

RESOLUTION A.269 (VIII) adopted on 20 November 1973
RECOMMENDATION FOR SKIPPERS OF FISHING VESSELS ON ENSURING A VESSEL'S ENDURANCE
IN CONDITIONS OF ICE FORMATION

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**RECOMMENDATION FOR SKIPPERS OF FISHING VESSELS ON
ENSURING A VESSEL'S ENDURANCE IN CONDITIONS OF
ICE FORMATION**

THE ASSEMBLY,

NOTING Article 16(i) of the Convention on the Inter-Governmental Maritime Consultative Organization concerning the functions of the Assembly,

RECOGNIZING the need for proper information to skippers on the danger involved in ice formation on vessels and necessary counter-measures to be taken in order to avoid losses of fishing vessels due to icing,

RECALLING Resolution A.168(ES.IV) concerning the Recommendation on Intact Stability of Fishing Vessels, in particular Appendix VIII thereof,

HAVING CONSIDERED the Recommendation adopted by the Maritime Safety Committee at its twenty-seventh session,

ADOPTS the Recommendation for Skippers of Fishing Vessels on Ensuring a Vessel's Endurance in Conditions of Ice Formation as set out in the Annex to this Resolution,

INVITES all governments concerned to take steps to put into effect the Recommendation as soon as possible.

ANNEX

**RECOMMENDATION FOR SKIPPERS OF FISHING VESSELS ON
ENSURING A VESSEL'S ENDURANCE IN CONDITIONS OF
ICE FORMATION**

1. BRIEF SURVEY OF THE CAUSES OF ICE FORMATION AND ITS INFLUENCE UPON THE SEAWORTHINESS OF THE VESSEL

The skipper of a fishing vessel should bear in mind that ice formation is a complicated process which depends upon meteorological conditions, condition of loading and behaviour of the vessel in stormy weather as well as on the size and location of superstructures and rigging. The most common cause of ice formation is the deposit of water droplets on the vessel's structure. These droplets come from spray driven from wave crests and from ship-generated spray.

Ice formation may also occur in conditions of snowfall, sea fog including arctic sea smoke, a drastic fall in ambient temperature, as well as from the freezing of drops of rain on impact with the vessel's structure.

Ice formation may sometimes be caused or accentuated by water shipped on board and retained on deck.

Intensive ice formation generally occurs on stem, bulwark and bulwark rail, front walls of superstructures and deckhouses, hawse holes, anchors, deck gear, forecastle deck and upper deck, freeing ports, aerials, stays, shrouds, masts and spars.

It should be borne in mind that the most dangerous areas as far as ice formation is concerned are the sub-Arctic regions.

The most intensive ice formation takes place when wind and sea come from ahead. In beam and quartering winds, ice accumulates quicker on the windward side of the vessel, thus leading to a constant list which is extremely dangerous.

Listed below are meteorological conditions causing the most common type of ice formation due to spraying of a vessel. Examples of the weight of ice formation on a typical fishing vessel of displacement in the range 100 to 500 tons is also given. For larger vessels the weight will be correspondingly greater.

Slow accumulations of ice take place:

- at ambient temperature from -1°C to -3°C and any wind force;
- at ambient temperature -4°C and lower and wind force from 0 to 9 m/sec;
- under the conditions of precipitation, fog or sea mist followed by a drastic fall of the ambient temperature.

Under all these conditions the intensity of ice accumulation may not exceed 1.5 t/h.

At ambient temperature of -4°C to -8°C and wind force 10 – 15 m/sec, rapid accumulation of ice takes place. Under these conditions the intensity of ice accumulation can lie within the range 1.5 to 4 t/h.

Very fast accumulation of ice takes place:

- at ambient temperature of -4°C and lower and wind forces of 16 m/sec and over;
- at ambient temperature -9°C and lower and wind force 10 to 15 m/sec.

Under these conditions the intensity of ice accumulation can exceed 4 t/h.

The skipper should bear in mind that ice formation adversely affects the seaworthiness of the vessel as ice formation leads to:

- an increase in the weight of the vessel due to accumulation of ice on the vessel's surfaces which causes the reduction of freeboard and buoyancy;
- a rise of the vessel's centre of gravity due to the high location of ice on the vessel's structures with corresponding reduction in the level of stability;
- an increase of windage area due to ice formation on the upper parts of the vessel and hence an increase in the heeling moment due to the action of the wind;
- a change of trim due to uneven distribution of ice along the vessel's length;
- the development of a constant list due to uneven distribution of ice across the breadth of the vessel;
- impairment of the manoeuvrability and reduction of the speed of the vessel.

