

IMO's work towards safety of shipping in the Arctic

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International Maritime Organization



IMO

- Specialized UN agency
- IMO Convention: adopted in 1948, entered into force in 1958, formally known as Inter-Governmental Maritime Consultative Organization - IMCO
- 174 Member States, three associate members
- Headquarters in London, UK since 1958
- IGOs and NGOs participate as observers
- Annual budget £30+ million
- Secretariat – just over 250 staff, more than 50 nationalities



- Primarily a technical UN agency,
concerning maritime safety and security; pollution prevention;
and facilitation of maritime traffic
 - About 50 mandatory instruments
- Mission statement:
“Safe, Secure and Efficient Shipping on Cleaner Oceans”



IMO at work - Structure

- Assembly
- Council –
40 elected Members
- Committees:
 - **Maritime Safety Committee (MSC)**
 - Marine Environment Protection Committee (MEPC)
 - Legal Committee (LEG)
 - Facilitation Committee (FAL)
 - Technical Cooperation Committee (TCC)



Sub-Committee structure reporting to MSC & MEPC

- Sub-Committee on Ship Design and Construction (SDC)
- Sub-Committee on Pollution Prevention and and Response (PPR)
- Sub-Committee on Human Element, Training and Watchkeeping (HTW)
- Sub-Committee on Ship Systems and Equipment (SSE)
- **Sub-Committee on Navigation, Communication and Search and Rescue (NCSR)**
- Sub-Committee on Carriage of Cargoes and Containers (CCC)
- Sub-Committee on Implementation of IMO Instruments (III)

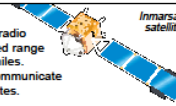
Surviving disaster – The Titanic and SOLAS

In 1914, two years after the Titanic disaster of 1912, in which 1,503 people lost their lives, maritime nations gathered in London adopted the International Convention for the Safety of Life at Sea (SOLAS Convention), taking into account lessons learned from the Titanic. The 1914 version was superseded by SOLAS 1929, SOLAS 1948, SOLAS 1960 (the first adopted under the auspices of the International Maritime Organization) and SOLAS 1974. SOLAS 1974 is still in force today, but it has been amended and updated many times. The regulations relating to life saving appliances and arrangements, contained in chapter III of SOLAS, a new version of which entered into force on 1 July 1998, are intended to ensure that in the event of a catastrophe at sea, passengers and crew have the greatest chances of survival. Improved design and equipment, better fire protection, satellite communications, rescue planes and helicopters and trained personnel also contribute to improved safety at sea.



Distress alert

The Titanic used radio which had a limited range of 200 nautical miles. Ships can now communicate globally via satellites.



Helicopters and rescue planes

Unavailable in 1912, helicopters and rescue planes are now used to locate, search for and rescue survivors.



Speed of navigation around ice

The Commission into the Titanic ruled the loss was due to collision with an iceberg brought about by excessive speed at which she was being navigated. Under SOLAS, when ice is reported on or near his course the master of every ship at night is bound to proceed at a moderate speed or alter course.

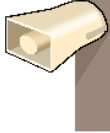
Ice patrol

In the first SOLAS 1914, after the Titanic disaster, ice patrols in the north Atlantic were set up and continue to be a SOLAS requirement.



Public address system

There was no public address system on the Titanic and news filtered to the passengers slowly, adding to the disorder and confusion. Under SOLAS, all passenger ships must be fitted with a public address system.



Lifeboat design

Some people died from hypothermia in the Titanic lifeboats because they were open and gave no protection against the cold. Under SOLAS, lifeboats must be fully or partially enclosed. On passenger ships, partially enclosed lifeboats can be used as they are easier to get into, but they must have a collapsible roof to fold across.



Crew in lifeboat drill

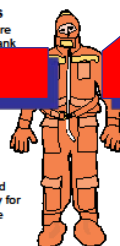
The Titanic lacked training in lowering the lifeboats. Boat they were assigned were not filled to capacity and were strong. In SOLAS, every crew member must undergo regular practice in lifeboat training manuals.

