

Status on Implementation of the AMSA 2009 Report Recommendations; For the Period March 2015-March 2017

2017-02

Protection of the Arctic Marine Environment (PAME)

Arctic Council Secretariat

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For the Period March 2015-March 2017

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Guide to Acronyms and Abbreviations

<u>Acronym</u>	<u>Definition</u>		
AECO	Association of Arctic Expedition Cruise Operators	ERMA	Environmental Response Management Application
AIA	Aleut International Association	GHG	greenhouse gas
AIS	Automatic Identification System	GSIS	Global Integrated Shipping Information System
AMAP	Arctic Monitoring and Assessment Program (Arctic Council Working Group)	HFO	heavy fuel oil
AMATII	Arctic Maritime and Aviation Transportation Infrastructure Initiative	IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
AMSA	Arctic Marine Shipping Assessment	ICC	Inuit Circumpolar Council
AMTP	Arctic Marine Tourism Project	ICES	International Council for the Exploration of the Sea
AmverNet	Automated Mutual Assistance Vessel Rescue Network	IHO	International Hydrographic Organization
AOOGG	Arctic Offshore Oil and Gas Guidelines	IICWG	International Ice Charting Working Group
AOR	Arctic Ocean Review	IMO	International Maritime Organization
ARHC	Arctic Regional Hydrographic Commission	IMSO	International Maritime Satellite Organization
ASTD-EG	Arctic Shipping Traffic Data Expert Group	IWC	International Whaling Commission
BIMCO	Baltic and International Maritime Council	JCOMM	WMO-IOC joint Technical Commission for Oceanography and Marine Meteorology
BWMC	Ballastwater Management Convention (IMO)	LRIT	Long Range Identification and Tracking
CAFF	Conservation of Arctic Flora and Fauna (Arctic Council Working Group)	MARPOL	International Convention for the Prevention of Pollution from Ships
CBD	Convention on Biological Diversity	MEMA	Meaningful Engagement of Indigenous Peoples and Local Communities in Marine Activities
CBMP	Circumpolar Biodiversity Monitoring Program	MEPC	Marine Environment Protection Committee
CMTS	Committee on the Marine Transportation System	MOSPA	Operational Guidelines that implement the Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic
DNV	Det Norske Veritas	MPA	marine protected area
EBSA	Ecologically or Biologically Significant Marine Area	MSC	Maritime Safety Committee
EPPR	Emergency Prevention, Preparedness and Response (Arctic Council Working Group)		

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NAMMCO Commission	North Atlantic Marine Mammal	SAMBR	State of the Arctic Marine Biodiversity Report
NGO	non-governmental organization	SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
NOx	nitrogen oxide		
NOOA	National Oceanic and Atmospheric Administration (USA)	SDWG	Sustainable Development Working Group (Arctic Council Working Group)
NSR	Northern Sea Route		
PAME	Protection of the Arctic Marine Environment (Arctic Council Working Group)	SOLAS	Convention for the Safety of Life at Sea (IMO)
PM	particulate matter	SONS	Spill of National Significance
RP3	Recommended Practices for Arctic Oil Spill Prevention	SOx	sulfur oxide
		SRS	ship reporting system
SAO	Senior Arctic Official	STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
SAR	search and rescue		
SARiNOR	Search and Rescue in the High North		
TFOPP	Task Force on Oil Pollution Prevention (Arctic Council Task Force)		
VOS	Voluntary Observing Ship scheme		
WGICA	Integrated Ecosystem Assessment for the Central Arctic Ocean		
WMO	World Meteorological Organization		

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Executive Summary

The 2017 Progress Report on Implementation of the 2009 Arctic Marine Shipping Assessment (AMSA) Recommendations is the fourth effort by the Arctic Council's Working Group on the Protection of the Arctic Marine Environment (PAME) to document and track progress on developments in Arctic marine environment protection, maritime safety and collaboration with other international and regional Organizations, observer states and industry in accordance with the 17 AMSA Recommendations to promote safety and environmental protection and awareness of current and future Arctic shipping activity.

In course of the eight years after the adoption of the AMSA report we have witnessed significant achievements and progress in the enhancement of maritime safety and the protection of the marine environment in Arctic waters due to the successful implementation and significant advances in carrying out many of the AMSA recommendations.

As new and forthcoming developments in the Arctic will to some extent overtake the rest of the AMSA Recommendations, this report will be the final one of this kind on the progress on the specific 17 AMSA recommendations. However, PAME and the other relevant Working Groups of the Arctic Council will continue to work on enhancing Arctic maritime safety and the protection of marine environment. And progress on these activities and achievements, especially with regard to shipping in the Arctic waters, will be continuously reported to the Senior Arctic Officials and Ministers.

Eight years after the adoption of the AMSA Recommendations the Arctic Council and PAME can list major achievements, some of which are highlighted below:

The Polar Code

One of the main overall achievements in implementing the AMSA recommendations, especially of this biennium 2015-2017, is the adoption of the mandatory Polar Code by the International Maritime Organization (IMO). The Polar Code, which covers both maritime safety and environmental requirements, entered into force on 1 January 2017 through amendments to MARPOL and SOLAS Conventions, and is the first step to ensure robustness of ship operations in the Arctic waters.

The enforcement of the Polar Code will also improve passenger ship safety when sailing in the Arctic waters. Passenger ship safety has been one of the key topics in the work of the PAME WG. The requirements on the crew members will be enforced in July 2018 through amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), which sets qualification standards for masters, officers and watch personnel on seagoing merchant ships.

