



EMERGENCY PREVENTION,  
PREPAREDNESS AND RESPONSE



ARCTIC COUNCIL

Arctic Council  
status on implementation of the  
“Framework Plan for Cooperation on  
Prevention of Oil Pollution from  
Petroleum and Maritime Activities in the  
Marine Areas of the Arctic”

Arctic Council status on implementation of the “Framework Plan for Cooperation on Prevention of Oil Pollution from Petroleum and maritime Activities in the Marine Areas of the Arctic”

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## SUGGESTED CITATION

EPPR, 2017, Arctic Council status on implementation of the “Framework Plan for Cooperation on Prevention of Oil Pollution from Petroleum and maritime Activities in the Marine Areas of the Arctic”. Emergency Prevention, Preparedness, and Response (EPPR). 22pp.

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## PUBLISHED BY

Arctic Council Secretariat

This report is available as an electronic document from the Arctic Council’s open access repository: [oaarchive.arctic-council.org](http://oaarchive.arctic-council.org)

## ISBN

978-82-93600-20-6 (digital, A4, PDF)

# 1. Background

In 2015, the Arctic Council Ministers approved the “Framework Plan for Cooperation on Prevention of Oil Pollution from Petroleum and Maritime Activities in the Marine Areas of the Arctic” (Framework Plan).

In the Framework Plan the Arctic States (referred to as “the Participants”) intended to strengthen cooperation between their competent national authorities in order to facilitate implementation. In addition it was agreed to cooperate with the private sector in order to improve standards and best practices for the prevention of oil pollution in the Arctic marine environment. .

It was also agreed that the competent national authorities should seek to cooperate in the best possible way to implement the Framework Plan. Implementation may be discussed in the relevant bodies of the Arctic Council when appropriate.

The objective of the Framework Plan is to strengthen cooperation, including exchange of information, among the Participants in the field of prevention of marine oil pollution in order to protect the Arctic marine environment.

The Framework Plan applies to petroleum and maritime activities in the marine areas of the Arctic that entail a risk of oil pollution to the Arctic marine environment.

The nature of cooperation was intended to be in accordance with relevant rules of international law and with the national legislation (laws and regulations) and, as appropriate, policies of the respective States.

Regarding information on processes, regulations, policies and practices related to the prevention of pollution of the Arctic marine environment by oil, it was agreed that the Participants may request such information from other Participants.

The Participants may also respond to such requests from other Participants, either directly or through existing fora and in addition share any information of this nature that they consider may be of interest to other Participants.

As an important element of oil pollution prevention, the Framework Plan notes the intention of the Participants to carry out impact assessments – in accordance with their national legislation (laws and regulations) and, as appropriate, policies – including environmental impact and risk assessments of petroleum and maritime activity which may result in the pollution of the Arctic marine environment by oil.

The Participants intend to protect and conserve the Arctic marine environment, including wildlife, vulnerable ecosystems and ecosystem services, while regulating or engaging in petroleum and maritime activities in the marine areas of the Arctic, in accordance with their national legislation (laws and regulations) and, as appropriate, policies.

The Framework Plan is not legally binding and does not create any rights nor obligations for the Participants under international law.

Nothing in the Framework Plan, including the exchange of information provisions, affects the respective positions of the Participants on the Law of the Sea in the marine areas of the Arctic or other marine area.

In the Iqaluit Declaration Ministers “Welcome the Framework Plan for Cooperation on Prevention of Oil Pollution from Petroleum and Maritime Activities in the Marine Areas of the Arctic,” and decide through Working Groups, expert-level dialogues, and further actions to prevent marine oil pollution, including regular exchanges of knowledge and experience among Arctic offshore petroleum regulators,” Since then, it was agreed between the EPPR and PAME Chairs that EPPR would have the lead on prevention. The SAO Chair and SAOs welcomed this decision at the SAO meeting in Anchorage (October 2015).

## 2. Status of progress on initiatives related to prevention of oil pollution from Arctic petroleum activity

### 2.1 Develop an overview of measures for improved safety.

#### Recommendation

Cooperate to develop an overview of the existing and potential technical and operational safety measures specifically designed to prevent oil pollution in the Arctic marine environment from offshore petroleum activity.

