

SUMMARY REPORT

4th meeting of the Arctic Shipping
Best Practice Information Forum

24-25 November 2020

SUMMARY
REPORT FOR
INFORMATION

2021



ARCTIC COUNCIL

PAME

Protection of the Arctic Marine Environment

4TH FORUM MEETING SUMMARY REPORT

SUMMARY FROM THE 4TH
MEETING OF PAME'S
ARCTIC SHIPPING BEST
PRACTICE INFORMATION
FORUM – 24-25
NOVEMBER 2020

JANUARY 2021



MEETING SUMMARY

The Arctic Council's Arctic Shipping Best Practice Information Forum (the Forum) convened virtually on 24th – 25th November 2020 for the fourth time since its inception in 2017. The purpose of the Forum is to support effective implementation of the IMO Polar Code by making publicly available on a [dedicated Web Portal](#) information relevant to all those involved in safe and environmentally sound Arctic shipping, including shipowners/operators, regulators, classification societies, marine insurers, and indigenous and local communities, amongst others.

The original meeting was scheduled to take place at IMO Headquarters in London on 11th -12th May 2020 but was postponed due to the COVID-19 pandemic.

The theme of the 4th Forum meeting was *The Polar Code: Trending Toward Success*. The overarching focus was the identification of information to support implementation of the Polar Code, with important aspects of interpretation highlighted including the human element, voyage planning, amongst others, with important presentations from key Forum Participants. One of the key topics and a source of considerable debate was the Polar Operational Limitations Assessment Risk Indexing System (POLARIS), which is currently scheduled in IMO's work plan for review in 2021, subject to proposals put forward by IMO Members States and affiliations.

The meeting was chaired by Iceland's Sverrir Konráðsson. Co-chairs were Peter Oppenheimer (United States) and Drummond Fraser (Canada), who co-chair PAME's Shipping Expert Group, supported by the PAME Secretariat, and Forum Organizing Committee member, Michael Kingston, a Special Advisor to PAME, who also represented IMO at the meeting.

[The meeting agenda](#), available in Annex I, included 16 presentations from various Forum Participants. Presentations are available in Annex II.

The meeting commenced with Chair Sverrir Konráðsson emphasising the importance of holding Forum meetings to continue the Forum's work despite the current COVID-19 restrictions. This was underlined by the large attendance, in part due to the ease of attending a virtual meeting rather than travelling to a face-to-face meeting, as well as the support of IMO in highlighting the Forum through Circulars to all IMO Member States and Affiliates. Attendance rose by over 80% to 147 individuals, far exceeding last year's total of 80 individuals who attended the 3rd annual Forum meeting. The Participants list is linked [here](#).

Participants included representatives of the Arctic States, Permanent Participants, Observer States and Observer Organization (such as IMO and WMO), shipowners, classification societies and intergovernmental organizations, amongst others, involved in implementing, complying with and/or making information available to support the implementation of or compliance with the Polar Code.

The Forum Organizing Committee distributed a follow-up meeting [survey](#), to solicit feedback and suggestions from [Participants](#). The survey response are important in helping shape the focus and organization of subsequent Forum meetings. The Committee also sent out a call to the Participants to review and enhance information for the Web Portal to further strengthen the Forum's ability to support Arctic shipping stakeholders. The Forum also encouraged Participants to make financial contributions to help the Forum's sustainability.

[The Forum Web-Portal](#) is the foundation upon which most of the Forum's efforts are tied. Efforts to advance the Web-Portal are continuous. An overview of the Web-Portal was presented by Michael Kingston, [available here](#). In the welcome it was noted that the Forum's Web Portal has become a "treasure trove" for Arctic navigators, seeing significant expansion of information submitted since the previous Forum's meeting. This also highlighted the

importance of the intersessional work undertaken in the organising and processing of the information in order to appear on the Web Portal.