Number of lifeboats

The Titanic did not have enough lifeboats for all passengers. Under SOLAS, passenger ships must carry enough lifeboats (some of which can be substituted by liferafts) for all passengers, plus liferafts for 25%.

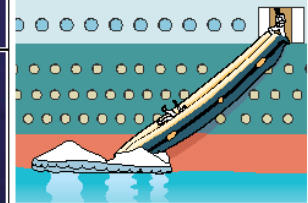
Immersion suits

hypothermia. Under SOLAS, a specific number of immersion suits must be carried on both passenger and cargo ships, mainly for the crews of rescue boats.



Evacuation chutes

Passengers on the Titanic jumped from windows and doorways into the lifeboats as they were lowered, often injuring themselves or other passengers. New emergency evacuation chutes are both safer and quicker.



The Carpathia
Received distress call at 12.25am. Travelled 58 miles and picked up first lifeboat at 1.00am.

Radio waves

The Californian
Stopped because of the ice less than 20 miles from the Titanic. Did not approach until after 6.00am when the Carpathia was spotted. Arrived at 7.30am - too late to rescue any survivors.

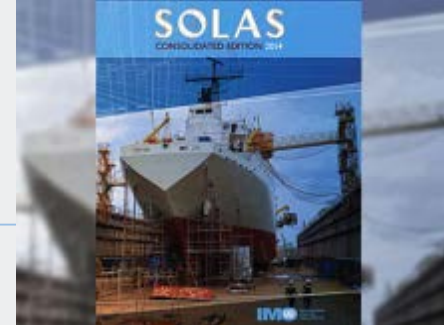
The Titanic
Hit iceberg at 11.40pm and sank at 2.20am.

Distress watch

The Californian was less than 20 miles away but the radio officer had gone off duty when the distress messages were sent. Under SOLAS, every ship while at sea must maintain a continuous watch on the distress and safety frequencies.



1912



INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA (SOLAS), 1974

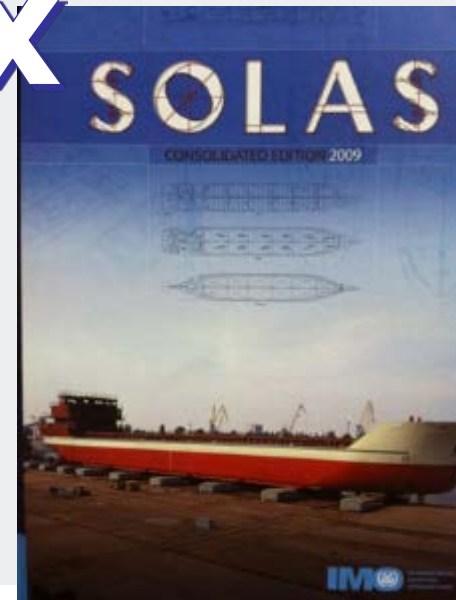
Chapter V – Safety of Navigation

• SOLAS Chapter V – Safety of Navigation

- 1 Application
- 2 Definitions
- 3 Exemptions and equivalents
- 4 Navigational warnings
- 5 Meteorological services and warnings
- 6 Ice Patrol Service
- 7 Search and rescue services
- 8 Life-saving signals
- 9 Hydrographic services
- 10 Ships' routing
- 11 Reporting systems
- 12 Vessel traffic services
- 13 Establishment and operation of navigational systems
- 14 Ship manning
- 15 Principles relating to bridge design and layout and to navigational systems and equipment on board
- 16 Maintenance of equipment
- 17 Electromagnetic compatibility
- 18 Approval, surveys and performance standards of navigational systems and equipment and voyage data recorder
- 19 Carriage requirements for shipborne navigational systems and equipment
- 19-1 Long-range identification and tracking of ships
- 20 Voyage data recorder
- 21 International Code of Signals and IAMSAR Manual
- 22 Navigation bridge visibility
- 23 Pilot transfer arrangement
- 24 Use of heading and/or track control systems
- 25 Operation of steering gear
- 26 Steering gear: testing and drills
- 27 Nautical charts and nautical publications
- 28 Records of navigational activities and daily reporting
- 29 Life-saving signals to be used by ships, aircraft or persons in distress
- 30 Operational limitations
- 31 Danger messages
- 32 Information required in danger messages
- 33 Distress situations: obligations and procedures
- 34 Safe navigation and avoidance of dangerous situations
- 34-1 Master's discretion
- 35 Misuse of distress signals