It is of great importance to ensure a harmonized implementation and enforcement of the Polar Code, where both the IMO and Arctic Council have a major role to play. PAME is developing a project for member states to report on Polar Code implementation, Port State Control regime statistics on ship compliance, and challenges in complying with the Polar Code. Furthermore PAME has in cooperation with the maritime industry decided to establish an Arctic Shipping Best Practice Information Forum. The aim of this Forum is to increase awareness of the Polar Code and to facilitate the exchange of information and best practices associated with maritime operations in the Arctic.

Carriage and use of HFO in Arctic waters

PAME has worked to address the risks associated with the use and carriage of HFO by vessels in the Arctic for several years. Two new projects on this topic were conducted in the current period; HFO Phase IIIA "Heavy fuel Oil Releases from Shipping in the Arctic" and HFO Phase IIIB "Possible Hazards for Engines and Fuel Systems Using Heavy Fuel Oil In Cold Climate". The Phase IIIA project compiled information about shipping incidents involving the release of HFO into the marine environment above the 55th parallel north.

The Phase IIIB report describes marine fuels, fuel systems onboard ships, fuel treatment and what possible hazards are involved when operating such HFO fuel and engine systems. PAME will continue its work and is considering new projects in connection to mitigating risks associated with the use and carriage of HFO by vessels in the Arctic.

Some of the Arctic Council member states submitted documents concerning carry and use of HFO in the Arctic waters to the 70th Session of the IMO's Marine Environmental Protection Committee (MEPC70). To ensure that discussions on the carriage and use of HFO in Arctic waters will be continued in IMO, the Arctic States need to be active and ask for a new Agenda item for the future discussions.

Enforcement of the Ballast Water Management Convention

As a result of Finland's ratification of the IMO Ballast Water Management Convention (BWMC) in September 2016 the Convention will enter into force on 8 September 2017. As invasive species have been considered globally to be one of the most severe threats to the biodiversity of Oceans and Seas, the enforcement of the Convention will enhance the protection of the Arctic marine environment.

Legally binding Agreements among the Arctic States

Working within the Arctic Council, the Arctic States have shown that they can respond to new challenges by establishing binding cooperation. This is made particularly clear by the negotiation of legally binding agreements, such as the Arctic Search and Rescue Agreement and the Arctic Oil Spill Preparedness and Response Agreement. Two important milestones in the Arctic Councils work towards sustainable developments in the Arctic.

The collaboration with other international Organizations, observer states and industry

PAME works continuously to strengthen its collaboration with international organisations. During the last eight years PAME has met with important international organizations (such as IMO, ICES, IALA, IICWG, IWC, NAMMCO) and significant progress has been made in the cooperation with these important relevant organizations.

In 2015 a joint IMO-PAME and World Maritime University (WMU) international conference "ShipArc" on safe and sustainable shipping in a changing arctic environment, was held in Malmö, Sweden. Furthermore, as a follow-up IMO's Secretary General stated his willingness to further strengthen the IMO's collaboration with the Arctic Council in the coming years.

At the Arctic Council's 2013 Ministerial Meeting several important shipping countries were granted observer status in the Arctic Council, (e.g. China, Republic of Korea, Singapore, Japan). Some of these observer States have actively participate in the PAME meetings and made substantial contributions to

its work and shared knowledge of the region. In 2016 an Arctic workshop was held in the Republic of Korea with representatives from PAME.

PAME has during the last eight years had increasing engagement with industry on key topics related to shipping e.g. passenger ship safety. To further enhance the cooperation with industry PAME has decided to invite the national ship-owner association of the host country of the PAME meetings to take part in its deliberations.

Future developments

These main achievements show clearly the successes that can be achieved through implementation of the AMSA recommendations in good international cooperation, and the importance of the Arctic Council.

The Arctic is changing fast. Human activity and international interest continues to grow, and at the same time the effects of climate change are becoming increasingly more visible in the Arctic. The increase in shipping activity in the Arctic still constitutes a risk to the vulnerable environment and must be met by relevant measures to reduce the risk of accidents and pollution. Joint commitment and international cooperation is an imperative for a safe, clean and sustainable development in the region. The Arctic Council's work on safe shipping and the protection of the Arctic Ocean is more important now than ever before.

Looking forward – many challenges remain and new ones are emerging with regard to ship operations in the Arctic. We will see continuous increase in the Arctic shipping activities and it is only through good international cooperation that we can properly address and find future solutions.

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Status of Progress on Recommendations¹

THEME I – Enhancing Arctic Marine Safety

I(A). Linking with International Organizations

“That the Arctic states decide to, on a case by case basis, identify areas of common interest and develop unified positions and approaches with respect to international organizations such as: the International Maritime Organization (IMO), the International Hydrographic Organization (IHO), the World Meteorological Organization (WMO) and the International Maritime Satellite Organization (IMSO) to advance the safety of Arctic marine shipping; and encourage meetings, as appropriate, of member state national maritime safety organizations to coordinate, harmonize and enhance the implementation of the Arctic maritime regulatory framework.”

