



POLAR CODE for Non-SOLAS Vessels

Proposals for Development of Phased
Application of POLAR CODE
for Non-SOLAS Vessels for prevention
of polar water accidents



TEAM: POLAR VOYAGER

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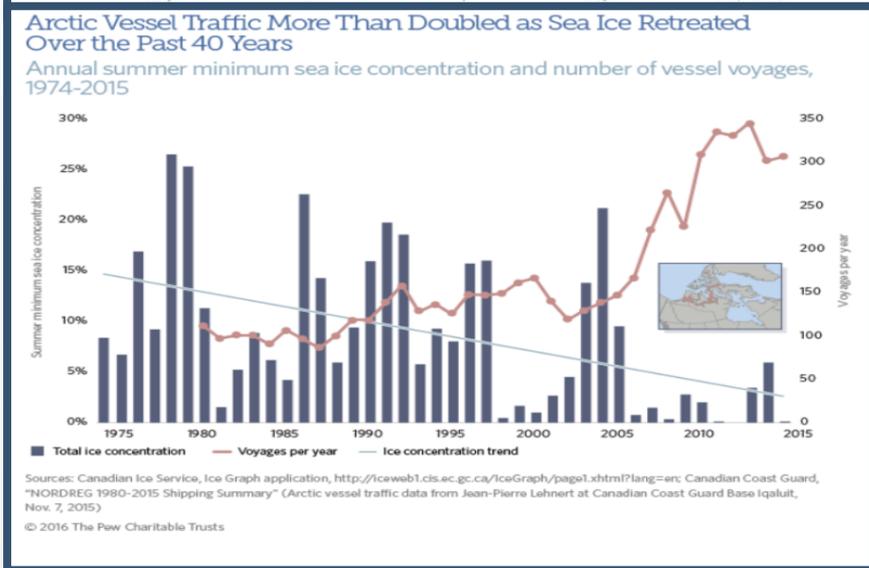
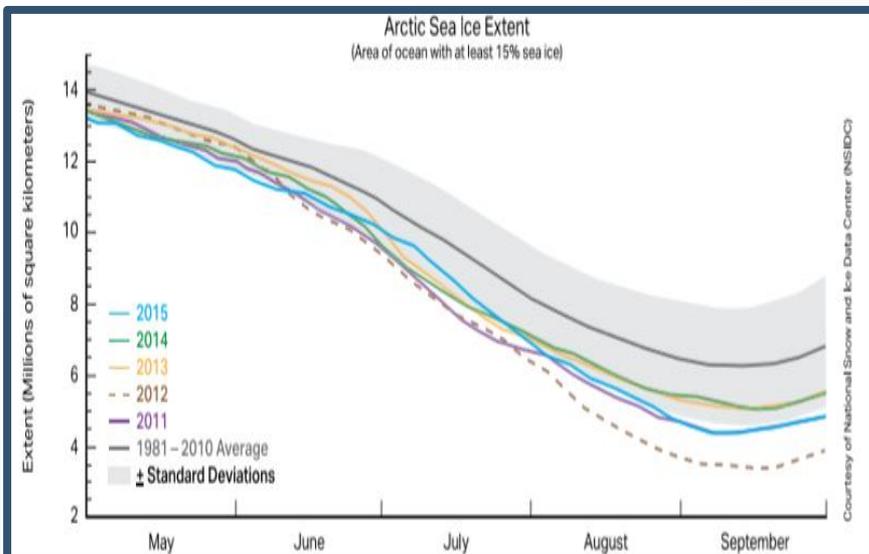


Section
1

Background

- Needs
- Hazards
- History
- Configuration

Why a need for the mandatory IMO Polar Code



New Shipping Lines



Operators



Oil & Gas



Environment



Mineral



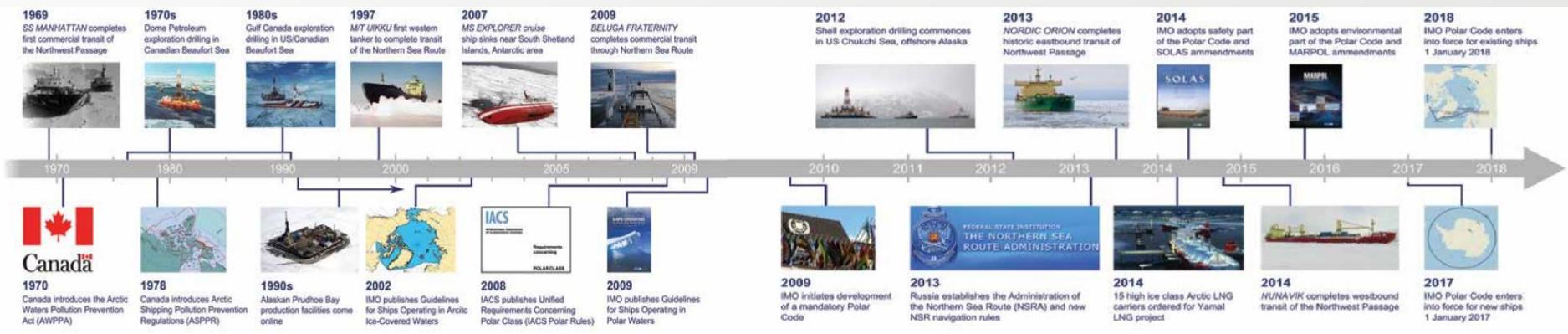
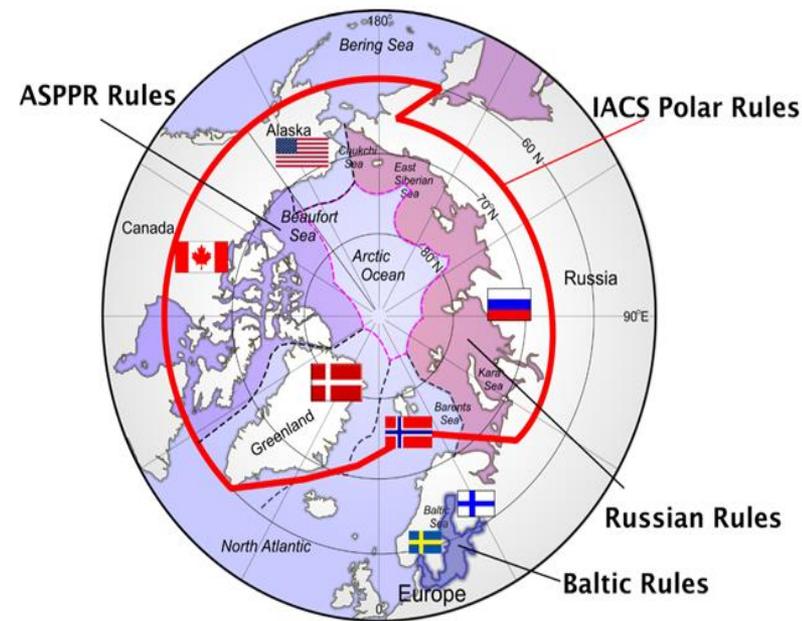
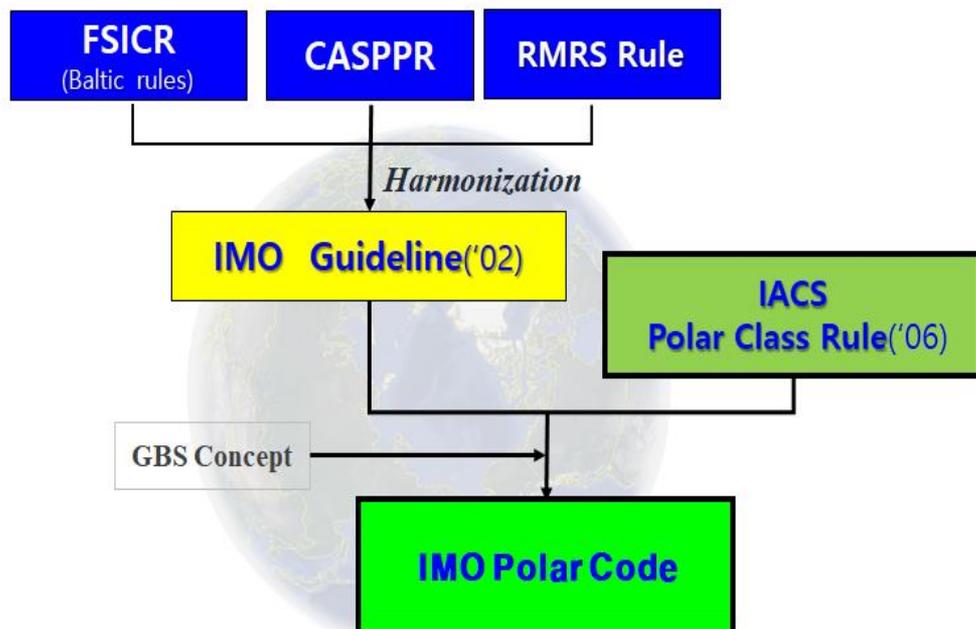
Tourism

Source of Hazards in polar waters



- Ice
- Topside icing
- Low temperature
- Extended periods of darkness or daylight
- High latitude (navigation, communication, ice information)
- Remoteness (limited SAR facilities), Possible lack of accurate and complete hydrographic data and information
- Lack of ship crew experience
- Lack of suitable emergency response equipment
- Rapidly changing and severe weather conditions
- Environmental sensitivity
- Additional recognized risks

History



Polar Code

Title	SOLAS 2014 Amend / Chapter XIV / Reg. 1
Effective Date	1/1/2017
Note	A new chapter XIV is added by Res.MSC.386(94).