Appendix: Rules for the management, operation and financing of the North Atlantic Ice Patrol

37 regulations & an appendix



SOLAS chapter V – Safety of Navigation

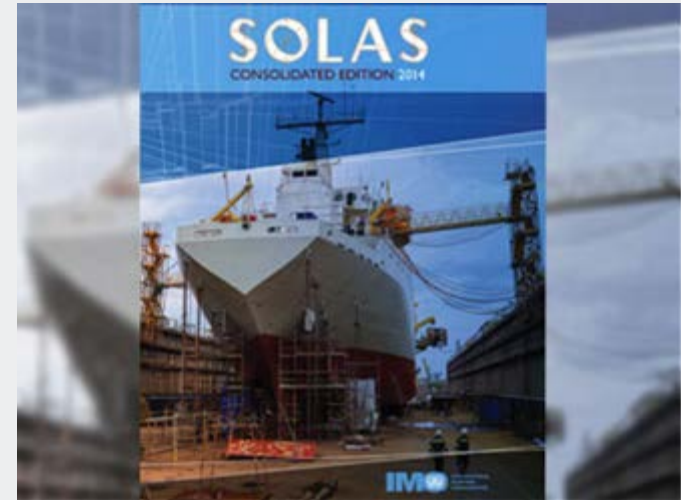


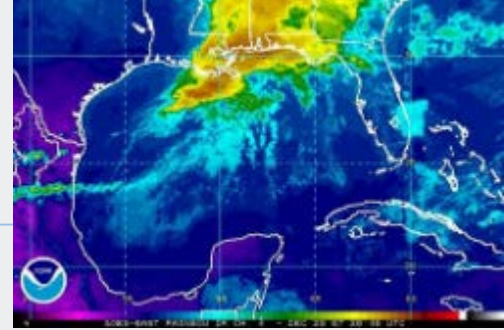
What is then the State's obligation as a coastal States?



SOLAS chapter V – coastal State's obligations

- 4 Navigational warnings
- 5 Meteorological services and warnings
- 6 Ice Patrol Service
- 7 Search and rescue services
- 8 Life-saving signals
- 9 Hydrographic services
- 10 Ships' routing
- 11 Ship reporting systems
- 12 Vessel traffic services
- 13 Establishment and operation of aids to navigation
- 27 Nautical charts and nautical publications
- 31 Danger messages
- 32 Information required in danger messages
- 33 Distress situations: obligations and procedures





Reg. 5 Meteorological services and warnings

... encourage the collection of meteorological data by ships at sea and to arrange for their examination, dissemination and exchange in the manner most suitable for the purpose of aiding navigation.

... undertake to carry out, in co-operation, the meteorological arrangements.

Forecasts, warnings, synoptic and other meteorological data intended for ships shall be issued and disseminated by the national meteorological service.

SOLAS Chapter V – coastal State's obligations

Reg. 6 Ice Patrol Service (see also appendix)

The Contracting Governments undertake to continue an ice patrol and a service for study and observation of ice conditions in the North Atlantic....



SOLAS Chapter V – coastal State's obligations

Reg. 31&32 Danger messages & information therein
when intelligence of any of the dangers is received (from masters), these will be promptly brought to the knowledge of those concerned ...

- 1 Ice, derelicts and other direct dangers to navigation;
- 2 Tropical cyclones (storms);

and subsequent further observations should be made and transmitted hourly.



Weather routeing - resolution A.528(13)

Weather conditions can also affect a ship's navigation, and in 1984, the IMO Assembly adopted resolution A.528(13), ***Recommendation on Weather Routeing***, which recognizes that weather routeing - by which ships are provided with "optimum routes" to avoid bad weather - can aid safety.

