PAME

Protection of the Arctic Marine Environment

FORUM WEB-PORTAL

Arctic Shipping Best Practice Information Forum 4th Annual Meeting - Virtual

24th & 25th November 2020

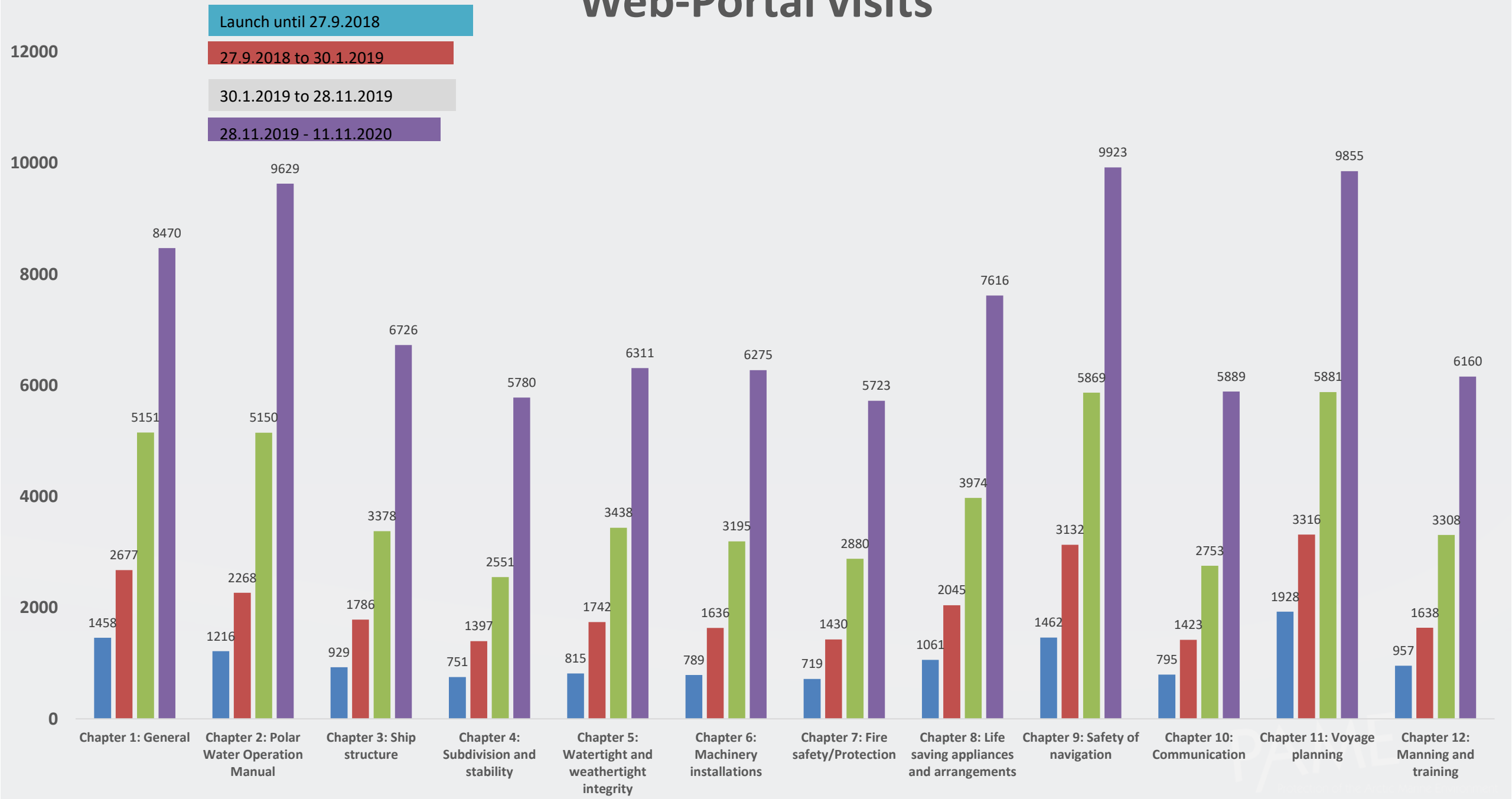
Michael Kingston, Special Advisor to PAME