Comments were invited on the proposition that the remit of the Forum be expanded to include the safety and sustainability of all Arctic maritime operations, perhaps outside the parameters of the Polar Code. The Survey results will be analysed and this consideration discussed further.

The PAME Secretariat and the Forum Organizing Committee deeply appreciate the support of all Participants. It is pleasing to see that this collective effort is paying dividends in that the Forum and Web Portal is gaining traction, coverage, and significant respect in the international arena. It is starting to achieve both PAME and the Participants’ objectives for safe shipping and the protection of our environment, and the concerns of the Arctic’s inhabitants, based on a collaborative approach.

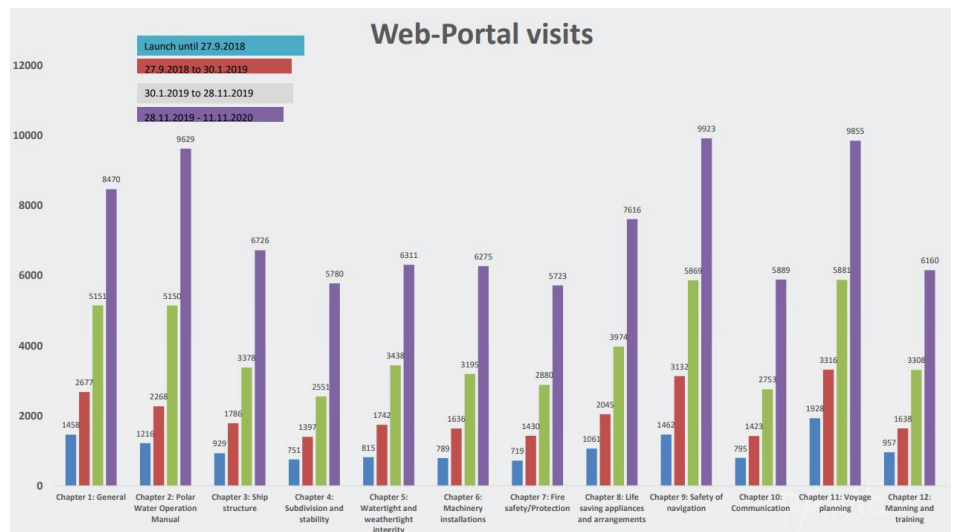
SESSION 1: OPENING SESSION

FORUM WEB PORTAL ([PDF LINK](#)) ([VIDEO LINK](#))

MICHAEL KINGSTON, SPECIAL ADVISOR TO PAME

The presentations began with an overview of the developments that the Forum’s [Web Portal](#) has seen. An increase of almost 50% in traffic can be attributed to visual and technical improvements. It also emphasised the work of Participants in crosslinking to the Portal. Examples used include the [IMO](#) and [WMO](#) Websites.

The presentation highlighted the addition of new Participants and the provision of further and important information by participants, such as the Bering Sea Elders Group, which has provided important information on [Voyage Planning](#), and ICS and OCIMF’s development of [Additional Guidance for Polar Water Operations Manuals](#). Further work will focus on contributions relating to Part II of the Polar Code.