Lead State and Partners	Status of Recommendation I(A)
PAME, WMU, IMO,	The ShipArc 2015 Conference on Safe and Sustainable Shipping in a changing Arctic, was held in Malmø, hosted by WMU and planned and co-sponsored by WMU, IMO and the Arctic Council /PAME WG.
PAME, Russia	In 2016 the International Conference "Northern Sea Route - to strategic stability and equal partnership in the Arctic" was held in Russia, on board of the nuclear-powered icebreaker "50 LET POBEDY".
PAME, ARHC	The Arctic regional Hydrographic Commission (ARHC) presented its report "Update on the Activities of the ARHC" and attachments to PAME in September 2015. PAME adopted a record of Decision noting the substantial value of the Arctic Voyage Planning Guides produced.
PAME, IICWG	The International Ice Charting Working Group (IICWG) gave a presentation on their work to PAME in September 2015. The implementation of

¹ Neither this Report nor the information it contains constitutes an assessment by any PAME member government of the consistency with international law, including the Law of the Sea, of domestic laws, regulations or other measures or resolutions identified or referenced herein.

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	<p>the Polar Code and its implication for Ice Services and maritime industry is a major focus area. The Shipping Expert Group will explore possible areas of collaboration.</p>
<p>PAME, Norway</p>	<p>At PAME’s invitation, representatives from the Norwegian Coastal Agency gave a presentation on BarentsWatch and Havbase in September 2015.</p>
<p>PAME, Marine, Trade & Energy Group, DW LLP</p>	<p>At PAME’s invitation, a representative from the Marine, Trade & Energy Group, DWF LLP made a presentation in February 2016 on the role of marine insurance in support of the Polar Code.</p>
<p>PAME and maritime industries</p>	<p>As a joint initiative by the maritime industries and PAME an “Arctic Shipping Best Practices Information Forum” is established . . The aim is to increase awareness of the IMO Polar Code and to facilitate the exchange of information and best practices associated with operations in the arctic. The terms of reference was adopted by PAME I 2017.</p>
<p>PAME, the Arctic Economic Council’s WG on Maritime Transportation</p>	<p>The Arctic Economic Council gave a presentation in PAME II 2016 on its work with regard to shipping, and it’s Maritime Transportation WG.</p>
<p>PAME, Arctic Coast Guard Forum</p>	<p>The Arctic Coast Guard forum gave a presentation on it's work in PAME II 2016.</p>
<p>PAME, WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM) Expert Team on Sea Ice (ETSI)</p>	<p>The WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM) Expert Team on Sea Ice (ETSI) made a presentation at PAME I-2017 on its Arctic-related projects, priorities and activities..</p>
<p>PAME, National Ship owner Associations</p>	<p>PAME II 2016 decided that for its future meetings, the national ship owner associations of the Arctic State hosting the PAME meeting should be invited to make a presentation on Arctic shipping issues.</p>
<p>EPPR, Arctic Coast Guard Forum</p>	<p>EPPR and ACGF provide regular updates at each other's meetings. EPPR is planning to host ACGF content on the EPPR website to facilitate</p>

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	information sharing.
CAFF	<p>As part of its support to the CBD EBSA workshop held in March 2014 in Finland all the data gathered to inform this workshop (including the AMSAIC data) have been archived and made accessible on the Arctic Biodiversity Data Service (ABDS) so as to facilitate any future work on this issue.</p> <p>CAFF working with PAME have developed an Arctic Protected Areas: indicator report.</p> <p>CAFF is developing phase 2 of the land cover change index, a framework to harness remote sensing potential for use in Arctic biodiversity monitoring and assessment activities and to produce a series of satellite-based remote sensing products focusing on the circumpolar Arctic</p>

I(B). IMO Measures for Arctic Shipping

“That the Arctic states, in recognition of the unique environmental and navigational conditions in the Arctic, decide to cooperatively support efforts at the International Maritime Organization to strengthen, harmonize and regularly update international standards for vessels operating in the Arctic. These efforts include:

- *Support the updating and the mandatory application of relevant parts of the Guidelines for Ships Operating in Arctic Ice-covered Waters (Arctic Guidelines); and,*
- *Drawing from IMO instruments, in particular the Arctic Guidelines, augment global IMO ship safety and pollution prevention conventions with specific mandatory requirements or other provisions for ship construction, design, equipment, crewing, training and operations, aimed at safety and protection.”*

Lead State and Partners	Status of Recommendation I(B)
Member States and IMO	<p>IMO finalized its work on a global mandatory code for ships operating in polar waters (Polar Code). The Code entered into force on the 1th of January 2017.</p> <p>PAME emphasized the need for timely implementation of the Polar Code.</p>
Norway	<p>Norway co-sponsored a proposal to IMO Maritime Safety Committee (MSC) on additional performance</p>

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	<p>and/or test standards to be developed in support of the implementation of the Polar Code to be considered by IMO (MSC 97/21/3). The issue has been added to agenda of the relevant sub committees (SSE and NSCR)</p>
<p>PAME , Norway & USA</p>	<p>HFO Phase IIIA (USA) “Heavy fuel Oil Releases from Shipping in the Arctic” and IIIB (Norway) “Possible Hazards for Engines and Fuel Systems Using Heavy Fuel Oil In Cold Climate” – final project reports were published.</p> <p>PAME has worked with the risks associated with the use and carriage of HFO by vessels in the Arctic for several years. Two projects on this topic were completed in the current reporting period; HFO Phase IIIA (USA, Russian Federation, Kingdom of Denmark and Norway) “Heavy fuel Oil Releases from Shipping in the Arctic” and HFO Phase IIIB (Norway) “Possible Hazards for Engines and Fuel Systems Using Heavy Fuel Oil In Cold Climate”</p> <p>The scope of the HFO Phase IIIA project was shipping incidents involving the release of HFO into the marine environment above the 55th parallel north. The areas considered were the Arctic and near-Arctic. Environmental conditions in the Arctic and near-Arctic are often extreme and similar. The document describes characteristic of the Arctic environment and biota and other aspects relevant for oil spills. Appendix A of the final project document, lists shipping incidents identified in publicly available sources between 1970 and 2014 which involve a release or spill from a vessel of oil and any resulting liability from such release.</p> <p>The HFO Phase IIIB report describes marine fuels, fuel systems onboard ships, fuel treatment and what possible hazards are involved when operating such HFO fuel and engine systems. Furthermore, it presents results, where available empirical data were analyzed in order to discern why ship engines fail and whether it could be related to the use of HFO.</p>
<p>PAME and Member States</p>	<p>PAME I 2017 decided to include in its 2017-19 Work Plan four projects in connection with mitigating risks associated with the use and carriage of HFO by vessels in the Arctic</p>