CHAPTER XIV

SAFETY MEASURES FOR SHIPS OPERATING IN POLAR WATERS

Regulation 1

Definitions

For the purpose of this chapter:

1 Polar Code means the International Code for Ships Operating in Polar Waters, consisting of an introduction and parts I-A and II-A and parts I-B and II-B, as adopted by resolutions MSC.385(94) and of the Marine Environment Protection Committee, as may be amended, provided that:

1. amendments to the safety-related provisions of the introduction and part I-A of the Polar Code are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the annex other than chapter I; and
2. amendments to part I-B of the Polar Code are adopted by the Maritime Safety Committee in accordance with its Rules of Procedure.

* Refer to the resolution of the Maritime Safety Committee on the International Code for Ships Operating in Polar Waters, by the Marine Environment Protection Committee.

2 Antarctic area means the sea area south of latitude 60° S.

3 Arctic waters means those waters which are located north of a line from the latitude 58°00' 00 N and longitude 042°00' 00 W to latitude 64°37' 00 N, longitude 035°27' 00 W and thence by a rhumb line to latitude 67°03' 00 N, longitude 026°33' 00 W and thence by a rhumb line to the latitude 70°49' 00 N and longitude 008°59' 00 W (Sørkapp, Jan Mayen) and by the southern shore of Jan Mayen to 73°31' 6 N and 019°01' 0 E by the Island of Bjørnøya, and thence by a great circle line to the latitude 68°38' 29 N and longitude 043°23' 08 E (Cap Kanin Nos) and hence by the northern shore of the Asian Continent eastward to the Bering Strait and thence from the Bering Strait westward to latitude 60° N as far as Il'pyskiy and following the 60th North parallel eastward as far as and including Etolin Strait and thence by the northern shore of the North American continent as far south as latitude 60° N and thence eastward along parallel of latitude 60° N, to longitude 056°37' 00 W and thence to the latitude 58°00' 00 N, longitude 042°00' 00 W.

4 Polar waters means Arctic waters and/or the Antarctic area.

5 Ship constructed means a ship the keel of which is laid or which is at a similar stage of construction.

6 At a similar stage of construction means the stage at which:

1. construction identifiable with a specific ship begins; and
2. assembly of that ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less.

Title	MARPOL 2015 Amend / Annex I / Reg. 46
Effective Date	1/1/2017

Chapter 11 – International Code for Ships Operating in Polar Waters (Newly added by Res.MEPC.265(68))

Regulation 46

Definitions

For the purpose of this Annex:

1 Polar Code means the International Code for Ships Operating in Polar Waters, consisting of an introduction, parts I-A and II-A and parts I-B and II-B, adopted by resolutions MSC.385(94) and MEPC.264(68), as may be amended, provided that:

1. amendments to the environment-related provisions of the introduction and chapter 1 of part II-A of the Polar Code are adopted, brought into force and take effect in accordance with the provisions of article 16 of the present Convention concerning the amendment procedures applicable to an annex; and

2. amendments to part II-B of the Polar Code are adopted by the Marine Environment Protection Committee in accordance with its Rules of Procedure.

2 Arctic waters means those waters which are located north of a line from the latitude 58°00' 00 N and longitude 042°00' 00 W to latitude 64°37' 00 N, longitude 035°27' 00 W and thence by a rhumb line to latitude 67°03' 00 N, longitude 026°33' 00 W and thence by a rhumb line to the latitude 70°49' 00 N and longitude 008°59' 00 W (Sørkapp, Jan Mayen) and by the southern shore of Jan Mayen to 73°31' 6 N and 019°01' 0 E by the Island of Bjørnøya, and thence by a great circle line to the latitude 68°38' 29 N and longitude 043°23' 08 E (Cap Kanin Nos) and hence by the northern shore of the Asian Continent eastward to the Bering Strait and thence from the Bering Strait westward to latitude 60° N as far as Il'pyskiy and following the 60th North parallel eastward as far as and including Etolin Strait and thence by the northern shore of the North American continent as far south as latitude 60° N and thence eastward along parallel of latitude 60° N, to longitude 056°37' 00 W and thence to the latitude 58°00' 00 N, longitude 042°00' 00 W.

3 Polar waters means Arctic waters and/or the Antarctic area.

Title	STCW Convention & Codes, 2016 Amend / STCW Convention / Regulation V/4
Effective Date	7/1/2018

Regulation V/4, Added by Res.MSC.416(97)

Mandatory minimum requirements for the training and qualifications of masters and deck officers on ships operating in polar waters

1 Masters, chief mates and officers in charge of a navigational watch on ships operating in polar waters shall hold a certificate in basic training for ships operating in polar waters, as required by the Polar Code.

2 Every candidate for a certificate in basic training for ships operating in polar waters shall have completed an approved basic training for ships operating in polar waters and meet the standard of competence specified in section A-V/4, paragraph 1, of the STCW Code.

3 Masters and chief mates on ships operating in polar waters, shall hold a certificate in advanced training for ships operating in polar waters, as required by the Polar Code.

4 Every candidate for a certificate in advanced training for ships operating in polar waters shall:

1. meet the requirements for certification in basic training for ships in polar waters;
2. have at least two (2) months of approved seagoing service in the deck department at management level or while performing watchkeeping duties at the operational level, within polar waters or other equivalent approved seagoing service; and
3. have completed approved advanced training for ships operating in polar waters and meet the standard of competence specified in section A-V/4, paragraph 2 of the STCW Code.

5 Administrations shall ensure that candidates for certificates in basic training for ships operating in polar waters are qualified in accordance with paragraphs 2 and 3 of this regulation.

Transitional provisions

6 Until 1 July 2020, seafarers who commenced approved seagoing service in polar waters prior to 1 July 2018 shall be able to establish that they meet the requirements of paragraph 2 by:

1. having completed approved seagoing service on board a ship operating in polar waters or equivalent approved seagoing service, performing duties in the deck department at the operational or management level for a period of at least three months in total during the preceding five years; or

2. having successfully completed a training course meeting the training guidance established by the Organization for ships operating in polar waters.*

* Refer to section B-V/g of the STCW Code.

7 Until 1 July 2020, seafarers who commenced approved seagoing service in polar waters prior to 1 July 2018 shall be able to establish that they meet the requirements of paragraph 4 by:

1. having completed approved seagoing service on board a ship operating in polar waters or equivalent approved seagoing service, performing duties in the deck department at management level, for a period of at least three months in total during the preceding five years; or

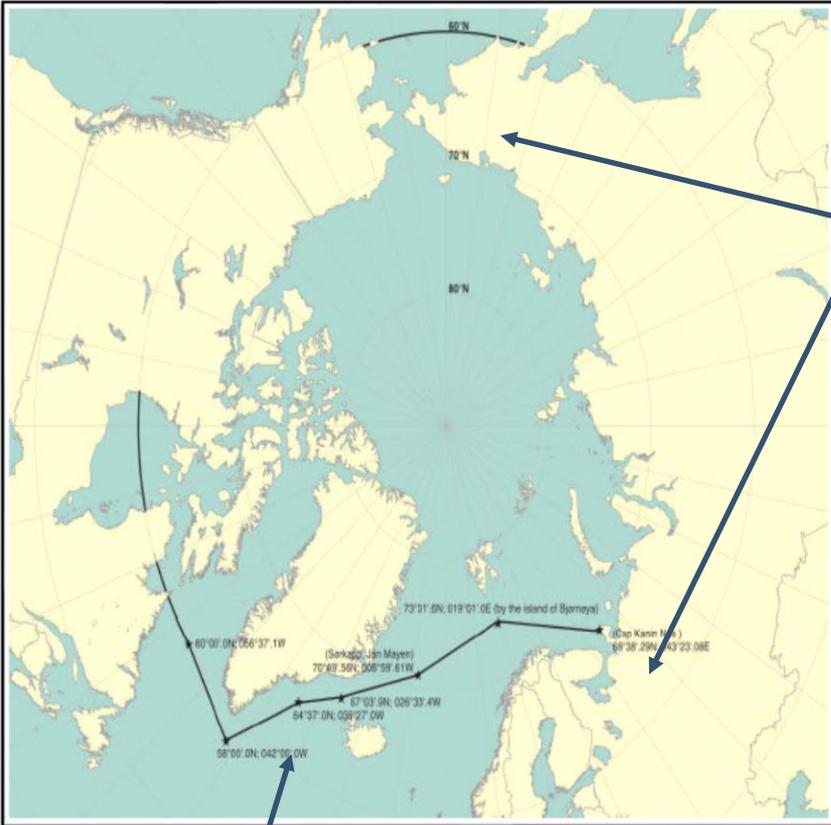
2. having successfully completed a training course meeting the training guidance established by the Organization for ships operating in polar waters* and having completed approved seagoing service on board a ship operating in polar waters or equivalent approved seagoing service, performing duties in the deck department at the management level, for a period of at least two months in total during the preceding five years.