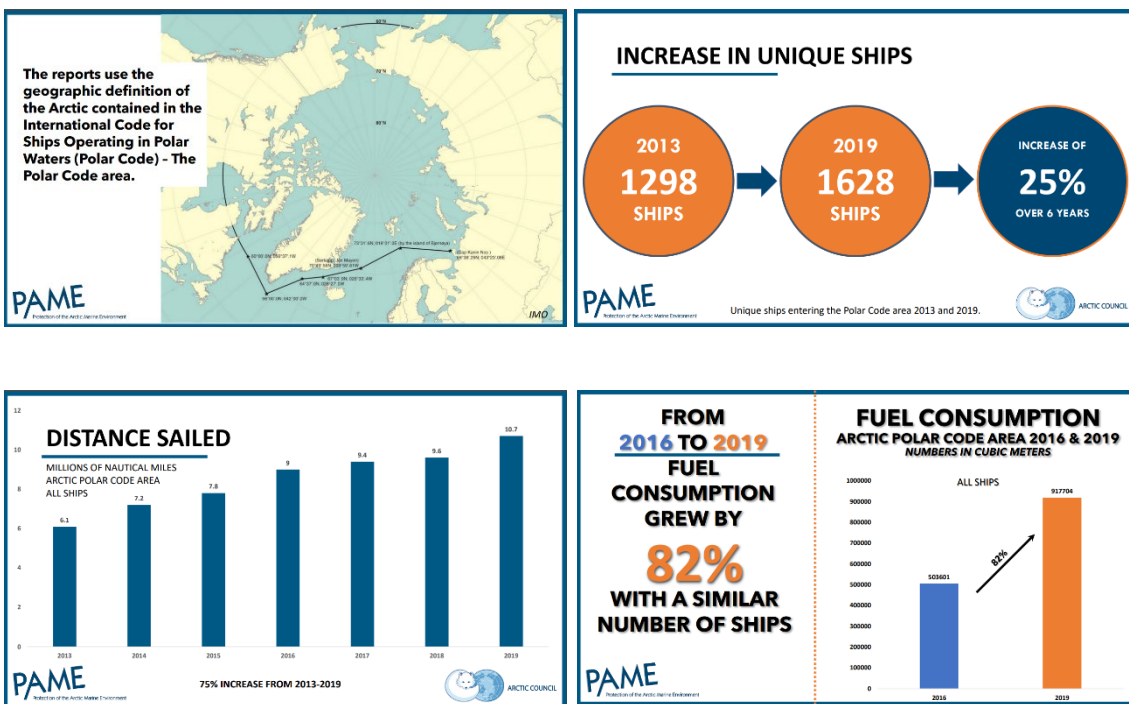


SHIPPING IN THE ARCTIC POLAR CODE AREA ([LINK](#))

HJALTI HREINSSON, PAME SECRETARIAT PROJECT MANAGER

The presentation highlighted PAME’s Arctic Ship Tracking Database (ASTD) project and demonstrated how it provided data for analysis performed in two 2020 PAME Arctic Shipping Status Reports (ASSR) on shipping activities in the Arctic. ASSR #1 focused on the increase in [Arctic Shipping](#); ASSR #2 focused on the use of [Heavy Fuel Oil \(HFO\)](#) which received vital input from the IMO. Requirements for access to the data and other details are available on the [ASTD Website](#).

ASSR #1 included some interesting results that included analysing the frequency by vessel type of navigations in Arctic regions, finding that fishing vessels accounted for 40% of vessel movements. Also of note were the findings that between 2013 and 2019 there has been a 75% increase in the distance travelled by vessels in the same region, exposing vessels and their crews to more remote and challenging waters for longer periods.



Results from the ASSR #2 show that HFO vessels, that is vessels burning the fuel defined by IMO as “oils, other than crude oils, having a density at 15°C higher than 900 kg/m³ or a kinematic viscosity at 50°C higher than 180 mm²/s.” accounted for approximately 10% of shipping traffic in the Arctic area. The most used fuels by far were distillate marine fuel, (over 60%) followed by residual fuel (39%), with only 3 ships using LNG. However, ships used more than one fuel, including many LNG tankers, who can operation both LNG and HFO. In such instances, HFO was marked as the dominant fuel used.

The presentation highlighted PAME’s ongoing project that seeks to increase knowledge regarding fuel use in the Arctic, including discussions with ship operators. The project is also looking at the behavior of low sulphur fuels in Arctic waters.

UPDATE FROM THE IMO ([LINK](#))

DR HEIKE DEGGIM, DIRECTOR OF IMO MARITIME SAFETY DIVISION

The presentation highlighted IMO's active support of PAME's work, and IMO's work continued global work through the pandemic, with particularly stringent efforts being made to ensure ship and crew safety.