#### Status

##### **EPPR**

In December 2015 at the EPPR Working Group Meeting, Norway provided a presentation on a Norwegian led report responding to section 2.1 of the Framework Plan titled, “Overview of Measures Specifically Designed to Prevent Oil Pollution in the Arctic Marine Environment from Offshore Petroleum Activities”. Norway sponsored the report, hiring Proactima to gather international input, including from Arctic states. The report is complete and Norway presented it to EPPR for adoption under its Prevention portfolio. EPPR will seek approval by the AC in advance of the SAO meeting in Portland, Maine. Norway has also made the report available to the AORF, and they may independently decide to move forward with the report.

##### **PAME**

At PAME’s second meeting of 2016 a concept paper for a project to update guidance from the 2009 Arctic Offshore Oil and Gas Guidelines identified non-emergency operations including waste management as one chapter to look at again for the possibility of identifying current best practices. Some of this waste management relates to possible oil in the water practices. The section on 6.1 Management Techniques for Drilling Wastes and Production Effluents includes guidance on Waste from Drilling Activities, Production Waste Discharges, and Fluid Waste from Well-Testing and are areas that could be updated and expanded upon. PAME continues to explore the possibility of including a project in the 2017-2019 Workplan on these topics.

In March 2014 PAME published the Safety Systems Management and Safety Culture Report that contains numerous relevant recommendations on preventing a major “Deepwater Horizon” type accident from happening in the Arctic offshore. These recommendations

have been formatted into an online survey of implementation actions. At their second 2016 meeting, PAME decided to ask EPPR to circulate this survey since these recommendations are related to emergency discharges of oil and accidents. EPPR has agreed to circulate this survey and collect the answers provided by member states regulatory authorities. EPPR will consider the results when developing and prioritizing future projects.

### **Kingdom of Denmark/Danish Center for Environment and Energy**

To prevent oil pollution in the Arctic marine environment from offshore petroleum activities a number of reports prepared by the Danish Center for Environment and Energy (DCE) serves as scientific input to the Greenland authorities in the regulation of offshore activities to secure high environmental standards:

*“Store Hellefiskebanke, Greenland. Environmental assessment of oil spills and the potential for combating oil spills”* (<http://dce.au.dk/udgivelser/vr/nr-201-250/>). An evaluation of the environmental pros and cons of the different oil spill response techniques, for which the concept of a strategic Net Environmental Benefit Analysis (sNEBA) was developed. *“Oil spill response in Greenland: Net Environmental Benefit Analysis, NEBA, and environmental monitoring”* (in press). This report includes environmental assessment and recommendation of off-shore oil spill response strategies in Greenland in relation to oil/gas and mineral activities.

*“Environmental performance evaluation for oil companies”* (<http://dce.au.dk/udgivelser/tr/nr-50-99/>). The environmental performance evaluation system developed in order to achieve an objective and transparent evaluation of oil company’s environmental performance.

## 2.2 Promote standardization activities.

### Recommendation

- a) promote the development of standards and/or best practices relevant to the prevention of oil pollution in the Arctic, e.g., well design, source control, capping, containment and other technical and operational measures;
- b) assess whether existing and proposed standards for petroleum activity are sufficient to meet Arctic challenges; and
- c) support participation of technical experts in the efforts referred to in this section.

### Status

#### **EPPR**

In June 2015, EPPR approved the project (co-led by Norway and the U.S.) “International standards for petroleum, offshore-oil and maritime industries.” The aim of the project is to

give a brief introduction to how standards for the petroleum-, offshore- and maritime industry are developed, how they are maintained and followed up. A comprehensive report with a description of the processes related to standardization is under development. In addition to this, an easy to understand summary report will be prepared for submission to the Arctic Council Ministerial Meeting in 2017.

The document is intended as an aid to understanding the processes and organizations involved in developing standards that are relevant to the petroleum industry. To increase awareness of the overall standards process, and to establish a dialogue between the Arctic Council and industry regarding how standards are identified, developed and maintained, including future needs for Arctic standards, a joint EPPR-IOGP workshop took place in June 2016. The agenda addressed the need for standardization, identification and development of standards for the Arctic.