Goal :

The goal of this code 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 of the Organization

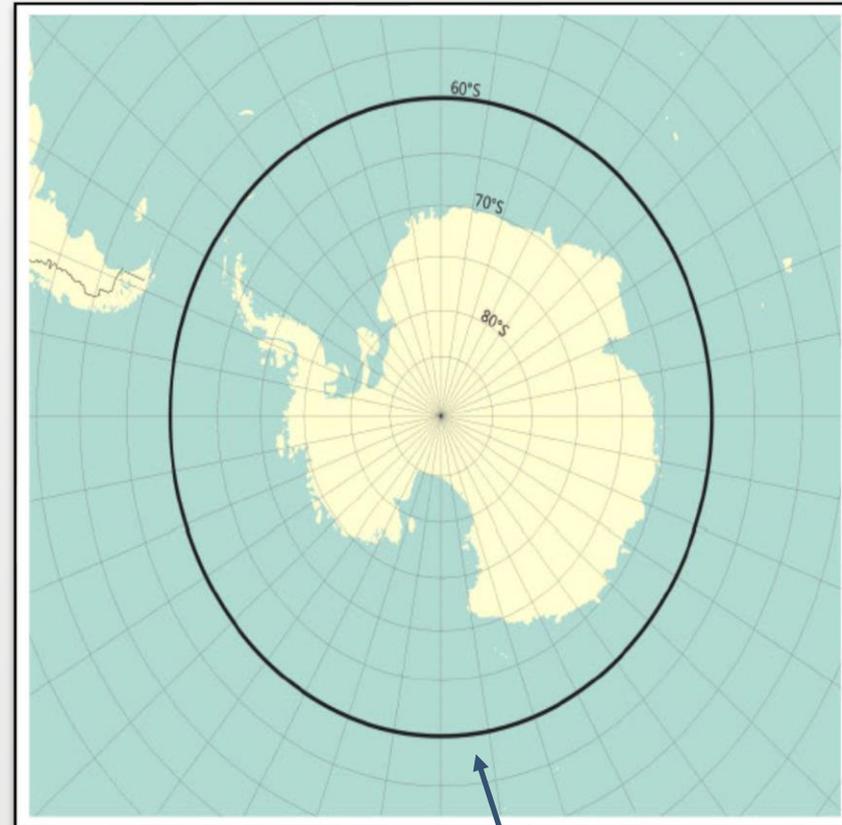
Arctic

Excluding area around Iceland, the Norwegian mainland, Russia's Kola Peninsula, the White Sea, the Sea of Okhotsk, and Alaska's Prince William Sound



Including waters around the southern exposure of Greenland

Antarctic



South of latitude 60°S

Structure of the Polar Code

Polar Code Draft	Mandatory provisions	Recommendations
	Part I-A (on safety measures)	Part I-B (additional guidance)
	Part II-A (on pollution prevention)	Part II-B (additional guidance)

Part I:

Part I-A: Mandatory provisions on safety measures in accordance with the relevant SOLAS chapter

Part I-B: Recommendations on safety

Part II:

Part II-A: Mandatory provisions on pollution prevention in accordance with relevant MARPOL Annexes

Part II-B: Recommendations on pollution prevention



included through a new Ch. XIV In SOLAS

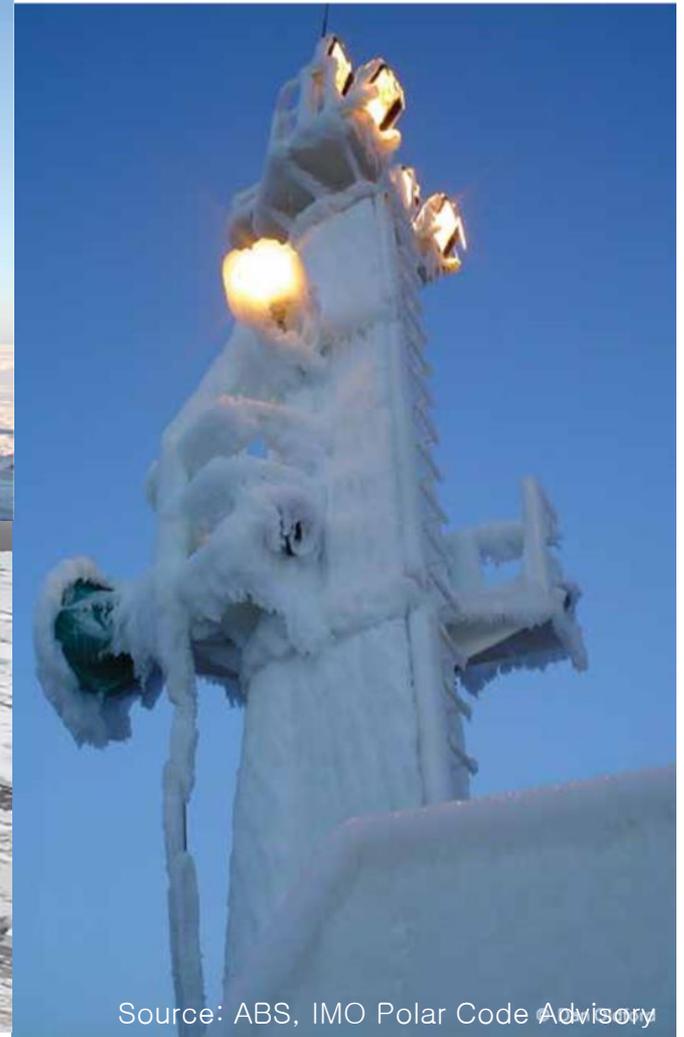


included in MARPOL Annexes I, II, IV and V



Section
2

Problem



SOLAS Vessels in Polar waters => Polar Code

Non SOLAS Vessels in Polar waters? => ?

What is Non-SOLAS vessel?

Regulation 3

Exceptions

- (a) The present Regulations, unless expressly provided otherwise, do not apply to:
- (i) Ships of war and troopships
 - (ii) Cargo ships of less than 500 tons gross tonnage
 - (iii) Ships not propelled by mechanical means
 - (iv) Wooden ships of primitive build
 - (v) Pleasure yachts not engaged in trade
 - (vi) Fishing vessels



Small Cargo Vessels



Pleasure Yachts



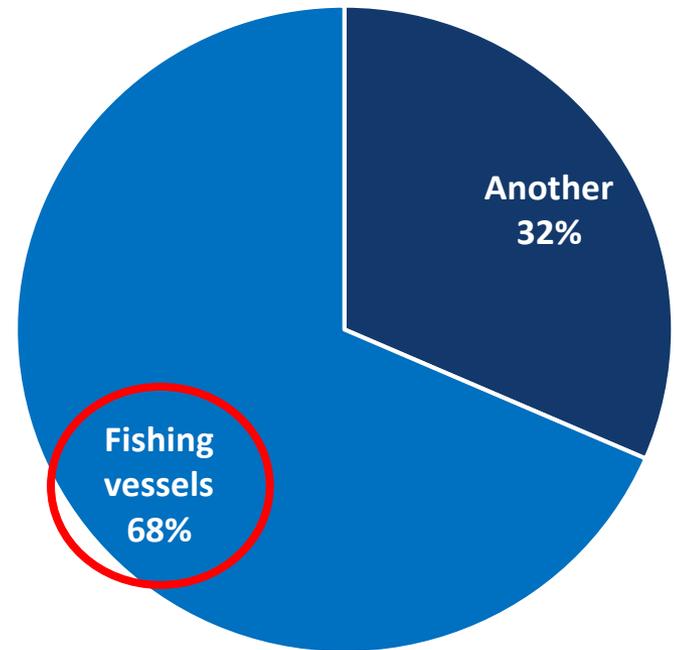
Fishing Vessels

Marine accidents of Fishing boat (Non-SOLAS vessel) accounts for about **70%** of total

Marine accidents according to vessel type

	Passenger ship	Cargo ship	Fishing boat	Oil tanker	Tug boat	Others	Total
2012	32	109	1315	45	104	249	1854
2013	29	107	839	52	78	201	1306
2014	51	111	1029	51	102	221	1565
2015	66	115	1621	65	94	401	2362
2016	65	116	1794	67	77	430	2549
Total	243	558	6598	280	455	1502	9636

Rate of Non-SOLAS ships accidents



Source: <https://www.kmst.go.kr>

Unit: Number of vessels

Accident data of Non-SOLAS ships in polar water

Artic Council Members

- **12 incidents** (2011 and 2015) reported by Canada
- **43 incidents** (2011 and 2015) reported by the Russian Federation
- **182 incidents** (2000 and 2015) reported by Norway
- **30 loss and 266 spill incidents** (2006 and 2014) reported by the United States

IHS Maritime & Trade

- **39 incidents** of hull and machinery damage to fishing vessels in Polar waters (2010~2015)

Allianz Global Corporate & Specialty (AGCS)

- 55 incidents are identified in "Arctic circle waters" for 2014
- Of these, **13 involved fishing vessels** and **5 concerned vessels** categorized as "others"

Data of Non-SOLAS ships accidents in polar water

MSC 99/INF.17
Page 4

Yachts

6 Yachts have also been active in the Antarctic since the 1970s, with vessel numbers and trip frequency steadily rising over the last four decades. Not only have vessel numbers jumped, so have also number of visits by the same yacht each season. The greatest concentration of these vessels is near the Antarctic Peninsula, below Chile and Argentina, so the majority of data captured is representative of that region¹. Safety issues occur on yachts frequently, for example rolling through 360 degrees, having stability issues due to ice accretion, broken rudders, groundings, being beset and holed by ice, stranded in dense fog, lost presumed sunk by storms, capsizing.²

7 Between 2011 and 2015, five serious yacht accidents have occurred in either the New Zealand or Chilean Search and Rescue Regions of Responsibility (SRRs). This is not a comprehensive summary of all yacht accidents and incidents in Antarctic waters.

