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# 1. General information

## 1.1 Ice-breaking service

The Government Ice-breaking service is managed by the Swedish Maritime Administration. The functions of the Local and Regional Office of the Government Ice-breaking Service are, within the operating district, to obtain a pass information, requests and instructions concerning the ice-breaking service between the Head of the Service, interesting parties and perform any task imposed by the Executive Board of the Ice-breaking Service.

The state icebreakers are the **ODEN**, **YMER**, **FREJ**, **ATLE** and **ALE**.

The offshore-vessels **TOR VIKING II**, **BALDER VIKING** and **VIDAR VIKING** are, when necessary, time chartered by the Swedish Maritime Administration. The buoytender-vessel **BALTICA** and **SCANDICA** and municipal and private tugboats are rented when necessary. The main function of the State ice-breaking is to break ice between open waters and water protected from sea ice, pack ice and similar ice obstacles (sea ice-breaking).

## 1.2 The Executive Boards of Ice-breaking Services and Ice-breakers

### Sweden

Postal address: Swedish Maritime Administration, Ice-breaking Division  
Sydatlanten 15, SE 418 34 GÖTEBORG

Telephone: Switchboard (08.00-16.40) .....+46-(0)31-64 77 00  
Head of Ice-breaking Division .....+46-(0)31-64 77 82  
Deputy Head of Ice-breaking Division .....+46-(0)31-64 77 83  
Operating centre .....+46-(0)31-64 77 80

During those hours when the Operating office is unmanned and a 24-hour duty system is in operation, the telephone number to the duty officer can be obtained from the telephone-answering unit:

Telephone: **+46-(0)31-64 77 80**  
Fax: +46-(0)31-64 77 89  
Telex: 64416 Iceserv S  
E-mail: [opc@sjofartsverket.se](mailto:opc@sjofartsverket.se)  
Internet: [www.sjofartsverket.se](http://www.sjofartsverket.se)

**Actual information:** The unit will provide a brief account of the ice situation for the day, the operating areas of the icebreakers together with instructions for shipping and an updated ice chart at "Winter navigation", at Swedish Maritime Administration homepage:

[www.sjofartsverket.se](http://www.sjofartsverket.se) also on common web-page [www.baltice.org](http://www.baltice.org)

### Code letters and telephone-numbers for the Swedish icebreakers

Icebreaker	Callsign	Telephone	Fax	VHF and MF
Ale	SBPQ	+46(0)11-19 16 00	+46(0)11-19 16 01	All icebreakers Channel 16 and 2332 kHz
Atle	SBPR	+46(0)11-19 16 30	+46(0)11-19 16 31	
Frej	SBPT	+46(0)11-19 16 20	+46(0)11-19 16 21	
Oden	SMLQ	+46(0)11-19 16 40	+46(0)11-19 16 41	
Ymer	SDIA	+46(0)11-19 16 10	+46(0)11-19 16 11	
Tor Viking II	SLJT	+870 326 600 410		
Balder Viking	SLKA	+870 326 582 910		
Vidar Viking	SLKD	+870 326 583 510		
Baltica	SJOY	+46(0)10-239 00 11		
Scandica	SKFZ	+46(0)10-239 05 15		

**Finland (authority)**

Postal address: Finnish Maritime Administration, Winter Navigation Department  
PB 171  
FIN-00181 HELSINKI, FINLAND

Telephone: Switchboard (08.00-16.15) +358-(0)204 481  
Director +358-(0)204 48 42 16  
Maritime Over Inspector +358-(0)204 48 44 16  
Economic Planner +358-(0)204 48 43 16  
Secretary +358-(0)204 48 42 51

Fax: +358-(0)204 48 44 70  
E-mail: [winternavigation@fma.fi](mailto:winternavigation@fma.fi)  
Internet: [www.fma.fi](http://www.fma.fi)

**Code letters and telephone-numbers for the Finnish icebreakers**

Icebreaker	Callsign	Telephone (GSM)	Telephone (Sat)	VHF and MF
Urho	OHMS	+358(0)400 21 96 81	+358(0)306 20 75 00	All icebreakers Channel 16 and 2332 kHz
Sisu	OHMW	+358(0)400 21 96 82	+358(0)306 20 74 00	
Voima	OHLW	+358(0)400 31 81 56	+358(0)306 20 76 50	
Fennica	OJAD	+358(0)400 10 71 59	+358(0)306 20 77 00	
Nordica	OJAE	+358(0)400 24 65 51	+358(0)306 20 78 00 ,, 725	
Otso	OIRT	+358(0)400 21 96 80	+358(0)306 20 73 00	
Kontio	OIRV	+358(0)400 31 44 92	+358(0)306 20 72 00	
Botnica	OJAK	+358(0)400 20 38 76	+358(0)306 20 79 00 ,, 730	

**Finland (icebreaker operations)**

Postal address: Finnish State Shipping Enterprise, Ice-breaking Operations  
Valimotie 16  
FIN-00380 HELSINKI FINLAND

Telephone: Switchboard (08.00-16.15) +358-(0)306 207 000  
Director Ice-breaking +358-(0)306 207 160

Fax: +358-(0)306 207 033

**Denmark**

Postal address: Søværnets Operative Kommando, Operationssektionen, Istjenesten  
Postbox 483  
DK-8100 ÅRHUS C, DENMARK

Telephone: +45-89 43 30 99  
+45-89 43 31 53

Fax on demand: +45-89 43 32 44 (ice information)

Fax: +45-89 43 32 30

Telex: 64527 SHIPPOS DK

E-mail: [opsstaff@sok.dk](mailto:opsstaff@sok.dk)  
Internet: [www.forsvaret.dk/sok](http://www.forsvaret.dk/sok)

**Norway**

Postal address: Kystverket Sørøst, Ismeldingtjensten  
Serviceboks 625, N-4809 ARENDAL, NORGE

Telephone: +47-3701 97 00 / -3701 97 18 / -4815 41 42

Fax: +47-3701 97 01 / -3702 76 19

E-mail: [ismelding@kystverket.no](mailto:ismelding@kystverket.no)  
Internet: [www.kystverket.no](http://www.kystverket.no)

**Estonia**

Postal address: Maritime Safety Division  
René Sirol (Head of ice-breaking)  
Lume 9, EE.104 16 TALLINN ESTONIA

Telephone: +372 620 57 00  
Fax: +372 620 57 06  
E-mail: rene.sirol@vta.ee

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**Latvia**

Postal address: Free Port of Riga Authority  
Kn Eduards Delveris (Head of ice-breaking)  
Meldru 5a, LV-1015 RIGA LATVIA