The report "Standardization as a Tool for Prevention of Oil Spills in the Arctic" (Revision No. 04, dated July 30, 2016) was received by Norway as a final deliverable from the contractor (Proactima AS). The report, which describes how engineering and technical standards are identified, developed, established, and maintained, represents an intensive a one-year effort involving Arctic Council member states, with significant review and input by industry. The Arctic Council Co-leads and industry interface occurred through telephone conferences, written communication, and a formal public workshop. The final report includes information on international organizations and their roles in standardization work, national standardization systems and organizations sorted by country, and classification societies. A synopsis of the report will be prepared as a Ministerial deliverable.

#### **CAFF**

In relation to part (c) CAFF is currently working to implement recommendation #4 from the Arctic Biodiversity Assessment (ABA) which is focused on the mainstreaming of Arctic biodiversity and requires the incorporation of 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. Implementation of this recommendation requires establishing a clear framework that defines and develops biodiversity objectives and provisions (biodiversity principles) in the Arctic context; including practical approaches and tools for incorporating biodiversity principles into Arctic Council work and for broader application as outlined in Recommendation #4.

#### **PAME**

In March 2014 PAME published the Safety Systems Management and Safety Culture Report that contains a review of current Common Arctic Standards and Practices for Arctic offshore oil and gas operations and a discussion of their status and needs that is still relevant.

#### **Kingdom of Denmark/DCE/GINR**

In the development of best practices to prevent oil pollution in Greenland a series of assessment reports and guidelines have been developed by DCE, in cooperation with the Greenland Institute of National Resources for Greenland (GINR):

- Strategic Environmental Impact Assessments (SEIAs) for the entire Westcoast of Greenland and Northeast Greenland (update in preparation), based on present knowledge concerning species distribution, tolerance and threshold levels toward oil exploration activities.
- Guidelines for preparing an environmental impact assessment for offshore and onshore (in preparation) activities in Greenland.
- Strategy for the selection of drilling mud (DCE). Developed into a guideline in 2017.
- *“Baseline studies for assessing ecotoxicological effects of oil activities in Baffin Bay”* (DCE). To give a better understanding of short- and long-term effects of oil pollution on the Arctic marine ecosystem.

## 2.3 Strengthen cooperation of national regulators.

### Initiative

a) promote cooperation between competent national authorities on issues concerning the prevention of Arctic marine oil pollution from petroleum activities.

### Status

#### **General information**

With the establishment of Arctic Offshore Regulators Forum, national regulators have a forum to exchange information, collaborate, and promote cooperation in the area of prevention.

#### **Petroleum Safety Authority (PSA)**

The Arctic Offshore Regulators Forum (AORF) was created in 2015 to promote cooperation between the national authorities on issues concerning the prevention of Arctic marine oil pollution from petroleum activities. The inaugural meeting was held in Washington D.C. in April 2015. Subsequent meetings were held in October 2015, April 2016 and in October 2016. The AORF is open for membership from the relevant petroleum authorities within the Arctic nations. The chair of the AORF follows the chair nation of the AC, currently U.S.A. Although there is no AORF website, information is posted on some of the regulators websites, e.g. BSEE/USA and PSA/Norway. The terms of reference for AORF are available at the following site: <https://www.bsee.gov/sites/bsee.gov/files/meeting-minutes/safety/aorf-terms-of-reference-final-may-2015.pdf>

#### **PAME**

PAME created the web-based resource – the Arctic Offshore Oil and Gas Regulators Resource (AOOGRR) for making information from all Arctic National and Regional regulators readily available (<http://www.pame.is/index.php/projects/offshore-oil-and-gas/mre>).

PAME notes with satisfaction that the March 2014 Safety Systems Management and Safety Culture Report recommendation that “Arctic states should promote international standards and promote or establish an Arctic Offshore Regulators Forum to address and share knowledge of offshore Arctic-relevant issues...” was realized.

## 3. Status of progress on initiatives related to measures for prevention of oil pollution from Arctic maritime activity

### 3.1 Strengthen traffic monitoring and management

#### 3.1.1 Remote and aerial surveillance

##### Initiative

- a) share lessons learned and best practices from responding to/monitoring pollution incidents and operating in harsh Arctic environments;
- b) develop operational procedures for pollution patrol, ice patrol, etc. in the Arctic;
- c) explore possible exchange of personnel for familiarization tours as part of the crew;
- d) explore the possibility of coordination of earth observation satellites to acquire/share imagery over contiguous waters.