www.arcticshippingforum.is

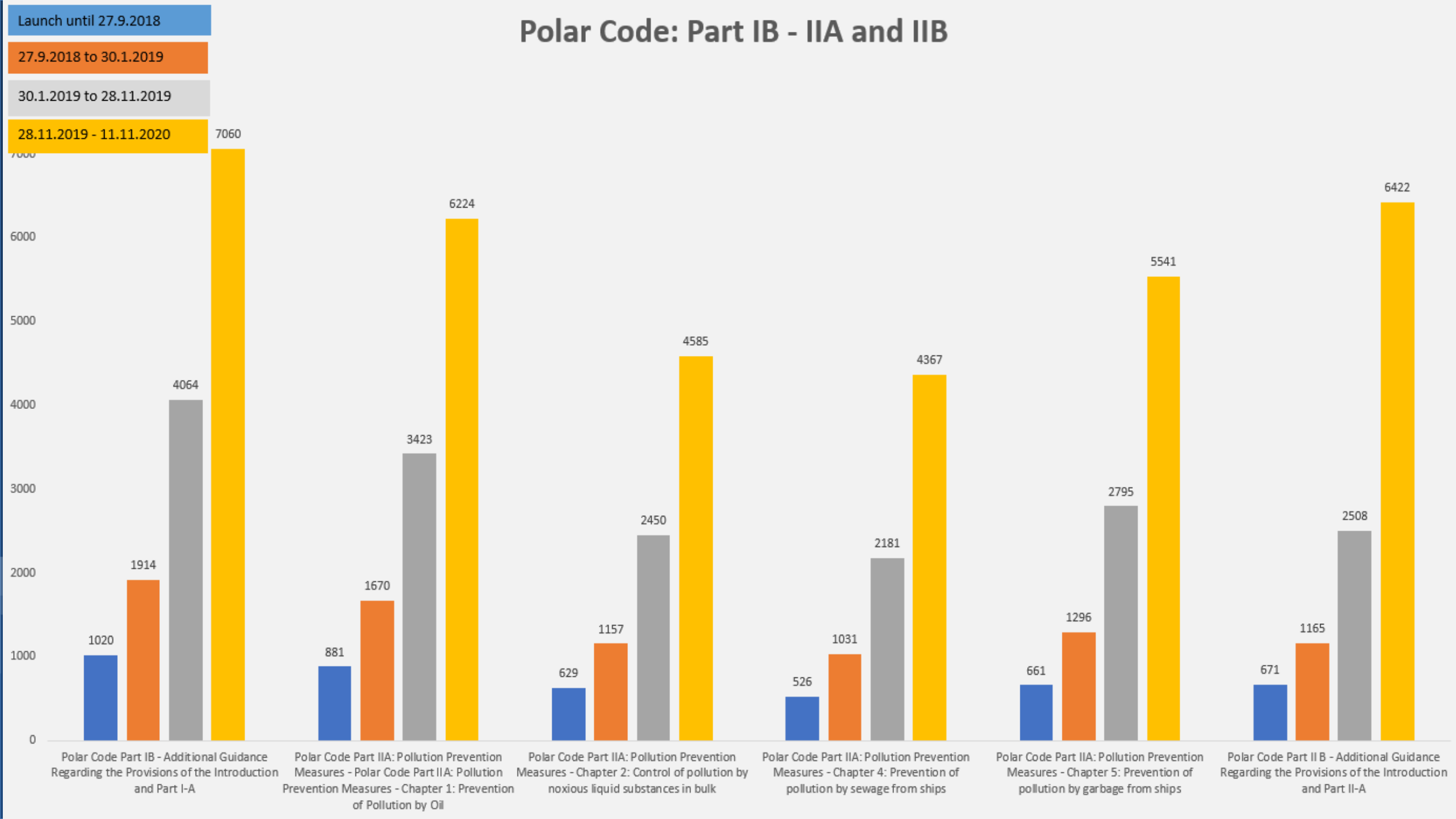
PAME

Protection of the Arctic Marine Environment

Web-Portal visits



Polar Code: Part IB - IIA and IIB



Arctic Shipping Best Practice Information Forum

					Average increase (chapters)	94%
Web Portal visits						
	27.9.2018	30.1.2019	28.11.2019	11.11.2020	Visits since 28.11.2019	Difference
www.arcticshippingforum.is - Total visits	-	10.535	17475	55943	38468	220%
Arctic State Administrations	3156	5606	10938	15308	4370	40%
Forum Participants	2598	5874	11149	14341	3192	29%
-						
Site	Visits					
Part IA - Safety Measures						
Chapter 1: General	1458	2677	5151	8470	3319	64%
Chapter 2: Polar Water Operation Manual	1216	2268	5150	9629	4479	87%
Chapter 3: Ship structure	929	1786	3378	6726	3348	99%
Chapter 4: Subdivision and stability	751	1397	2551	5780	3229	127%
Chapter 5: Watertight and weathertight integrity	815	1742	3438	6311	2873	84%
Chapter 6: Machinery installations	789	1636	3195	6275	3080	107%
Chapter 7: Fire safety/Protection	719	1430	2880	5723	2843	99%
Chapter 8: Life saving appliances and arrangements	1061	2045	3974	7616	3642	92%
Chapter 9: Safety of navigation	1462	3132	5869	9923	4054	69%
Chapter 10: Communication	795	1423	2753	5889	3136	114%
Chapter 11: Voyage planning	1928	3316	5881	9855	3974	68%
Chapter 12: Manning and training	957	1638	3308	6160	2852	86%
Polar Code Part IB	-					
Additional Guidance Regarding the Provisions of the Introduction and Part I-A	1020	1914	4064	7060	2996	74%
Polar Code Part IIA: Pollution Prevention Measures	-					
Chapter 1: Prevention of Pollution by Oil	881	1670	3423	6224	2801	82%
Chapter 2: Control of pollution by noxious liquid substances in bulk	629	1157	2450	4585	2135	87%
Chapter 4: Prevention of pollution by sewage from ships	526	1031	2181	4367	2186	100%
Chapter 5: Prevention of pollution by garbage from ships	661	1296	2795	5541	2746	98%

POLAR CODE CHAPTERS: EXPLANATION AND SUBMISSIONS

- Polar Code Part IA - Safety Measures
- Polar Code Part IB
- Polar Code Part IIA: Pollution Prevention Measures
- Polar Code Part II B

CONTACT

- Contact Forum Organizers

IMO INFORMATION ON THE POLAR CODE

- IMO Polar Code Information

OTHER INFORMATION

- Annual Forum meetings
- Covid-19 Guidance
- Operational Documents
- Other Information

SUBMIT INFORMATION TO THE WEB-PORTAL

To submit information for the web-portal, click this link and fill in the form. The information will be reviewed and added to the web-portal consequently and the submitter contacted via e-mail.

ABOUT THE FORUM

