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DEVELOPMENT OF A MANDATORY CODE FOR SHIPS OPERATING IN POLAR WATERS

Additional MARPOL provisions for the Polar Code

Submitted by FOEI, IFAW, WWF, Pacific Environment and CSC

SUMMARY

Executive summary:	In this document, FOEI, IFAW, WWF, Pacific Environment and CSC elaborate proposals for MARPOL provisions for application in polar regions which should be included in a mandatory Polar Code
Strategic direction:	5.2
High-level action:	5.2.1
Planned output:	5.2.1.19
Action to be taken:	Paragraph 23
Related documents:	DE 53/18/3; DE 54/13/3; and MEPC 60/21/1

Introduction

1 A new high-priority work item to develop a mandatory Polar Code was approved at MSC 86 and tasked to the DE Sub-Committee. Norway submitted a document to MEPC 61 (MEPC 60/21/1) providing some ideas for an environmental chapter that such a Code could contain. IMO has already recognized that the polar regions require special measures to provide adequate protection from the potential impact of vessels operating in these waters, e.g., the waters south of 60 degrees South are designated an Antarctic Special area for the purpose of MARPOL Annex I, II and V, and a recent amendment to MARPOL Annex I will prohibit the carriage and use of heavy fuel oils in these waters. This document[1] outlines a range of measures relevant to the MARPOL Convention Annexes ("MARPOL measures") that would provide greater and proportionate protection for polar waters and that therefore should be included in the mandatory Polar Code.

[1] The preparation of this document for the IMO's DE Sub-Committee was assisted by Clean Air Task Force, Earthjustice, and the Antarctic and Southern Ocean Coalition (ASOC), an umbrella NGO (whose members include FOEI, IFAW and WWF) with expert observer status at the Antarctic Treaty Consultative meetings (ATCM) and meetings of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).

2 The Polar Code must reflect an issue of particular significance in the Arctic region: the unique vulnerability of indigenous and other local communities to the risks of shipping. Indigenous and other local communities live amidst and depend upon these marine environments for livelihood, health and culture[2]. Indigenous and other local communities' culture, health, livelihood and environment will be most acutely affected by increased shipping in the Arctic, and thus provisions which meet their needs must be an integral part of protections contained in the Code[3]. Given the fact that the draft Polar Code appears to be adopting a risk-based approach, measures that respect indigenous rights and that prevent or minimize specific impacts to culture, livelihood, health and environment must occur, through consultation with indigenous and local communities, in the drafting and in the application of the Polar Code[4].

Additional MARPOL measures required for vessels operating in polar regions

Oils

3 Oil is routinely released into the marine environment from ships through tank washings, deck runoff, and bilge water discharges, and the level of discharges can be substantial. For example, the average cruise ship produces more than 95,000 litres of oily bilge water from engines and machinery each week[5]. The Arctic's sensitive waters and imperilled marine life and ecosystems justify the application of strict oil pollution discharge standards for vessels in the region. Therefore, it is proposed that the Polar Code introduces a ban on vessel discharges of oil or oily mixtures into Arctic waters, providing equivalent protection to that already in existence for Antarctic waters (Annex I, Regulation 15(b)(4)).

4 In addition, the accidental release of oil into the Arctic marine environment threatens birds and mammals, such as eiders, polar bears, and seal pups, by compromising their feathers and fur, which can lead to hypothermia and death[6]. Arctic wildlife also can be susceptible to oil spills because it tends to congregate in large numbers to breed, nest, and rear young at certain times and locales each year[7]. Moreover, the impracticability of cleaning up an oil spill in the Arctic could lead to oil persistence in affected areas, consequently causing uptake of oil in marine and coastal food chains[8]. For these reasons, it is proposed that the Polar Code eliminate the use and carriage of heavy fuel oil by vessels operating in certain Arctic waters due to the threat of substantial and irrevocable environmental harm.

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2 Arctic Council, *Arctic Marine Shipping Assessment 2009 Report* 5 (April 2009) ("Importantly, many local Arctic residents today depend heavily on marine resources for subsistence and the local economy; over-the-ice travel and boat transport allow the use of large marine areas during much of the year."), *available at* http://pame.is/amsa/amsa-2009-report [hereinafter AMSA].

3 *Id.* ("Arctic residents express concern for the social, cultural and environmental effects of [Arctic development] expansion. The possibility of oil spills is a major concern and hunters are especially concerned about the disruption of marine species and their hunting practices. The costs and benefit of Arctic shipping will likely be unevenly distributed among and within communities and regions. Constructive and early engagement of local residents in planned Arctic marine development projects can help to reduce negative impacts and to increase positive benefits.").