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<p>Canada, USA, Russia</p>	<ul style="list-style-type: none"> - Collect and report Information for the most recent three-year period on the number, types and routes of ships in the Arctic that used HFO as fuel (including quality or grade) or transported it as cargo, including if available the volume of HFO carried as bunker fuel and/or cargo as well as the destination of HFO transported as cargo; - In partnership with SDWG, collect, report and/or review information about on-shore use by indigenous and local communities of HFO as well as the extent to which such communities rely on ships that burn HFO to deliver supplies and provisions; - Prepare an information paper summarizing PAME’s work on HFO for submission by Arctic States to IMO’s Marine Environmental Protection Committee; and - Commission a study that explores the environmental, economic, technical and practical aspects of the use by ships in the Arctic of alternative fuels, including LNG. <p>Canada & USA (MEPC70/17/11 and Russia (MEPC70/17/9) submitted documents to MEPC70 on the use and carriage of HFO in Arctic waters. Discussions will be continued both in IMO as well as in PAME.</p>
<p>EPPR</p>	<p>EPPR has developed a “Guide to oil spill response in snow and ice conditions in the Arctic”. The guide is also developed to be a global guide through IMO. The draft guide was approved by IMO PPR3 in February 2016 and the final approval was made by IMO MEPC70 in October 2016.</p>
<p>PAME, Finland & Russia</p>	<p>PAME I 2017 discussed a project proposal regarding how PAME can report on Polar Code implementation, Port State Control regime statistics on ship compliance, and challenges in observing the Polar Code. A revised project proposal will be discussed at the PAME II 2017 meeting.</p>

I(C). Uniformity of Arctic Shipping Governance

“That the Arctic states should explore the possible harmonization of Arctic marine shipping regulatory regimes within their own jurisdiction and uniform Arctic safety and environmental protection regulatory regimes, consistent with UNCLOS, that could provide a basis for protection measures in regions of the central Arctic Ocean beyond coastal state jurisdiction for consideration by the IMO.”

Lead State and Partners	Status of Recommendation I(C)

I(D). Strengthening Passenger Ship Safety in Arctic Waters

“That the Arctic states should support the application of the IMO’s Enhanced Contingency Planning Guidance for Passenger Ships Operating in Areas Remote from SAR Facilities, given the extreme challenges associated with rescue operations in the remote and cold Arctic region; and strongly encourage cruise ship operators to develop, implement and share their own best practices for operating in such conditions, including consideration of measures such as timing voyages so that other ships are within rescue distance in case of emergency.”

Lead State and Partners	Status of Recommendation I(D)
<p>PAME (Canada, USA and Norway)</p> <p>EPPR</p> <p>Norway</p>	<p>PAME continued its discussion on the Arctic Marine Tourism Project (AMTP).</p> <p>EPPR’s SAR Expert group, established in December 2015, will as part of its mandate take into consideration the needs of the cooperate with cruise industry organizations when developing exercises and after action reports. .</p> <p>A Search and rescue exercise for research purposes took place in ice infested waters North of Svalbard in April 2016. The objective was to</p>

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<p>Kingdom of Denmark</p>	<p>identify and explore gaps between the functionality provided by SOLAS approved safety equipment and the new functionality required by the Polar Code. The exercise was especially focused on search and rescue operations with regard to passengers. The findings were presented to IMO MSC 97 in November 2016.</p> <p>In 2016 the Kingdom of Denmark implemented national regulations for shipping safety and mandatory pilotage for passenger vessels carrying more than 250 passengers in Greenland waters.</p>
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I(E). Arctic Search and Rescue (SAR) Instrument

“That the Arctic states decide to support developing and implementing a comprehensive, multi-national Arctic Search and Rescue (SAR) instrument, including aeronautical and maritime SAR, among the eight Arctic nations and, if appropriate, with other interested parties in recognition of the remoteness and limited resources in the region.”

Lead State and Partners	Status of Recommendation I(E)
<p>EPPR</p>	<p>Pursuant to the Arctic Council Iqaluit 2015 Declaration, EPPR will advise SAOs on relevant SAR incidents and events and maintain a repository of lessons learned and best practices of Arctic SAR incidents and events. EPPR facilitates implementation of the SAR agreement by focusing on enhancing cooperation, highlighting best practices, exchanging information, analyzing results of exercises, and sharing lessons learned. EPPR will maintain a repository for lessons learned in Arctic SAR exercises and incidents and best practices of Arctic SAR incidents and events. EPPR recognizes operational SAR tactics vary and remain the responsibility of member states. In December 2015 an Expert Group on Search and Rescue (SAR EG) was established to promote and assess implementation of the Arctic Search and Rescue agreement.</p>

THEME II – Protecting Arctic People and the Environment

II(A). Survey of Arctic Indigenous Marine Use

“That the Arctic states should consider conducting surveys on Arctic marine use by indigenous communities where gaps are identified to collect information for establishing up-to-date baseline data to assess the impacts from Arctic shipping activities.”