##### Status

##### **General information**

The eight Arctic nations formally established the Arctic Coast Guard Forum which is a venue for operational practitioners to share information and best practices, conduct joint Arctic operations and exercises, and collaborate on tactical Arctic issues.

##### **CAFF**

In relation to part (d) CAFF, through its Circumpolar Biodiversity Monitoring Programme (CBMP) is creating 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. MODIS satellite products of relevance to Arctic processes are being converted to a more Arctic-friendly projection, facilitating a top-of-the-world analysis perspective organized after marine, coastal, terrestrial and freshwater ecosystems.

##### **Norwegian Coastal Administration (NCA)/Norwegian Oil Spill Associated for Operating Companies (NOFO)**

In relation to part (d), the project “Oljevern 2015”, conducted by NCA and NOFO, one of the topics examines how to understand satellite images with oil in ice. This is also related to aerial surveillance and observation of oil in ice.

### 3.1.2 Enhancing cooperation on maritime risk assessments.

#### Initiative

- a) exchange experience and best practices of data collection and analysis for maritime risk assessments;
- b) exchange maritime traffic and environmental sensitivity data and associated methodologies; and
- c) explore the possibility of developing a common and publicly accessible database of Arctic maritime traffic and environmental sensitivity data.

#### Status

##### **CAFF**

In relation to parts (a), (b), and (c) CAFF has been developing the Arctic Biodiversity Data Service (ABDS – [www.abds.is](http://www.abds.is)). The ABDS is the data-management framework for CAFF and is an online, interoperable data management system which serves as a focal point and common platform for all CAFF programs and projects as well as a dynamic source for up-to-date circumpolar Arctic biodiversity information and emerging trends. The goal of the ABDS is to facilitate access, archiving, analysis and display of biodiversity information for scientists, practitioners, managers, policy makers and others working to understand, conserve and manage Arctic wildlife and ecosystems. It ensures that biodiversity data generated by CAFF are organized and accessible to guarantee a lasting legacy.

The ABDS serves as the Arctic node for with UNESCO's Ocean Biogeographic Information System (OBIS) and the Global Biodiversity Information Facility (GBIF) ensuring wider access and availability of Arctic marine biodiversity data. Access to the ABDS data framework will be crucial to inform any future environmental risk/sensitivity initiatives.

CAFF produces a range of products focused on monitoring and assessing the status and trends of biodiversity in the Arctic Marine ecosystems, which would inform any risk and sensitivity work in the Arctic. For example, the upcoming CBMP State of the Arctic Marine biodiversity report (SAMBR) summarizes the status and trends in key biotic elements of the Arctic marine environment and also evaluate the existing monitoring. The report also come up with recommendations for future relevant monitoring. 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.

## **Norway/Norwegian Coastal Administration**

Under this recommendation, Norway introduced to EPPR the project “Risk assessment methods and metadata – exchange of experience and best practice”.

There is currently no funding for this project, therefore it is on hold until funding is in place.

## **Kingdom of Denmark/Ministry of Defense**

The Danish Ministry of Defense has conducted a Marine Environmental Risk Assessment – concerning waters in and adjacent to Greenland and the Arctic. The analyses quantify and describe the likelihood of marine accidents with and without pollution by spill of oil products, oil/chemical cargo products and fuels, as well as corresponding spill volumes. The analysis also includes prognoses on future ship traffic around Greenland in 2027. Further the analysis has looked at the environmental risk related to the shipping accidents. The environmental risk analysis is based on ship traffic accident frequencies and distribution and vulnerability of environmental resources in the selected area. The Risk Assessment has been followed by a study focusing on oil spill contingency as well as risk reducing measures linked to type and level of ship traffic in Greenland waters. (<http://bit.ly/2k70PVJ>)

Danish and Greenlandic agencies have requested DCE to, in cooperation with GINR, identify important areas for ecosystems and biodiversity in Greenland (<http://www2.dmu.dk/pub/sr43.pdf>). More extensive analysis has been made or is planned for, with regards to environmental consequences from shipping. The projects include an Ecosystem Based Management approach in the analysis for future possible suggested management initiatives (<http://dce2.au.dk/pub/TR61.pdf>).