INTERNATIONAL MARITIME
ORGANIZATION



IMO

ASSEMBLY - 13th session
Agenda item 10(b)

Distr.
GENERAL
A 13/Res.528
1 May 1984
Original: ENGLISH

RESOLUTION A.528(13)

adopted on 17 November 1983

RECOMMENDATION ON WEATHER ROUTEING

THE ASSEMBLY,

RECALLING Article 16(j) of the Convention on the International Maritime

IMO/WMO WORLDWIDE MET-OCEAN INFORMATION AND WARNING SERVICE – GUIDANCE DOCUMENT

(Resolution A.1051(27) (being revised))

Give harmony with the IMO/IHO World-Wide Navigational Warning Services (WWNWS) for MSI provisions (resolution A.705(17), as amended and resolution A.706(17), as amended).

Sets out provisions of:

- Meteorological information arrangement;
- Issuing and preparation services;
- METAREA coordinator resources and responsibilities; among other things.

Other relevant guidance documents

1 MSC.1/Circ.1293/Rev.1 (2018)

Participation in the WMO Voluntary Observing Ships Scheme

2 MSC.1/Circ.1310/Rev.1 (2014)

Joint IMO/IHO/WMO MSI Manual

3 Resolution A.918(22) (2002)

IMO Standard marine communication phrases

4 And so on

Shipping user perspective

1. WMO publication: WMO No. 9, Volume D, *Information for Shipping*

Details of service availability, broadcast times and radio frequencies for services provided to vessels at sea

2. *Definition and harmonization of the format and structure of Maritime Services in the context of e-navigation*

(Resolution, may be adopted next month, see NCSR 6/23/Add.1, annex 10)

3. *Initial descriptions of maritime services in the context of e-navigation*

(Circular, may be approved next month, see NCSR 6/23/Add.1, annex 11)

Shipping user perspective – in the context of e-navigation

Ice navigation service user needs (Maritime Service 13)

Information related to	Examples
En route or at sea	<ul style="list-style-type: none">• Broad, area-based forecasts• Higher detail in complex waterways• Increased interest in synoptic features and movement• Longer forecast lead-time essential
Entering, transiting and exiting a port	<ul style="list-style-type: none">• Point (small area) based forecasts• High spatial and temporal detail• Real-time observations• Focus on short-term lead times
At berth	<ul style="list-style-type: none">• Forecasts of changes to ice conditions
Planning a trip	<ul style="list-style-type: none">• Focus on short-term timeframes, as well as longer forecast lead times• Forecasts and warnings• Specific details on timing of wind changes or hazardous weather leading to changes in ice conditions• Focus on forecast details for specific areas or routes
Vessel and equipment design	<ul style="list-style-type: none">• Historical values of low air temperatures and water temperatures• Focus on ocean and sea routes

Shipping user perspective – in the context of e-navigation

Meteorological information service user needs (Maritime Service 14)

Information related to	Examples
En route or at sea	<ul style="list-style-type: none">• Broad, area-based forecasts• Higher detail in complex waterways• Increased interest in synoptic features and movement• Longer forecast lead-time essential
Entering, transiting and exiting a port	<ul style="list-style-type: none">• Point (small area) based forecasts• High spatial and temporal detail• Real-time observations• Warnings of reduced visibility, squalls• Focus on short-term lead times
At berth	<ul style="list-style-type: none">• Warnings of squalls, thunderstorms• Forecasts of general weather conditions
Planning a trip	<ul style="list-style-type: none">• Focus on short-term timeframes, as well as longer forecast lead times• Increased interest in synoptic features and movement• Forecasts and warnings• Specific details on timing of wind changes or hazardous weather• Focus on forecast details for specific areas or routes
Vessel and equipment design	<ul style="list-style-type: none">• Historical values of low air temperatures and water temperatures• Focus on ocean and sea routes

