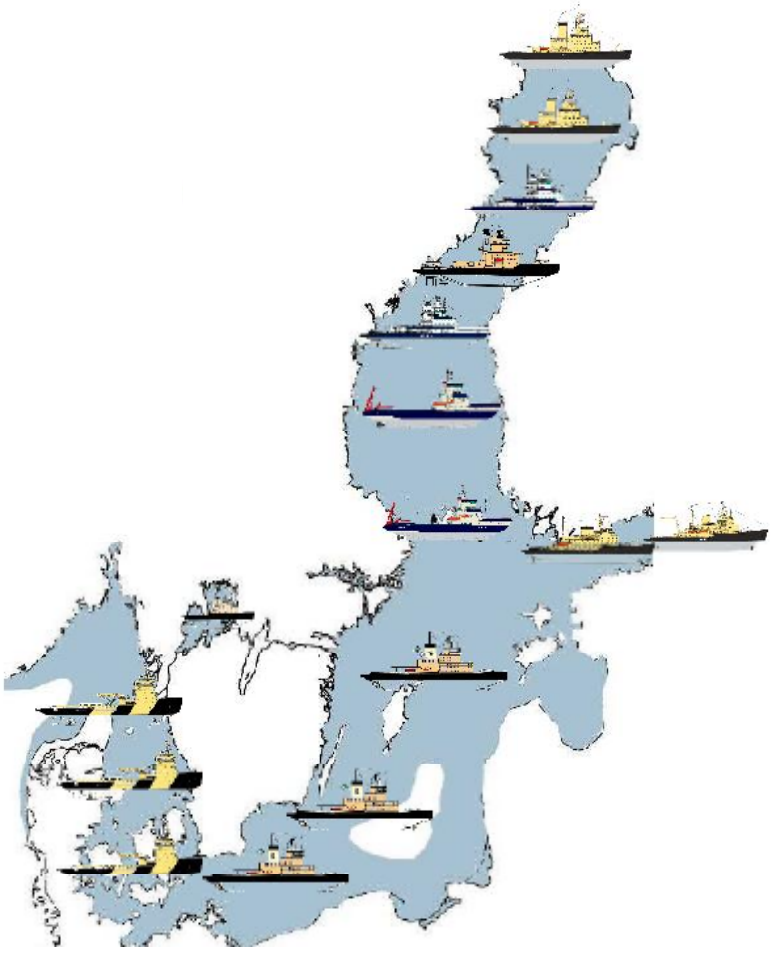

Figure 12 The distribution of the Finish and Swedish Icebreakers in a severe ice winter

During the past decade the trading activities between the EU countries and Russia and the Baltic countries has grown in a healthy way. The winter 2002-03 showed how vulnerable this trading is in wintertime.

The forest industry in Sweden and Finland are depending on supplies from Russia and the Baltic states. A pulp mill cannot close down in wintertime because of lacking raw materials. The pulp industries depend today on raw fibre from the forest. Because of the Chloride free process the time between harvest and use in the mill cannot be more than 3 weeks. In a situation of delays in traffic and lack of assisting capacity a situation where the mill runs out of raw material and have to close may occur. At the same time the harvested material will loose value and can only be used as bio energy.

In the Finnish Gulf the Russian capacity to assist the ships to the Russian ports were insufficient. Some ports in the Baltic countries closed and in the Bay of Riga an icebreaker was chartered at high expenses to keep up the traffic. This was considered to be an almost normal winter. The reason was not lacking of icebreaking capacity, all icebreakers were not in operation, but there was demand for icebreaking capacity in other countries than the one that had the resources.

4 Joint EU resources to keep mobility and ensure safety

In the view of a joint EU and a TEN-T program that is to ensure the mobility in EU it would be natural to see to that the resources that are needed to keep the infrastructure available are jointly shared.

Figure 13 The large icebreakers equipped to force heavy ice and ice ridges

The icebreakers today are of two different characters. The larger ones will force the ice in the northern area. They are built and equipped to ensure mobility in thick ice, capable of passing ridges and pass through ice fronts where there is only ice to the full depth. They have a width that suits the large ships calling the Northern Bothnia/Baltic. See Figure 13. The newer icebreakers in Finland and Sweden are of a lighter type that suit the Southern Baltic area and on the West Coast. The ships are maximised for multipurpose missions and have the strength in bollard pull of up to 200 tons. The ships are used in North Sea services during the summer season but could just as well be stationed in the Baltic for assistance in a rescue operation, in safety and environmental protection and to do joint EU services in the area.