Telephone: +371 708 20 01  
E-mail: captain@rok.bkc.lv

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**Poland**

Postal address: Harbour Master Port of Gdynia  
Kn Wojciech Oziemski (Head of ice-breaking)  
ul. Polska 2, 81-339 GDYNIA. POLAND

Telephone: +48 (0)58 620 28 53  
Fax: +48 (0)58 661 60 51  
E-mail: kpgdynia@umgdy.gov.pl

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**Germany**

Postal address: Wasser- und Schifffahrtsdirektion Nord, Hinderburgufer 247  
D-241 06 KIEL, DEUTSCHLAND

Telephone: +49 431 3394 8120  
Fax: +49 431 3394 6399  
E-mail: rkurtz@wsd-nord.de  
Internet: www.wsd-nord.wsv.de

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**Russia**

Postal address: Harbour Master Port of St. Petersburg Gapsalskaya Street 10  
198035 ST. PETERSBURG RUSSIA

Telephone: +7 812 326 08 58 (information on ice-breaking)  
Fax: +7 812 327 40 21  
E-mail: kom@mail.pasp.ru  
Internet: www.pasp.ru

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**1.3 VTS-centres and Local Offices****VTS-centre Luleå**

Postal address: Bay of Bothnia Maritime Traffic Area  
Strömörvägen 9  
974 37 LULEÅ

Telephone: +46(0)920-25 83 90  
Fax: +46(0)920-25 53 06  
E-mail: vtslulea@sjofartsverket.se

**VTS-centre Gävle**

Postal address: Sea of Bothnia Maritime Traffic Area  
Bönan  
805 95 GÄVLE

Telephone: +46(0)26-64 71 50  
Fax: +46(0)26-994 69  
E-mail: vtsgavle@sjofartsverket.se

### **VTS East Coast**

Postal address: Box 16  
151 21 SÖDERTÄLJE  
Telephone: +46(0)8 554 24 500  
Fax: +46(0)8 554 24 505  
E-mail: vtsec@sjofartsverket.se

### **VTS-centre Malmö**

Postal address: Southcoast Maritime Traffic Area  
Box 855  
201 80 MALMÖ  
Telephone: +46(0)40-20 43 50  
Fax: +46(0)40-30 18 68  
E-mail: vtsmalmo@sjofartsverket.se

### **VTS West Coast**

Postal address: Westcoast Maritime Traffic Area  
Sydatlanten 15  
418 34 GÖTEBORG  
Telephone: +46(0)31-64 77 73  
Fax: +46(0)31-64 77 79  
E-mail: vtswc@sjofartsverket.se

### **VTS-centre Trollhättan**

Postal address: Vänerns Maritime Traffic Area  
Box 949  
461 29 TROLLHÄTTAN  
Telephone: +46(0)520-47 22 60  
Fax: +46(0)520-47 22 63  
E-mail: vtstrollhattan@sjofartsverket.se

## **Local Offices**

### **Luleå**

Sven Haneborn  
Bay of Bothnia Maritime Traffic Area  
Strömvägen 9  
974 37 LULEÅ  
+46(0)920-25 83 91  
GSM: +46(0)70-554 59 00  
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### **Piteå**

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Box 716, 941 28 PITEÅ  
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<b>Halmstad</b>	Lennart Pettersson Halmstads Hamn & Stuveri AB Box 1 301 02 HALMSTAD +46(0)35-15 53 00, 15 53 10 GSM: +46(0)708-50 56 26 Telefax +46(0)35-14 05 93 E-mail: lp@porthalmstad.com
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<b>Trollhättan</b>	Tommy Andersson Trollhätte kanals Maritime Traffic Area Box 949, 461 29 TROLLHÄTTAN +46(0)520-47 22 11 Telefax +46(0)520-47 22 63 GSM: +46(0)708 47 22 68 E-mail: tommy.andersson@sjofartsverket.se

## 2. Information about Winter Navigation (information for industry, ship owners, shippers and charters)

### 2.1 Common information

The purpose of these rules is to jointly ensure the efficiency of Swedish merchant shipping and to reduce its total costs in wintertime without lowering the standard of service.

The Swedish Maritime Administration Icebreaking Division follows the development and changes of ice conditions and by providing icebreaking services and apply an apt traffic restriction policy to accomplish safe and efficient traffic to Swedish ports.

### 2.2 Traffic restrictions

Traffic restrictions are imposed to improve the efficiency of vessel traffic.

From then icebreaker assistance is only given to vessels, which meet the requirements set out in the traffic restrictions.

The first restrictions - ice class II and minimum 2 000 dwt - is normally initiated in early December for the harbours in Bay of Bothnia.

The traffic restrictions are then gradually tightened up during normally and severe winters to ice class 1A and minimum 4 000 dwt. (see the table mentioned below)

Traffic restrictions can be supplemented by cargo restrictions e.g. 2 000 tonnes loaded and/or unloaded cargo per port.

The Swedish Maritime Administration (SMA) will announce tightening of traffic restriction if possible six (6) days before entry their into force (Saturdays and holidays included).

Abatement of traffic restrictions will come into force on the day as it is announced.

Information on traffic directions and existing and notified traffic restrictions is obtained via the ice-report issued by the Swedish Hydrological and Meteorological Institute (SMHI) (see Weather and ice information), on the SMA home page <http://www.sjofartsverket.se> enter Infrastructure and Maritime Traffic, then Winter navigation and also on [www.baltice.org](http://www.baltice.org)

#### Guiding data for traffic restrictions

The table describes the approximate date and the minimum ice strengthens during a normal winter

<i>Minimum Ice Class/Min. dwt</i>	<i>Bay of Bothnia</i>	<i>Sea of Bothnia</i>
II / 1 300	1/12	1/1
II / 2 000	15/12	15/1
1C / 1 300		
1B / 2 000	1/1	1/2
1A / 3 000	15/1	15/2
1A / 4 000	31/1	–
1A / 3 000	10/4	–
1B / 2 000	10/5	1/4
II / 2 000	15/5	15/4
1C / 1 300		

Due to variations in winter ice-conditions it is not possible to give the corresponding guiding data for shipping in other coastal areas. In Lake Vänern and Lake Mälaren one would normally have to expect restrictions being imposed during the months of January through April.

Ice-class and tonnage-size requirements will vary according to the degree of severity of the winter. Small harbours and loading wharves may have to be closed, even if winter navigation is in progress within other parts of the same region, if there is a lack of locally owned icebreakers and due to a limited availability of state icebreaker resources.

Directions for an alternate port of call might also be given.

Local icebreakers of sufficient size and with adequate engine power must be available within the various districts.