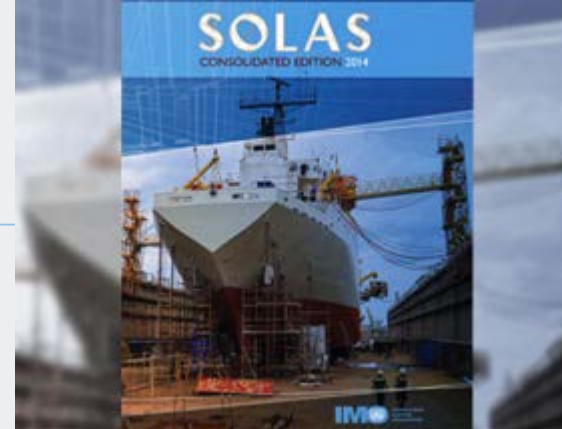
International Convention on Maritime Search and Rescue, 1979

Designed to improve existing arrangements and provide a framework for carrying out search and rescue operations following accidents at sea.

3.1.1 Parties shall coordinate their search and rescue organizations and should, whenever necessary, coordinate search and rescue operations with those of neighbouring States.



SOLAS Chapter V – Safety of Navigation



Regulation 7 Search and rescue services

... undertakes to ensure that necessary arrangements are made for distress communication and co-ordination in their area of responsibility and for the rescue of persons in distress at sea around its coasts.

These arrangements shall include the establishment, operation and maintenance of such SAR facilities ...

... and shall, so far as possible, provide adequate means of locating and rescuing such persons.

Search and Rescue in Arctic waters

Polar shipping will grow over the coming years.

More ships sailing in Arctic waters implies a greater risk of incidents occurring and requires coastal States in the Arctic to enhance their response system, including the availability of search and rescue (SAR) facilities.



Search and Rescue in Arctic waters

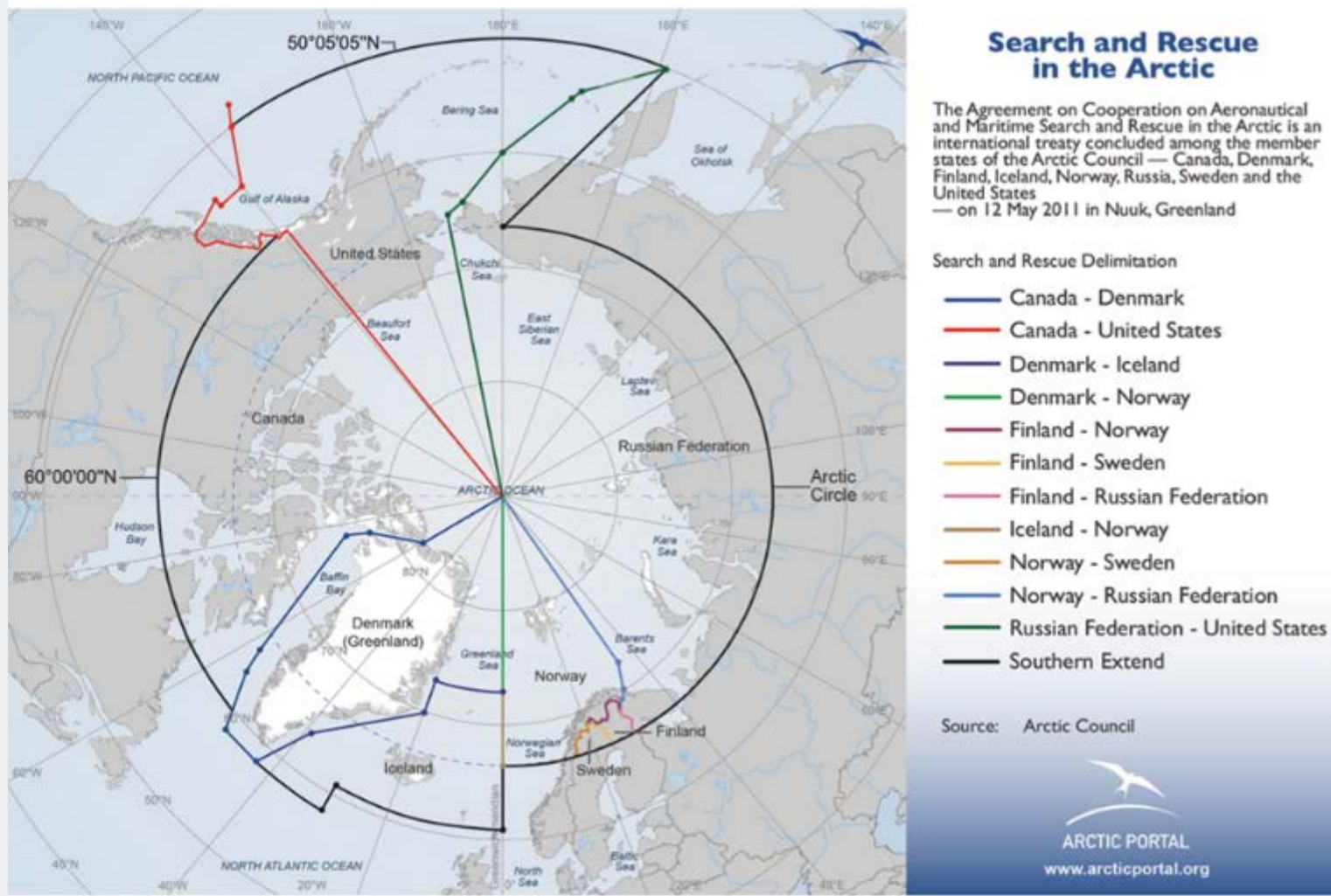
Remote and harsh environment of the polar regions

