Proposals for mitigating the risks associated with the use and carriage of HFO by vessels in the Arctic

Prepared for submission to the PAME Shipping Expert Group

Introduction

In recognition of the risks posed by heavy fuel oil in Arctic waters, in February 2016, the Arctic Council's Protection of the Arctic Marine Environment (PAME) Working Group invited Arctic Council Member States, Permanent Participants and Observers to submit proposals for mitigating the risks associated with the use and carriage of HFO by vessels in the Arctic. In response, the Circumpolar Conservation Union (CCU) and WWF submit the following recommendations for consideration by PAME.

While the International Maritime Organization (IMO) is the appropriate international body to regulate heavy fuel oil (HFO) use and carriage, as well as black carbon emissions from international shipping operating in the Arctic, there are a number of steps the Arctic Council and PAME can take toward safeguarding the Arctic marine environment and Arctic inhabitants, including Indigenous peoples. These steps could also spur additional and/or hastened action on the issue at the IMO. Thus, we have intentionally linked our recommendations to PAME to potential IMO outcomes.

Addressing the risks associated with HFO in the Arctic should be undertaken through two strategies, each requiring solutions tailored to the Arctic region:

- Addressing the use of HFO on board and carriage of HFO as bunker and ballast,
- Addressing the carriage of HFO as cargo (refined and crude).

For the reasons outlined below, CCU and WWF believe that phasing out HFO use by shipping sector in the Arctic is the most effective available mitigation strategy and should be a priority at this time, and we respectfully submit the following language for PAME's consideration:

"In recognition of the rapid pace of Arctic change and in accordance with the 2015-2025 Arctic Marine Strategic Plan's Goal 3 – Promote safe and sustainable use of the marine environment, taking into account cumulative environmental impacts – PAME encourages Arctic states and interested Observers to work together within the IMO to address the risks associated with the use of HFO in the Arctic and identify mitigation measures, with the aim to phase out the use of HFO and carriage of HFO for use as ship fuel (bunker) and ballast in the region by 2020."

Further recommendations:

- PAME to develop guidelines for phasing out the use of HFO by shipping sector in the Arctic in line with the recommendatory measure in the IMO's Polar Code that encourages ships to apply regulation 43 of MARPOL Annex I when operating in Arctic waters.

"PAME further encourages Arctic states and interested Observers to consider additional mitigation measures to reduce the risks associated with the carriage of HFO as cargo, such as routeing measures and/or mandatory reporting."

- PAME to investigate the volume of HFO carried as cargo and the routes used to help inform the protection of sites that may be particularly vulnerable to HFO spills, such as areas of ecological and biological significance and/or areas with a direct connection to local communities dependent on marine resources.

Strategy to address the use of HFO and carriage of bunkers and ballast

Proposals

A) Amendment to MARPOL 73/78

The simplest and most direct mechanism to reduce harmful emissions and take a significant step toward mitigating spill impacts would be to prohibit HFO use, as well as the carriage of HFO as bunker and ballast in the Arctic, through an amendment to MARPOL Annex I. Similar to Regulation 43 in Chapter 9 of the same Annex, which applies to the Antarctic, an Arctic-specific regulation that addresses HFO use and carriage as bunker and ballast could achieve the recommended phase out by 2020.

While Arctic vessel traffic and corresponding emissions of black carbon are projected to increase in the near and mid-term[1], black carbon emissions in some parts of the Arctic from land-based sources are already declining or are expected to fall due to stricter regulations[2], increasing the relative importance of addressing emissions from shipping. Switching from HFO fuel to alternative fuel, such as low-sulphur distillate fuel, is expected to reduce black carbon emission levels by on average 30 percent[3]. Furthermore, the high fuel sulphur content of HFO prevents the use of diesel particulate filters (DPFs) that are estimated to remove 80-90% of black carbon emissions[4].

