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TP 8941 E

**Interim Standards
for the Construction,
Equipment and Operation
of Passenger ships
in the Sea Ice Areas
of Eastern Canada**

Canada

INTERIM STANDARDS FOR THE CONSTRUCTION, EQUIPMENT AND OPERATION
OF PASSENGER SHIPS IN SEA ICE AREAS
OF EASTERN CANADA

Recognizing that special risks of ice damage may occur in certain waters off the East Coast of Canada and that these risks can endanger safety of life at sea, the following Standards have been adopted by the Board of Steamship Inspection pursuant to paragraph 370(2)(a) of the Canada Shipping Act.

1. TITLE

These Standards shall be known as the "INTERIM STANDARDS FOR THE CONSTRUCTION, EQUIPMENT AND OPERATION OF PASSENGER SHIPS IN SEA ICE AREAS OF EASTERN CANADA".

2. Application

2.1 Subject to sections 2.1.1 and 2.1.2 the standards shall apply to all passenger ships that are;

- (a) registered in Canada or
- (b) engaged in the coasting trade of Canada

when operating within economic zones of eastern Canada.

2.1.1 Subject to sections 2.1.3 and 2.1.4 all ships when operating in the economic zones of eastern Canada shall comply with section 12 of the Standards.

2.1.2 Subject to sections 2.1.3 and 2.1.4 all ships when operating in the sea ice areas of eastern Canada shall comply with sections 6 to 11 of the standards.

2.1.3 Existing ships over 40 m in length shall comply with the standards as far as is reasonable and practicable. Such vessels will be subject to special consideration by the Board.

2.1.4 New and existing ships not over 40 m in length will be specially considered by the Board. However, the spirit of the standards shall be maintained as far as is reasonable and practicable.

2.2 Exemptions and Equivalentents

2.2.1 Notwithstanding anything in these Standards the Board may, if satisfied that it can with propriety do so, exempt any ship from full compliance with any of the requirements of these Standards:

2.2.2 Nothing in these standards shall be construed as interpreting or detracting from existing statutory or regulatory requirements.

2.2.3 Where the standards require that a particular fitting, material, appliance, apparatus or item of equipment thereof shall be fitted to or carried on a ship, or that any particular provision shall be made or any procedure or arrangement shall be complied with, the Board may allow any other fitting, material, appliance, apparatus, item of equipment or type thereof to be fitted or carried, or any other procedure or arrangement to be made to the ship, if it is satisfied by trial thereof or otherwise that each fitting, material, appliance, apparatus, item of equipment or type thereof, or that any particular provision, procedure or arrangement is at least as effective as that required by the standards.

3. INTERPRETATIONS

In the Standards

“accommodation space” includes

- (i) passenger spaces,
- (ii) crew space,
- (iii) offices,
- (iv) pantries, and
- (v) spaces similar to any of the foregoing not being service spaces or open spaces on deck;

“approved” means approved by the Board of Steamship Inspection;

“Board” means the Board of Steamship Inspection;

“breadth of the ship” means the greatest moulded breadth at or below the ship’s deepest subdivision load water line;

“bulkhead deck” means the uppermost deck up to which transverse watertight bulkheads are carried;

“draught” means the vertical distance from the moulded base line amidships to a subdivision load water line;

“existing ship” means a ship that is not a new ship and that has previously operated successfully in the sea ice area of eastern Canada;

“ice covered waters” means waters covered by ice to such an extent as to require the ship to make extraordinary manoeuvres or to be assisted by an ice breaker;

“length” in respect of a ship means, the horizontal distance between perpendiculars erected at the extreme ends of the deepest subdivision load water line of the ship;

“margin line” means a line drawn at least 76 mm below the upper surface of the bulkhead deck at the side of a ship, and used for the purpose of determining the floodable length of the ship;

“new ship” means

- (a) a passenger ship, the construction of which is commenced on or after 1st January, 1989
- (b) a non-passenger ship, which is converted to a passenger ship on or after 1st January, 1989
- (c) a passenger ship, that was a non-Canadian ship and is registered in Canada, on or after 1st January, 1989
- (d) a passenger ship, that is a non-Canadian ship which is engaged in the coasting trade of Canada, or
- (e) a passenger ship that is registered in Canada and has operated in Canadian waters other than the sea ice areas of eastern Canada.