International cooperation is critical and the excellent work facilitated by the Arctic Council in the field of SAR in the Arctic is acknowledged.

Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic, 2011



Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic, 2011



IMO Secretary-General awaits formal notification of the Agreement by the Parties

Shipping in polar waters



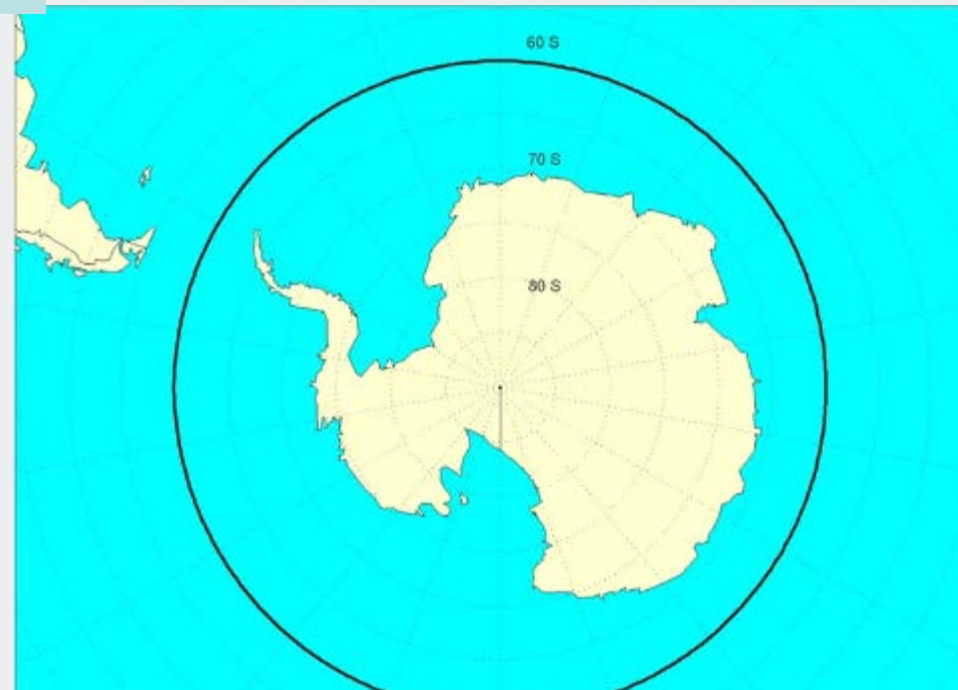
Adoption of an international code of safety for ships operating in polar waters (Polar Code)

International code of safety for ships operating in polar waters (Polar Code)

Applicable to ships to which SOLAS chapter I applies
(mainly passenger ships and cargo ships and excludes certain small craft,
fishing vessels, pleasure yacht etc.)