2. RECOMMENDATIONS FOR SKIPPERS ON ENSURING THE VESSEL'S ENDURANCE UNDER CONDITIONS OF ICE FORMATION

2.1 Prior to departure

2.1.1 Firstly, the skipper should, as in the case of any voyages in any season, ensure that the vessel is generally in a seaworthy condition giving full attention to basic requirements such as:

- (a) loading of the vessel within the limits prescribed for the season (see 2.1.2(a));
- (b) weathertightness and reliability of the devices for closing cargo and access hatches, outer doors and all other openings in the decks and superstructures of the vessel and the watertightness of the sidescuttles and of ports or similar openings in the sides below the freeboard deck to be checked;
- (c) condition of the freeing ports and scuppers as well as operational reliability of their closures to be checked;
- (d) emergency and life-saving appliances and their operational reliability;
- (e) operational reliability of all external and internal communication equipment;

- (f) condition and operational reliability of the bilge and ballast pumping systems.

2.1.2 Further, with special regard to possible ice accretion, the skipper should:

- (a) consider the most critical loading condition against approved stability documents with due regard to fuel and water consumption, distribution of supplies, cargoes and fishing gear and with allowance for possible ice accretion;
- (b) be aware of the danger in having supplies and fishing gear stored on open weatherdeck spaces due to their large ice accretion surface and high centre of gravity;
- (c) ensure that a complete set of warm clothing for all members of the crew is available on the vessel as well as a complete set of hand tools and other appliances for combating ice accretion, a typical list thereof for small vessels is shown at Appendix;
- (d) ensure that the crew is acquainted with the location of means for combating ice accretion, as well as the use of such means, and that drills are carried out so that members of the crew know their respective duties and have the necessary practical skills to ensure the vessel's endurance under conditions of ice accretion;
- (e) acquaint himself with the meteorological conditions in the region of fishing grounds and en route to the place of destination; study the synoptical maps of this region and weather forecasts; be aware of warm currents in the vicinity of the fishing grounds, of the nearest coastline relief, of the existence of protected bays and of the location of icefields and their boundaries;
- (f) acquaint himself with the timetable of the radio stations transmitting weather forecasts and warnings of the possibility of ice accretion in the area of the relevant fishing grounds.

2.2 At sea

During the voyage and when the vessel is on the fishing grounds the skipper should keep himself informed on all long-term and short-term weather forecasts and should arrange for the following systematic meteorological observations to be systematically recorded:

- (a) temperatures of the air and of the sea surface;
- (b) wind direction and force;
- (c) direction and height of waves and sea state;
- (d) atmospheric pressure, air humidity;
- (e) frequency of splashing per minute and the intensity of ice accumulation on different parts of the vessel per hour.

All observed data should be recorded in the vessel's log-book. The skipper should compare the weather forecasts and icing charts with actual meteorological conditions, and should estimate the probability of ice formation and its intensity.

When the danger of ice formation arises the following measures should be taken without delay:

- (a) all the means of combating ice formation should be ready for use;
- (b) all the fishing operations should be stopped, the fishing gear should be taken on board and placed in the underdeck spaces. If this cannot be done all the gear should be fastened for storm conditions on its prescribed place;

It is particularly dangerous to leave the fishing gear suspended since its surface for ice formation is large and the point of suspension is generally located high;

- (c) barrels and containers with fish, packing, all gear and supplies located on deck as well as portable mechanisms should be placed in closed spaces as low as possible and firmly lashed;
- (d) all cargoes in holds and other compartments should be placed as low as possible and firmly lashed;
- (e) the cargo booms should be lowered and fastened;
- (f) deck machinery, hawser reels and boats should be covered with duck covers;
- (g) life-lines should be fastened on deck;

- (h) freeing ports fitted with covers should be brought into operative condition, all objects located near scuppers and freeing ports and preventing water drainage from deck should be taken away;
- (i) all cargo and companion hatches, manhole covers, weathertight outside doors in superstructures and deckhouses and portholes should be securely closed in order to ensure complete weathertightness of the vessel, access to the weather deck from inner compartments should be allowed only through the superstructure deck;
- (j) a check should be carried out as to whether the amount of water ballast on board and its location is in accordance with that recommended in "Stability Guidance to Skippers"; if there is sufficient freeboard, all the empty bottom tanks fitted with ballast piping should be filled with sea-water;
- (k) all fire-fighting, emergency and life-saving equipment should be ready for use;
- (l) all drainage systems should be checked for their effectiveness;
- (m) deck lighting and searchlights should be checked;
- (n) a check should be carried out to make sure that each member of the crew has warm clothing;
- (o) reliable two-way radio communication with both shore stations and other vessels should be established; radio calls should be arranged for set times.