The International Maritime Organization's adoption o the International Code for Ships Operating in Polar Waters (Polar Code) prompted the Arctic Council's Working Group on the Protection of the Arctic Marine Environment (PAME) to establish of the **Arctic Shipping Best Practice Information Forum (Forum).** The aim of the Forum is to raise awareness of the Polar Code amongst all those involved in or potentially affected by Arctic marine operations and to facilitate the exchange of information and best practices on Polar Code implementation among Forum participants.

Forum participation is open to Arctic States, Permanent Participants, and Arctic Council Observers as well as any widely-recognized professional organization dedicated to improving safe and environmentally sound marine operations in the Arctic as demonstrated by expertise and experience i Arctic shipping and/or related issues.

The principal product of the Forum is a Web portal which provides links to authoritative information that are indispensable to the effective implementation of and compliance with the Polar Code. Organized by th chapters of the Polar Code, the Web portal links to information submitted by Forum participants and vetted according to agreed criteria by the Forum's Steering Committee, In addition, the Web portal contains links to information provided by administrations of the eight Arctic States (Canada, Kingdom of Denmark, Finland, Iceland, Norway, Russian Federation, Sweden and the United States of

Web Portal

HOME PAGE

PAME
Protection of the Arctic Marine Environment

CHAPTER 1 – GENERAL: Full Polar Code text

As adopted from IMO - Full Polar Code text

CHAPTER 1 - GENERAL: Full Polar Code text

POLAR CODE CHAPTERS: EXPLANATION AND SUBMISSIONS

Part IA - Safety Measures

Polar Code Part IB

Polar Code Part IIA: Pollution Prevention Measures

Polar Code Part II B

ARCTIC STATE INFORMATION

Arctic State information site.

FORUM PARTICIPANTS

This site overviews participants of the Forum.

WEB PORTAL HOME

Forum home page.

Web Portal

Easier Navigating links on Each Chapter

PAME

Protection of the Arctic Marine Environment

FORUM: PARTICIPANTS

This page lists Participants of the Arctic Shipping Best Practice Information Forum. According to the Forum's Terms of Reference, the "Arctic States intend Forum participation to be open to Arctic States, Permanent Participants and Arctic Council Observers as well as any widely-recognized professional organizations dedicated to improving safe and environmentally sound marine operations in the Arctic as demonstrated by expertise and experience in Arctic shipping and/or related issues...."

To apply for participant status, please contact PAME (pame@pame.is).