Figure 14 “Tor Viking” in open sea and “Botnica” the new type of icebreakers

Presently most of the icebreakers are used only during the ice season in wintertime. There is an overcapacity of icebreakers in mild and average ice conditions. The Finnish Maritime Administrations has organised the capacity so it is possible to engage the new icebreakers in other services when not needed for service in the Baltic. The Swedish Maritime Administration has signed a contract that gives access to additional icebreakers in case they are needed in wintertime. However as the icebreakers are a national resource they will not be used in other countries in case of a demand. From the perspective of EU this is not a well-used resource.

The new icebreakers are in comparison to other type of vessels also suitable to use for skimming and collect oil in tanks as they have a carrying capacity of between 1 300 and 2 500 tons.

The Swedish Ship Owner Association has pointed out the possibility to use the coastal tankers that in short notice could assist as lighters in case of an accident that requires capacity to lighten the ship. The icebreaker can carry heavy pumps to be used for transfer of fluids.

The increased shipping in the BSR gives new demands on the safety and the provision of emergency resources in the area. Recent accidents in the South Baltic Sea show that it is of value to have rescue resources of heavier types stationed in the BSR. In 2003 a bulker, (see Table 2 and Enclosure 2) sunk in the Baltic.

Table 2 Information of sunken bulker from Lloyds Agency

{PRIVATE}Vessel Name	FU SHAN HAI
Vessel Type	Bulk Carrier
Flag	China
Built	1995
Tons Gross	38,603
{PRIVATE}Cargo	Fertiliser{PRIVATE}
{PRIVATE}Salvors	Wijsmuller Salvage BV
Date Reported	02 June 2003
LOF Date	31 May 2003
LOF edition	2000
SCOPIC Invoked?	Yes
SCOPIC Incorporated?	Yes
SCR	[Unknown]
{PRIVATE}**Casualty Details** - see Case Reports	
Collided with mv Gdynia on 31st May near Bornholm Island South coast of Sweden. Subsequently sank with fertiliser and heavy fuel oil on board. Crew rescued.	

The debate after the accident focused very much on the responsibilities shared by the countries (Denmark and Sweden) and “Lloyds Open Form”. In cases like this it would be possible to reduce the risk of major pollution and further risks if the sole responsibility and resources were allocated to a common source in the area under the head of EU. The progress of the work in HELCOM has proved that this is more flexible than to try to go the long way all the way through the formal decisions in IMO to make progress in the Baltic. The importance of the Baltic as a closed sea area that is vital for the stated in the BSR should be enough to declare it a special area where special rules apply.

The effect of this accident could have been reduced if there were a heavy tug or another powerful resource available that could have grounded the ship before she sunk. An icebreaker would be ideal for this kind of service. The size of the icebreakers and the capacity in their tanks etc would also make the icebreakers suitable for environmental rescue services, skimming oil or other floating pollution. There are enough ships to cover the whole region and it could be possible to position some of the icebreakers in other areas when they are not needed in the Baltic. The icebreakers could be positioned in strategic places, like in Slite, on Gotland, in the Belt etc. where it is suitable from a strategic point of view.

Figure 15 The icebreakers can be used in different tasks in in summertime

The Baltic could be declared as a special area by the HELCOME and by this make exceptions from some of the shipping rules that may be a hazard or hindrance of quick rescue actions in case of emergency. One of these rules should be to make an exception of the negotiation in the “Lloyds Open Form” towage and salvage to protect the environment in the Baltic Sea. From a socio- economical point of view there are no reasonable comparisons what so ever between the protections of business economics to secure the lowest bid for salvage and the result of a sunken tanker in the area. The terms of cost for towing and rescue should be one of the conditions that apply to all ships that enter the area. This would be undersigned by all states in the area for sure.

Denmark, Germany and the new EU member countries Poland, Lithuania, Latvia and Estonia do not keep their own icebreaking resources for the assistance of larger ships like the big bulkers or tankers. It is too expensive for some of the countries, others do not see it too big a risk not having one and are maybe prepared to charter tonnage when it is needed.

It should be noted that the icebreakers are the only ships that can act and function regardless the weather, ice conditions, etc. and that is a readily resource in the area.