## **PAME**

### *Arctic Ship Traffic Data (ASTD)*

The ASTD project responds to increased attention and activities of shipping in the circumpolar Arctic by providing a password-protected online platform for analyzing shipping activities in the Arctic. The ASTD project data will be available to Arctic States and the Arctic Council subsidiary bodies providing access to reliable, accurate and comprehensive Arctic shipping data and information to facilitate trend analyses on ship traffic in the Arctic, including the number of ships in the Arctic, types of ships, routes and other relevant information.

The ASTD will be accessed through the Havbase platform which will be adapted and “tailor made” to meet the requirements and needs of the ASTD. The Havbase platform is operated by the Norwegian Coastal Administration (NCA) and is compatible with other systems such as the Arctic Spatial Data Infrastructure (Arctic-SDI) platform and the Arctic biodiversity data service.

The ASTD project will look to secure sustainability by collecting historical shipping data on an ongoing basis, rather than collecting information a single time as the 2005 AMSA database did.

The objective is to develop a long-term, sustainable collection of Arctic shipping information consisting of a repository with selected ship traffic data provided by Arctic Council Member States and a web application/tool to extract information from the repository, allowing for trend analysis and other related uses.

Norway has developed a ship traffic database named Havbase (meaning: "Oceans database"). Havbase has an Arctic module called "Havbase Arctic" but it was first developed for Norway's ocean area for management plans purposes. Havbase is open for public viewing ([www.havbase.no](http://www.havbase.no)), however much of the functionality in Havbase is reserved for users with a username and password (log in). Today Norwegian governmental institutions, and several scientists with the Arctic as a research area, have access to the data.

The ASTD-EG has noted that Havbase meets most of the identified system requirements in the ASTD project. In addition, it offers additional solutions which could be useful to PAME and other working groups under the Arctic Council, including the calculation of emissions from ships and fuel type used by ships. Havbase is operated by the Norwegian Coastal Administration and is therefore a government-owned and operated system.

#### *Arctic Shipping Best Practices Information Forum*

PAME has undertaken a project to develop an Arctic Shipping Best Practices Information Forum that would be composed of a web portal with links to key Arctic shipping-related information (e.g., best practices, industry standards, guidelines, etc.) as well as an annual meeting of members.

#### *IMO and the Polar Code*

The Arctic States cooperated closely in IMO in the finalization of the global mandatory code for ships operating in polar waters (Polar Code) that entered into force on the 1th of January 2017. PAME has followed this work closely, and emphasized the need for timely implementation of the Polar Code. Paris MOU adopted guidelines in May 2016, with entry into force on 1 January 2017.

PAME is developing a project on reporting on Polar Code implementation, Port State Control regime statistics on industry compliance and challenges confronted by the industry in observing the Polar Code.

Information on accidents involving vessels in Arctic waters as defined by the Polar Code PAME has gathered information with regard to incidents involving non SOLAS ships; fishing vessels and private pleasure crafts in Arctic waters.

#### **Kingdom of Denmark/Danish Maritime Authority**

'ArcticWeb' is a flagship project funded by the Nordic Council of Ministers', which aims to support safety of navigation in the Arctic, through better and more effective dissemination of important maritime information, together with the development of tools assisting

vessels, companies and authorities to better handle the processes ensuring a sustainable and safe maritime transport in the Arctic.

One of the tools presently developed in the project is the Voyage Risk Assessment Tool. It is a dynamic tool for vessels, calculating and presenting present and future risk levels on planned voyage. Risk calculations are based on and combining risk levels for a number of parameters (area, wind, waves, icing, temperature, ice cover and icebergs, distance to other vessels and rescue resources, etc.). Vessels are different and the individual risk levels are estimated and entered by the Master/bridge team on each vessel. The Voyage Risk Assessment Tool can present the objective risk levels calculated for each vessel or simply provide vessels with easy access to safety information necessary to perform risk assessments on own or company systems.

The Voyage Risk Assessment Tool will be operational by the end of 2017.

The project is managed by the Danish Maritime Authority and has participants from Iceland, Norway, Greenland and Denmark.

## 3.2 Improve maritime services

### 3.2.1 Navigational charts

Initiative

- a) explore coordination of hydrography and mapping surveys to improve the safety of Arctic shipping; and
- b) exchange experiences and best practices on hydrography and nautical charting in the Arctic.