For both Polar regions

Maximum extent of **Arctic** waters application

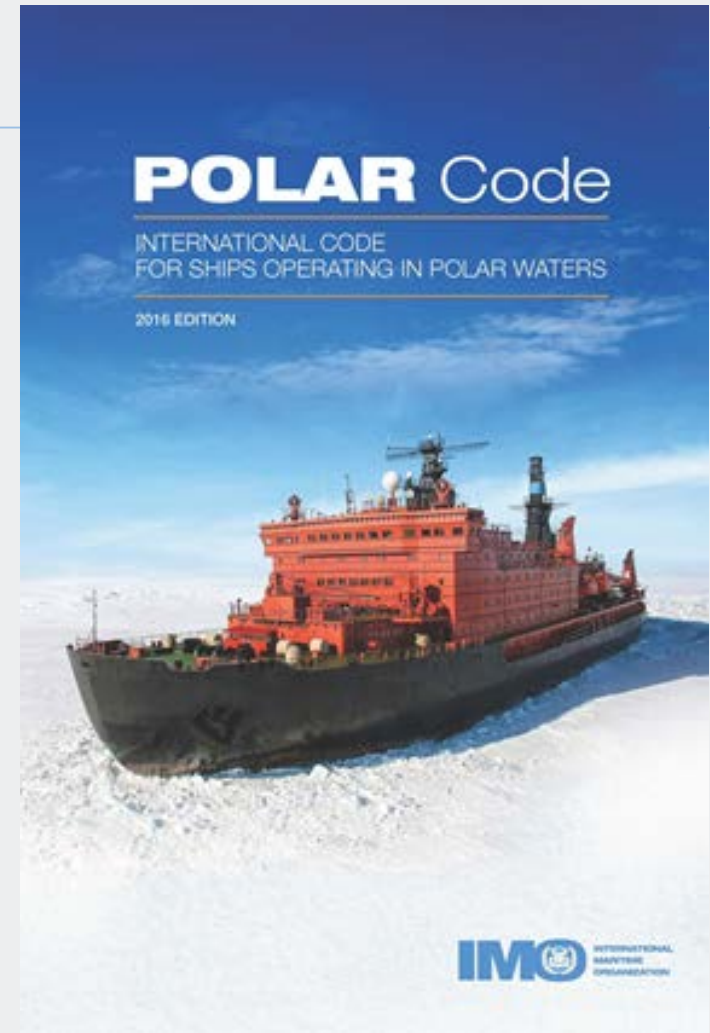


Maximum extent of **Antarctic** Waters application

Polar Code

Intended to cover the full range of shipping-related matters relevant to navigation in waters surrounding the two poles.

- Part I Safety measures
- Part I Prevention of pollution



WHAT DOES THE POLAR CODE MEAN FOR SHIP SAFETY?

EQUIPMENT



WINDOWS ON BRIDGE
Means to clear melted ice, freezing rain, snow, mist, spray and condensation



LIFEBOATS
All lifeboats to be partially or totally enclosed type



CLOTHING I
Adequate thermal protection for all persons on board



CLOTHING II
On passenger ships, an immersion suit or a thermal protective aid for each person on board



ICE REMOVAL
Special equipment for ice removal: such as electrical and pneumatic devices, special tools such as axes or wooden clubs



FIRE SAFETY
Extinguishing equipment operable in cold temperatures; protect from ice; suitable for persons wearing bulky and cumbersome cold weather gear



OPERATIONS & MANNING



NAVIGATION
Receive information about ice conditions



CERTIFICATE & MANUAL
Required to have on board a Polar Ship Certificate and the ship's Polar Water Operational Manual



TRAINING
Masters, chief mates and officers in charge of a navigational watch must have completed appropriate basic training (for open-water operations), and advanced training for other waters, including ice

DESIGN & CONSTRUCTION



SHIP CATEGORIES
Three categories of ship which may operate in Polar Waters, based on:
A) medium first-year ice
B) thin first-year ice
C) open waters/ice conditions less severe than A and B



MATERIALS
Ships intended to operate in low air temperature must be constructed with materials suitable for operation at the ships polar service temperature