## 2.3 Exemptions

If there is available ice-breaking capacity or if the weather and ice forecast is favourable (temporary easy ice conditions) exemptions can be granted.

Exemptions are always granted for one voyage only.

Applications for exemptions are easiest made by e-mail to **opc@sjofartsverket.se**

The date of the intended voyage, destination, name of vessel, deadweight, engine output, year of build and ice class should be stated.

**As a rule, exemptions are not granted to vessels more than 20 years of age or to vessels carrying transit goods.**

## 2.4 Prioritization

Vessels in distress are always assisted first.

Afterward vessels going to or coming from Denmark, Finland, Norway, Sweden or Germany are assisted, with priority given to passenger vessels and to vessels carrying goods of special significance

Otherwise there are no prioritization between the vessels.

The Captain of the icebreaker can ensure safe and efficient traffic change turn of assisted vessels.

Tugs with barges (barges connected with cables or hawsers) and so-called river vessels are not suitable for winter navigation and are not assisted by Swedish Ice-Breaking Service.

Head of Icebreaking Division can deny vessel assistance or postpone it, although the vessel formally meets all requirements.

This is based on reports that the vessel is not suitable for winter navigation and such a vessel cause unacceptable delays for other vessels.

## 2.5 Traffic information

Harbour office, agents, vessels or ship owners should at least once a week pre-report expected vessels to relevant VTS-centre.

Imposing traffic restrictions starts the obligation to report and is valid until the traffic restrictions are lifted.

For ice breaking service to be timely and efficient, ship owners and/or agents should inform the VTS-centre about the schedules and changes in schedule of their vessels.

### 3. Navigating in Ice

The Swedish Maritime Administration will not assume any liability for delay, damage or any other loss, caused to ship, its personnel, passengers or load that occur in connection to icebreaker assistance.

**Assistance and advices is given to ships at their own risk**

#### 3.1 Captain obligations

The captain shall control that there are routines and instructions for safe navigation in ice in the ships ISM-manual.

#### 3.2 Notification and Reporting

In order to provide all winter shipping information needed by the Executive Board of the Ice-Breaking Service and the icebreakers, ships bound for Swedish and Finnish ports subject to traffic restrictions and situated in the Bay of Bothnia and the Sea of Bothnia, are requested to report the following on VHF:

<b>Reporting line:</b>	When passing Svenska Björn* 59 33N 20 01E
<b>Call signal:</b>	VTS GAVLE
<b>Channel:</b>	VHF channel 84 (or phone +46(0)26 647 150)
<b>Contents of report:</b>	- ship's name - nationality - destination and ETA - speed
<b>Language:</b>	Swedish or English (using IMO Marine Communications Phrases)

\*A more southerly line can be given if motivated bay the ice situation..

#### 3.3 Icebreaker contacts

On board the ships and vessels, constant radio monitoring shall be maintained.

The icebreakers in operation will continuously watch VHF channel 16 and MF 2332 kHz.

Call to icebreakers can also be connected through Swedish Coast Radio. Icebreakers can also be contacted by telephone according to the table on side 1.

VHF traffic on recommended communication channels shall be used when giving orders from icebreakers to assisted vessels.

### 3.4 Instructions for captains on ships receiving ice-breaking assistance

3.4.1. All instructions given from icebreakers must be complied with.

3.4.2. Particular attention shall be paid to the following:

- The recommended VHF channel shall be constantly monitored.

- The vessel's propulsion machinery shall be ready for rapid manoeuvres at all time.

- The icebreaker decides if and when the vessel shall be towed.

- If the vessel springs a leak or sustains any other damage that may affect the vessel's ability to follow the icebreaker or otherwise to comply with the directives given from the icebreaker, this must be communicated immediately to the icebreaker.

- To be eligible for icebreaker assistance, vessels navigating in ice-covered waters must be equipped with a powerful searchlight.

Vessels forming part of a convoy, which has got stuck in the ice, must keep their searchlights switched off.

3.4.3. Instructions are given to assisting vessels via VHF on dedicated assistance channel.

3.4.4. In order to avoid collisions, a vessel in convoy shall inform other vessels without delay on the dedicated assistance channel if it stops or slows down its speed substantially.

3.4.5. During the hours of darkness, the state icebreakers show a blue light at their mastheads, which is visible all around the horizon.

3.4.6. Vessels failing to comply with prescribed restrictions and traffic directions or orders given from icebreakers will be refused assistance.

3.4.7. Finnish icebreakers are equipped with two rotating red warning lights located on top of each other that are lit whenever the icebreaker has to stop unexpectedly or has to make an abrupt reduction in speed. The assisted vessel/vessels will then have to use every possible means to immediately make full astern. It is to be noted that this warning equipment does not exist on the Swedish icebreakers.

## 3.5 Instructions for vessels on Lake "Vänern" and river "Göta Älv"

### 3.5.1 Reporting

When traffic restrictions are in force on the River "Göta Älv" and on Lake "Vänern" vessels should report to VTS-centre in "Trollhättan" **Tel +46 (0) 520-47 22 60 or On VHF Channel 14 or 16**

**At the following occasions**

- Before departure from or at passage Gothenburg
- Passage "Dalbobron" north- or south heading
- At arrival to and at departure from harbours in Lake "Vänern"

### Arrival

Vessel shall report after mooring. The arrival report shall contain the following: vessels name, nationality, estimated time of departure, Dwt, shaft output, draft, ice-class, cargo quantity and next destination.

### Departure

The VTS-centre in "Trollhättan" should 6 h. before departure from Gothenburg or harbours in Lake "Vänern" be informed. If the departure will be delayed the VTS-centre should be informed as soon as possible.

### 3.5.2 Passage in the Canal during ice-conditions

If a vessel get stuck in pack ice the following vessel are not allowed to pass. The following vessel should stop at a distance allowing the vessel how got stuck possibility to go astern and out of the pack ice.

According to the ice conditions special meeting places will be appropriated.

When ice obstacles occur in the Canal tug-boats will assist the merchant vessels. If vessels observe pack ice or other obstacles they should immediately report that to the tug-boat or nearest Canal-office.

- a) Meeting is not allowed above the lock of "Brinkebergskulle".
- b) Meeting is not allowed above the lock Nr 2, meeting shall take place north of the pier in "Åkerssjö". Vessels on its way down shall wait in "Åkerssjö" north of the pier until the lock is ready.
- c) Meeting above the lock of "Ströms" shall take place in the river, not between the piers.

## 3.6 Towing

In difficult ice-conditions such as hard ice-pressure or passage through heavy ice-ridges, towing might be the only means for ensuring a safe and effective assistance.