4 The right of indigenous peoples to be consulted on matters of importance to them has been established by, *inter alia*, international conventions, UN declarations and resolutions. Examples include: Articles 18-19 of the UN General Assembly, *United Nations Declaration on the Rights of Indigenous Peoples: resolution/adopted by the General Assembly*, 2 October 2007, A/RES/61/295; Article 27 of the UN General Assembly, *International Covenant on Civil and Political Rights*, 16 December 1966, United Nations, Treaty Series, vol. 999, p. 171; Article 7 of the International Labour Organization (ILO), *ILO Declaration on Fundamental Principles and Rights at Work*, June 1988.

5 AMSA, at 137.

6 *Id*. at 136.

7 *Id.* at 138.

8 *Id.* at 136-138.

Noxious liquid substances in bulk

5 The discharge of noxious liquid substances into the delicate marine environment of the Arctic presents a significant and unnecessary risk. It is proposed that vessel discharges of noxious liquid substances or mixtures containing such substances into Arctic waters be prohibited, just as they are for Antarctic waters (Annex II, Regulation 13(8)).

Sewage, sewage sludge and grey water

6 The risks and impacts of sewage, sewage sludge and grey water discharges from ships in polar regions are increasing as ship traffic rapidly expands in these areas[9]. For example, cruise ships, which have the potential to generate and discharge as much waste as a small town[10], are increasing in both polar regions[11,12]. Concerns exist over the vulnerability of polar marine ecosystems to sewage-related discharges since these areas are characterized by especially low light and temperature conditions, slowing decomposition[13]. Polar marine environments will be particularly vulnerable because of the potential to be less tolerant to rapid changes in the nutrient status of the water column or seabed. Polar regions also have heightened vulnerability due to the presence of sensitive wildlife species in some locations. Moreover, the Arctic has an additional susceptibility: coastal communities including indigenous populations which are dependent on marine ecosystems for their subsistence, health, livelihood and cultural survival. It is well established that people eating fish can contract illnesses (including gastrointestinal illnesses, diarrhoea, ear, nose and throat illnesses, vomiting, hepatitis, and respiratory diseases) from contact with faecal-contaminated waters[14]. While most sewage-caused illnesses are acute, some are potentially life-threatening[15]. Furthermore, sewage, sludge and grey water are all possible vectors for the introduction of alien species.

7 MARPOL Annex IV measures for sewage discharge were not established with polar waters in mind, but more generally for discharges globally in warmer climates with faster decomposition rates. Further, MARPOL IV restrictions prescribe distances from shore and rates at which discharges may occur, since shorelines are appropriately viewed as vulnerable resources that these measures aim to protect. Polar shorelines and communities are equally if not more vulnerable, but important ecological features can be found far offshore, such as ice floes, ice lines, and sensitive wildlife species (e.g., marine mammals), which are equally in need of protection. Therefore, restrictions based purely on proximity to shorelines, are inadequate. Also, MARPOL IV measures refer to on-shore reception and processing facilities. However, Arctic coastal communities lack such infrastructure, leading the Arctic Council to fear that wastes stockpiled on ships will be both illegally and

9 FOEI, IUCN, Greenpeace, IFAW and WWF, *Shipping Management Issues to be Addressed*, (Nov. 20, 2009), (submitted to IMO's Sub-Committee on Ship Design and Equipment and reviewed as DE 53/18/3).

10 US Environmental Protection Agency, Cruise Ship Discharge Assessment Report 1-1 (2008), *available at* http://www.epa.gov/owow/oceans/cruise_ships/pdf/0812cruiseshipdischargeassess.pdf [hereinafter EPA 2008 Cruise Ship Assessment].

11 ASOC (2008) A decade of Antarctic tourism: Status, change, and actions needed. XXXI ATCM, ASOC IP041.

12 AMSA, at 72.

13 *See*, *inter alia*, Norway, *Environmental Aspects of Polar Shipping*, (Jan. 12, 2010), (submitted to IMO's Marine Environment Protection Committee and reviewed as MEPC 60/21/1).

14 US Government Accounting Office, Implementation of the Beach Act of 2000: EPA and States Have Made Progress Implementing the Act, but Further Actions Could Increase Public Health Protection 1 (2007), *available at* http://www.gao.gov/new.items/d071073t.pdf [hereinafter Beach Act Report]; Joint Group of Experts on the Scientific Aspects of Marine Environmental Protections, A Sea of Troubles 5-6 (2001), *available at* http://unesdoc.unesco.org/images/0012/001229/122986e.pdf [hereinafter GESAMP].