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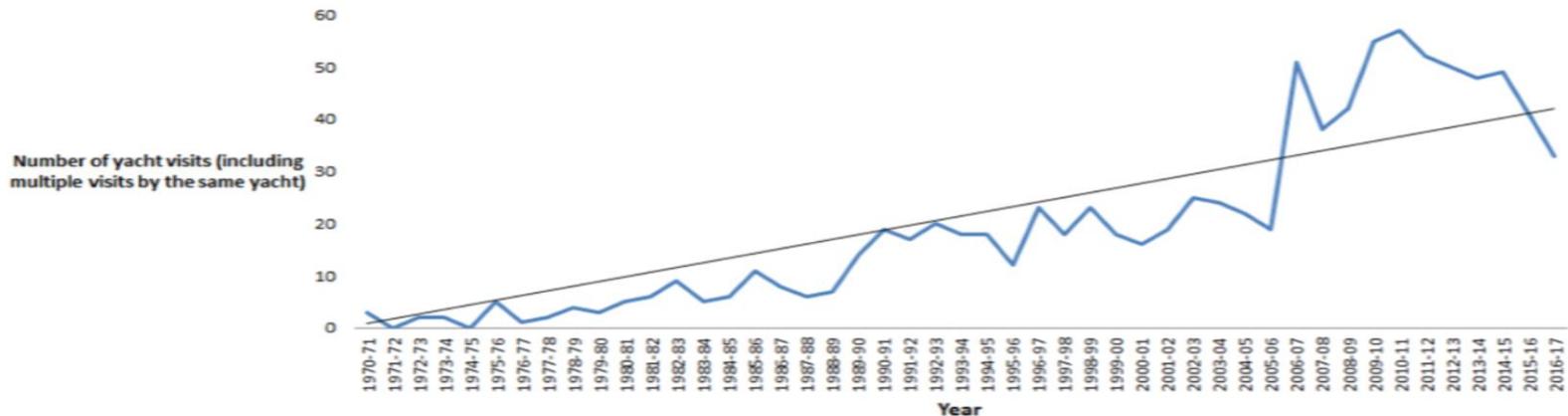


Figure: Yacht visits to Antarctic waters 1970s - 2017

Cases of Accidents

Important lessons can be learned from the numerous recent accidents involving small vessels in polar waters

Accidents in Antarctic waters

Accidents in Arctic waters

Jeong Woo 2

Republic of Korea
Fishing vessel
Fishing for toothfish

2012, Ross Sea, Antarctica

Incident: Fire on board and sank

Loss of life: 3

Environmental Impact: Fuel oil lost

Search & Rescue (SAR): Over 14 days

Areas for learning lessons: Fire protection, emergency distress communications

Berserk

Norway
Pleasure yacht
Expedition

2011, Ross Sea, Antarctica

Incident: Lost, presumed sank in severe weather

Loss of life: 3

Environmental Impact: Diesel lost

Search & Rescue (SAR): Over 8 days

Areas for learning lessons: Voyage planning, communication, reporting of position to maritime rescue coordination centre

Insung No 1

Republic of Korea
Fishing vessel
Fishing for toothfish

2010, north of Ross Sea, Antarctica

Incident: captured and sank

Loss of life: 21

Environmental Impact: Fuel oil lost

Search & Rescue (SAR): A number of days

Areas for learning lessons: Vessel shelter operation, communication of safety related matters, emergency training, prioritisation of rescue

Polonus

Poland
Pleasure yacht
Sailing cruise

2014, King George Island, Antarctica

Incident: Stranded in bad weather

Loss of life: 0

Environmental Impact: None

Search & Rescue (SAR): Crew rescued, fuel removed from yacht

Areas for learning lessons: Communication, monitoring of shoreline adjacent to stranding

Kai Xin

China
Fishing vessel
Fishing for krill

2013, Scotia Sea, Antarctica

Incident: Caught fire and sank

Loss of life: 0

Environmental Impact: Heavy fuel oil possibly all consumed by fire

Search & Rescue (SAR): 97 crew rescued by 3 other vessels

Areas for learning lessons: Vessel maintenance, storage on board, crew training

Mar Sem Fim

Brazil
Pleasure yacht
Motor cruise

2012, King George Island, Antarctica

Incident: Beset in ice and sank

Loss of life: 0

Environmental Impact: Fuel oil lost

Search & Rescue (SAR): Crew rescued by Chilean Navy

Areas for learning lessons: Operation in ice, voyage planning, rescue, monitoring post-spill

Oryong 501

Republic of Korea
Fishing vessel
Fishing for pollock

2014, Bering Sea off Chukotka, Arctic

Incident: Swamped, flooded and sank

Loss of life: 53

Environmental Impact: Fuel oil lost

Search & Rescue (SAR): A number of fishing vessels and US Coastguard aircraft

Areas for learning lessons: Vessel stability

Dalny Vostok

Russia
Fishing vessel
Trawling

2015, Sea of Okhotsk off Kamchatka

Incident: Sank, cause undetermined

Loss of life: At least 57 + 12 missing

Environmental Impact: Fuel oil lost

Search & Rescue (SAR): Many fishing vessels and Russian aircraft

Areas for learning lessons: Vessel stability, drills, training and working conditions of crew

Tituvenay

Russia
Fishing vessel

2015, near Safety Island, Arkt. Rts. Arctic

Incident: Stranded

Loss of life: 0

Environmental Impact: None reported

Search & Rescue (SAR): Refloated, inspected and returned to service

Areas for learning lessons: Voyage planning

Saputi

Canada
Fishing vessel

2016, off Baffin Island, Davis Strait, Arctic

Incident: Struck ice, hull damage, water ingress

Loss of life: 0

Environmental Impact: None reported

Search & Rescue (SAR): Assistance and escort

Areas for learning lessons: Operation in ice

Katmai

US
Fishing vessel
Fishing for cod

2008, Bering Sea

Incident: Sank after taking on water and flooding

Loss of life: 7

Environmental Impact: Fuel oil lost

Search & Rescue (SAR): A number of days, some crew rescued

Areas for learning lessons: Vessel stability, berths, back up pumps

Alaska Ranger

US
Fishing vessel

2008, Bering Sea

Incident: Flooded and sank after taking on water when hull's watertight envelope broke

Loss of life: 5

Environmental Impact: Fuel oil lost

Search & Rescue (SAR): Over great distance, most of crew rescued

Areas for learning lessons: Converted vessels, material condition of vessel, watertight integrity, loss of stowage, crew training, survival suits

This infographic is based on papers submitted to the International Maritime Organization (IMO) by Friends of the Earth International, Pacific Environment and WWF, supported by the Antarctic & Southern Ocean Coalition and Environmental Investigation Agency. Designer: Margherita Gagliardi

MSC 101/7 : SAFETY MEASURES FOR NON-SOLAS SHIPS OPERATING IN POLAR WATERS



“This document proposes a draft Assembly resolution urging Member States to take steps, on a voluntary basis, to implement the safety measures of the Polar Code for non-SOLAS ships ”



“Feasibility and consequences of applying the requirements in chapters 9* and 11* of the Polar Code to non-SOLAS vessels operating in polar waters”