Lead State and Partners	Status of Recommendation II(A)
PAME, AIA	PAME received an update on the “Arctic Marine Indigenous Use Mapping: Tools for Communities” project in September 2016. An agreement of cooperation between AIA and the Korea Maritime Institute on the project was been signed on 21 November 2015. Additional support for the project has been received via a grant from the North Pacific Research Board on August 16, 2016. The project is currently undergoing a testing phase in Sand Point, Alaska.

II(B). Engagement with Arctic Communities

“That the Arctic states decide to determine if effective communication mechanisms exist to ensure engagement of their Arctic coastal communities and, where there are none, to develop their own mechanisms to engage and coordinate with the shipping industry, relevant economic activities and Arctic communities (in particular during the planning phase of a new marine activity) to increase benefits and help reduce the impacts from shipping.”

Lead State and Partners	Status of Recommendation II(B)
PAME, AIA, USA	The ongoing Project entitled “Meaningful Engagement of Indigenous Peoples and Local Communities in Marine Activities” (MEMA Project), will prepare a narrative report with a compilation of information on existing mechanisms, processes, recommendations and guidelines for engagement of indigenous peoples and local communities in marine activities that have been developed in the Arctic. In June 2015 EPPR has launched the project

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EPPR, AIA, USA, Canada, Norway	"Prevention, Preparedness and Response in small communities". The implementation strategy engages communities in a self-assessment survey of their preparedness, as well as risk and impact. This will result in an evaluation of preparedness and exposure in small communities. The outcomes from the project is expected to be: (1) greater awareness of risk and preparedness at a local level, and access to best practices, (2) the ability for national governments to address misperception or lack of awareness, and (3) the identification of gaps in preparedness relative to risk. A summary report and interactive map will be ready for approval for the Fairbanks ministerial meeting in 2017.
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II(C). Areas of Heightened Ecological and Cultural Significance

“That the Arctic states should identify areas of heightened ecological and cultural significance in light of changing climate conditions and increasing multiple marine use and, where appropriate, should encourage implementation of measures to protect these areas from the impacts of Arctic marine shipping, in coordination with all stakeholders and consistent with international law.”

Lead State and Partners	Status of Recommendation II(C)
CAFF	As part of its work on mainstreaming of Arctic biodiversity CAFF is developing a set of biodiversity principles aimed at helping to incorporate biodiversity objectives and provisions into all Arctic Council work and encourage the same for on-going and future international standards, agreements, plans, operations and/or other tools specific to development in the Arctic. This includes, but is not restricted to, oil and gas development, shipping, fishing, tourism and mining.

II(D). Specially Designated Arctic Marine Areas

“That the Arctic states should, take into account the special characteristics of the Arctic marine environment, explore the need for internationally designated areas for the purpose of environmental protection in regions of the Arctic Ocean.”

Lead State and Partners	Status of Recommendation II(D)
ICES,PAME	An ICES/PAME WG on Integrated Ecosystem Assessment for the Central Arctic Ocean (WGICA) has been established for the period 2016-18, to consider vulnerability of the ecosystem of the Central Arctic Ocean in relation to climate change, Arctic shipping, and other impacts induced by natural and anthropogenic change.
CAFF	CAFF co-Chaired a first workshop in this process and participation in an assessment being considered for CAFFs 2017-19 work plan. CAFF is releasing the State of the Arctic Marine Biodiversity Report (SAMBR). The SAMBR summarizes the status and trends in key biotic elements of the Arctic marine environment and provides advice on how to better improve marine biodiversity monitoring across the Arctic. The results are based on efforts to find, gather, integrate and interpret all available existing Arctic marine biodiversity monitoring datasets to improve the detection and understanding of changes in circumpolar marine biodiversity. The CBMP reporting mechanisms are designed to reduce the time between detection of a change on the ground and an effective policy response. All data generated via CAFF monitoring and Assessments during 2015-17 is archived and made accessible via CAFFs Arctic Biodiversity Data Service (ABDS) which also functions as the Arctic node within UNESCOS Oceanographic Biogeographic Information System (OBIS)

II(E). Protection from Invasive Species

“That the Arctic states should consider ratification of the IMO International Convention for the Control and Management of Ships Ballast Water and Sediments, as soon as practical. Arctic states should also assess the risk of introducing invasive species through ballast water and other means so that adequate prevention measures can be implemented in waters under their jurisdiction.”

Lead State and Partners	Status of Recommendation II(E)
<p>Finland</p> <p>Russia</p>	<p>Ratified the BWMC (2004) on 8 September 2016, which lead to the entry into force of the Convention on 8 September 2017.</p> <p>A ballast water exchange requirement has put into force in all Russian ports accordingly to the regulation of the BWMC.</p>
<p>USA (NOAA)</p>	<p>NOAA prepared a white paper on Arctic Economic Pressures and Invasive Species Concerns for the CAFF Invasive Species Working Group meeting in Akureyri, Iceland, March 2016.</p>
<p>PAME, CAFF</p>	<p>CAFF has together with PAME developed a strategy to prevent the introduction of alien and aquatic invasive species into Arctic ecosystems (Invasive Species Project). The Arctic Invasive Species Strategy and Action plan (ARIAS) identifies actions that the Arctic Council and its partners need to take to protect the Arctic from one of its most significant threats: the adverse impacts of invasive alien species. These are priority actions directed towards all Arctic ecosystems, taking environmental, cultural and economic drivers, impacts and response measures into consideration. CAFF worked closely with PAME on the marine components of the strategy.</p>

II(F). Oil Spill Prevention

“That the Arctic states decide to enhance the mutual cooperation in the field of oil spill prevention and, in collaboration with industry, support research and technology transfer to prevent release of oil into Arctic waters, since prevention of oil spills is the highest priority in the Arctic for environmental protection.”