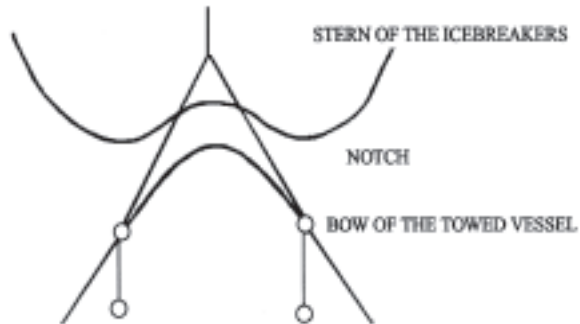
**If the below mentioned conditions cannot be fulfilled, towing in the icebreaker's notch is no longer safe, therefore not to be performed.**

The master of the icebreaker is then entitled to refuse assistance of the vessel until assistance is possible without towing.

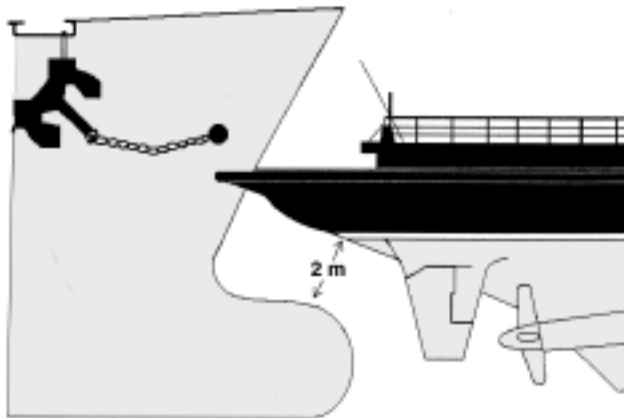
Towing of fully operative vessels by icebreakers is free of charge. The fee for towing in the nature of salvage or some other relief operation is determined by the Swedish Maritime Administration on a year-to-year basis.

Normally, towing will then take place by brining in the vessel's bow into the towing notch of the icebreaker. The icebreaker will hand over two or four cables, which are to be fastened to the towing bollards.

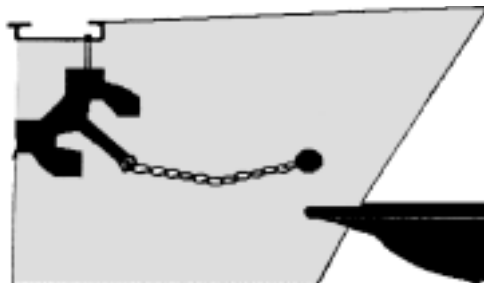
- Icebreaker and the towed vessels are connected as bellow:



- The vessel shall be prepared to make fast or cast off the towing cable at any time.
- For bulb vessels, the distance between the topside of the bulb and the icebreaker hull must be at least two metres (see illustration).



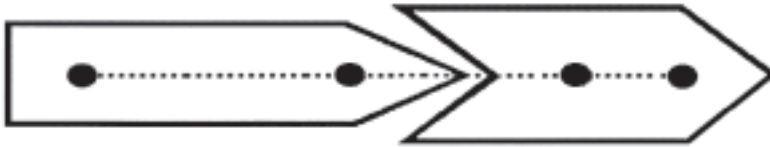
- For vessels with anchors placed on the outside of the vessel in such a manner that the anchors may come into contact with the icebreaker's towing notch, the anchors will have to be catted, i.e. moved astern (see illustration) or placed onto deck before towing operation can begin.



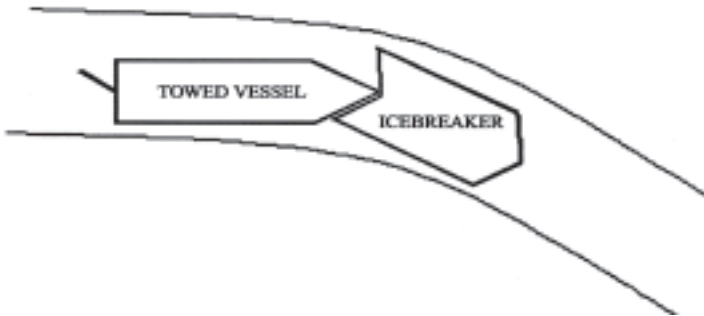
**The hull of the towed vessel is always acting as an active rudder of the icebreaker.**

- During towing operation the towed vessel shall be steered manually, and the machine must be ready for manoeuvring

- When proceeding straight ahead the vessel should be kept in even line with the icebreaker's masts.



- The towed vessels propulsion machinery shall only be used according to given instructions from the icebreaker.
- If the vessel cannot keep the engine output as high as required or it is affected by rudder problems, the icebreakers should be notified immediate, so that it will slow down.
- If the vessel is asked by the icebreaker to help in changing course, the helm has to be turned in according to given instructions from the icebreaker as the towed vessel's hull is acting as the rudder for the hole towing combination.



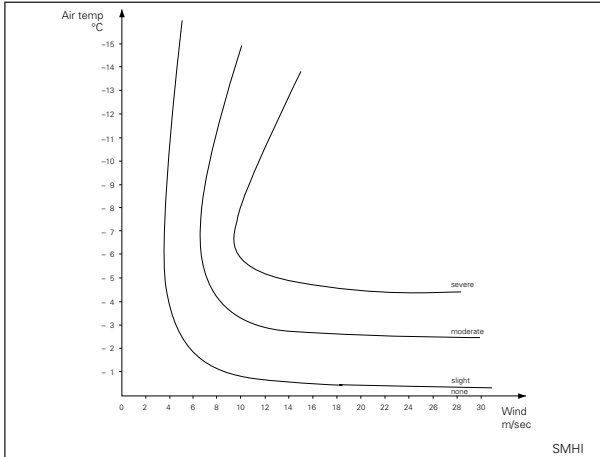
### 3.7 Danger of icing

Danger can arise under certain conditions for ships and cargoes as a result of icing before the ship has arrived at the ice-covered waters or after the ship has left the ice-covered waters. As soon as the temperature of the surface water has dropped to the vicinity of 0° C (+3° C and below) ice can be formed on the deck, superstructure and deck cargo, if any, of the ship in conjunction with water breaking or spraying over the deck.

As the layer of ice grows, a displacement in weight takes place. This displacement reduces the stability of the ship.