- * Chapter 9 – Safety of Navigation
- * Chapter 11 – Voyage Planning



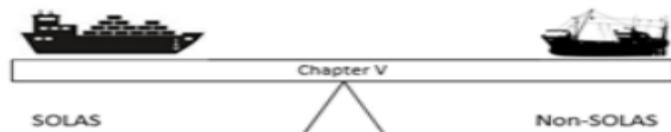
Section 3

Solutions

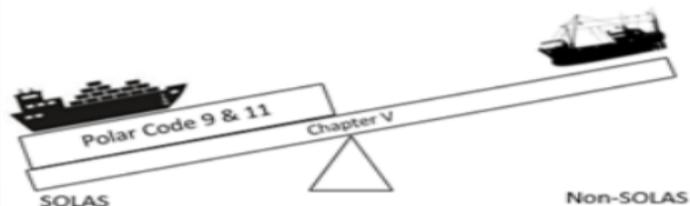
- Phase 1
- Phase 2
- Phase 3
- Phase 4

Solutions

Msc101/7 annex1, page1



Same level of risk = Same level of safety measures

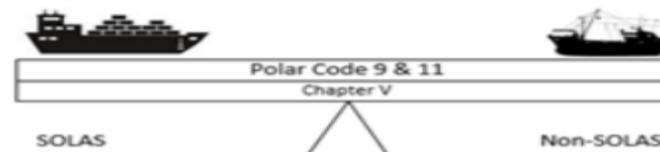


Same level of risk \neq Same level of safety measures

Current state



Same level of risk = Same level of safety measures

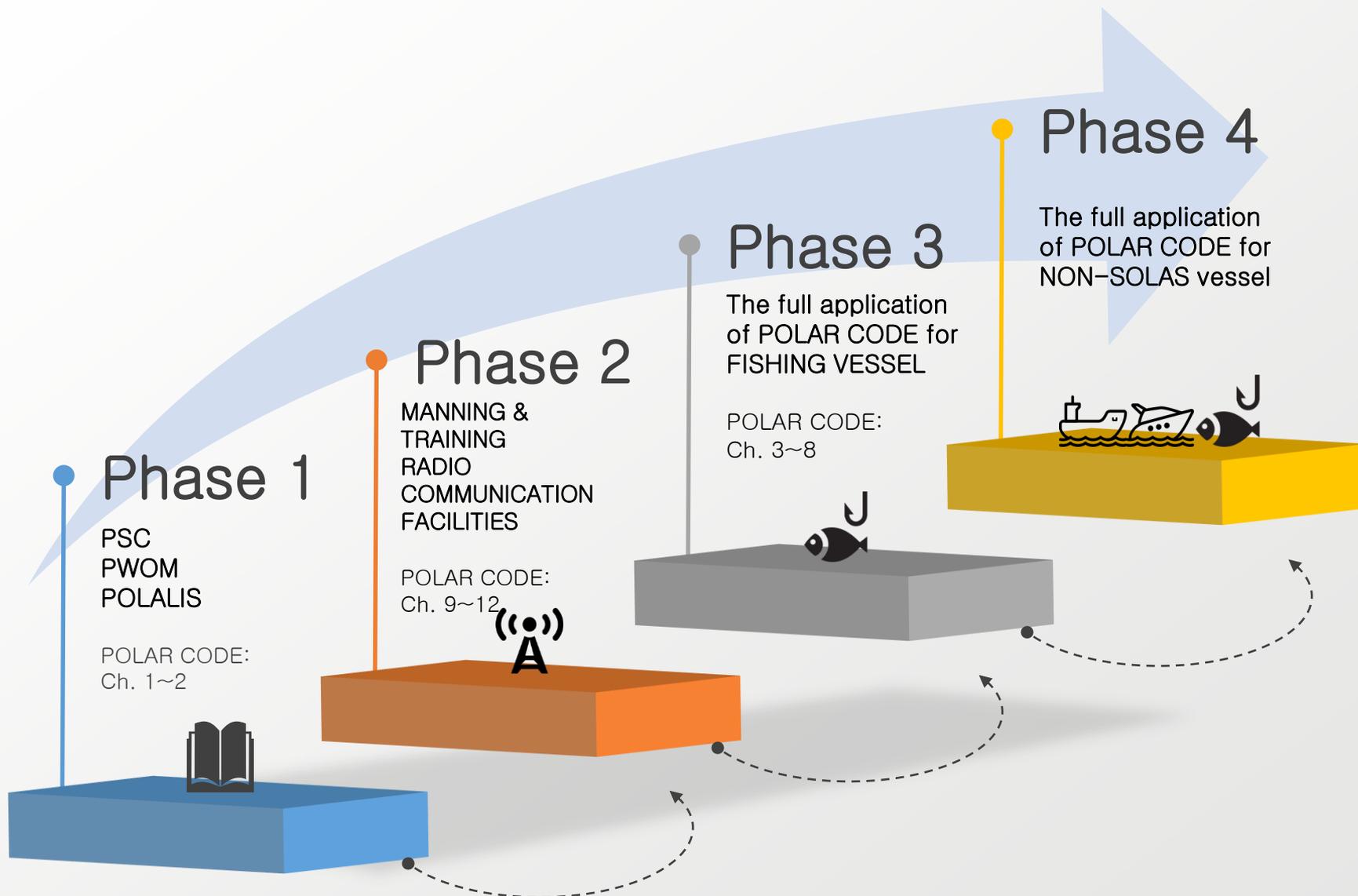


Same level of risk = Same level of safety measures

Future state

It is strongly required to apply the Polar Code, Step-by-Step, starting with feasible and urgent areas first

Solutions



Polar Code part I-A & part I-B

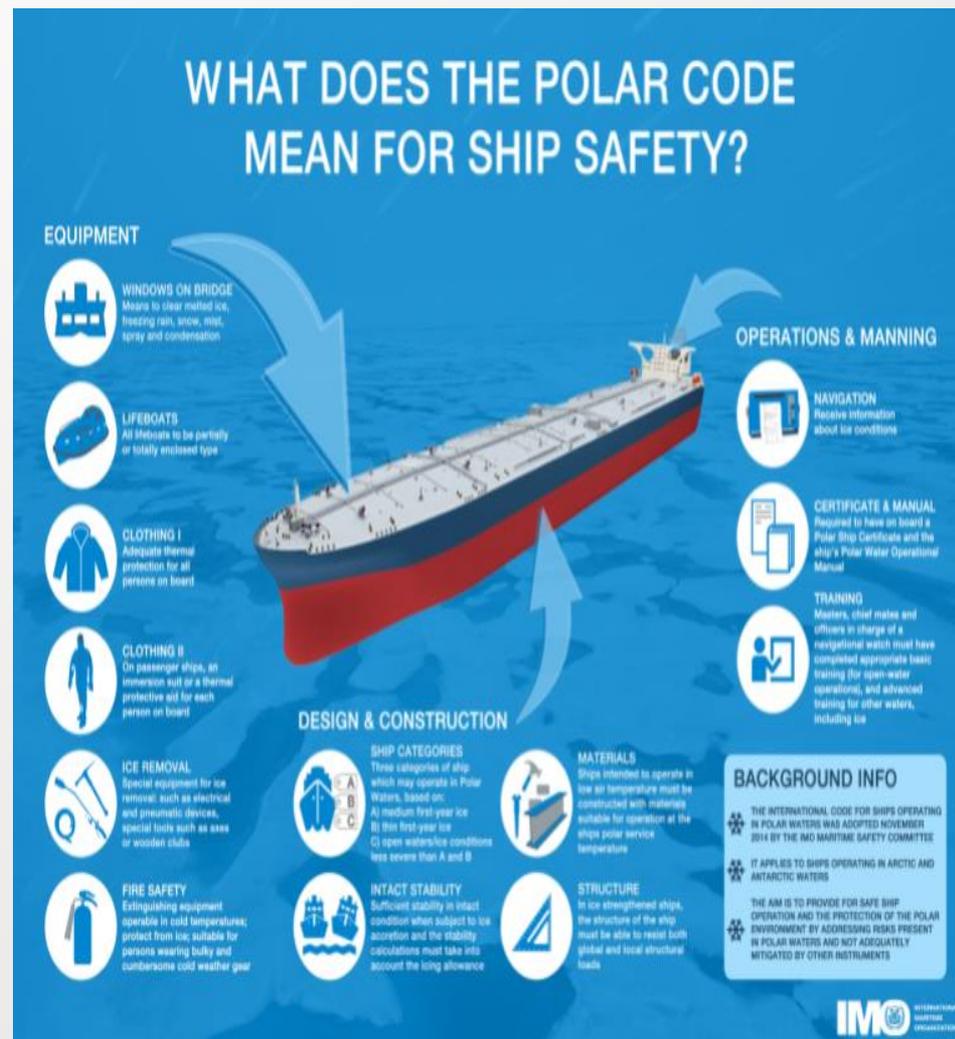
Part I-A: Safety Measures

- CH 1 – General **PHASE 1**
- CH 2 – Polar Waters Operational Manual (PWOM)

- CH 3 – Ship Structure
- CH 4 – Subdivision and Stability
- CH 5 – Watertight and Weather-tight Integrity
- CH 6 – Machinery Installations
- CH 7 – Fire Safety/Protection **PHASE 3**
- CH 8 – Life-saving Appliances

- CH 9 – Safety of Navigation
- CH 10 – Communication
- CH 11 – Voyage Planning
- CH 12 – Manning and Training **PHASE 2**

Part I-B: Additional Guidance



Phase 1



THIS IS TO CERTIFY:

- 1 That the ship has been surveyed in accordance with the applicable safety-related provisions of the International Code for Ships Operating in Polar Waters.
- 2 That the survey³ showed that the structure, equipment, fittings, radio station arrangements, and materials of the ship and the condition thereof are in all respects satisfactory and that the ship complies with the relevant provisions of the Code.

Category A/B/C³ ship as follows:

Ice Class and Ice Strengthened Draft Range (A)

Ice class	Maximum draft		Minimum draft	
	Aft	Fwd	Aft	Fwd

2.1 Ship type: tanker/passenger ship/other⁴ (B)

2.2 Ship restricted to operate in ice free waters/open waters/other ice conditions⁴

2.3 Ship intended to operate in low air temperature: Yes/No⁴

2.3.1 Polar Service Temperature:°C/Not Applicable⁴

2.4 Maximum expected time of rescuedays

3 The ship was/was not³ subjected to an alternative design and arrangements in pursuance of regulation(s) XIV/4 of the International Convention for the Safety of Life at Sea, 1974, as amended. (C)

4 A Document of approval of alternative design and arrangements for structure, machinery and electrical installations/fire protection/life-saving appliances⁴ and arrangements is/is not⁴ appended to this Certificate.

5 Operational limitations (D)

The ship has been assigned the following limitations for operation in polar waters:

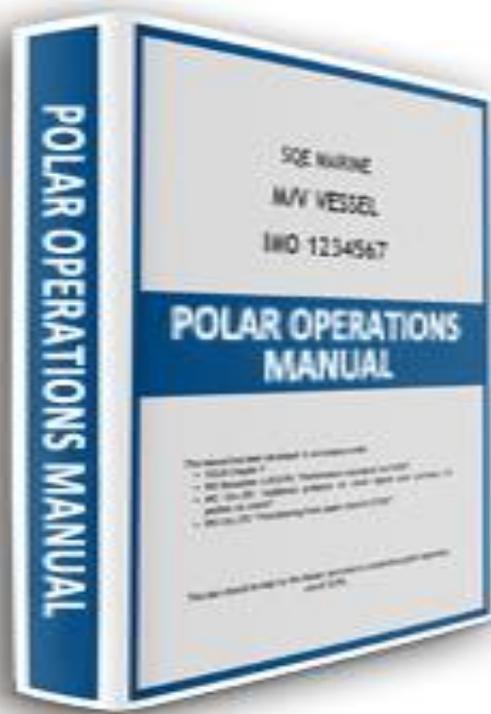
5.1 Ice conditions:

5.2 Temperature:

5.3 High latitudes:

³ Subject to regulation 1.3 of the International Code for Ships Operating in Polar Waters.
⁴ Delete as appropriate.