Prohibiting the carriage as bunker and ballast will also be a significant step in reducing the risks from HFO spill impacts. Estimated figures for 2012 from Det Norske Veritas (DNV) indicate that, although only 28 percent of the vessels operating in the Arctic used HFO, HFO accounted for 75 percent of the total bunker fuel mass onboard of all vessels operating in the region[5]. The International Council on Clean Transportation (ICCT) is working to update and expand upon the DNV analysis over the next couple of months. The ICCT plans to estimate Arctic vessel activity, fuel carriage, fuel consumption, and air emissions for 2015, with projections to 2020 and 2025. Preliminary results are expected in August 2016.

PAME Actions

- To encourage the IMO to consider an HFO-use phase out, Arctic states could agree to voluntarily heed the Polar Code's encouragement not to use HFO in the Arctic and request the same from Arctic Council Observer States. While this would only apply to a limited number of flag states, it would show significant leadership from those most impacted by HFO use in the region.

[1] AMAP (2015). Summary for Policy-Makers: Arctic Climate Issues 2015, Short-lived Climate Pollutants, AMAP Secretariat (7).
[2] EPA (2012), "Report to Congress on Black Carbon." March (177).
[3] Lack, D. A. and Corbett, J. J. (2012) Black Carbon from Ships: A Review of the Effects of Ship Speed, Fuel Quality and Exhuast Gas Scrubbing, Atmos. Chem. Phys. 12: 3985-4000 10.5194/acp-12-3985-2012.
[4] Azzarra, Alyson, R. Minjares and D. Rutherford (2015), "Needs and opportunities to reduce black carbon emissions from maritime shipping." The International Council on Clean Transportation, March 23.
[5] DNV (2013). HFO in the Arctic-Phase 2, for Norwegian Environmental Agency, DNV Doc. No./Report No.: 2013-1542-16G8ZQC-5/1, 6, 33 (2013).

- Alternatively, or in addition, Arctic states could consider building on PAME's regional reception port facilities work and take action or develop HFO voluntary guidelines from a port state perspective.
- PAME could invite the ICCT to its PAME-II 2016 meeting to present on the findings from its research described above and allow those findings to inform any PAME products on HFO during this work program.
- Senior Arctic Officials may agree to submit PAME's work products on HFO from this biennium to the IMO's Marine Environment Protection Committee with recommendatory action.
- To support rapid implementation and compliance with an HFO-use phase out in the Arctic, PAME could commission research on the environmental benefits and economic feasibility of alternative fuel use in Arctic shipping.

B) Revision of the Polar Code

Another way to manage the risks associated with the use of HFO would be to revise the IMO's International Code for Ships Operating in Polar Waters (Polar Code). While the Polar Code takes commendable steps toward limiting the environmental impact of shipping in Polar Regions, it lacks any accounting for air emissions and falls short of requiring that vessels use an alternative to heavy fuel oil when operating in the Arctic (though it does encourage it).

A measure to prohibit the use of HFO and carriage of HFO as bunker and as ballast would require amendment of Part IIA Chapter 1 of the Polar Code. This would introduce a new operational requirement phasing-out or immediately prohibiting HFO use and HFO carriage as bunker and ballast in Arctic waters. Such a measure would have the same impact as described above – an on-average 30% reduction in black carbon emissions[6], as well as diminished risk from the impacts of an HFO spill – but is a less direct way of achieving the same result from a procedural standpoint.

Such a measure would be a natural progression of recent work to address the risks associated with shipping in polar waters, and in discussions on the Polar Code some IMO Member States indicated support for a measure banning the use of HFO in Arctic waters. However, this route would still ultimately require amending MARPOL 73/78, since the Polar Code is mandatory only through amendments of the SOLAS and MARPOL Conventions. Furthermore, the Polar Code only comes into effect from January 2017 and is not due to be re-opened or reviewed at this time. The next phase of work on the Polar Code will most likely focus on safety aspects of non-SOLAS vessels, such as fishing vessels, private yachts and small cargo ships under 500GT.

PAME Actions

- In line with the recommendatory measure in the IMO's Polar Code, which encourages ships to apply regulation 43 of MARPOL Annex I when operating in Arctic waters, PAME could develop voluntary guidelines for phasing out the use of HFO in the Arctic.