Lead State and Partners	Status of Recommendation II(F)
<p>EPPR, PAME</p>	<p>EPPR coordinates the the follow up of the implementation of the Framework Plan developed by the Task Force on Oil Pollution Prevention (TFOPP) . A report, with matrix as an annex, has been developed in cooperation with PAME, to identify follow-up activities that support objectives in the Framework Plan. The report/matrix was forwarded to the 2017 ministerial meeting.</p> <p>The report "Overview of measures specifically designed to prevent oil pollution in the Arctic marine environment from offshore petroleum activities" provides a comprehensive overview of measures based on contributions from the industry and R&D institutions through a baseline survey and a review of open source information. The report demonstrates that extensive research and development initiatives have been ongoing for several decades related to enhancing the safety of offshore petroleum activities in the Arctic and cold climate regions. The report, although being a documentation of facts, presents observations, recommendations and suggestions for further work.</p> <p>EPPR has prepared a report on Standardization as a Tool for Prevention of Oil Spills in the Arctic for approval by the Ministerial meeting in 2017. The objective of the work is to describe how engineering and technical standards are developed, maintained, and utilized in the prevention of oil spills from offshore petroleum and maritime activities. During report development, international trade organizations were provided an opportunity to provide comments. EPPR also conducted a joint workshop with the International Oil and Gas</p>

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	<p>Producers to discuss existing standards and risk assessment.</p> <p>A primary responsibility of the EPPR Working Group is to contribute to the advancement of emergency prevention, preparedness and response capabilities and protocols within the Arctic marine environment. EPPR accomplishes many of its objectives through the implementation of the Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic (MOSPA Agreement) and associated Operational Guidelines that delineate the practical aspects of executing the MOSPA Agreement. The objective of the MOSPA Agreement is to strengthen cooperation, coordination and mutual assistance among the Parties on oil pollution preparedness and response in the Arctic in order to protect the marine environment from pollution by oil. In order to accomplish these EPPR initiatives specific to the MOSPA Agreement, as well as future initiatives as determined by consensus of the EPPR membership, the EPPR adopted the creation of the Marine Environmental Response Experts Group.</p>
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II(G). Addressing Impacts on Marine Mammals

“That the Arctic states decide to engage with relevant international organizations to further assess the effects on marine mammals due to ship noise, disturbance and strikes in Arctic waters; and consider, where needed, to work with the IMO in developing and implementing mitigation strategies.”

Lead State and Partners	Status of Recommendation II(G)
PAME, IWC	At PAME’s invitation, representative from the Scientific Committee of the International Whaling Commission (IWC) made a presentation on IWC’s Arctic relevant programs and activities and indicated its support for ongoing communication and further collaboration among IWC, PAME and NAMMCO.

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CAFF	As part of CAFF’s Circumpolar Biodiversity Monitoring Program (CBMP), a Marine Mammal Expert Group was established in 2008 under the Marine Steering Committee.
USA	Noise generated by anthropogenic activities (such as commercial shipping and oil & gas seismic exploration) is recognized as a potential threat to marine mammals, which are protected in the USA by the Marine Mammal Protection Act and the Endangered Species Act. Current scientific data suggest that increased background noise levels can have negative impacts on the acoustic habitat of many species (including marine mammals) by interfering with the detection and interpretation of critical acoustic cues, such as those used for communication, detection of prey and predators, or navigation. To support the analyses of these effects at ecologically-relevant scales and to increase our understanding of the changing ocean acoustic environment, the U.S. National Oceanic and Atmospheric Administration (NOAA) in 2015/16 established a system of 11 Ocean Noise Reference Stations, including one in Arctic waters, to monitor and characterize long-term trends and changes in the ambient sound field.

II(H). Reducing Air Emissions

“That the Arctic states decide to support the development of improved practices and innovative technologies for ships in port and at sea to help reduce current and future emissions of greenhouse gases (GHGs), Nitrogen Oxides (NOx), Sulfur Oxides (SOx) and Particulate Matter (PM), taking into account the relevant IMO regulations.”

Lead State and Partners	Status of Recommendation II(H)
PAME, Norway Finland	Norway regularly submits updates on IMO’s work with respect to black carbon to the Shipping Expert Group. Finland submitted two documents to PAME I 2017 and IMO PPR4 (PPR4/9/2 ; PPR4/9/3) meetings “Experiences on MAAP measurements” (MAAP = Multiangle Absorption Photometry measuring method) and “Preliminary results

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<p>Kingdom of Denmark</p>	<p>from the BC measurements” and an information paper (PPR4 INF.7) “Black Carbon emission measurements using different marine fuels”.</p> <p>Following introduction of strict limits on sulphur emissions from ships in 2015 in the North Sea and Baltic Sea, the Kingdom of Denmark has tested different types of remote sensing technology to detect non-compliance. The experience gained and the procedures developed will likely be useful for enforcement of future emissions-reducing legislation in the Arctic.</p>
<p>Russia</p>	<p>Russia submitted a document to MEPC (MEPC 68/3/5 AND 68/3/5/CORR.1)on black carbon emissions from shipping in ice conditions in the Arctic</p>

THEME III – Building the Arctic Marine Infrastructure

III(A). Addressing the infrastructure deficit

“That the Arctic states should recognize that improvements in Arctic marine infrastructure are needed to enhance safety and environmental protection in support of sustainable development. Examples of infrastructure where critical improvements are needed include: ice navigation training; navigational charts; communications systems; port services, including reception facilities for ship-generated waste; accurate and timely ice information (ice centers); places of refuge; and icebreakers to assist in response.”