The skipper should seek to take the vessel away from the dangerous area keeping in mind that the lee edges of icefields, areas of warm currents and protected coastal areas are a good refuge for the vessel during weather when ice formation occurs.

Small fishing vessels on fishing grounds should keep nearer to each other and to larger vessels.

It should be remembered that the entry of the vessel into an icefield presents certain danger to the hull especially when there is a high sea swell. Therefore the vessel should enter the icefield at a right angle to the icefield edge at low speed without inertia. It is less dangerous to enter an icefield bow to the wind. If a vessel must enter an icefield with the wind on the stern, the fact that the edge of the ice is more dense on the windward side should be taken into consideration. It is important to enter the icefield at the point where the ice floes are the smallest.

2.3 During ice formation

If in spite of all measures taken the vessel is unable to leave the dangerous area, all means available for removal of ice should be used as long as it is subjected to ice formation.

Depending on the type of vessel, all or many of the following ways of combating ice formation may be used:

- (a) removal of ice by means of cold water under pressure;
- (b) removal of ice with hot water and steam;
- (c) breaking up of ice with ice crow's, axes, picks, scrapers, wooden sledge hammers and clearing it with shovels.

When ice formation begins the skipper should take into account recommendations listed below and ensure their strict fulfilment:

- (a) report immediately ice formation to the shipowner and establish with him constant radio communication;
establish radio communication with the nearest vessels and ensure that it is maintained;
- (b) do not allow ice formation to accumulate on the vessel, immediately take steps to remove from the vessel's structures even the thinnest layer of ice and ice sludge from the upper deck;
- (c) check constantly the vessel's stability by measuring the roll period of the vessel during ice formation. If the rolling period increases noticeably, immediately take all possible measures in order to increase the vessel's stability;
- (d) ensure that each member of the crew working on the weather deck is warmly dressed and wears a safety line securely attached to the guard rail;
- (e) bear in mind that the work of the crew on ice clearing entails the danger of frost bite. For this reason it is necessary to make sure that the men working on deck are replaced periodically;

- (f) keep the following structures and gears of the vessel first free from ice:
 - aerals
 - running and navigational lights
 - freeing ports and scuppers
 - life-saving craft
 - stays, shrouds, masts and rigging
 - doors of superstructures and deckhouses
 - windlass and hawse holes;
- (g) remove the ice from large surfaces of the vessel, beginning with the upper structures (such as bridges, deckhouses etc.), because even a small amount of ice on them causes a drastic worsening of the vessel's stability;
- (h) when the distribution of ice is not symmetrical and a list develops, the ice must be cleared from the lower side first. Bear in mind that any correction of the list of the vessel by pumping fuel or water from one tank to another may reduce stability during the process when both tanks are slack;
- (i) when a considerable amount of ice forms on the bow and a trim appears, ice must be quickly removed. Water ballast may be redistributed in order to decrease the trim;
- (j) clear ice from the freeing ports and scuppers in due time in order to ensure free drainage of the water from the deck;
- (k) check regularly for water accumulation inside the hull;
- (l) avoid navigating in following seas since this may drastically worsen the vessel's stability;
- (m) register in the vessel's log-book the duration, nature and intensity of ice formation, amount of ice on the vessel, measures taken to combat ice formation and their effectiveness;
- (n) if, in spite of all the measures taken to ensure the vessel's endurance in conditions of ice formation, the crew is forced to abandon the vessel and embark on life-saving craft (life-boats, rafts) then, in order to preserve their lives, it is necessary to do all possible to provide all the crew with warm clothing or special bags as well as to have a sufficient number of life-lines and bailers for speedy bailing out of water from the life-saving craft.

APPENDIX

Typical list of equipment and hand tools required for combating ice formation:

- 5 Ice crows or crowbars
- 5 Axes with long handles
- 5 Picks
- 5 Metal scrapers
- 5 Metal shovels
- 3 Wooden sledge hammers
- 3 Fore and aft life-lines to be rigged each side of the open deck fitted with travellers to which lizards can be attached

Safety belts with spring hooks should be provided for no less than 50 per cent of the members of the crew (but not less than 5 sets), which can be attached to the lizards.

- Notes:*
- 1. Number of hand tools and life-saving appliances may be increased at the shipowners' discretion.
 - 2. Hoses which may be used for ice combating should be readily available on board.

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