PARTICIPANTS

Please click the boxes for information on each participant

- Alaska Maritime Prevention & Response Network (Alaska Network)
- American Bureau of Shipping (ABS)
- Arctic Coast Guard Forum (ACGF)
- Arctic Economic Council (AEC)
- Arctic Regional Hydrographic Commission (ARHC)
- Association of Arctic Expedition Cruise Operators (AECO)
- Baltic and International Maritime Council (BIMCO)
- Bonn Agreement
- British Antarctic Survey

Importance of working hard intersessionlly with Participants

PAME
Protection of the Arctic Marine Environment

Guidelines for the Development of a Polar Water Operational Manual

2019

OCIMF

International Chamber of Shipping

Shaping the Future of Shipping

Participant

- OCIMF
- ICS

PAME

Protection of the Arctic Marine Environment

PART I-B:

CHAPTER SUMMARY

There is important additional guidance to Chapters 1, 2, 3, 6, 8, 9, 10 and 11. There is also detailed additional guidance for important definitions under the Polar Code such as the Mean Daily High Temperature, the Mean Daily Average Temperature, and the Mean Daily Low Temperature. For the full text of Part I B Additional Guidance, see below.

SUBMISSIONS

- Bering Sea Elders Group
- International Chamber of Shipping (ICS)
- Oil Companies International Marine Forum (OCIMF)
- International Maritime Organization (IMO)
- National Geospatial-Intelligence Agency
- World Meterological Institute

Participant

- OCIMF
- ICS

Additional Guidance

Part IB

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Protection of the Arctic Marine Environment

World Meterological Institute

PART I-B: ADDITIONAL GUIDANCE REGARDING THE PROVISIONS OF THE INTRODUCTION AND PART I-A: Full Polar Code text

As adopted from IMO - Full Polar Code text

Additional Guidance to **Section 2** (Definitions) of the Introduction)

Additional Guidance to **Chapter 1** (General)

Additional Guidance to **Chapter 2** (Polar Water Operation Manual (PWOM)

Additional Guidance to **Chapter 3** (Ship Structure)

Additional Guidance to **Chapter 8** (Life-Saving Appliances and Arrangements)

Additional Guidance to **Chapter 9** (Safety of Navigation)

Additional Guidance to **Chapter 10** (Communication)

Additional Guidance to **Chapter 11** (Voyage Planning)

POLAR CODE CHAPTERS: EXPLANATION AND SUBMISSIONS

Part IA - Safety Measures

Polar Code Part IB

Participant

- OCIMF
- ICS

Additional Guidance

Part IB

PAME
Protection of the Arctic Marine Environment

PART I-B: ADDITIONAL GUIDANCE REGARDING THE PROVISIONS OF THE INTRODUCTION AND PART I-A: Full Polar Code text

As adopted from IMO - Full Polar Code text

Additional Guidance to **Section 2** (Definitions) of the Introduction)

Additional Guidance to **Chapter 1** (General)

Additional Guidance to **Chapter 2** (Polar Water Operation Manual (PWOM)

- **3.1** Recommendation on the content of the Polar Water Operational Manual The Polar Water Operational Manual (PWOM) is intended to address all aspects of operations addressed by chapter 2 of part I-A. When appropriate information, procedures or plans exist elsewhere in a ship's documentation, the PWOM itself does not need to replicate this material, but may instead cross-reference the relevant reference document. A model Table of Contents is found in appendix 2. The model follows the general structure of chapter 2. Not every section outlined below will be applicable to every polar ship. Many category C ships that undertake occasional or limit polar voyages will not need to have procedures for situations with a very low probability of occurrence. However, it may still be advisable to retain a common structure for the PWOM as a reminder that if assumptions change then the contents of the manual may also need to be updated. Noting an aspect as "not applicable" also indicates to the Administration that this aspect has been considered and not merely omitted.
- **3.2** Guidance on navigation with icebreaker assistance With respect to navigation with icebreaker assistance, the following should be considered:

Participant

- OCIMF
- ICS

Additional Guidance

Part IB

PAME
Protection of the Arctic Marine Environment

CHAPTER SUMMARY

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SUBMISSIONS

Bering Sea Elders Group

International Chamber of Shipping (ICS)

Hyperlink: Guidelines for the Development of a Polar Water Operational Manual

The International Chamber for Shipping (ICS) and the Oil Companies International Marine Forum (OCIMF) jointly published this document in 2019. ICS and OCIMF members consider that how a ship is operated in Polar waters, and especially in ice, is a critical aspect for safe operations. The quality of the PWOM will have an impact on achieving safe operations. This document suplements the Polar Code and its Appendix II, which provides a model for a PWOM. The document states that while Appendix II is a useful starting point, ICS and OCIMF members have found that additional information is needed to develop a quality PWOM.

- ICS

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Protection of the Arctic Marine Environment

Oil Companies International Marine Forum (OCIMF)

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Hyperlink 2: Northern Sea Route – Best practices and Challenges (2017)
For Part IB, see pages 1 and 12.

Hyperlink 3: Offshore Vessel Operations In Ice and or Severe Sub Zero Temperatures in Artic and Sub Artic regions (2014).