IMO's recent work on the ban of HFO was explained, and the development of Voyage Planning Guidelines, and on-going work on Safety Appliances, and Guidelines for non-SOLAS vessels.

PAME was congratulated for establishing the Forum and the Web Portal.

DISCUSSION

A discussion began with questions on safety of crew changes during the pandemic and how long these new measures may need to remain in place.

The issue of the POLARIS review, scheduled in IMO's work plan for 2021, was discussed and Dr. Deggim emphasised that it will require IMO Members States to lead that with proposals to IMO. In the meantime, the POLARIS Guidelines will continue as-is until such a review takes place.

SESSION 2 SUPPORTING AWARENESS, INTERPRETATION, AND IMPLEMENTATION OF THE POLAR CODE

NORCE: POLAR CODER COMPLIANCE AND ENFORCEMENT ([LINK](#))

PIOTR GRACZYK, RESEARCH SCIENTIST, NORCE

A representative from the Norwegian Research Centre (NORCE) spoke on the Project: Polar Code Implementation, Compliance and Enforcement, explaining the objective of developing a better understanding of knowledge gaps in the Polar Code and how different Flag States are interpreting it, including how it is implemented in national legislation, and in practice.

ICS/OCIMF – GUIDELINES FOR DEVELOPMENT OF A PWOM ([LINK](#))

CHRIS OLIVER, NAUTICAL DIRECTOR, ICS

The ICS representative highlighted the International Chamber of Shipping (ICS) / Oil Companies International Marine Forum (OCIMF) – Guidelines for the Development of a Polar Water Operational Manual.

The representative emphasising that it was only guidance and must be viewed in that context. To ensure the appropriate safety and regulatory thresholds are met each vessel must develop its own individual PWOM as there are so many different factors to consider but the Guidelines are a helpful assistant.

DISCUSSION

The discussion heard that Norway are leading a PAME project on the Implementation of the Polar Code which aims to obtain information from all Arctic States, and the possibility of collaboration with the NORCE project was discussed.

Notable comments included the importance of including any information pertaining to indigenous rights in Polar Water Operational Manuals along with any environmental or protected species considerations.

On the issue of interpretation, the meeting heard that most day-to-day interpretations are made by flag states, and the importance of capturing that information.

SESSION 3: MULTILATERAL BODIES - SUPPORT RELATED TO SAFE ARCTIC NAVIGATION

HYDROGRAPHY IN THE ARCTIC ([LINK](#))

RDML SHEPARD SMITH (USA), DIRECTOR NOAA OFFICE OF COAST SURVEY CHAIR, ARCTIC REGIONAL HYDROGRAPHIC COMMISSION

The presentation focused on the new types of survey technology that are being deployed in order to fill the substantial gaps in the regions chart data. Newly acquired high resolution data is intended to integrate with S-100 Navigation services.

IICWG: STATUS OF ICE CHARTING IN THE ARCTIC ([LINK](#))

MARIANNE THYRRING, CO-CHAIR – INTERNATIONAL ICE CHARTING WORKING DANISH METEOROLOGICAL INSTITUTE, DIRECTOR GENERAL

The presentation outlined the structure of the IICWG, and its objective to promote the standardisation of ice information. The presenter highlighted the importance IICWG places on collaboration with the Forum to highlight its ice information and on-going work.

The range of projects the group covers includes the production of S411 ice charts for ECDIS, IICWG highlighted its work in relation to the POLARIS methodology, recognizing it as an important tool for ice captains. Future ambitions include the production of an iceberg density product that gives users real time feedback.

WMO WEATHER SERVICE IN THE ARCTIC – TOWARDS SAFETY OF LIFE AT SEA ([LINK](#))

SARAH GRIMES, HEAD MARINE SERVICES DIVISION, WMO

The presenter gave an overview of the role of the WMO in the provision of marine weather services in the Arctic, including a seasonal forecast each May and October.