Lead State and Partners	Status of Recommendation III(A)
<p>PAME, Member States</p> <p>PAME, USA, Russian Federation (Co-Chairs), with Finland, Norway, Sweden, Kingdom of Denmark (GL), Iceland, Canada</p>	<p>In 2015 PAME encouraged Member States to strengthen and expand terrestrial AIS networks where appropriate and feasible in order to support safety of navigation, risk reduction, search and rescue and incident response.</p> <p>PAME completed the Regional Reception Facilities Plan (RRFP) and submitted the final draft document to PAMEII-2016 for consideration by PAME representatives, permanent members, and observers. The completed Arctic RRFP project, with consensus from all AC country delegations, is now ready for consideration by SAO’s (spring 2017 Ministerial) with the recommendation for submittal of the Arctic RRFP to the IMO’s Marine Environment Protection Committee (MEPC) with co-sponsorship and/or support of each AC country delegation to MEPC for consideration by the committee. The Arctic RRFP provides a viable alternative framework for ensuring MARPOL/POLAR CODE compliance for arctic shipping and enhanced pollution prevention from ship’s waste.</p>
<p>PAME, Canada, USA, Norway, Sweden, Finland, Russia, Kingdom of Denmark</p>	<p>National ice centers collaborate via International Ice Charting Working Group on data standards, ice products and services, exchange of expertise, input to regulators, input to new satellite missions focused Arctic shipping safety.</p>

III(B). Arctic Marine Traffic System

“That the Arctic states should support continued development of a comprehensive Arctic marine traffic awareness system to improve monitoring and tracking of marine activity, to enhance data sharing in near real-time, and to augment vessel management service in order to reduce the risk of incidents, facilitate response and provide awareness of potential user conflict. The Arctic states should encourage shipping companies to cooperate in the improvement and development of national monitoring systems.”

Lead State and Partners	Status of Recommendation III(B)
PAME, USA	PAME established the Arctic Shipping Traffic Data Expert Group (ASTD-EG), consisting of experts from Member States and the PAME Secretariat, in order to develop a draft design document, a data sharing document, a cost-sharing agreement and a Memorandum of Understanding (MOU) among the Arctic States, regarding Arctic Ship Traffic Data Sharing. PAME I-2017 approved these documents for submission to SAOs for approval and signature [will be updated based on final decision by SAOs in March 2017]
PAME, Norway	PAME received an update from Norway in 2015 and 2016 regarding the status of current ship traffic in the high seas areas of the Central Arctic Ocean and invited Norway to continue to provide an update on the ship traffic in the High seas areas of the Arctic.
Norway	Norway operates two polar orbiting satellites capable of detecting AIS-equipped vessels in the Arctic. It is aimed to maintain two satellites in operation at all times. Norway has during 2016-17 worked on constructing replacement satellites, which are planned to be launched during the next years as current satellites are expected eventually to fail. Furthermore Norway has in this period started initial planning of a chain of environmentally friendly shore based AIS-receivers to enable real time traffic monitoring of AIS equipped vessels along the coast of the Svalbard archipelago. Implementation of the shore based receivers is

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	contingent on availability of financing.
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III(C). Circumpolar Environmental Response Capacity

“That the Arctic states decide to continue to develop circumpolar environmental pollution response capabilities that are critical to protecting the unique Arctic ecosystem. This can be accomplished, for example, through circumpolar cooperation and agreement(s), as well as regional bilateral capacity agreements.”

Lead State and Partners	Status of Recommendation III(C)
EPPR, Member States	<p>EPPR is assigned the responsibility for maintaining the Operational Guidelines that implement the Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic (MOSPA) to which all Arctic Council countries are signatories. Under the leadership of the U.S., a second table top exercise took place in May-June 2016. One of the lessons learned in the exercise After Action Report was the development of the MER Experts Group in order to focus on the implementation of the MOSPA Agreement and Operational Guidelines. The MER Experts Groups will focus specifically on:</p> <ul style="list-style-type: none"> • Implementing lessons learned noted in each MOSPA Agreement Exercise After-Action Report (AAR). • Ensuring corrective actions and recommendations are reflected as updates to the MOSPA Agreement and Operational Guidelines submitted to SAOs and Ministerial level for approval. • Making recommendations for training focus areas and training opportunities. • Participating in various (current and future) activities and projects specific to EPPR’s MER roles and responsibilities. <p>The EPPR project Development of a Database of Arctic Response Assets created a stand-alone, searchable database of major response assets in the Arctic. The database and user manual will be an EPPR deliverable for the 2017 Ministerial meeting.</p> <p>The project Conditions on Oil Spill Circumpolar Response Viability Analysis will estimate when different types of oil spill response systems can be effectively deployed in different areas of the Arctic based on historical met-ocean conditions. The goal of this effort is to provide more science-based</p>