Status

#### **United States**

In the summer of 2016, the US Coast Guard and the Canadian Coast Guard conducted joint extended continental shelf mapping operations in the Arctic. Less than 1 percent of U.S. Arctic waters have been surveyed with modern survey methods.

In anticipation of growing vessel traffic in the Arctic, NOAA is increasing its charting activities in the region to help ensure navigation safety. In summer 2016, NOAA ships Rainier and Fairweather conducted hydrographic surveying projects in the U.S. Arctic along the western coast of Alaska, including Kotzebue Sound, Port Clarence and Point Hope.

Reconnaissance bathymetry was also collected along the main shipping route, which extends from the Aleutians up through the Bering Strait as a joint effort with the USCG

Cutter Healy. NOAA will use these hydrographic surveys to update nautical charts for Alaska's waters. (<http://www.thebristolbaytimes.com/>)

### **Kingdom of Denmark/Danish Center for Operational Oceanography**

A new Danish system, based on the Helmsman system, where tide-corrected hydrographic data are presented in a system including tracks and other relevant information from other vessels and users is being tested. This type of systems can be further developed and data exchanged between maritime users making a large amount of information available to many. In addition, the use of satellites with lidar sensors can be further investigated for use in generating hydrographic information for users.

### 3.2.2 Improve meteorological and oceanographic forecasts

#### Initiative

- a) exchange experience and best practices in the field of forecasting meteorological, oceanographic and ice related conditions and hazards as well as regarding climatological ice and metocean information; and
- b) improve methods, standards and systems for detecting and monitoring metocean and ice related conditions, and distributing this information, when appropriate, in a timely manner between Participants and communities throughout the Arctic.

#### Status

### **Kingdom of Denmark/The Danish Meteorological Institute**

Arctic meteorological services provide broadcasts daily forecasts and warnings to mariners. The Danish Meteorological Institute has implemented its IGA Weather Forecasting Model operationally, which has improved marine forecasting in the North Atlantic - especially improving local wind-forecasting.

A large number of ice-metocean parameters are available via Copernicus Maritime Environmental Monitoring Service for the Arctic. ESA's Sentinel satellite program is a European long term investment in improvement in ice-metocean information and forecasting under EC Copernicus. ESA's Sentinel 1 Program and contributing satellite missions is a world leading data source for daily high resolution sea ice and iceberg information.

### **Kingdom of Denmark/Danish Center of Operational Oceanography**

DCOO develops a wide range of decision aides enabling mariners and other users operating in the Arctic to plan and carry out operations safely – hereunder Impact Maps. Impact Maps

containing meteorological and oceanographic data are widely used to identify areas and timeframes where operations in the Arctic can be carried out safely. Impact Maps also include valuable remote sensing information as well as current and forecasted ice conditions in a given area of interest for the user. DCOO is interested in exchanging information with others as well as sharing experience in developing tools for operational users.

### 3.2.3 Broadband and satellite communications

#### Initiative

Exchange information on relevant systems of broadband and satellite communication to improve safety of navigation in the Arctic.

#### Status

##### **Task Force on Telecommunications Infrastructure in the Arctic**

The Task Force Telecommunications Infrastructure in the Arctic (TFTIA) was formally established in September 2015 and will conclude its work with a report to the SAO meeting in Juneau (February 2017) and the Arctic Council Ministerial Meeting in May 2017.

The TFTIA mandate prescribes the deliverables should include:

- A circumpolar assessment of telecommunications and network infrastructure; and
- Recommendations on public-private partnerships that will enhance telecommunications in the Arctic

TFTIA have also coordinated relevant activities with the Arctic Economic Council.

Several initiatives related to satellite communications systems covering the Arctic have been initiated over the recent years, and a few are under construction. Iridium NEXT (US) will replace its existing system with a first launch from Q3/2016, based on satellites with increased bandwidth (still narrowband) compared to the existing Iridium low earth orbit (LEO) system. Iridium NEXT will include capacity for Global Maritime Distress and Safety System (GMDSS) as well as air traffic management capacity for Automatic Dependent Surveillance –Broadcast (ADS-B). OneWeb (US/UK) is another LEO system planning to provide global broadband to users. The system may be available from around 2020. However, several technical, financial and regulatory challenges remain to be handled before such a megaconstellation can be launched with 648 satellites.