WMO highlighted its intersessional work in supporting the Forum's Web Portal through enhanced and additional information submissions, as well as cross-linking the Web Portal to the [WMO Website](#). The WMO highlighted their October 2019 Extreme Maritime Weather Symposium held at IMO, and that they will be hosting the second symposium on Extreme Maritime Weather in 2022.

DISCUSSION

A discussion began with a suggestion that Hydrographic data could be crowdsourced, and in relation to that how there has historically been issues surrounding the quality threshold of the submitted data as there is an inherent inconsistency with operational data that has subjectively been assessed for its quality. Going on to argue that if the only measure is the "best available" data, we should work on the premise that if it adds any knowledge then it is valid data.

IICWG highlighted their Iceberg project and invited Forum Participants to engage with them in relation to the project.

Ice Sat 2 was discussed, and how its data currently has limited use as a stand-alone product. Whilst work continues on improving resolution this data is more useful when used alongside additional data.

SESSION 4 POLARIS REVIEW

IACS PERSPECTIVE ([LINK](#))

JAMES BOND

The second day of proceedings began with a presentation from the American Bureau of Shipping (ABS) on behalf of the International Association of Classification Societies. It emphasised that in using POLARIS for ice class evaluation to produce a risk index value, great importance is placed on understanding the operational reach of POLARIS. It is not a tool that indicates any given route to be safe but should be used as guidance when evaluating risk.

INDIVIDUAL INDUSTRY PERSPECTIVE ([LINK](#))

JAMES BOND, ABS, DIRECTOR POLAR OPERATIONS RESEARCH & ICE CLASS SHIPS ROB HINDLEY, AKER ARCTIC, HEAD OF MACHINERY & STRUCTURAL DESIGN

The discussion continued with a dual presentation from representatives of the American Bureau of Shipping (ABS) and Aker Arctic.

The presenters particularly emphasised how more data is required for a proper review, suggesting that the Forum could facilitate this process and therefore the POLARIS Review. ABS is currently developing an app to collect POLARIS data. The continued discussion on this subject was detailed and voluminous and ran into extended time beyond the conclusion of the Forum as scheduled, highlighting a need for a broader understanding of how POLARIS can be appropriately utilized and reviewed at IMO. The discussion highlighted the need for further discussion as to how the Forum/PAME can assist and those discussions are on-going with the Presenters and other industry experts.

SESSION 5 POLAR CODE – THE HUMAN ELEMENT

SAFETY OF ARCTIC SEAFARERS AND FISHERMEN SURVIVAL IN COLD WATER ([LINK](#))

CPT. HILMAR SNORRASON, MARITIME SAFETY AND SURVIVAL TRAINING CENTRE, ICELAND

The presentation highlighted the issue of appropriate Personal Protective Equipment, and the importance of preparation for an overboard situation and rapid response. Lessons from the past, using traditional clothing that have proved reliable was also considered. Importantly, up to date knowledge of weather conditions must be maintained and properly interpreted.

SEARCH AND RESCUE (SAREX) UPDATE ([LINK](#))

KNUT ESPEN SOLBERG, PRINCIPAL SPECIALIST WINTERIZATION NORWEGIAN COASTAL ADMINISTRATION/GMC MARITIME/UNIVERSITY OF STAVANGER

The Presentation emphasized the importance of using up to date data on accidents and survival rates. It was found that Time to Rescue (TTR) was proportional to the number of people on board, and the location. Scenarios for incidents were presented. One of them highlighted an incident where 40 survivors or fewer could be transported directly back to a helicopter base, as well as over 40 necessitating the establishment of a temporary place of safety, due to the increase in rescue time. A greater number of evacuation platforms reduces TTR. Helicopter support is essential for prolonged operations and strain on SAR personnel must be addressed. Sheltered water or evacuation onshore can be simulated by a companion vessel or a mobile temporary place of safety. The later should be included in government SAR portfolios.