In addition:

- We have also published a book through Witherby Seamanship: The use of large tankers in Seasonal First Year Ice and Severe sub-Zero conditions. (2010), however this has to be purchased this can be purchased for £125 at https://www.witherbyseamanship.com/large-tanker-sub-zero-ice.html
- Other information papers from OCIMF: https://www.ocimf.org/publications/information-papers.aspx#sectionBreadcrumb

International Maritime Organization (IMO)

National Geospatial-Intelligence Agency

World Meterological Institute

- OCIMF

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Protection of the Arctic Marine Environment

CHAPTER 2:

CHAPTER SUMMARY

Chapter 2 describes the content to be included in the Polar Water Operational Manual (PWOM), a mandatory ship-specific document designed to support decision making through the identification of procedures for operations under routine and emergency conditions. The PWOM must contain references to methodologies used to determine capabilities and limitations of a vessel in ice. The Regulations require that vessels develop and carry a PWOM on board, and require that a variety of risk-based procedures are taken into consideration. These are set out in the text of Chapter 2 below, and in the Part 1B Additional Guidance.

SUBMISSIONS

- American Bureau of Shipping (ABS)
- DNV GL
- International Chamber of Shipping (ICS)
- International Ice Charting Working Group
- Lloyd's Register (LR)
- Oil Companies International Marine Forum (OCIMF)
- World Meterological Organization
- The Environment Agency of Iceland

Participant

- OCIMF
- ICS

Polar Water Operational Manual

Part IA Chapter 2

PAME
Protection of the Arctic Marine Environment

CHAPTER 11:

CHAPTER SUMMARY

This chapter is designed to ensure that the company, master, and crew are provided with sufficient information to enable operations to be conducted with due consideration to the safety of ships and persons on board and, as appropriate, environmental protection. These considerations need to be referenced in the Polar Waters Operational Manual. By way of example, they include but are not limited to Notices to Mariners that are ordinarily contained in government publications. These are set out in the text of Chapter 11 below, and in the Part 1B Additional Guidance.

SUBMISSIONS

International Chamber of Shipping (ICS)

Oil Companies International Marine Forum

Participant

- OCIMF
- ICS

Voyage Planning

Part IA Chapter 11

PAME
Protection of the Arctic Marine Environment

POLAR CODE CHAPTERS: EXPLANATION AND SUBMISSIONS

- Polar Code Part IA - Safety Measures
- Polar Code Part IB
- Polar Code Part IIA: Pollution Prevention Measures
- Polar Code Part II B

CONTACT

- Contact Forum Organizers

IMO INFORMATION ON THE POLAR CODE

- IMO Polar Code Information

OTHER INFORMATION

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Participant

IMO

IMO Information Page

Portal Home Page

PAME
Protection of the Arctic Marine Environment

CHAPTER 8:

CHAPTER SUMMARY

Chapter 8 contains requirements that provide for safe escape, evacuation, and survival under various operating conditions. Provisions contained in this chapter of the Polar Code will apply to new and existing vessels if such vessels may encounter the conditions the provisions are intended to address. Requirements for partially or totally enclosed lifeboats are stricter in the Polar Code than in the otherwise applicable SOLAS requirements. This includes having specific means in place to assist with escape or evacuation in ice and snow conditions, and provision for personal survival equipment that provide sufficient frostbite protection. These are set out in the text of Chapter 8 below, and in the Part 1B Additional Guidance.

SUBMISSIONS

- American Bureau of Shipping (ABS)
- DNV GL
- International Maritime Organization (IMO)
- Lloyd's Register (LR)
- Maritime Department, Norwegian Ministry of Trade, Industry and Fisheries
- Oil Companies International Marine Forum (OCIMF)
- World Meterological Organization

Participant

IMO

Life Saving Appliances and Arrangements

Part IA

Chapter 8

PAME
Protection of the Arctic Marine Environment

International Maritime Organization (IMO)

Interim guidelines on life-saving appliances and arrangements for ships operating in polar waters.

- Note IMO Circular 26 June 2019 (MSC.1/Circ.1614)

Hyperlink: IMO in the polar environment: Search and Rescue

The following video which is part of a series on IMO in the polar environment, focuses on search and rescue in polar regio
the challenges of search and rescue operations in these inhospitable polar regions.

Participant

IMO

Life Saving Appliances and Arrangements

Part IA

Chapter 8

PAME

Protection of the Arctic Marine Environment

Oil Companies International Marine Forum (OCIMF)

International Maritime Organization (IMO)

Guidance on Surveys:

- Note IMO Circular 16 December 2016 (MSC.1/Circ.1562)

Guidance on methodologies for assessing operational capabilities and limitations in ice

- Note IMO Circular 6 June 2016 (MSC.1/Circ.1519)

Interim guidelines on life-saving appliances and arrangements for ships operating in polar waters.