C) Arctic emission control area (ECA)

The IMO could also reconsider the implementation of an emission control area (ECA) in some or all of Arctic waters. Irrespective of the pending IMO decision on a 2020 versus 2025 global sulphur cap (0.5%) implementation date, the pace of climate change in the Arctic and particular risks associated with oil pollution in cold water warrant early and/or additional action to reduce

[6] Lack, D.A. and Corbett, J.J, (2012).

emissions of SOx, NOx, and particulate matter. However, to be an effective mitigation measure, an ECA would require companion measures, such as limiting or eliminating the use of scrubbers thus minimizing HFO spill risk.

One of the reasons the North American ECA does not include the Arctic is because traffic levels were too low at the time of adoption to meet a negotiated threshold. The facts that vessel traffic levels and emissions are increasing[7], low carbon economies are becoming a reality, and northern communities are demanding fair and equal treatment warrant a re-examination of the geographic application of the North American ECA.

Introducing an Arctic ECA could allow for stricter requirements for air emissions of SOx, NOx and particulate matter, including a requirement for the maximum sulphur content in fuels to be no more than 0.1%. Such a measure would address local Arctic pollution problems in areas with higher background concentrations of pollutants and vulnerability to pollution load, while simultaneously reducing black carbon emissions and negative health impacts. An Arctic ECA would not on its own address the risks of spills and impacts on ecosystems and wildlife, including the threat to the food security of local Indigenous peoples; it would need to be coupled with an APM/PSSA as described below. Additionally, an Arctic ECA does not imply a requirement on type of fuel, so any fuel meeting the sulphur limits could be compliant, including low sulphur heavy fuel oils and heavy fuel oils with the use of scrubbers. Therefore, an Arctic ECA would not reduce the need for oil pollution preparedness and response teams to be able to respond to an HFO spill and may not address black carbon emissions as effectively as other measures.

PAME Action

- Arctic states could commission and submit an analysis of shipping air emissions impacts on communities, wildlife and habitats in the Arctic to the IMO.

Strategy to address the carriage of HFO as cargo

An amendment to MARPOL 73/78 Annex I could be adopted to prohibit the carriage of HFO as cargo and eliminate the risk of an HFO spill from shipping (as Regulation 43 prohibits the carriage in bulk of the specified oils in the Antarctic). Due to the dependence of some local communities on HFO for household use, as well as existing hydrocarbon activity in the region, a more tailored approach to address HFO carriage as cargo in the Arctic (than was the case for the Antarctic) may be necessary. For now, the use of routeing measures and mandatory reporting should be considered.

D) Designation of Areas to be Avoided (ATBA) and other routeing measures

To further reduce the risk of an HFO spill in Arctic waters, the designation of specific routeing measures (e.g. two-way traffic routes and areas to be avoided [ATBAs]) around hazardous areas or sensitive marine habitats should be considered.

The majority of the Arctic is poorly charted[8]. Established routes that direct vessel traffic such as traffic separation schemes, recommended tracks or two-way routes can be created in more adequately charted, safer-to-navigate areas. These measures decrease incidents such as ship groundings, collisions with other vessels, ice, or subsistence users, etc. A defined route will be critical in areas of the Arctic where the risks of these incidents are high, such as in the 53-mile wide Bering Strait.

[7] AMAP (2015), *AMAP Assessment 2015: Black carbon and ozone as Arctic climate forcers.*
[8] AMAP (2015), *AMAP Assessment 2015: Black carbon and ozone as Arctic climate forcers.*

ATBAs can complement traffic routes or exist independently of other routeing measures. ATBAs exist in areas of known or potential hazards, as well as in areas of heightened ecological significance.[9] ATBA designations have been delineated in the U.S. Arctic[10] near the Aleutian Islands "in order to reduce the risk of a marine casualty and resulting pollution and damage to the environment."[11] At the March 2015 meeting of the IMO Maritime Safety Committee's Navigation, Communications and Search and Rescue (NCSR) Sub-Committee, the United States' proposal made in NCSR 2/3/5 emphasized the benefits of several ATBAs to help reduce the risk of shipping accidents, as they impose a safe distance between ships and shoreline. This, in turn, protects habitat from an HFO spill caused by grounding and provides additional time to mount a response to maritime emergencies. However, routeing measures and ATBAs, although extremely useful in the mitigation of HFO spills, do not directly address the impacts of emissions from ships.