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	<p>decision-making in Arctic oil spill response contingency planning. An additional benefit of this study will be to identify components or methods used in response countermeasures that could be enhanced through additional research and development. The report will be submitted as an EPPR deliverable for the 2017 Ministerial meeting.</p>
<p>Norway</p> <p>Norway</p> <p>Norway, Russia</p> <p>Russia</p>	<p>Norway developed and presented a risk assessment and an emergency response analysis for Svalbard and Jan Mayen to EPPR. Recommendations from these studies will be used to improve the Environmental response capacity in these areas .</p> <p>Norway held a large, full scale oil spill response exercise was held in the Svalbard area in the fall 2016.</p> <p>Norway and Russia hold annual oil spill response exercises are held in the Barents Sea in relation to a bilateral agreement between Norway and Russia. Furthermore, two table top exercises, focusing on oil drift from a Norwegian offshore petroleum installation into Russian territorial waters, were conducted.</p> <p>Modern multipurpose salvage vessels have been built and delivered for enhancement of oil spill preparedness and response in the Arctic region. For example, one multipurpose salvage vessel with ice class with a total capacity 4 MW and two similar vessels with total capacity 7 MW are a combination of icebreaker and the vessel for oil spill combating.</p>

III (D). Investing in Hydrographic, Meteorological and Oceanographic Data

“That the Arctic states should significantly improve, where appropriate, the level of and access to data and information in support of safe navigation and voyage planning in Arctic waters. This would entail increased efforts for: hydrographic surveys to bring Arctic navigation charts up to a level acceptable to support current and future safe navigation; and systems to support real-time acquisition, analysis and transfer

Lead State and Partners	Status of Recommendation III(D)
PAME, USA	<p>The USA completed an informal review of the United Nations Environment Program 1st World Ocean Assessment, giving particular consideration to those chapters relating to shipping in the Arctic and current and proposed PAME work on shipping-related issues. A summary report was provided to the PAME Shipping Expert Group at PAME II 2016 in Portland. The 1st WOA is a baseline document assessing the state of all the world’s oceans. The several references to Arctic Ocean issues, include impacts of climate change on ice conditions in the Arctic and on changing Arctic marine habitat and effects on marine animals and mammals especially on species diversity. The 1st WOA provides an excellent source for reference materials on scientific literature (on Oceans in general and in those chapters devoted to Arctic/Polar issues) for PAME and other AC WG project leads. The complete document is available from UNEP.ORG</p>
Russia	<p>In order to improve hydrographic surveys and works, the direction of software-and- technical re-equipment of hydrographic units and vessels is consistently implemented with application of modern efficient and intense technical means and methods for bottom relief survey. Stationary surveying complexes based on modern multi-beam echo sounders of Company KONGSBERG EM3002D, EM2040D and EM710RD and mobile surveying complex based on multi-beam echo sounder of Company TeletdainResonSeaBatT20-P with opportunities for various applications from charting to search and research of underwater objects were installed in surveying vessels.</p>

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	<p>Operating experience of these echo sounders during period 2010 - 2016 in the ice conditions of the Arctic has shown their high efficiency of data collection and processing for marine cartography.</p> <p>In 2015, the removal of radioisotope thermoelectric generators (RTGs) used for energy supply of aids to navigation was completed from the coasts of the Arctic Seas surrounding of the Russian Federation. Total numbers of evacuated RTGs were 396. Investment in this project was carried out from the federal budget of the Russian Federation, and at the expense of international technical assistance in the frames of the program to reduce global radiative threats. Currently Federal State Unitary Hydrographic Department implements measures on equipping aids to navigation with non-polluting sources of energy supply based on renewable energy sources (photovoltaic panels, wind power plants).</p> <p>In 2015, 30 AIPs were put in operation. During the period 2011-2015, 238 AIPs were put into operation . In 2016, transportation and installation of 25 units is provided.</p>
<p>Russia</p>	<p>According to the Rules of Navigation in the Water Area of NSR, approved by the order of the Minister of Transport of the Russian Federation from 1/17/2013 No. 7, the NSR Administration daily posts on the official website the analysis of a hydrometeorological situation and the hydrometeorological forecast, advance time till 72 o'clock on the water area of NSR, and also: coastal warning East, coastal warning West, types of ice conditions ("easy", "average", "heavy"), charts of an ice condition of Arctic Ocean and the seas of Kara, Laptev, East-Siberian, Chukchi, weather charts of the northern polar region, daily hydrometeorological information of METAPEA XX and METAPEA XXI, the weekly hydrometeorological bulletin AARI, long-term ice forecasts for the first and second half of the Arctic navigation in the water area of NSR (July-October). This information on a hydrometeorological situation is available to</p>

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	<p>users of the website round the clock and can be used by Masters for planning of voyages to the water areas of NSR.</p>
<p>Kingdom of Denmark</p>	<p>ArcticWeb is a web application for voyage planning providing easy access to relevant data, services and tools e.g. ice and weather information, ship positions, navigational warning, a reporting tool and a search and rescue tool. ArcticWeb is targeted at mariners and focused on usability and minimized data volumes. ArcticWeb is an initiative started by the Danish Maritime Authority and has been operational for the waters around Greenland since 1st January 2014. Today over 100 vessel users, 25 ice pilots and 100 shore users, e.g. Authorities, Rescue Centers, Vessel Operators and Meteorological Institutes, are registered and actively use ArcticWeb to plan and execute voyages. In 2016, 75-80% of cruise vessels navigating the waters around Greenland made use of ArcticWeb</p>