In future when the TEN-T also cover the sea routes it also comes natural to allocate a common resource to ensure safety and protect the environment. Today the coast guards in respective countries have acknowledged the situation and are claiming new and extra resources to be able to act and handle ships in distress. This would not be necessary if EU declared the intention of setting up a joint service for the BSR for safety and environmental protection.

Enclosure 1

Article from the Finnish Maritime Administrations

Planned multi-purpose vessel's technical capacity is being mapped

21.10.2003

There are plans on procuring a new multi-purpose vessel for service in the Gulf of Finland. In addition to ice breaking services, it would also have capacity for oil combating in summer and winter conditions, emergency towing and sea salvage.

The minister of transport and communications has appointed a working group to look at the technical requirements for combining the vessel's different functions, where the main focus is on the draught. The Finnish Environment Institute (SYKE) wants a vessel capable of operating along the coast, where the Finnish Maritime Administration, again, needs a vessel with sufficient mass for icebreaking.

"Luck has been on our side as far as oil transports in the Gulf of Finland are concerned", states Sirkka Hautojärvi, chief secretary of the Ministry of the Environment. Statistically, there should have been a serious accident already. "A few years back in time the Finnish oil combating capacity was still estimated as sufficient, but the situation has changed radically". In 2002, 69 million tonnes of oil were transported in the Gulf of Finland, and in 2010 volumes are estimated at 130 million tonnes. In 1997 the figure was as low as 37 million tonnes.

Hautojärvi hopes that Estonia and Russia also participates in this work on their part. It has been suggested that Russia could procure a similar vessel as Finland, for example through eco conversion. Finland supports the Russian oil combating organisation by half a million euro this year.
Meriväylä 3/2003

Enclosure 2

News flash

Sweden - Denmark Oil Slick Planning June 2003

STOCKHOLM, June 2 (From AFP) - Swedish coastguard ships on Monday battled to clean up a 12-kilometer oil slick leaking from a Chinese cargo ship that sank at the weekend after a collision, officials said. The Fu Shan Hai bulk carrier went down in Danish waters between the Swedish coast and Denmark's Bornholm island on Saturday following a collision with a Polish freighter. Lying at a depth of 70 meters,the ship was carrying 1,700 tonnes of oil, of which about 100 tonnes has already leaked out. "Oil is oozing out from the vessel all the time," Swedish coastguard officer Patrik Mathiasson told Swedish news agency TT. He said the coastguard hoped to be able to minimise the pollution on the Swedish coastline, but admitted that some of the oil would reach the southern coast, probably by Tuesday. The slick was about 12 kilometers long and three kilometers wide on Monday morning, he said.

STOCKHOLM, Sweden (From AP) - Residents and rescuers worked Tuesday to clean up patches of oil that leaked from a sunken Chinese freighter on to southern Sweden's sandy beaches.
"We have a string of oil leading from the sunken ship to the coast," Swedish coast guard spokesman, Jan Sjoelin said, adding that nearly 83,700 liters (22,100 gallons) was streaming from the sunken Fu Shan Hai freighter. Some 60 people from nearby towns along the coast, including rescue services, were taking part in the cleanup along 10 kilometers of the picturesque shore, which is a popular destination for tourists. The Fu Shan Hai sank Saturday, north of the popular Danish resort island of Bornholm, 40 kilometers southwest of Sweden. Environmental ships from Sweden, Denmark and Germany were able to contain most of the nearly 39-square-kilometers lick off the coast. Sjoelin said more oily paste is expected because the Fu Shan Hai has another 2 million liters (nearly 553,000 gallons) still aboard it. The spill was evident, glistening on the surface of the water, but nothing compared to the devastation wrought on French and Spanish coasts last year when the oil tanker Prestige split in two in the Atlantic Ocean, disgorging millions of gallons of fuel oil. "We're not talking about pictures like the ones we saw from France and Spain, but more like lumps that will land on the beaches because we can't catch them out here," said Elo Jacobsen, skipper of one of the Danish ships helping in the clean up. The Fu Shan Hai, which was carrying 66,000 tons of fertilizer, went down after colliding with the Cyprus-registered Gdynia in clear weather. The Chinese ship's 27 crew members were rescued and taken to Bornholm. No one was injured on the Gdynia. Danish maritime authorities said they expect a report on the accident to be ready later this week. As many as 160,000 vessels sail through Danish straits annually, on the main route for sailing between the Baltic Sea and the North Sea.

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