“passenger” means any person carried on a ship, but does not include

- (a) the master or a member of the crew or a person employed or engaged in any capacity on board the ship on the business of that ship, or
- (b) a child under one year of age;

“passenger ship” means a ship carrying more than twelve passengers;

“passenger space” means space provided for the use of passengers;

“ship” means a vessel of any description used in navigation that is propelled by machinery;

“deepest subdivision load waterline” means the waterline which corresponds to the greatest draught determined in accordance with the Full Construction Regulations;

“sea ice area subdivision waterline” means the waterline used in determining the subdivision of the ship in accordance with these Standards;

“watertight” in relation to a structure means the structure is capable of preventing the passage of water through it in any direction, under a head of water up to the ship’s margin line;

4. SEA ICE AREAS OF EASTERN CANADA

4.1 Subject to section 4.1.1 the sea ice areas of eastern Canada are those areas where old ice may be present and are defined as:

- (a) the area south of 60° North latitude bounded by;
 - (i) in the west, the eastern sea boards of Labrador & Newfoundland;
 - (ii) in the east, the line drawn defined by the territorial waters and fishing zones order, zone number 4;
 - (iii) in the south,

for the month of January	50° North latitude
for the month of February	49° North latitude
for the month of March	48° North latitude
for the month of April	47° North latitude
for the month of May	48° North latitude
for the month of June	48° North latitude
for the month of July	48° North latitude
for the month of August	56° North latitude
for the month of September	60° North latitude
for the month of October	60° North latitude
for the month of November	57° North latitude
for the month of December	59° North latitude

- (b) the area known as the Strait of Belle Isle to the following extent
- (i) during the months of January, February, March and April, north of 51° North latitude
 - (ii) during the month of May, north of a line drawn between Port au choix, Pointe Riche, Newfoundland Island and 50° North latitude, 59° West longitude and 50° North latitude, 61° West longitude and the south shore of Quebec at 61° West longitude.
 - (iii) during the month of June, north of a line drawn between, Green Point 49°41 North latitude, 57°57 West longitude, Newfoundland Island and 49° North latitude, 60° West longitude and 49° North latitude, 61° West longitude and the South Shore of Quebec at 61° West longitude.
 - (iv) during the month of July North 51° North latitude.

4.1.1 A Steamship Inspector may, during seasons of exceptional ice conditions, extend or reduce the defined sea ice areas as ice conditions warrant.

5. RESPONSIBILITY

5.1 It shall be the responsibility of the owner, charterer or agent, to inform the ship's master of any restrictions which may apply to the ship under these Standards.

5.2 Masters are to be reminded that while compliance with these Standards will facilitate the passage of the ship through Canadian waters, events or circumstances may require a steamship inspector or a pollution prevention officer to exercise the powers prescribed by the Canada Shipping Act.

5.3 It shall be the responsibility of the master to exercise prudence and good seamanship having regard to weather forecasts and the navigational zone and to make those reports required by section 7 and 9 of the standards.

6. ICE ADVISOR

6.1 All ships to which the standards apply shall, when operating within a declared sea ice area, have on board a person or persons having the experience described in Section 6.2 in navigating in ice covered waters.

6.2 The person or person referred to in Section 6.1 shall;

- (a) have a minimum of 15 days as Senior Watchkeeping Officer on a ship which has operated successfully through ice covered waters; or
- (b) shall have a minimum of 10 days as Watchkeeping Officer on a ship which has operated successfully through ice covered waters and have successfully completed an ice navigation course approved by the Board; or
- (c) in the case of ships on short scheduled runs that person or persons shall have a minimum of 15 days experience navigating on a ship which has operated successfully through ice covered waters relating to those waters to be navigated.