(PSC)

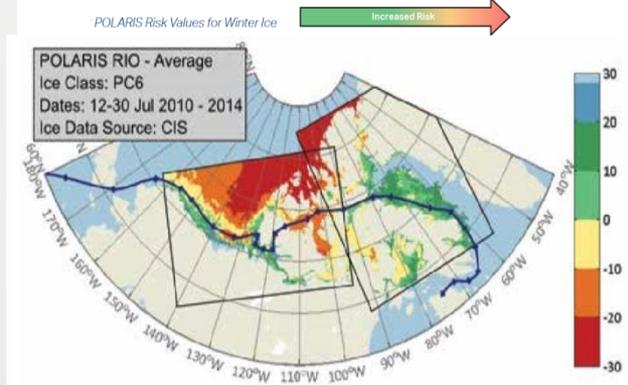


(PWOM)

Increasing Ice Thickness (Severity) →

Polar Ship Category	Ice Class	Winter Risk Values (RVs)											
		Ice Free	New ice 0-10 cm	Grey ice 10-15 cm	Grey White ice 15-30 cm	Thin First-year ice 1st Stage 30-50 cm	Thin First-year ice 2nd Stage 50-70 cm	Medium First-year ice 1st Stage 70-95 cm	Medium First-year ice 2nd Stage 95-120 cm	Thick First-year ice 120-200 cm	Second-year ice 120-200 cm	Light Multi-year ice 250-300 cm	Heavy Multi-year ice 300+ cm
A	PC 1	3	3	3	3	2	2	2	2	2	2	1	1
	PC 2	3	3	3	3	2	2	2	2	2	1	1	0
	PC 3	3	3	3	3	2	2	2	2	2	1	0	-1
	PC 4	3	3	3	3	2	2	2	2	1	0	-1	-2
	PC 5	3	3	3	3	2	2	1	1	0	-1	-2	-2
B	PC 6	3	2	2	2	2	1	1	0	-1	-2	-3	-3
	PC 7	3	2	2	2	1	1	1	-1	-2	-3	-3	-3
	IA Super	3	2	2	2	2	1	0	-1	-2	-3	-4	-4
C	1A	3	2	2	2	1	0	-1	-2	-3	-4	-4	-4
	1B	3	2	2	1	0	-1	-2	-3	-4	-5	-5	-5
	1C	3	2	1	0	-1	-2	-2	-3	-4	-4	-5	-6
No Ice Class	3	1	0	-1	-2	-3	-3	-3	-4	-5	-6	-6	

↓ Decreasing Ice Class



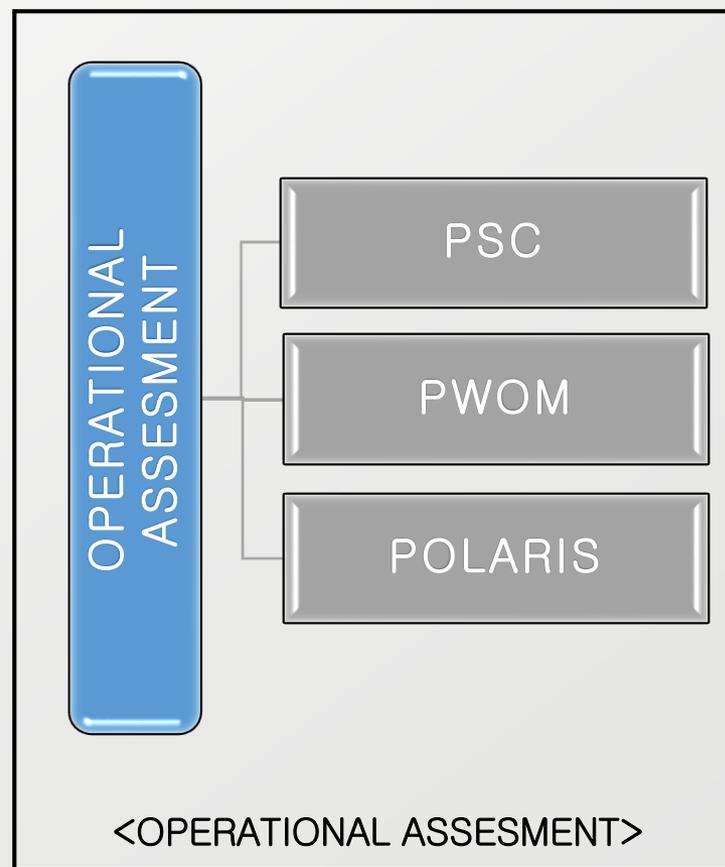
(POLARIS)

The mandatory application of **PSC**, **PWOM** and the recommendation of utilization of **POLARIS** for NON-SOLAS Vessels (Polar Code Ch. 1~2)

OPERATIONAL ASSESSMENT

To establish procedures or operational limitations, an assessment of the ship and its equipment shall be carried out, taking into consideration the following:

- Anticipated range of operating and environmental conditions, such as:
 - Operation in low air temperature
 - Operation in ice
 - Operation in high latitude
 - Potential for abandonment onto ice or land
- Hazards
- Additional hazards, if identified



PSC (POLAR SHIP CERTIFICATE)

There are four principal components in PSC:

- A. Ship category and ice class information
- B. Other thresholds for applicable regulations
(ship type, ice operations, low air temperature)
- C. Provisions for alternative design and arrangements
- D. Operational limitations (ice conditions, temperature, high latitudes)

THIS IS TO CERTIFY:

- 1 That the ship has been surveyed in accordance with the applicable safety-related provisions of the International Code for Ships Operating in Polar Waters.
- 2 That the survey³ showed that the structure, equipment, fittings, radio station arrangements, and materials of the ship and the condition thereof are in all respects satisfactory and that the ship complies with the relevant provisions of the Code.

Category A/B/C ⁴ ship as follows:				
Ice Class and Ice Strengthened Draft Range				
Ice class	Maximum draft		Minimum draft	
	Aft	Fwd	Aft	Fwd

2.1 Ship type: tanker/passenger ship/other⁴

2.2 Ship restricted to operate in ice free waters/open waters/other ice conditions⁴

2.3 Ship intended to operate in low air temperature: Yes/No⁴

2.3.1 Polar Service Temperature:°C/Not Applicable⁴

2.4 Maximum expected time of rescuedays

3 The ship was/was not⁴ subjected to an alternative design and arrangements in pursuance of regulation(s) XIV/4 of the International Convention for the Safety of Life at Sea, 1974, as amended.

4 A Document of approval of alternative design and arrangements for structure, machinery and electrical installations/fire protection/life-saving appliances⁴ and arrangements is/is not⁴ appended to this Certificate.

5 Operational limitations

The ship has been assigned the following limitations for operation in polar waters:

5.1 Ice conditions:

.....

5.2 Temperature:

.....

5.3 High latitudes:

³ Subject to regulation 1.3 of the International Code for Ships Operating in Polar Waters.

⁴ Delete as appropriate.

PWOM (Polar Water Operational Manual)

PWOM is a supplement to the Polar Ship Certificate and should include a collection of risk based operational procedures specific to the Polar environment

Structure of PWOM

1 – Operational Capabilities & Limitations	1.1	Operations in ice
	1.2	Operations in low air temperature
	1.3	Communication and navigation capabilities in high latitude
	1.4	Voyage duration
2 – Ship Operations	2.1	Strategic planning
	2.2	Arrangements for receiving forecasts of environmental conditions
	2.3	Verification of hydrographic, meteorological and navigational information
	2.4	Operation of special equipment
	2.5	Procedures to maintain equipment and system functionality
3 – Risk Management	3.1	Risk mitigation in limiting environmental condition
	3.2	Emergency response
	3.3	Coordination with emergency response providers
	3.4	Procedures for prolonged entrapment by ice
4 – Joint Operations	4.1	Escorted operations
	4.2	Convey operations

POLARIS (Polar Operational Limit Assessment Risk Indexing System)

Polar Operational Limit Assessment Risk Indexing System (POLARIS)

- A recommendatory IMO Circular through the Maritime Safety Committee in 2016
- A harmonized methodology for assessing operational limitations in ice
- Voyage planning or on-board decision making in real time on the bridge
- RISK INDEX OUTCOME (RIO): Suggest the operations should stop and be reassessed or proceed cautiously with reduced speeds in negative RIO