CREW TRAINING FOR POLAR WATERS AND INSPECTION CAMPAIGN ON THE POLAR CODE IN 2022 ([LINK](#))

VLADIMIR KUZMIN, RUSSIAN FEDERATION

The presentation highlighted all the training centres, documents, certificates of proficiency, number of ships by flag, numbers of ships with Polar Certificates to visit Russian ports since 2017, along with a series of inspection statistics for the Arctic zone both in and outside of the Polar Code area. Crew training at Universities was also covered, with Pilots and Navigators with many years' experience on the Northern Sea Route (NSR) providing the training.

DISCUSSION

The discussion began with a question on whether there was any means to ascertain the number of accidents prevented by robust training. However, no clear answer was forthcoming. It may be something that the Forum returns to.

The “maximum expected time of rescue” meaning was discussed, and the Forum was informed that it is a point that was discussed at IMO’s SSC7 meeting. Canada, USA, and New Zealand are currently working on methodologies that are aimed to be discussed further at SDC8 (2022). It was highlighted that there is ample opportunity for further engagement.

In addition to the Forum, the EPPR is also interested in finding ways to contribute to the “maximum expected time of rescue” work. These comments were welcomed by Forum members.

On the question of plans for training and certifying instructors, the commentators present agreed that some type of apprenticeship or training institute programme leading to a qualification must be undertaken before one can become a trainer.

The Forum heard that the [Lloyds of London Challenge and Implications of Removing Shipwrecks in the 21st Century](#) report contained figures from the Large Casualty Working group of the International Group of P&I Clubs that showed human error was responsible for 75%-80% of accidents. It also heard that there is a recent [report](#) published by Allianz in relation to Arctic Operations suggesting that the Polar Code is having an impact on reducing accidents in the Arctic.

SESSION 6 ARCTIC VOYAGE PLANNING

VOYAGE PLANNING AND NAVIGATING ON THE NORTHERN SEA ROUTE

([LINK](#))

SERGEY TOLMACHEV COUNSELLOR, MISSION OF THE RUSSIAN FEDERATION TO THE IMO

The presentation gave comprehensive account of the rules for applying, gaining admission, and navigating the NSR including safety and pollution prevention procedures, some of which predate the Polar Code, all important data for Voyage Planning.

It explained how SAR services include ice breaker assistance. The procedures in the Polar Code remain essential and are complimented by the NSR regime, details of which can be found on the Forum’s [Web Portal](#).

MARINER’S GUIDE: A VOYAGE PLANNING TOOL BASED ON INDIGENOUS KNOWLEDGE AND COMMUNITY RECOMMENDATIONS ([LINK](#))

SAM DAVIN, WWF

The presentation highlighted the development of quick and user-friendly guide for mariners, with the purpose to communicate community concerns about shipping; to inform the development of low impact corridors and to provide recommendations to reduce the impact from shipping. The presentation WWF’s newly promoted Western Arctic Mariners guide, in addition to previous guides developed, and how they are proving to be successful, indicating that ensures a harmonious relationship between shipping operators and the indigenous populations. The presentation highlighted how developed guidelines appear on the Forum Web Portal.

SUBSISTENCE HUNTING & ARCTIC SHIPPING ([LINK](#))

MELLISA JOHNSON, BERING SEA ELDERS GROUP

The presentation discussed the relationship between Subsistence Hunting & Arctic Shipping. An insightful account was given of the importance of maintaining migration patterns and habitats without disturbance. A ship too close to a hunter will mask the animal sounds they rely on to hunt. Polar guidance on Marine Mammal Avoidance needs to be expanded. Communication and partnerships with other communities on safe routing must improve. Vessels must avoid discharges in protected and subsistence use areas to protect community food sources.

DISCUSSION

A discussion followed beginning with a suggestion of collaboration from the Bering Sea Elders Group and organisations such as WWF to create a guide for the Bering Sea and Bering Strait Region and incorporate knowledge from their communities and elders.

On the question of the use of depth sounders on the NSR. There are some recent internal structural changes, and it is not clear whether this information is available. This issue may be addressed in the future.