7. ICE INFORMATION

7.1 The Master of Ships operating in the waters and during the period defined in Section 4 shall:

- (a) (i) contact ECAREG CANADA who will inform them whether or not their route lies across a sea ice area and supply latest ice information if applicable; and

- (ii) receive information contained in paragraph (a) by means of facsimile equipment; and
- (iii) seek information from ships already in the area regarding ice conditions; or

(b) in the case of ships on short scheduled runs make full use of all available sources of local knowledge.

8. Conduct Of Ship

- 8.1 The ship shall comply with the Collision Regulations and in particular proceed at safe speed having regard to visibility, and prevailing ice conditions.
- 8.2 Any requirement for escort should be arranged by the Owner, or by the Master or Agent, on his behalf.
- 8.3 No ship shall navigate within the sea ice areas unless it complies with part I of the Charts and Publications Regulations, as if it were a ship to which part I of those Regulations applies and within waters to which that part applies.
- 8.4 Every ship shall be under the conduct of an ice advisor while navigating in ice covered waters.
- 8.5 The ice advisor described in paragraph 8.4 shall comply with the hours of rest provisions in the Safe Manning Regulations.

9. Reporting

- 9.1 Reporting of ice conditions during hours of operation shall be at the meteorological synoptic times of 0000, 0600, 1200 and 1800 Z (UTC - coordinated universal time) according to procedures and format specified in the Environment Canada Marine Weather Observing Manual (MANMAR). This manual specifies an international ice reporting code which may be transferred/reported to any Canadian Marine Radio Station.

10. Equipment Failures And Casualties

10.1 When a ship sustains damage or suffers a casualty, or a malfunction of any items required by section 11, the master shall report the incident to either,

- (a) ECAREG CANADA, or
- (b) local VTS Centre.

11. Ship Arrangements

11.1 General

11.1.1 All passenger ships operating in the sea ice area shall have 4 hulls constructed of approved steel or other approved material.

11.1.2 Watertight doors shall not normally be fitted in any watertight bulkheads below the bulkhead deck. However where such doors are fitted, to permit efficient operation of the ship, they shall be

- (a) power operated and capable of being independently closed from
 - (i) the wheelhouse,
 - (ii) at some position above the bulkhead deck, and
 - (iii) locally at the door;
- (b) subject to (a) constructed, operated and fitted in accordance with sections 14 to 18 of the Hull Construction Regulations;
- (c) kept closed during navigation except to permit the passage of passengers or crew or when work in the vicinity of the door necessitates its being open. The door must be immediately closed when the transit through the door is complete or when the task which necessitated its being open is finished; and
- (d) if fitted in transverse watertight bulkhead within passenger spaces below the bulkhead deck then the subdivision on both sides shall be protected by longitudinal bulkheads having no openings, and located inboard of the extent of damage described in section 11.2.1.

- 11.1.3 All ships shall be fitted with trim and heel indicators.
- 11.1.4 All dry compartments, accommodations and machinery spaces below the bulkhead deck, not normally manned, shall be fitted with bilge alarms having indicators in wheelhouse and sounding pipes readily accessible from bulkhead or higher deck.
- 11.1.5 Search Lights
- No ship shall navigate within the sea ice area unless it complies with Section 32 and 33 of the Navigating Appliances and Equipment Regulations, as if it were a ship to which those sections apply and within waters to which those sections apply and the searchlight positioned so as not to blind the ice navigator.
- 11.1.6 Ships operating on dedicated routes or on less onerous voyages may be specially considered by the Board.
- 11.1.7 The design of the hull scantlings shall not be less than for a Type A ship as defined in the Arctic Shipping Pollution Prevention Regulations.
- 11.2 Damage Assumptions
- 11.2.1 The assumed extent of damage is:
- (a) longitudinal extent $1/3L^{2/3}$ or 14.5 metres, whichever is less, positioned so as to include at least two consecutive compartments anywhere within the length of the ship;
 - (b) transverse extent 0.1B or 2 metres whichever is less measured inboard from the ships side at right angles to the centre line at the level of the sea ice area subdivision waterline but not to be less than 1 metre inboard from the ships side;
 - (c) vertical extent from the base line upwards to the underside of the bulkhead deck; or
 - (d) if any damage of lesser extent than indicated above would result in a more severe condition regarding heel or less righting lever such damage shall be assumed in calculations.