If the ice cannot be removed, the point is gradually reached where the metacentric height becomes so low that the ship runs the risk of capsizing. Icing can also take place at higher water temperatures if the air temperature is below 0° C. In this case the air-cools down the water breaking over the ship and ice is formed when the water comes in contact with the cold surfaces on board. Consequently, captains on ship which traffic the Baltic area during the winter must be constantly prepared for the occurrence of icing on their ships in severe weather conditions. When keen winds are expected and the weather is such that there is danger of icing, small ships at sea are advised to seek shelter, ships in port should remain where they are until the weather improves. The following diagram shows the connection between the degree

of ice formation, wind force and air temperature. Other causes which have an influence on the degree of ice formation is the ships course and speed, the wave height and the temperature of the sea surface.



The diagram is applicable to the conditions in the Baltic and the Bay of Bothnia for ships of more than 500 dwt.

### 3.8 Sea rescue

As a result of the shipping catastrophes which have occurred in the Baltic due to severe weather conditions and icing, all ship's captains, particularly foreign captains who not have experience of icing, are exhorted to contact the nearest Swedish coastal station as soon as difficulties arise for their ships at sea off the Swedish coast and report their difficulties together with their positions, course and other information which may be of importance. In this way their situation will become known to the various parts included in the sea rescue service and these can, if the situation should worsen, prepare to intervene before it is too late. Safety measures of this type are available free of charge for vessels.

### 3.9 Instruction for shipwrecked persons

Should a marine disaster, in which those in distress are forced to jump into the water or to enter the lifeboats, occur during the winter it is of the greatest importance that those involved be warmly dressed. Wet clothes should be kept on. Above all, gloves or mittens should not be thrown away. Hands must be protected against rapid chilling so that those in distress can hold on to lifelines or suchlike. Tests have been carried out in Sweden with watertight clothing in water with a temperature of 4° C. The tests were carried out both with hands of the test subjects unprotected and protected. In the tests in which hands were not protected, the skin temperature of the hands had dropped to 10° C after 30 minutes, the temperature at the fingertips was 5° C and the pain experienced at the fingertips was so severe that the fingers could not be used. When good-quality mittens protected hands, the hand temperature was still approximately 20° C after 30 minutes.

Skin exposed to cold and wind will suffer local freezing at the air temperatures and wind forces specified below:

-4° C approx. 20 m/s	-14° C approx. 5 m/s
-8° C approx. 10 m/s	-34° C approx. 1 m/s

## 4. Ice Classes and Requirements

### 4.1 Finnish-Swedish Ice Classes

Defining ice-strengthening requirements, the Swedish Maritime Administration uses the Finnish-Swedish Ice-Class Designations valid from 2003. The maximum ice-class draught amidships shall normally be taken as the summertime fresh-water load line draught according to Finnish-Swedish Ice-Classes SJÖFS 2003:4.

For vessels that according to the rules in SJÖFS 2003:4 (Finnish-Swedish ice class rules) are existing vessels of ice class 1A Super and 1A shall comply with earlier requirements regarding engine output no longer than 1 January 2005 or 1 January in the year when 20 years has elapsed since the year the vessel was delivered, whichever occurs the latest.

The vessel's engine power is considered to be the total propulsion machinery power for which the vessel and machinery are designed.

If technical means are used to prevent the machinery from being driven with full power, or if this is prohibited according to regulations being followed on board, then the power limited in this manner is considered to be the vessel's engine power.

The tables below, 4.2.1 or 4.2.2, provide a comparison between the Finnish-Swedish Ice-Class Designations and the class designations used by selected classification societies, including ice-strengthening codes.

If a ship has an ice-class not mentioned in tables 4.2.1. or 4.2.2 of one of the classification societies mentioned in tables 4.2.1 or 4.2.2 or an ice-class of another classification society, not mentioned in tables 4.2.1 or 4.2.2, the equivalence of the ship's ice-class is subject to approval of the Swedish Maritime Administration

#### Finnish-Swedish Ice-Class Designations

<i>Ice-Class</i>	<i>For navigation in</i>	
IA Super	Extremely difficult ice-conditions	>100 cm
IA	Difficult ice-conditions	>50-100cm
IB	Moderately difficult ice-conditions	30-50 cm
IC	Easy ice-conditions	15-30 cm
II	Very easy ice-conditions	10-15 cm

## 4.2 Equivalence between Ice-class notations

### 4.2.1 Ships the keels of which are laid or which are at a similar stage of construction on or after 1 September 2003.

#### 4.2.1.1 American Bureau of Shipping

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>I AA</b>	<b>IA Super</b>
<b>I A</b>	<b>IA</b>
<b>I B</b>	<b>IB</b>
<b>I C</b>	<b>IC</b>

#### 4.2.1.2 Bureau Veritas

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>IA Super</b>	<b>IA Super</b>
<b>IA</b>	<b>IA</b>
<b>IB</b>	<b>IB</b>
<b>IC</b>	<b>IC</b>

#### 4.2.1.3 Det Norske Veritas

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>ICE-1A*</b>	<b>IA Super</b>
<b>ICE-IA</b>	<b>IA</b>
<b>ICE-IB</b>	<b>IB</b>
<b>ICE-IC</b>	<b>IC</b>

#### 4.2.1.4 Germanischer Lloyd

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>E4</b>	<b>IA Super</b>
<b>E3</b>	<b>IA</b>
<b>E2</b>	<b>IB</b>
<b>E1</b>	<b>IC</b>

#### 4.2.1.5 Lloyd's Register of Shipping

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>1AS<sup>1)</sup></b>	<b>IA Super</b>
<b>1A<sup>1)</sup></b>	<b>IA</b>
<b>1B</b>	<b>IB</b>
<b>1C</b>	<b>IC</b>

<sup>1)</sup> If the vessel has a longitudinal framing system, the longitudinal frame section modules and shear area to be defined according to the rules in SJÖFS 2003:4, for ships built to ice-class 1AS or 1A of Lloyd's Register of Shipping. Otherwise, for such a ship, ice-class 1AS of Lloyd's Register of Shipping is equivalent to Finnish-Swedish ice-class IA, and ice-Class 1A of Lloyd's Register of Shipping is equivalent to the Finnish-Swedish ice-class IB.

#### 4.2.1.6 Nippon Kaiji Kyokai (Class NK)

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>IA Super</b>	<b>IA Super</b>
<b>IA</b>	<b>IA</b>
<b>IB</b>	<b>IB</b>
<b>IC</b>	<b>IC</b>

#### 4.2.1.7 Registro Italiano Navale

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>IAS</b>	<b>IA Super</b>
<b>IA</b>	<b>IA</b>
<b>IB</b>	<b>IB</b>
<b>IC</b>	<b>IC</b>

#### 4.2.1.8 Russian Maritime Register of Shipping

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>ULA <sup>1)</sup></b>	<b>IA Super</b>
<b>UL <sup>1)</sup></b>	<b>IA Super</b>
<b>L1 <sup>1)</sup></b>	<b>IA</b>
<b>L2 <sup>1)</sup></b>	<b>IB</b>
<b>L3 <sup>1)</sup></b>	<b>IC</b>
<b>LU7 <sup>1)</sup></b>	<b>IA Super</b>
<b>LU5 <sup>1)</sup></b>	<b>IA Super</b>
<b>LU4 <sup>1)</sup></b>	<b>IA</b>
<b>LU3 <sup>1)</sup></b>	<b>IB</b>

<sup>1)</sup> The equivalence may be granted provided that the engine power of the ship complies with the provisions given in chapter 3 of SJÖFS 2003:4

#### 4.2.2 Ships the keels of which have been laid or which have been at a similar stage of construction before 1 September 2003.