- Note IMO Circular 26 June 2019 (MSC.1/Circ.1614)

National Geospatial-Intelligence Agency

World Meterological Institute

PART I-B: ADDITIONAL GUIDANCE REGARDING THE PROVISIONS OF THE INTRODUCTION AND PART I-A: Full Polar Code text

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Additional Guidance to **Chapter 9** (Safety of Navigation)

Additional Guidance to **Chapter 10** (Communication)

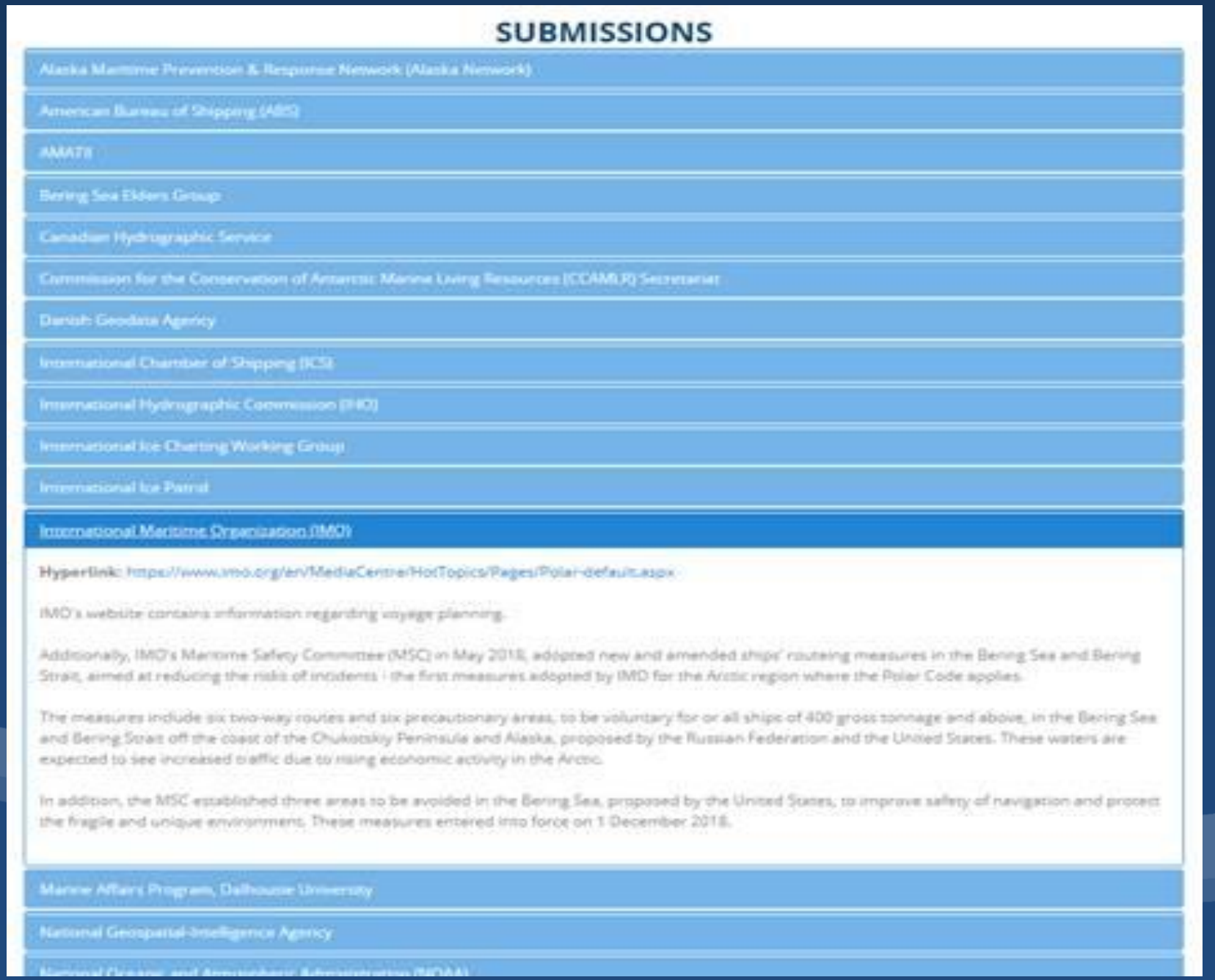
Participant

- IMO

Additional Guidance

Part IB

PAME
Protection of the Arctic Marine Environment



Participant

- IMO

Voyage Planning

Part IA

Chapter 11

PAME
Protection of the Arctic Marine Environment

SUBMISSIONS

DNV GL

Icelandic Transport Authority

Oil Companies International Marine Forum (OCIMF)