PAME Actions

- PAME could contribute its considerable expertise on Arctic ecology and environment to develop voyage-planning criteria including low impact corridors to assist mariners in avoiding hazards and sensitive areas.

E) Designation of a PSSA or PSSAs

The designation of one or several Arctic Particularly Sensitive Sea Areas (PSSA) could be another option for mitigating the risk of carriage of HFO cargoes in the Arctic. A PSSA could include a suite of other APMs such as ATBAs, ship routeing schemes, mandatory reporting for vessels carrying HFO cargoes, mandatory no anchoring areas to further address the risk of an HFO spill in specific areas, identification of places of refuge, and/or restrictions or controls on emissions. The Western European Waters PSSA adopted an APM requiring mandatory reporting for single hull tankers carrying heavy grades of fuel oil.

Alternatively, a network of smaller Arctic PSSAs could be established to protect key habitat areas, each including a ban on use of HFO within their APMs. While this approach would be less comprehensive, it could allow for more tailored APMs to each specific location. Within the EEZs of each Arctic nation, AMAP has identified a total of 97 areas that meet the established criteria for a PSSA, including critical habitat for marine mammals such as the beluga whale[12]. A network of Arctic PSSAs could also include portions of the Arctic High Seas. A 2011 report produced for the Arctic Council recommended that a core "sea ice area" of habitat could be protected under this approach[13]. However, this option has not been pursued yet by Member States.

[9] International Maritime Organization. (2013). Ships' Routeing 2013 Edition. Ships and Routing 2013 Edition.
[10] The US Arctic as defined in: The US Arctic Research and Policy Act (ARPA) of 1984 as amended 1990, 15. U.S.C §§ 4101-4111.
[11] SN.1/Circ.331. Routing Measures Other Than Traffic Separation Schemes. 2015. Available at: http://www.ak-mprn.org/wp-content/uploads/2015/12/IMO-SN.1_Circ.331-dated-13-July-2015.pdf
[12]Arctic Council (2013). Identification of Arctic marine areas of heightened ecological and cultural significance: Arctic Marine Shipping Assessment (AMSA) IIc. Arctic Monitoring and Assessment Programme (AMAP).
[13] Det Norske Veritas (2013). HFO in the Arctic-Phase 2, for Norwegian Environmental Agency, DNV Doc. No./Report No.: 2013-1542-16G8ZQC-5/1, 6, 33 (2013)

There are also drawbacks to addressing the risk of HFO use through PSSA designation. Although APMs could offer a suite of management measures to address multiple shipping impacts, enforcement of specific APMs can lag behind the designation of a PSSA[14].

PAME Actions

- PAME could build on AMAP's PSSA work and develop implementation plans, including identification of mitigation measures, for the highest priority areas.

Conclusion

Of the suite of the IMO policy proposals outlined in this submission, CCU and WWF recommend an amendment to MARPOL 73/78 Annex I introducing a prohibition on the use of HFO and the carriage of HFO for use as ships' fuel (bunker) and ballast in Arctic waters. As noted above, there are specific actions PAME could take within the Arctic Council to support and/or expedite an HFO-use phase out in the Arctic. With respect to the carriage of HFO as cargo, CCU and WWF recommend further consideration of strict routeing measures, and where appropriate potential PSSAs with appropriate APMs until such time that local and global dependence on HFO has diminished. CCU and WWF appreciate PAME's consideration of these recommendations and efforts to come to a consensus on a way forward, with view toward taking action within PAME, as well as toward Arctic states collectively proposing action at the IMO in the very near future.

[14] Guan, S. (2011). Vessel-Source Pollution Prevention in Particularly Sensitive Sea Areas. *Water Resource and Environmental Protection*.