Other systems may also be implemented and operational from 2020-2025, with more targeted coverage of the Arctic areas, either regional or pan-arctic. Both Canada and Norway have concrete plans for polar broadband solutions aimed at governmental and commercial users, be it on land, in the air or at sea. Such systems may provide narrowband and/or broadband communications capacity comparable to what is available through existing geostationary satellites/systems.

The use of VHF for maritime narrowband data communications (ship-ship or ship-shore) may include the addition of VHF Data Exchange (VDE) via satellite. The 2-way data communication will use frequency bands close to the AIS frequencies, and will allow for equipment onboard that may combine both AIS and VDE RX/TX functionality. A Norwegian VDE demonstration satellite, Norsat-2, is under construction and launch is planned for Q1/2017. Provided successful demonstration of the technology and selected services supporting the e-Navigation Maritime Service Portfolio (MSP), the satellite based VDE communication may be fully adopted by the ITU at the World Radio Conference in 2019.

### **Norwegian Coastal Administration**

#### Maritime Broadband Radio

The Norwegian Coastal Administration has invested in several Maritime Broadband Radios. The radio is used for seamless data communication between vessels, surveillance aircrafts and land based facilities. The IP connectivity secures seamless exchange and sharing of data between assets with no latency, as well as possibilities to stream live HD video and voice without any further conventional infrastructure. Effective operational range between vessels exceeds 50 km, and between vessels and aircrafts up to 250 km, depending on a/c altitude. The effective bandwidth is 7 Mbit throughout the entire operational range. NCA considers to develop and establish a network of land-based radios connected to the internet. Encrypting the data stream is possible through end – to – end encryption.

[Please insert relevant text here, using above format. Bold name of WG/organization, followed by paragraph of running text.]

## 3.2.4 Prevention of marine incidents that could result in oil pollution

### Initiative

a) develop a catalogue of existing resources (tug boats, tow packages, ship arrestors, mooring buoys, etc.) that may play a role in minimizing the potential for, and the environmental impact of, a marine incident that could result in oil pollution, and to assess the adequacy of such resources.

### Status

#### **EPPR**

Through a U.S.-led initiative, a searchable database has been developed that includes Arctic specific oil spill response equipment. The database includes traditional oil spill response equipment such as boom, skimmers, dispersants, oil spill response vessels, dispersant application systems, in situ burn equipment – all of which were identified through internet searches, direct contact with oil spill removal organization, and Arctic Council member states' completion of a specific survey to help populate the database. The scope of this

initial project and contract did not provide for the types of equipment (tug boats, tow packages, mooring buoys, etc.) envisioned by the members of TFOPP; however, the software system would lend itself, with minor modification, to the addition of any types of equipment once such data was compiled. At this time there is no specific funding, lead country, or pending initiative to pursue the TFOPP catalogue of marine resources and the assessment of their adequacy.

### **Kingdom of Denmark**

The catalogue may, besides the mentioned existing resources, also include resources on biological knowledge that could minimize the environmental impacts of a potential oil spill. Such knowledge for Greenland is compiled in the Oil Spill Sensitivity Atlas', prepared by DCE and GINR. (<http://bios.au.dk/en/knowledge-exchange/for-government-agencies-and-anyone-with-a-special-interest/greenland-and-the-arctic/olie-og-miljoe/raadgivning/oil-spill-sensitivity-atlas/>).

In the selection of the right combination of technologies to combat oil spill knowledge about their potential impacts/side effects are crucial. Hence DCE have conducted a number of research activities as well as reviews to increase the knowledge base.

### 3.2.5 Navigation in ice conditions

#### Cooperation intentions

- a) exchange best practices and any other relevant information on national requirements and, when appropriate, industry standards for navigating in marine areas of the Arctic in ice conditions.

#### Status

Cooperation on this issue is developed continuously through The International Ice Charting Working Group (IICWG). The IICWG is a global forum for sharing experience and best practice between the international ice centers. The group was established in 1999 and is a collaboration forum and an open advisory body bridging daily ice information and regulators, shipping operators, navigators, decision makers, data providers.

#### **[The Kingdom of Denmark]/EU**

The European Space Agency's (ESA) Sentinel 1 program is a major step towards a new era and international collaboration on enhanced ice information and shipping safety in Arctic waters.