CLOSE

The Chair made closing announcements. Recognising the limitations of the virtual meeting environment the Chair raised the possibility of an interim meeting indicating that it will be discussed and in order to facilitate the virtual meeting certain items had to be dropped for the agenda that were on the original Agenda in May 2020. The Chair and Co-Chairs thanked all Participants and re-emphasised the importance of filling out the survey, and considering making financial contributions to help sustain the Forum. He emphasised that it was clearly an incredibly important project that must continue in order to protect seafarers, the environment, and the inhabitants of the Arctic.

POLARIS REVIEW EXTENSION.

Concern was raised that more information was required for a review of POLARIS guidelines. As no reports have been issued on the subject it makes for a difficult assessment as there is no information and the IMO itself is not an information gathering organisation, as such.

Silence does not necessarily mean agreement and there is no coordinated effort to assess the POLARIS guidelines in light of the scheduled 2021 review. In order to have a real discussion about how effectively it is working data needs to be gathered, in a consistent format: e.g., a logbook with the RIO & POLARIS calculations. PAME is a good platform where the Arctic States meet to collect and share this data. It is the collating and coordinating role that the Forum could fulfill in this instance.

The possibility of producing a template for distribution for feedback for 2021 was discussed, with the aim of distribution for use in a Review in 2022.

National recording requirements may capture much of the data required. Certain countries may be able to share POLARIS data with the Forum, but there is no confirmation of this.

Rather than trying to do something too quickly the Forum should be given time to consider this. Pilot schemes could be run in the interim.

Both POLARIS and ARIS are important tools in the toolbox of the navigation. POLARIS is too new to have built up sufficient data to analyse. Even so, the track record of ships using the systems is very good.

Some members called for more industry involvement and better communication from academia and damage reporting. The Forum is the perfect venue for this as it engages fully with industry and is able to bring in a broader range of stakeholders such as academics.

A Forum Organizing member highlighted that the Forum has made repeated requests to participants for submissions to the Web Portal and to raise issues concerning knowledge gaps, in order to let us know what we need to do going forward, and that POLARIS is very much one of those issues. There are very deliberate lines of communication that are set up for that reason. The Forum very much looks forward to being in receipt of all submissions and suggestions.

ANNEX I

ARCTIC SHIPPING
BEST PRACTICE
INFORMATION FORUM



4th ANNUAL MEETING
ONLINE
24-25 NOVEMBER 2020

Meeting theme: The Polar Code: Trending Toward Success.

PAME
Protection of the Arctic Marine Environment

DAY 1: 24 NOVEMBER

Session 1: Opening Session

ALL TIMES GMT

14.00 **Opening Remarks: The Arctic Council, PAME and the Forum**
Mr. Peter Oppenheimer and Mr. Drummond Fraser (*Co-chairs of PAME's Shipping Expert Group*)
Mr. Sverrir Konráðsson (*Forum Chair*)

14.10 **Forum Web-Portal (www.arcticshippingforum.is)**
Mr. Michael Kingston (*Michael Kingston Associates, Special Advisor to PAME*)

14.20 **Shipping in the Arctic Polar Code Area**
Mr. Hjalti Hreinsson (*PAME Secretariat*)

14.30 **Update from the IMO: Polar Code and Regulation Development during COVID-19**
Ms. Heike Deggim (*Director, Maritime Safety Division, IMO*)

14.45 **Discussion**

Session 2: Supporting Awareness, Interpretation, and Implementation of the Polar Code

15.10 **Norwegian Research Centre (NORCE) Project: Polar Code Implementation, Compliance, and Enforcement**
Mr. Piotr Graczyk (*Research Scientist, NORCE*)

15.25 **International Chamber of Shipping (ICS) / Oil Companies International Marine Forum (OCIMF) – Guidelines for the Development of a Polar Water Operational Manual**
Mr. Chris Oliver (*Nautical Director, ICS*)