15 Beach Act Report, at 1; GESAMP, at 5-8.

accidentally discharged into sensitive ecosystems[16]. These risks are heightened by the fact that cruise ships, with hundreds or thousands of people on board, travel to polar waters specifically to view wildlife and biodiversity hotspots[17,18].

8 For these reasons, strengthened sewage, sewage sludge and grey water discharge measures for the polar regions are necessary and must account for unique polar conditions, risks and vulnerabilities. Options include:

.1 banning all discharges of treated or untreated sewage and grey water from vessels operating in polar regions and certified to carry more than 10 people;

.2 creating sewage/sewage sludge/grey water "no discharge zones" in the most sensitive and biologically rich areas; and

.3 requiring advanced waste water treatment systems on board all vessels in polar regions.

Garbage

9 Garbage[19] from vessels that enters the ocean may become marine litter and hence a threat to ecosystems, wildlife, and coastal communities associated with marine waters[20]. However, the percentage of vessel-originated litter may vary regionally. In 2003, environmental group Stichting De Noordzee found that 40 per cent of marine litter in the Netherlands came from the sea – which included sources such as merchant shipping, fisheries, recreational vessels, and offshore facilities. While expected revisions to MARPOL Annex V will reduce the number of items allowed to be jettisoned overboard, some types of garbage will still be permitted to be discharged at sea (see MEPC 61/7/2).

10 Potentially, the most environmentally harmful category for permitted discharges is food waste, which is often the largest garbage waste stream component on ships[21,22]. A 2008 US EPA report indicates that if discharged in sufficient quantities, food waste can contribute to increases in biological oxygen demand, chemical oxygen demand, and total organic carbon, reduce water and sediment quality, adversely impact marine biota, increase turbidity, and raise nutrient levels[23]. Citing Polglaze (2003), the EPA report further states that food waste elements may be harmful to fish digestion and health. Moreover, continued disposal of food wastes in confined environments can cause nutrient pollution in areas of limited water exchange[24]. In addition, "regular and sufficiently large inoculations of food waste to an area may cause ecological changes such as perturbations to species behavioural patterns and alternation to community species composition and diversity (Polglaze, 2003)"[25]. A further potential environmental impact of discharged victuals may be

16 AMSA, at 137, Environmental Impacts and Disturbances from Cruise Ships.

17 *Id.*

18 Conservation International, Cruises, http://www.biodiversityscience.org/xp/CELB/programs/travel-leisure/cruises.xml.

19 Cruise ships generate the most garbage of any ship type. A large cruise ship can create about 7 tons of solid waste during a one-week voyage. EPA 2008 Cruise Ship Assessment, at 5-3.

20 Claudia Copeland, Congressional Research Service, Cruise Ship Pollution: Background, Laws and Regulations, and Key Issues 4 (last updated July 1, 2008).

21 EPA 2008 Cruise Ship Assessment, at 5-11.

22 Holland America Lines and Royal Caribbean Cruises, based on 2002 and 1999 figures, respectively, generated 12 cubic meters of food waste per vessel per week. *Id.* at 5-2.

23 *Id*. at 5-11.

24 *Id.* at 5-12.

25 *Id.*

the unintentional introduction of food associated plastics. The EPA report recommends that, in order to avoid the introduction of plastics with food wastes into the marine environment, it is essential to separate all food associated plastics before food wastes are ground up prior to being discharged at sea or incinerated to then be discharged at sea[26].

11 It is worth nothing that article 4(8) of the revised Annex II to the Antarctic Treaty System Environmental Protocol stipulates that "... any poultry or avian products not consumed shall be removed from the Antarctic Treaty area or disposed of by incineration or equivalent means that eliminates the risk of introduction of micro-organisms (e.g., viruses, bacteria, yeasts, fungi) to native flora and fauna." This requires that any poultry or avian products should not be released into the Antarctic Treaty Area (south of 60 degrees South) even after it has been through a grinder.

12 Arguments for a complete ban on garbage discharges, including ground-up food wastes, in polar waters include:

.1 the eradication of poor practices which result in plastics being unintentionally mixed with food wastes;

.2 simpler enforcement of discharge provisions, since all discharges would be banned and no discharges of any form of garbage would be permissible;

.3 the potential for the introduction of invasive micro-organisms via food wastes would be eliminated; and

.4 the risk to local water quality – because of the acidic nature of the waste, its significant volume (e.g., cruise ships), and the demand for oxygen as the food degrades – would be eliminated. A cruise ship carrying 500 people will generate food wastes from 1,500 or more meals daily; for the larger cruise ships with about 5,000 passengers and crew, the figure would clearly be much higher, perhaps closer to 25,000 meals a day[27].