#### **PAME**

PAME has undertaken a project to develop an Arctic Shipping Best Practices Information Forum that would be composed of a webportal with links to key Arctic shipping-related

information (e.g., best practices, industry standards, guidelines, etc.) as well as an annual meeting of members.

### 3.2.6 Icebreaking and ice-management services

#### Initiative

a) exchange best practices and information on existing icebreaking and ice-management services.

#### Status

##### **Norway/Norwegian Coastal Administration (NCA):**

Representatives from NCA are participating in Baltic Icebreaking Management (BIM), which includes representatives from the Scandinavian countries and Baltikum. In these annual meetings, countries exchange knowledge and experiences on ice-management.

##### **United States**

The United States has engaged in Polar Icebreaker dialogue with several Arctic nations, and conducted joint icebreaking training with Canada and Finland. In addition, the newly formed Arctic Coast Guard Forum provides a venue for operational information exchange.

The U.S. Coast Guard is in the Analyze/Select phase of acquiring a new polar icebreaker, which involves evaluating acquisition approaches and assessing the merits of each approach. The service's polar icebreaker acquisition program settled operational requirements informed by 11 interagency stakeholders in January 2016, published the requirements in an industry data package, and in March 2016 held an industry day attended by more than 90 organizations. Future industry engagement, including solicitation of commentary on a draft request for proposal, is projected as specifications develop and the program progresses. The service intends to begin production activities in 2020 under an accelerated acquisition timeline. <https://www.uscg.mil/hq/cg9/icebreaker/>

### 3.3 Reduce risks associated with use and transport of heavy fuel oil.

#### Initiative

a) explore and pursue ways to reduce the environmental risk posed by transportation, storage or use of heavy fuel oil by ships in the Arctic.

#### Status

## **CAFF**

One way to reduce environmental risk posed by transportation concerns the identification of vulnerable and sensitive areas. CAFF, in partnership with the AMAP and SDWG released the AMSA IIC report on the Identification of Arctic marine areas of heightened ecological and cultural significance. The report identified ecologically and culturally significant marine areas that are vulnerable to marine vessel activities in the Arctic in light of changing climate conditions and increasing multiple marine use. CAFF has also worked to support the identification of Ecologically and Biologically Sensitive Areas (EBSA) in the Arctic by the United Nations Convention on Biological Diversity (CBD). Information collected to inform identification of these areas can be found on the Arctic Biodiversity Data Service (ABDS).

## **PAME**

As a follow on to HFO Project Phase I and II, PAME has begun Phase III a project to develop a compendium of case study information on maritime incidents in the Arctic that resulted in a spill or release of HFO and the environmental impact thereof. This project is co-led by the United States, Norway and Canada.

## **Norway/Svalbard**

There is a ban on heavy fuel oil to prevent spill of HFO in the Svalbard area.

It is prohibited to bring or use heavy fuel oil in:

- Northeast Svalbard Nature Reserve
- Southeast Svalbard Nature Reserve
- Northwest Spitsbergen National Park
- Forlandet National Park
- South Spitsbergen National Park

In addition, it is also prohibited to sail with heavy fuel oil to Ny-Ålesund and Magdalenefjorden on the west coast of Svalbard. In total about 80% of the Svalbard area is covered by the ban.

## **Kingdom of Denmark/Danish Center for Environment and Energy**

Several initiatives/projects are ongoing to explore ways to reduce the environmental risk posed by transportation, storage or use of heavy fuel oil by ships in Greenland:

- DCE are lead in a project about fate and behavior of HFO in cold waters in relation to a risk assessment for use of HFO in cold / arctic waters.
- In the project "*Oil spill in Greenland waters - focus on environmental effects, challenges and solutions*" DCE looks into how to minimize the environmental impacts from oil spills from an ecological and biological angle.

- *"Integrated oil spill response actions and environmental effects – GRACE"*, EU project lead by Finland (SYKE), involving 13 partners, including Aarhus University, Denmark and Greenland Oil Spill Response Limited, Greenland. Focuses on developing, comparing and evaluating the effectiveness and environmental effects of different oil spill response methods in a cold climate. <http://www.grace-oil-project.eu/en-US/About>.