INTACT STABILITY
Sufficient stability in intact condition when subject to ice accretion and the stability calculations must take into account the icing allowance



STRUCTURE
In ice strengthened ships, the structure of the ship must be able to resist both global and local structural loads

BACKGROUND INFO



THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS WAS ADOPTED NOVEMBER 2014 BY THE IMO MARITIME SAFETY COMMITTEE



IT APPLIES TO SHIPS OPERATING IN ARCTIC AND ANTARCTIC WATERS



THE AIM IS TO PROVIDE FOR SAFE SHIP OPERATION AND THE PROTECTION OF THE POLAR ENVIRONMENT BY ADDRESSING RISKS PRESENT IN POLAR WATERS AND NOT ADEQUATELY MITIGATED BY OTHER INSTRUMENTS

Polar Code

Trend – ships not subject to SOLAS standards are found vulnerable, but Polar Code is not applicable to these ships, as it stands.

**IMO Maritime Safety Committee's consideration is on-going to possibly extend the applicability to non-SOLAS class ships
(MSC 101 in 5-14 June 2019)**



Source: <http://fisherynation.com>

Collaboration of Arctic Council and IMO for Arctic shipping



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MARITIME SAFETY COMMITTEE
101st session
Agenda item 7

MSC 101/INF.18
2 April 2019
ENGLISH ONLY
Pre-session public release: ☐

SAFETY MEASURES FOR NON-SOLAS SHIPS OPERATING IN POLAR WATERS

Arctic Shipping Best Practice Information Forum

Submitted by Canada, Denmark, Finland, Iceland, Norway,
Russian Federation, Sweden and United States

SUMMARY

Executive summary: The Arctic Council's Working Group on the Protection of the Arctic Marine Environment (PAME) established the Arctic Shipping Best Practice Information Forum ("Forum") in 2017. In May 2018, the Forum launched a public web portal to assist in the effective implementation of the International Maritime Organization's *International Code for Ships Operating in Polar Waters* (Polar Code). The aim of this document is to introduce the Arctic Shipping Best Practice Information Forum and its web portal to IMO.

Strategic direction, if applicable: Other work

MSC 101/INF.18
Arctic Shipping Best Practice
Information Forum, established by
PEME of Arctic Council
<https://pame.is/arcticshippingforum>

PAME
Protection of the Arctic Marine Environment

Home PAME Document Library Projects A WORKING GROUP OF THE ARCTIC COUNCIL

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POLAR CODE CHAPTERS: EXPLANATION AND SUBMISSIONS

Part A - Safety Measures

- Chapter 1: General
- Chapter 2: Polar Water Operation Manual
- Chapter 3: Ship structure
- Chapter 4: Subdivision and stability
- Chapter 5: Watertight and weather-tight integrity
- Chapter 6: Machinery installations
- Chapter 7: Fire safety/Protection
- Chapter 8: Life-saving appliances and arrangements
- Chapter 9: Safety of navigation
- Chapter 10: Communication
- Chapter 11: Voyage planning
- Chapter 12: Manning and training

Polar Code Part B

Polar Code Part B-A: Pollution Prevention Measures

Polar Code Part B-II

CONTACT

Contact Forum Organisers

OTHER INFORMATION

ABOUT THE FORUM

The establishment of the Arctic Shipping Best Practice Information Forum is in response to the newly adopted International Code for Ships Operating in Polar Waters (Polar Code) by the International Maritime Organization (IMO).

The aim of the Forum is to take awareness of its provisions amongst all those involved in or potentially affected by Arctic marine operations and to facilitate the exchange of information and best practices between the Forum participants.

Forum participation is open to Arctic States, Permanent Participants and Arctic Council Observer as well as any duly-recognised professional organisation dedicated to ensuring safe and environmentally sound marine operations in the Arctic as demonstrated by expertise and experience in Arctic shipping and/or related issues.

In addition to information provided by Forum participants, under the specific chapters of the Polar Code, highlighted on this site, Arctic State Administrators (Canada, Kingdom of Denmark, Finland, Iceland, Norway, Russian



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