13 Alternatively, another approach would be to identify mandatory discharge distances from more sensitive sites such as the nearest land, ice face and protected areas.

14 For the reasons articulated, it is proposed that Special Area status under MARPOL Annex V should be conferred on the Arctic through the Polar Code and all garbage including food wastes should be banned from discharge in both Arctic and Antarctic waters.

Air emissions – Nitrogen oxides (NO_x) and sulphur oxides (SO_x)

15 NO_x and SO_x emissions are associated with serious public health problems, including premature mortality, aggravation of respiratory and cardiovascular disease, changes in lung function, and chronic bronchitis. NO_x and SO_x emissions also contribute to ocean acidification. Approximately one-third of all NO_x and SO_x emissions end up in the oceans and the impact of these emissions on acidification is particularly severe in specific, vulnerable areas such as Arctic and Antarctic waters[28]. Because the most impacted ocean

26 *Id.*

27 David Rosenfeld, *Dirty Waters: Cashing in on Ocean Pollution*, DC Bureau (Jan. 18, 2010), *available at* http://dcbureau.org/20100104305/Natural-Resources-News-Service/dirty-waters-cashing-in-on-ocean-pollution.html.

28 Scott C. Doney *et al*., *Impact of Anthropogenic Atmospheric Nitrogen and Sulfur Deposition on Ocean Acidification and the Inorganic Carbon System*, 104 PNAS 14580, 14581, 14583.

areas are those directly around the release site, implementation of emissions reductions policies is especially important for these fragile ocean ecosystems.

16 As part of the Polar Code, enhanced NO_x and SO_x emission control measures should be considered for all vessels in polar waters. Stronger measures would result in significant reductions in harmful air pollutant emissions, with important health benefits for indigenous Arctic communities and other local populations. In addition, more stringent measures would slow ocean acidification in these sensitive waters.

Black carbon

17 Black carbon is a component of particulate matter (PM) and is produced by ships through the incomplete combustion of diesel fuel. Controlling the emissions of black carbon will result in significant health benefits as well as climate benefits, especially in sensitive regions such as the Arctic. While the magnitude of the effects of black carbon on the global climate is subject to some uncertainty, there is emerging consensus regarding the regional influence of black carbon on areas of snow and ice (e.g., Qian *et al*. 2009, Hadley *et al*., 2010; Asia Xu *et al*., 2009, Flanner *et al*., 2009). Black carbon, together with tropospheric ozone, and methane, may contribute to Arctic warming to a degree comparable to the impacts of carbon dioxide, though there remains considerable uncertainty regarding the magnitude of their effects. Emissions of black carbon have been identified by some researchers as the second strongest contribution to current global warming, after carbon dioxide emissions.

18 Climate processes unique to the Arctic have significant effects on global and regional climate. The Arctic continues to warm more rapidly than any other part of the globe. Furthermore, the IPCC noted nearly 10 years ago that changes in the Arctic have already taken place. These changes are not modelled future scenarios, but rather real changes happening in real time. These changes include unusual melting of glaciers, sea ice, and permafrost, and shifts in patterns of rain and snow fall, freshwater runoff, and forest/tundra growth. The consequences include disrupted wildlife migration patterns, altered fish stocks, modified agricultural zones, and increased forest fires.

19 In addition, many scientific studies have linked levels of PM2.5 to a series of significant health problems, including: premature death in adults with heart and lung disease; heart attacks; low birthweight; childhood pneumonia; chronic respiratory disease (e.g., bronchitis); aggravated asthma and other respiratory symptoms (e.g., coughing, wheezing).

20 In view of the regional climate impacts and the known health benefits of reducing particulate matter, it is proposed that black carbon emission reduction requirements for vessels in polar waters are introduced as part of the Code.

21 For additional information and discussion regarding shipping emissions of black carbon and their climate impact, see document MEPC 60/4/24 ("Reduction of emissions of black carbon from shipping in the Arctic," submitted by Norway, Sweden and the United States) and document MEPC 60/INF.20 ("New Inventory of short-lived climate forcing aerosols from international shipping activity in the Arctic," submitted by FOEI).

Potential control measures

22 Vessels operating in fragile polar regions should be leading the field and setting precedents with respect to reducing air emissions that impact health, the environment and climate. A range of measures should be considered for reducing emissions from ships in polar waters, including:

.1 increased energy efficiency through improvements to both the design and the operation of ships;

.2 increased use of renewable energy sources, such as wind and solar; and

.3 voyage optimization and vessel speeds.

Action requested of the Sub-Committee

23 The Sub-Committee is invited to note the information provided and consider these environmental proposals during its deliberations when considering environmental aspects of the Polar Code.