15.40 **Discussion**

15.55 **Health Break**

Session 3: Multilateral Bodies – Support Related to Safe Arctic Navigation

16.00 **Arctic Regional Hydrographic Commission (ARHC): Status of Nautical Charting in the Arctic**
Rear Admiral Shepard M. Smith (*ARHC Chair; Director, Office of Coast Survey, NOAA*)

16.15 **International Ice Charting Working Group (IICWG): Status of Ice Charting in the Arctic**
Ms. Marianne Thyrring (*IICWG Co-Chair; Director-General, Danish Meteorological Institute*)

16.30 **World Meteorological Organization (WMO): Marine Weather Service in the Arctic - Towards Safety of Life at Sea**
Dr. Sarah Grimes (*Head, Marine Services Division, WMO*)

16.45 **Discussion**

17.00 **Closing of Day 1**

DAY 2: 25 NOVEMBER

Session 4: POLARIS Review

(Polar Operational Limitation Assessment Risk Indexing System)

ALL TIMES GMT

14.00

Welcome and Day 1 Recap

Mr. Peter Oppenheimer, Mr. Drummond Fraser (*Co-chairs of PAME's Shipping Expert Group*) and Mr. Sverrir Konráðsson (*Forum Chair*)

14.10

POLARIS Review

Mr. James Bond (*Director, Polar Research and Ice Class Ships, American Bureau of Shipping (ABS)*) & Mr. Rob Hindley (*Head of Machinery & Structural Design, Aker Arctic*)

14.35

Discussion

Session 5: Polar Code – The Human Element

14.50

Survival in Cold Waters

Capt. Hilmar Snorrason (*Principal, Maritime Safety and Survival Training Centre, Icelandic Association for Search and Rescue*)

15.05

Search and Rescue (SARex) Update

Mr. Knut Espen Solberg (*University of Stavanger – GMC Yard*)

15.20

Crew Training for Polar Waters and Inspection Campaign on the Polar Code in 2022

Mr. Vladimir Kuzmin (*Russian Federation*)

15.35

Discussion

15.55

Health Break

Session 6: Arctic Voyage Planning

16.00

Voyage Planning and Navigating on the Northern Sea Route

Mr. Sergey Tomalchev (*Counsellor, Mission of the Russian Federation to the IMO*)

16.15

Mariner's Guide: A Voyage Planning Tool based on Indigenous Knowledge and Community Recommendations

Mr. Sam Davin (*Marine Shipping & Conservation Specialist, WWF-Canada*)

16.30

Subsistence Hunting & Arctic Shipping

Ms. Mellisa Johnson (*Executive Director of the Bering Sea Elders Group*)

16.45

Discussion

17.00

Next steps and Closing by meeting Chairs

17.15: END OF MEETING

ANNEX II

PRESENTATIONS:
Mr. Michael Kingston (IMO/PAME)
Mr. Hjalti Hreinsson (PAME Secretariat)
Dr. Heike Deggim (IMO)
Mr. Piotr Graczyk (NORCE)
Mr. Chris Oliver (International Chamber of Shipping - ICS)
Rear Admiral Shepard Smith (Arctic Regional Hydrographic Commission - ARHC)
Ms. Marianne Thyrring (International Ice Charting Working Group - IICWG)
Dr. Sarah Grimes (World Meteorological Organization (WMO))
Mr. James Bond (International Association of Classification Societies - IACS)
Mr. James Bond (American Bureau of Shipping - ABS) & Mr. Rob Hindley (Aker Arctic)
Cpt. Hilmar Snorrason (Landsbjörg)
Mr. Knut Espen Solberg (University of Stavanger)
Mr. Vladimir Kuzmin (Russian Federation - PSC/FSC Directorate)
Mr. Sergey Tolmachev (Russian Federation / Mission of the Russian Federation to the IMO)
Mr. Sam Davin (WWF-Canada)
Ms. Mellisa Johnson (Bering Sea Elders Group)

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PAME

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