11.2.2 Survival Assumptions

The final condition of the ship after damage and in the case of unsymmetrical flooding after equalization measures have been taken shall be as follows:

- (a) The righting lever curve (GZ) shall have a minimum range of 20 degrees beyond the position of equilibrium.
- (b) The righting lever (GZ) shall have a maximum value of at least 100 mm.
- (c) The final waterline, taking into account trim and heel, shall not reduce the freeboard according to the sea ice area subdivision waterline by more than 2/3 at any point in the length of the ship.
- (d) In the case of unsymmetrical flooding the total heel shall not exceed seven degrees.

11.2.3 For the purpose of making damage stability calculations the volume and surface permeabilities shall be in general as follows:

Spaces	Permeability
appropriated to cargo, or stores	60
occupied by accommodation	95
occupied by machinery	85
intended for liquids	0 or 95*
void Spaces	95

*Whichever results in the more severe requirements

Higher surface permeabilities are to be assumed in respect of spaces which, in the vicinity of the damage waterplane, contain no substantial quantity of accommodation or machinery and spaces which are not generally occupied by any substantial quantity of cargo or stores.

11.2.4 Unsymmetrical flooding is to be kept to a minimum consistent with efficient arrangements. Where it is necessary to correct large angles of heel, the means adopted shall be self-acting. Where cross-flooding arrangements are provided the time for equalization shall not exceed 15 minutes.

11.2.5 A double bottom shall be fitted extending from the forepeak bulkhead to the after peak bulkhead as far as this is practicable and compatible with the design and proper working of the ship. The inner bottom shall be continued out to the ship's sides in such a manner as to protect the bottom to the turn of the bilge. Such protection will be deemed satisfactory if the line of intersection of the outer edge of the margin plate with the bilge plating is no lower at any part than a horizontal plane passing through the point of intersection with the frame line amidships of a transverse diagonal line inclined at 25° to the base line and cutting it at a point one-half the ship's moulded breadth from the middle line.

11.3 LIFE SAVING EQUIPMENT

11.3.1 Every ship shall carry the following life saving equipment:

- (a) sufficient inflatable life rafts to accommodate the complement;
- (b) a rescue craft on each side of the vessel under a launching appliance; only one rescue craft need be carried on vessels less than 500 gross registered tons; and
- (c) one approved marine anti-exposure work suit for each member of the rescue boat crew plus two per survival craft launching station.

11.3.2 Any Inflatable liferafts, or rescue boats carried in compliance with the Life Saving Equipment Regulations shall count towards the requirements of sections 11.3.1 (a) and (b) respectively.

12. SUBDIVISION

12.1 The sea ice areas as defined in section 4 of the standards have been developed on the basis of the historical frequency of occurrence of old ice (sea ice which has survived at least one summers melt). Since younger types of sea ice and/or ice-bergs, may also be present and outside these areas, the areas do not imply that conditions elsewhere are ice free or without ice hazard.

12.2 Recognizing that first year fresh water ice may be as hard as old ice and the possible presence of ice bergs and sea ice, all ships operating within the economic zones of eastern Canada shall comply with the standard of subdivision specified in Section 12.2.1.

12.2.1 All ships shall have a deepest subdivision load waterline assigned in accordance with the Hull Construction Regulations to a two compartment standard of subdivision for operation in ice.