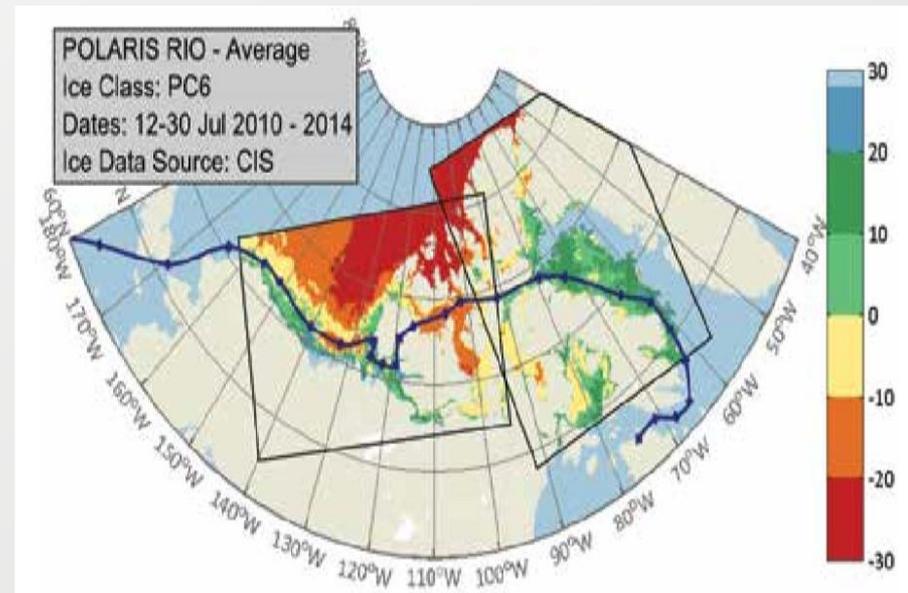
Increasing Ice Thickness (Severity) →

Polar Ship Category	Ice Class	Winter Risk Values (RVs)											
		Ice Free	New Ice 0-10 cm	Grey Ice 10-15 cm	Grey White Ice 15-30 cm	Thin First-year Ice 1st Stage 30-50 cm	Thin First-year Ice 2nd Stage 50-70 cm	Medium First-year Ice 1st Stage 70-95 cm	Medium First-year Ice 2nd Stage 95-120 cm	Thick First-year Ice 120-200 cm	Second-year Ice 120-200 cm	Light Multi-year Ice 250-300 cm	Heavy Multi-year Ice 300+ cm
A	PC 1	3	3	3	3	2	2	2	2	2	2	1	1
	PC 2	3	3	3	3	2	2	2	2	2	1	1	0
	PC 3	3	3	3	3	2	2	2	2	2	1	0	-1
	PC 4	3	3	3	3	2	2	2	2	1	0	-1	-2
	PC 5	3	3	3	3	2	2	1	1	0	-1	-2	-2
B	PC 6	3	2	2	2	2	1	1	0	-1	-2	-3	-3
	PC 7	3	2	2	2	1	1	1	-1	-2	-3	-3	-3
C	IA Super	3	2	2	2	2	1	0	-1	-2	-3	-4	-4
	1A	3	2	2	2	1	0	-1	-2	-3	-4	-4	-4
	1B	3	2	2	1	0	-1	-2	-3	-4	-5	-5	-5
	1C	3	2	1	0	-1	-2	-2	-3	-4	-4	-5	-6
	No Ice Class	3	1	0	-1	-2	-3	-3	-4	-5	-6	-6	-6

← Decreasing Ice Class

→ Increased Risk

POLARIS Risk Values for Winter Ice



Phase 2



The enforcement of **training for officers** in charge of navigation of fishing vessels in polar water and the deployment of **radio communication facilities** (Polar Code Ch. 9~12)

Manning & Training in Fishing Vessels

Title	POLAR Code 2015 / PART I-A / 12.2
Effective Date	1/1/2017
Note	This code applies to ships operating in polar waters. Ships constructed before 1 January 2017 shall meet this code by the first intermediate or renewal survey, whichever occurs first, after 1 January 2018.

12.2 Functional requirements

on board ships

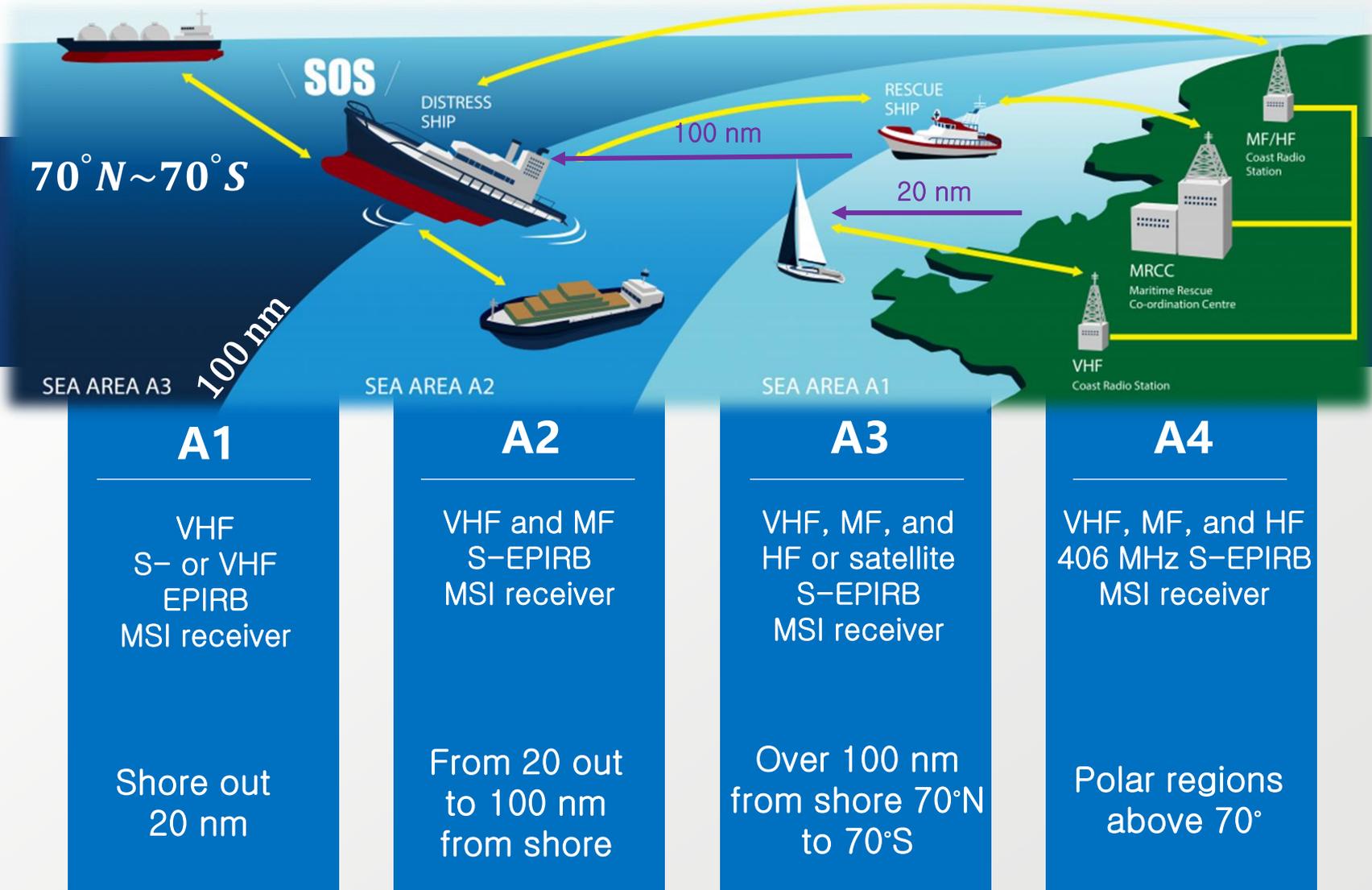


on board ships including fishing vessels

In order to achieve the goal set out in paragraph 12.1 above, companies shall ensure that masters, chief mates and officers in charge of a navigational watch **on board ships** operating in polar waters shall have completed training to attain the abilities that are appropriate to the capacity to be filled and duties and responsibilities to be taken up, taking into account the provisions of the STCW Convention and the STCW Code, as amended.

Companies shall ensure that officers in fishing vessel operating in polar waters are also trained to cultivate their ability to fulfill their duties and responsibilities, taking into account the provisions of the STCW Convention and the STCW Code, as amended

RADIO COMMUNICATION FACILITIES



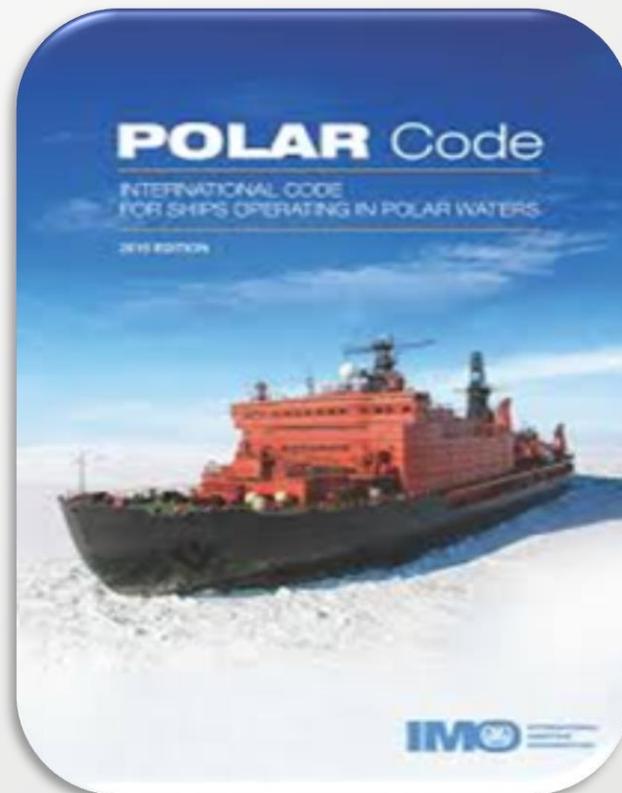
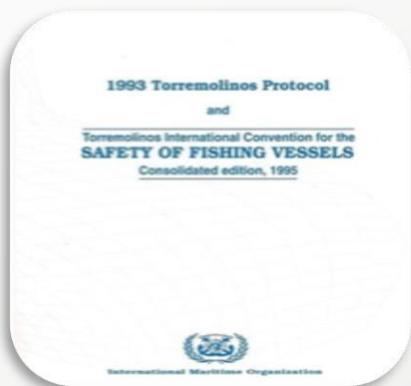
Phase 3