The International Chamber of Shipping

The International Hydrographic Organization

The International Maritime Organization (IMO)

Training of Seafarers

Resolution MSC.416(97), adopted on 25 November 2016, containing amendments to the STCW Convention, 1978 , including amended regulation I/1.1 adding definitions of "Polar code" and "Polar waters", amended regulation I/11 requiring continued seagoing service for masters and officers for the continued professional competence for ships operating in polar waters, amendments to chapter V of the STCW Convention (Regulation V/4 on "Mandatory minimum requirements for the training and qualifications of masters and deck officers on ships operating in polar waters").

This led to the development of IMO model course on Basic and Advanced Training for ships operating in polar waters (see image).

The Polar Code on the IMO website

IMO and Transport Canada have signed a Memorandum of Understanding to deliver regional capacity-building workshops to provide training for trainers to deliver training programmes for seafarers operating in Polar waters and on the implementation of the Polar Code.

The project harnesses IMO's competence as the United Nations specialized agency responsible for setting global standards for the safety, security and facilitation of international shipping and the prevention of pollution by ships, in collaboration with Canada's financial support and expertise in supporting implementation of the Polar Code.

The Nautical Institute

World Meteorological Organization Joint Technical Commission on Oceanography and Marine Meteorology (JCOMM)

Participant

- IMO

Manning & Training

Part IA

Chapter 12

PAME

Protection of the Arctic Marine Environment

PART I-B:

CHAPTER SUMMARY

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SUBMISSIONS

Bering Sea Elders Group

Oil Companies International Marine Forum (OCIMF)

International Maritime Organization (IMO)

Guidance on Surveys:

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National Geospatial-Intelligence Agency

World Meterological Institute

Participant

- IMO

Additional Guidance

Part IB

PAME
Protection of the Arctic Marine Environment

CHAPTER 11:

CHAPTER SUMMARY

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SUBMISSIONS

Bering Sea Elders Group

Hyperlink: http://eloka-arctic.org/

The link submitted is the electronic version of "The Northern Bering Sea: Our Way of Life", published by the Bering Sea Elders Group an alliance of thirty-nine Yup'ik and Inupiaq villages that seeks to protect the sensitive ecosystem of the Bering Sea, the subsistence lifestyle, and the sustainable communities that depend on it. The Northern Bering Sea: Our Way of Life highlights large hunting and fishing areas, and the ecological importance of the region.

The maps and information contained in the submission provide valuable information on locations and timing of marine mammal concentrations and marine mammal migratory routes. Information is also provided on locations and timing of subsistence hunting of marine mammals, an important cultural practice for the region.

Participant

- Bering Sea Elders Group

Voyage Planning

Part IA Chapter 11

PAME
Protection of the Arctic Marine Environment

CHAPTER 11:

World Wildlife Fund

Hyperlink 1: http://awsassets.wwf.ca/downloads/hudsonstraitmarinersguide_2.pdf?_ga=2.224626205.640108791.1510171305-2063225585.1506616454
Chapter 11 of the Polar Code calls for voyage planning that results in the least amount of impact on marine mammals in the Arctic. The Hudson Strait Mariner's Guide is designed to assist with this provisions. The Guide is made up of two large posters to be hung on the ship's bridge: a chart that will help mariner's identify whales, seals, polar bears and walrus, and maps of marine mammal habitat in both summer and winter. The guide lists phone numbers so mariners can report sightings and incidents at both the national and community level, and provides operational guidance when close to or encountering marine mammals.

Hyperlink 2: https://www.wwf.dk/wwfs_arbejde/gronland_og_arktis/sadan_arbejder_vi/oget_sejlads_er_en_trussel_mod_hvaler_/ Chapter 11 of the Polar Code calls on mariners to plan voyages with the least amount of impact on marine mammals in the Arctic. The Greenland Mariner's Guide is a tool for mariners to operationalize this chapter in the Code and reduce harm as much as possible on marine life in Greenlandic waters.

Hyperlink 3: http://oceanplanning.wwf.ca
Chapter 11 of the Polar Code requires mariners to plan voyages which results in the least amount of harm to marine life. WWF Arctic Oceans map depicts areas of high value to local communities and makes recommendations on use and protection for the region.