##### 4.2.2.1 American Bureau of Shipping

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>A1 (E)</b>	<b>II</b>
<b>Ships the classification drawings of which have been approved before 1<sup>st</sup> May 1971:</b>	
A1 (E) "Ice Strengthening" Class A	IA
A1 (E) "Ice Strengthening" Class B	IB
A1 (E) "Ice Strengthening" Class C	IC
A1 (E) "Ice Strengthening"	IC
<b>Ships the classification drawings of which have been approved on 1<sup>st</sup> May 1971 or thereafter:</b>	
A1 (E) "Ice Strengthening" Class I AA	IA Super
A1 (E) "Ice Strengthening" Class I A	IA
A1 (E) "Ice Strengthening" Class I B	IB
A1 (E) "Ice Strengthening" Class I C	IC
A1 (E) "Ice Strengthening" Class AA	II

##### 4.2.2.2 Bureau Veritas

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>I 3/3 E</b>	<b>II</b>
<b>Ships the classification drawings of which have been approved before 1<sup>st</sup> May 1971:</b>	
I 3/3 E glace I-Super	IA Super
I 3/3 E glace I	IA
I 3/3 E glace II	IB
I 3/3 E glace III	IC
<b>Ships the classification drawings of which have been approved on 1<sup>st</sup> May 1971 or thereafter:</b>	
I 3/3 Ice Class IA Super	IA Super
I 3/3 Ice Class IA	IA
I 3/3 Ice Class IB	IB
I 3/3 Ice Class IC	IC

## 4.2.2.3 Det Norske Veritas

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>1A1</b>	<b>II</b>
<b>Ships the classification drawings of which have been approved before 1<sup>st</sup> May 1971:</b> 1A1 Ice A 1A1 Ice B 1A1 Ice C	IA IB IC
<b>Ships the classification drawings of which have been approved on 1<sup>st</sup> May 1971 or thereafter:</b> 1A1 Ice 1A* 1A1 Ice 1A 1A1 Ice 1B 1A1 Ice 1C	1A Super 1A 1B 1C

## 4.2.2.4 Germanischer Lloyd

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>100 A5</b>	<b>II</b>
100 A5 E4 100 A5 E3 100 A5 E2 100 A5 E1	IA Super IA IB IC
<b>100 A5 EO4, EO3, EO2, EO1</b>	<b>II</b>
<b>100 A5 E, KE, ME</b>	<b>II</b>

The limitations K or M together with notations in the second part do not affect the ice-class.

#### 4.2.2.5 Lloyd's Register of Shipping

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>100 A1</b>	<b>II</b>
<b>Ships the classification drawings of which have been approved before 1<sup>st</sup> May 1971:</b>	
100 A1 Ice Class 1*	IA Super
100 A1 Ice Class 1	IA
100 A1 Ice Class 2	IB
100 A1 Ice Class 3	IC
100 A1 "Strengthened for Navigation in Ice"	IC
<b>Ships the classification drawings of which have been approved on 1<sup>st</sup> May 1971 or thereafter:</b>	
100 A1 Ice Class 1AS	IA Super
100 A1 Ice Class 1A	IA
100 A1 Ice Class 1B	IB
100 A1 Ice Class 1C	IC
100 A1 Ice Class 1D	II

#### 4.2.2.6 Nippon Kaiji Kyokai

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>NS</b>	<b>II</b>
<b>NS Class IA Super Ice Strengthening</b>	<b>IA Super</b>
<b>NS Class IA Ice Strengthening</b>	<b>IA</b>
<b>NS Class IB Ice Strengthening</b>	<b>IB</b>
<b>NS Class IC Ice Strengthening</b>	<b>IC</b>
<b>NS Class AA, A, B, C Ice Strengthening</b>	<b>II</b>

#### 4.2.2.7 Registro Italiano Navale

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>100A - 1.1</b>	<b>II</b>
<b>100A - 1.1 RG1*</b>	<b>IA Super</b>
<b>100A - 1.1 RG1</b>	<b>IA</b>
<b>100A - 1.1 RG2</b>	<b>IB</b>
<b>100A - 1.1 RG3</b>	<b>IC</b>
<b>IAS</b>	<b>IA Super</b>
<b>IA</b>	<b>IA</b>
<b>IB</b>	<b>IB</b>
<b>IC</b>	<b>IC</b>

#### 4.2.2.8 Russian Register of Shipping

Ice-class notation	Equivalent Finnish-Swedish Ice-class
<b>KM</b> <sup>1)</sup>	<b>II</b>
<b>KM ULA, UL</b> <sup>1)</sup>	<b>IA Super</b>
<b>KM L1</b> <sup>1)</sup>	<b>IA</b>
<b>KM L2</b> <sup>1)</sup>	<b>IB</b>
<b>KM L3</b> <sup>1)</sup>	<b>IC</b>
<b>KM L4</b> <sup>1)</sup>	<b>II</b>
<b>LU7</b> <sup>1)</sup>	<b>IA Super</b>
<b>LU6</b> <sup>1)</sup>	<b>IA Super</b>
<b>LU5</b> <sup>1)</sup>	<b>IA Super</b>
<b>LU4</b> <sup>1)</sup>	<b>IA</b>
<b>LU3</b> <sup>1)</sup>	<b>IB</b>
<b>LU2</b> <sup>1)</sup>	<b>IC</b>
<b>LU1</b> <sup>1)</sup>	<b>II</b>

<sup>1)</sup> For a ship classed with the Russian Register of Shipping and whose dead-weight is less than 15 000 tonnes, the ship's minimum engine power shall be as follows:

IA Super	$P = 0,57 \times \text{dwt} + 600 \text{ (hk)}; \geq$	3 500 hk
IA	$P = 0,50 \times \text{dwt} + 400 \text{ (hk)}; \geq$	900 hk
IB	$P = 0,43 \times \text{dwt} + 200 \text{ (hk)}; \geq$	900 hk
IC	$P = 0,35 \times \text{dwt} \text{ (hk)}; \geq$	900 hk
IA Super	$P = 0,419 \times \text{dwt} + 441 \text{ (kW)}; \geq$	2 574 kW
IA	$P = 0,368 \times \text{dwt} + 294 \text{ (kW)}; \geq$	662 kW
IB	$P = 0,316 \times \text{dwt} + 147 \text{ (kW)}; \geq$	662 kW
IC	$P = 0,257 \times \text{dwt} + \text{ (kW)}; \geq$	662 kW

### 4.3 Swedish Ice Class for traffic on Lake "Vänern"

These regulations are applicable to traffic on Lake "Vänern" for ships, the keel of which have been laid down or building has started on January 1, 2004 or later, and which do not have ice class in accordance with the regulations of the Swedish Maritime Administration (2003:4 Finnish - Swedish Ice Class Rules) shall have one of the following ice classes;

- Ice Class 1BV - Equivalent Finnish-Swedish Ice-class IC
- Ice Class 1CV - Equivalent Finnish-Swedish Ice-class II

## 5. Ordinance and Regulations for Winter Navigation

### 5.1 General

The ordinance and regulations for winter navigation consists of:

(Swedish Statute-Book) SFS 2000:1149 Isbrytarförordningen (Ice-breaking Service Ordinance)  
 Agreement between Sweden, Denmark, Finland and Norway on collaboration in icebreaking  
 (Statute-Book of the Swedish Maritime Administration) SJÖFS 1966:A20 Föreskrifter rörande  
 Statens isbrytarverksamhet (Regulations for the State Ice-Breaking Activities)  
 SJÖFS 2003:4 Finsk-svensk isklass (Finnish-Swedish Ice Classes)  
 SJÖFS 2003:16 Svensk isklass för trafik på Vänern (Swedish Ice Class for traffic on  
 Lake Vänern)  
 SJÖFS 2005:26 Taxa för isbrytning på beställning och mot ersättning (Taxes for icebreaking)  
 (New edition in December)

### 5.2 Ordinance

The Ice-breaking Service Ordinance (SFS 2000:1149) prescribes that vessels suitable for winter navigation may obtain icebreaker assistance in Swedish coastal waters and in sea-routes to Sweden between open sea and waters which are sheltered from sea-ice, drift-ice, pack-ice or similar ice obstacles.

On Lake "Vänern", Lake "Mälaren" and the River "Ångermanälven", government resources may break difficult ice to the extent determined by the Swedish Maritime Administration.

No charge is levied on towing or any other icebreaker assistance performed by icebreakers in connection with ice-breaking at sea.

The Swedish Maritime Administration fixes the charges for towing in the nature of salvage and for other assistance work on a year-to-year basis.

The Swedish Maritime Administration will not assume any liability for delay, damage or any other loss, caused to ship, its personnel, passengers or load that occur in connection to icebreaker assistance.

**Assistance and advices is given to ships at their own risk**

### 5.3 Which Vessels can count on State Icebreaker Assistance?

For a vessel to obtain state icebreaker assistance it must as a minimum have the Finnish-Swedish ice-class (or equivalent) and the minimum deadweight (dwt) that are applicable to a specific ice region in accordance with ice restrictions imposed by the Swedish Maritime Administration.

The Swedish Maritime Administration may refuse to give state icebreaker assistance to vessels whose assistance devices are out of order, or if hull, engine power, equipment or crew is such that navigation in ice may jeopardize the safety of the vessel, or if there is reason to suspect that the vessel's capability for navigating in ice is inferior to what is generally assumed for vessels belonging to the same ice-class.

(see also 2.4 Prioritization and 3.5 Towing)

In light of the above, the Executive Boards of the Finnish and Swedish Ice-Breaking Services have jointly decided that tugs with barges (barges connected with cables or hawsers) and so-called river vessels are not suitable for winter navigation and cannot count on state icebreaker assistance, even if they have a relevant ice-class granted by their classification society.

For winter navigation in areas where no specific ice restrictions are issued, the following requirements should be imposed on ships and vessels:

- a) The ship should possess the highest ice-class of a classification society approved by the state in question, or should have an equivalent design and strength as proved in an inspection of seaworthiness;
- b) The ship should have propulsion machinery with sufficient power to enable it to move in easy ice and in a broken channel inside the archipelago without icebreaker assistance;
- c) The ship should be of minimum 500 dwt;
- d) The ship's stability should be such that it will withstand some degree of icing even when carrying deck cargo without running the risk of capsizing.



## 6. Weather- and Ice- information

### 6.1 General about transmission

The Swedish Meteorological and Hydrological Institute (SMHI) daily issues a number of reports, directly or indirectly for shipping and navigation. These reports contains mainly weather forecast (including observations, storm-, gale-, icing- and ice-reports. Windspeed in m/s. Transmission means: telephony, Navtex, and broadcasting. Current ice chart can be transmitted by telefax, E-mail or radiofacsimile transmitted by Hamburg/Pinneberg.

### 6.2 Radiotelephony

**Weather- and ice reports** (with information from the ice-breaking service) are on request transmitted in clear English by the coast radio stations.

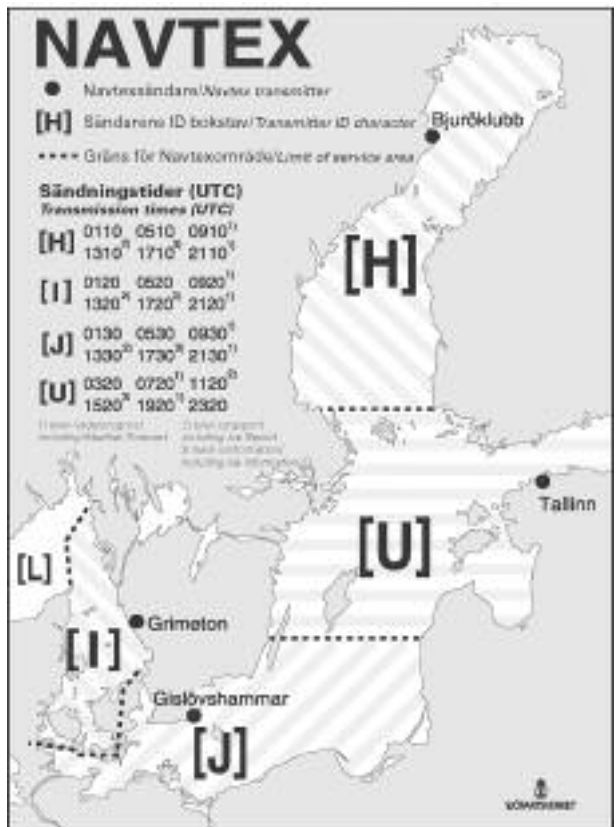
**Storm-, gale- and vital navigational warnings** are transmitted in English and Swedish immediately after they have been promulgated and after the first following silence period. All warnings are subsequently transmitted after each traffic list until cancellation.