CAPE TOWN
Agreement →

Full
Application

TORREMOLINOS
Protocol →



Full application of **POLAR CODE** for **FISHING VESSEL**
(Polar Code Ch. 3~8)

Phase 3

Torremolinos Protocol

Regulation III/8 – Ice accretion

- Icing allowances for stability calculations, ship design to minimize ice accretion, means for removing ice

Code of safety for fishermen and fishing vessels

Part A, appendix 10, and Part B, section 3.8

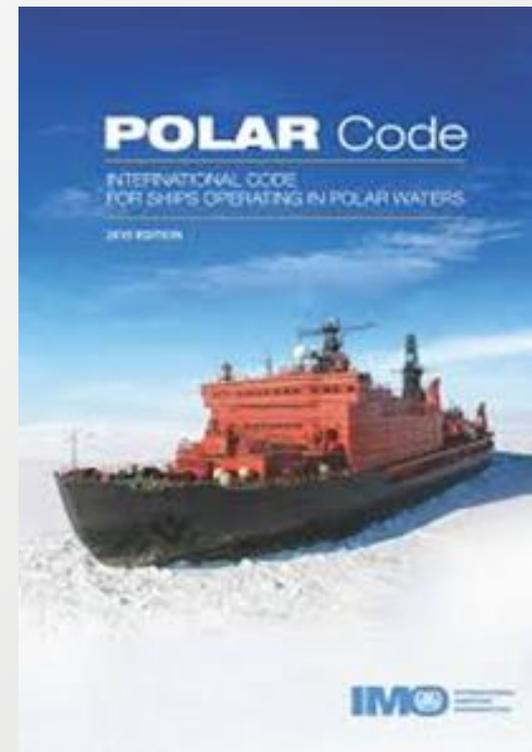
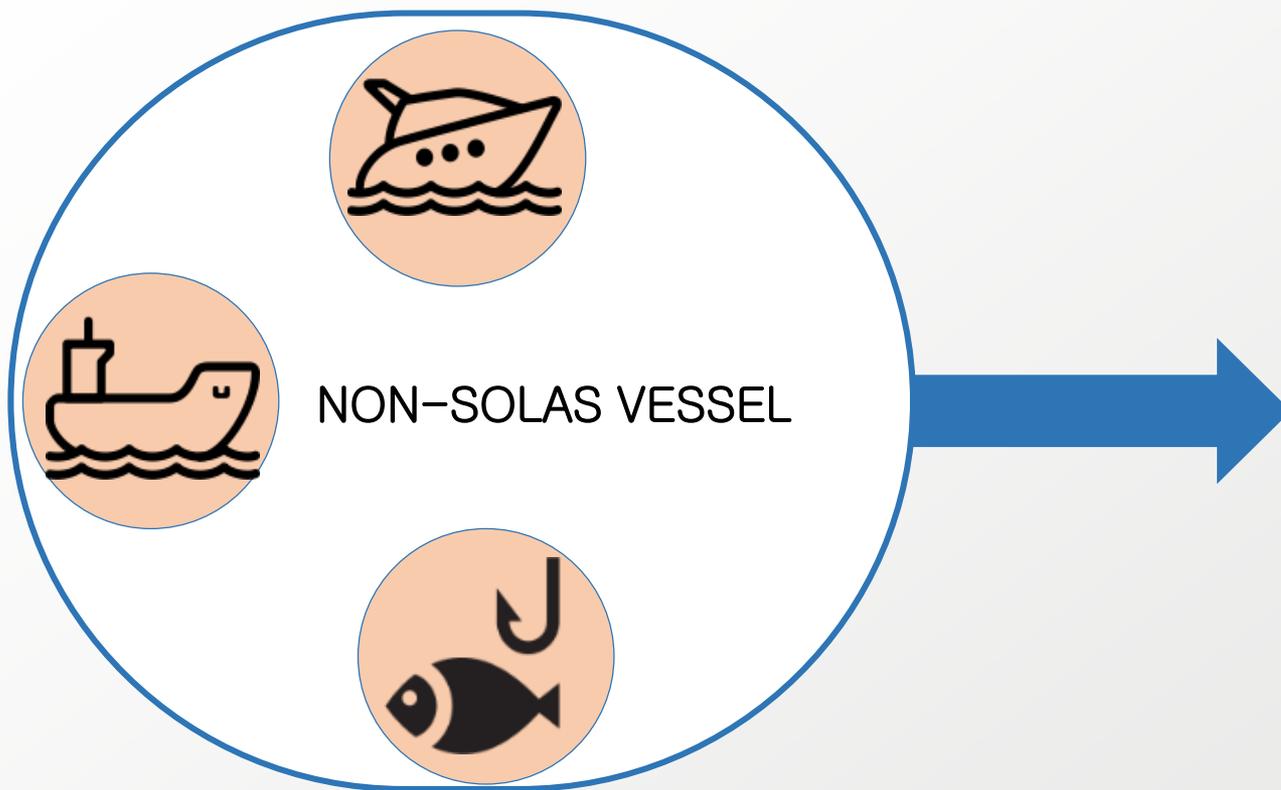
- Reduction of formation of ice and icing allowances for stability calculations for fishing vessels of 24 m and over in length

Voluntary guidelines for small fishing vessels

Design, construction and equipment

- Provisions regarding ice accretion and combating of ice formation for fishing vessels between 12 m and 24 m in length

Phase 4



Polar Code should be applied to
all Non-SOLAS Vessels



Section
4

Conclusion

Conclusion

We propose IMO the followings
for the Safety of NON-SOLAS vessels in Polar waters:

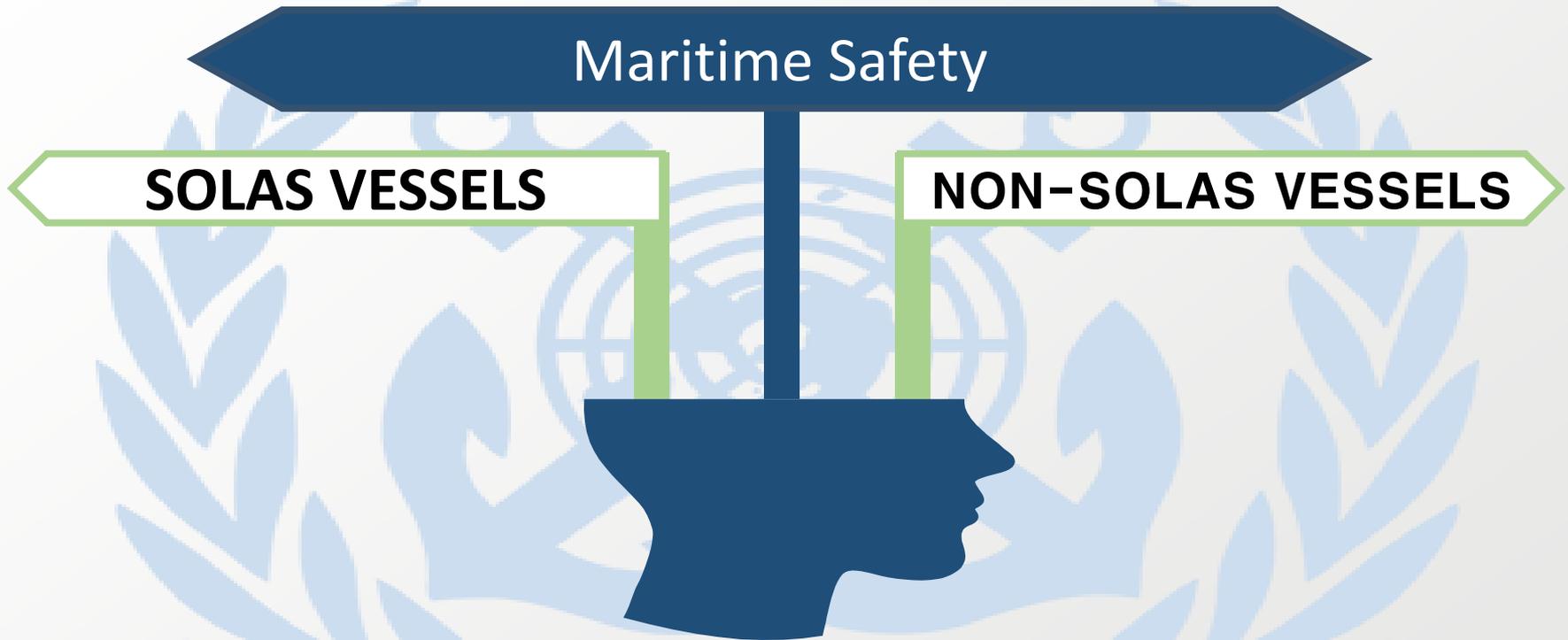
Phase 1: The deployment of **PSC, PWOM & POLARIS**, that can be applied immediately to all ships

Phase 2: The deployment of **training** for navigational officers and **communication equipment**

Phase 3: The full application of POLAR CODE for **FISSING VESSELS**

Phase 4: The full application of POLAR CODE for **NON-SOLAS VESSELS**

Conclusion



This proposal would be a commitment to IMO's SD 6 and a practical step towards the goal shared by IMO's Member States of improving the safety of all ships operating in polar waters.



Thank you

Source: <http://www.imo.org/en/About/Pages/Default.aspx>

Presented by Polar Voyager

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