Hyperlink 4: Eastern Arctic Mariner's Guide
The Eastern Arctic Mariner's Guide is made up of three large posters to be hung on a ship's bridge, consisting of:

- Visual identification chart that will help mariners recognize whales, seals, polar bears and walruses.
- Maps of critical habitat, migration routes and calving areas.
- Maps indicating designated conservation areas and ice, including community on-ice travel routes and caribou sea-ice crossings.
- Recommends courses of action regarding sensitive whale habitats, walrus habitat, caribou sea-ice crossings, shipping in polynyas and around floe edges, ice-breaking and Inuit travel routes as well as a tourism exclusion zone and travel speed.
- Lists phone numbers so mariners can report sightings and incidents at both the national and community level, and provides operational guidance when close to or encountering marine mammals.

WWF Arctic Programme

Participant

- World Wildlife Fund

Voyage Planning

Part IA
Chapter 11

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Protection of the Arctic Marine Environment

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- IMO

IMO Website
link to Forum
Web Portal

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Protection of the Arctic Marine Environment

WMO support for Shipping in Polar Waters

ACTIVITY AREAS (1)

- Marine Meteorology and Oceanography Programme (MMOP)

WORLD METEOROLOGICAL ORGANIZATION

PAME
Protection of the Arctic Marine Environment

Climate change and accelerating sea-ice melt in polar regions are opening up new polar shipping routes and increasing summer availability to traditionally ice-locked areas. Due to challenges of weather, communications and positioning (e.g. poor satellite coverage), the Arctic may become one of the highest risk areas in the world for safety of life and property at sea. Reliable marine weather forecasts and knowledge of state of the sea and sea-ice are crucial for safe navigation and planning voyages in both Arctic and Antarctic waters. Specialist skills in ice navigation are also needed to support safe passage of ships in polar waters. In cooperation with the International Maritime Organization (IMO), WMO supports the UN International Convention for Safety of Life At Sea (SOLAS) through the provision of maritime safety information, including in polar waters. In order to improve such services WMO is promoting the collection of cryosphere and weather observations from ships sailing in polar regions. This is guided by the IMO Polar Code.

WMO contribution to Arctic Shipping Best Practice Portal

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WMO

WMO Website
link to Forum
Web Portal

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Protection of the Arctic Marine Environment

ARCTIC STATE INFORMATION

This page contains information that each Arctic State and its relevant government agencies consider important for vessel owners, vessel operators, flag states, port states, and other interested stakeholders to consider when applying Polar Code requirements.

The information is non-exhaustive and all stakeholders are advised to contact relevant government agencies for specific advice.

- Canada
- Kingdom of Denmark
- Iceland
- Finland
- Norway
- Sweden
- Russian Federation
- United States of America

Non-Arctic States

United Kingdom:

The UK Maritime and Coastguard Agency (MCA) issued a marine guidance note (MGN 632 (M+F)) providing updated guidance and clarification for aspects of MARPOL Annex V, polar code and merchant shipping (prevention of pollution by garbage from ships) regulations 2020. (9/21/20): https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/919758/MGN_632_-_Amendment_1.pdf

Participant

- Arctic States
- Arctic State Information Page

PAME
Protection of the Arctic Marine Environment

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To apply for participant status, please contact PAME (pame@pame.is).

PARTICIPANTS

Please click the boxes for information on each participant

- Chile
- Egypt
- Equatorial Guinea
- International Association of Ports and Harbours (IAPH)
- International Maritime Pilots' Association (IMPA)
- Mexico
- National Maritime College of Ireland
- Nicaragua

Participants Page

- Several New Participants

PAME
Protection of the Arctic Marine Environment

CHAPTER 10:

CHAPTER SUMMARY

Chapter 10 provides for effective communications for ships and survival craft during normal and emergency situations, including explicit requirements for search and rescue (SAR) and telemedical assistance communications. Communication equipment on board shall have the capabilities for ship-to-ship and ship-to-shore communication, taking into account the limitations of communications systems in high latitudes and the anticipated low temperatures. There must also be specific sound signaling equipment for use when under escort. Low temperature capability of communication equipment must be demonstrated by both ships and survival crafts. In respect of survival craft, equipment must be operable for the maximum expected time of rescue. These are set out in the text of Chapter 10 below, and in the Part 1B Additional Guidance.

SUBMISSIONS

- American Bureau of Shipping (ABS)
- DNV GL
- International Ice Charting Working Group
- Lloyd's Register (LR)
- Oil Companies International Marine Forum (OCIMF)
- World Meteorological Organization Technical Commission on Oceanography and Marine Meteorology (JCOMM)

Knowledge Gaps

For Example:

Part 1, Chapter 10 - Communication

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Protection of the Arctic Marine Environment

Thank You

Michael Kingston, Special Advisor to PAME

On behalf of the PAME Arctic Shipping Best Practice Information Forum Organizing Committee

www.arcticshippingforum.is

PAME
Protection of the Arctic Marine Environment