The warnings are transmitted on VHF and MF traffic channels and MF working frequencies after announcement on VHF Ch. 16, DSC 2187,5 kHz and MF 2182 kHz.

Transmission times, frequencies and channels are shown on the map on next page.

### 6.3 NAVTEX

Coastal navigational warnings, ice-reports, storm- and galewarnings and weather reports are transmitted on Navtex according to this map. Meteorological warnings and vital navigational warnings are transmitted as soon as possible after they have been promulgated. Afterwards, they are repeated on the ordinary transmission times shown on the map.





## 6.4 Broadcasting

In clear Swedish. The forecasts are valid 24 hours. Storm- and gale warnings are read when occurrence. During the winter season warnings for icing are read.

<i>Time of broadcast Local time</i>	<i>Content</i>	<i>Broadcasting program</i>
0555–0600	All areas (see map page 30). Selected wind observations, sea level	P1 <sup>2)</sup>
0755–0800 <sup>1)</sup>	B-areas, short report (see map)	P1
1300–1305 <sup>1)</sup>	B-areas (see map)	P1
1555–1600	All areas (see map). Selected wind observations and Ice report	P1
2150–2200 <sup>1)</sup>	All areas (see map). Selected wind observations, 2 day forecast	P1

1) After a report for land districts.

2) The P1-program is transmitted on the FM-band but also on MW 1179 kHz (only at 0555 Local time)

## 6.5 Telefax and radiofacsimile transmission

### Telefax

Current ice chart in A4-format over the Baltic, Kattegat and Skagerrak can be transmitted by telefax via telephone or Mobiletelephone (NMT) after special arrangement from the Marine Forecasting Services. Weather forecast chart valid 24 hours covering Northern Europe can also be obtained, for a smaller fee.

### Radiofacsimile

SWEDISH ICE CHART is retransmitted by Hamburg/Pinneberg (DDH/DDK) according to following table.:

<i>Time UTC</i>	<i>Area</i>
1520	B1 – B7
1540	B7 – B14
2115	B1 – B14
1007*	B10 – B12

\*produced by "Bundesamt für Seeschifffahrt und Hydrographie", BSH

WEATHER CHARTS covering the Baltic area are transmitted by Hamburg/Pinneberg (DDH/DDK) and Offenbach/Mainflingen (DCF54) according to following table.

<i>Time UTC</i>		<i>Ref.time</i>	<i>Chart</i>
<i>DDH/DDK</i>	<i>DCF54</i>		
0430	0430	00	Weatheranalysis, North Atlantic, Europe
0512	0512	00	Forecast H+30 <sup>h</sup>
0717	—	00	Repetition from 0512
0730	0808	00	Forecast H+48 <sup>h</sup>
0804	0821	00	Forecast H+72 <sup>h</sup>
1050	1050	06	Weatheranalysis

1600	1600	12	Weatheranalysis
1834	1832	12	Forecast H+24 <sup>h</sup>

Note: Drumspeed/index of cooperation: 120/576.

Frequencies:	3855	kHz	Hamburg/Pinneberg (DDH/DDK)
	7880	kHz	”
	13882,5	kHz	”

*BRACKNELL (ENGLAND)* is transmitting weather charts covering the Baltic area and the North Sea. Frequencies: 3289,5 kHz, 8040 kHz and 11 086,5 kHz.

Further information about program and schedules can be obtained by *SMHI, Marine Forecasting Services*, phone +46-(0)11-495 84 05 fax +46-(0)11-495 84 03.

## 6.6 How to request for weather- and ice reports from vessels

Specially forecasts are subjected to a charge.

Local or detailed forecasts of meteorological- and oceanographically conditions (ice, sea-level, current or waves) can be obtained and are subjected to a charge.

Contact SMHI Maritime Forecasting Services

### SMHI Maritime Forecasting Services, Norrköping

Tel +46-(0)11-495 85 33

Fax +46-(0)11-495 80 53 (alt. +46(0)11 17 09 00)

Telex +54 64470

E-mail: [ice@prod.smhi.se](mailto:ice@prod.smhi.se)

Internet: [www.SMHI.se](http://www.SMHI.se)



## 6.7 Wind table

Comparing table between wind force in Beaufort, wind speed in m/s and description used in the sea report. In the sea report broadcast by the Swedish Broadcasting Corporation m/s is used in connection with an abridged Beaufort description (calm, breeze, gale, storm or hurricane).

<i>Description</i>	<i>Wind force Beaufort</i>	<i>Wind speed m/s</i>	<i>Sea Conditions</i>
Calm	0	0,0 – 0,2	Sea smooth and mirror-like
Light air	1	0,3 – 1,5	Scale-like ripples without foam crest
Light breeze	2	1,6 – 3,3	Small, short wavelets, which do not break
Gentle breeze	3	3,4 – 5,4	Large wavelets, some crests begin to break, foam of glassy appearance
Moderate breeze	4	5,5 – 7,9	Small waves, becoming longer, fairly frequent white foam crests
Fresh breeze	5	8,0 – 10,7	Moderate waves, taking a more pronounced long form, many white foam crests
Strong breeze	6	10,8 – 13,8	Large waves begin to form, white foam crests are more extensive everywhere
Near gale	7	13,9 – 17,1	Sea heaps up and white foam breaking waves begin to be blown in streaks along the direction of the wind
Gale	8	17,2 – 20,7	Moderately high waves of greater length edges of crests break into spindrift, foam is blown in wellmarked streaks along the direction of the wind
Strong gale	9	20,8 – 24,4	High waves, dense streaks of foam along the direction of the wind, crests of waves begin to topple, tumble and roll over, spray may reduce visibility
Storm	10	24,5 – 28,4	Very high waves with long overhanging crests. The resulting foam in great patches is blown in dense white streaks along the direction of the wind. On the whole, the surface of the sea is white in appearance. Visibility is reduced
Violent storm	11	28,5 – 32,6	Exceptionally high waves that may obscure small and medium-sized ships. The sea is completely covered with long white patches of foam lying along the direction of wind. Visibility reduced
Hurricane	12	32,7 – 36,9	The air is filled with foam and spray. Sea completely white with driving spray. Visibility very much reduced

Concerning ice codes, ice symbols on the ice charts and ice nomenclature, a booklet can be provided free of charge by SMHI, Marine Forecasting Services.

