

MARINE ENVIRONMENT PROTECTION
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**DEVELOPMENT OF MEASURES TO REDUCE RISKS OF USE AND CARRIAGE OF
HEAVY FUEL OIL AS FUEL BY SHIPS IN ARCTIC WATERS**

**Proposed methodology to analyse effects to Arctic communities and industries of a
ban on heavy fuel oil use and carriage as fuel by ships in Arctic waters**

Submitted by the United States

SUMMARY

Executive summary: This document responds to a request from the Committee for Member Governments to submit concrete proposals on an appropriate impact assessment methodology process to evaluate a ban on the use and carriage of heavy fuel oil (HFO) as fuel on ships in Arctic waters

Strategic direction, if applicable: 6

Output: 6.11

Action to be taken: Paragraph 20

Related documents: MEPC 71/14/4; MEPC 72/11/1 and MEPC 72/16 (paragraphs 11.5 and 11.9.3)

Introduction

1 The Committee, at its 72nd session, considered the development of measures to reduce the risk of use and carriage of heavy fuel oil (HFO) as fuel by ships in Arctic waters. In concluding its consideration, and noting that potential impacts of such measures on Arctic communities and economies should be taken into account, MEPC 72 developed the scope of work for the PPR Sub-Committee for this item, which includes "on the basis of an assessment of the impacts, develop a ban on HFO for use and carriage of fuel by ships in Arctic waters, on an appropriate timescale" (MEPC 72/16, paragraphs 11.5 and 11.9.3). Accordingly, the Committee called for the submittal of concrete proposals for an impact assessment methodology.

2 In this document, the United States presents a methodology for assessing the impact of an HFO ban. The United States believes that the methodology presented in this document represents a balanced approach to assessing both costs and benefits of an HFO ban to communities and industries in the Arctic. The results of an assessment using this methodology can be used to inform how an HFO ban is implemented.

3 Cost estimates, Arctic shipping data, and other data called for by this methodology can be compiled from existing publicly available demographic and statistical information, national economics agencies, automatic identification system (AIS) data, shipping directories (e.g. IHS Fairplay Maritime World Register of Ships), analyses by subject matter experts and industry estimates.

Step 1: Determination of the study area

4 While an HFO ban would only apply to Arctic waters as defined in the Polar Code (MARPOL Annex I, regulation 46.2), assessment of the impact of a ban may extend to "near Arctic" areas that are directly related to or significantly affect (or are affected by) shipping in the Polar Code Arctic. The geographic extent of the assessment, or, the "study area" should be defined by looking at key elements, including:

- .1 communities and industries that rely upon ships that would be affected by an HFO ban;
- .2 ports within the Polar Code Arctic;
- .3 ports in the near Arctic that act as hubs to communities within the Polar Code Arctic; and
- .4 existing ship traffic patterns.

5 For each community identified, population and other relevant demographic data should be considered in order to define populations that would be affected by a ban. The contribution of each economic activity to regional and national economies within the study area should be evaluated, as well as the extent to which they currently rely upon HFO-fuelled ships. For each port identified in the study area, the assessment should consider:

- .1 current usage by HFO-fuelled ships;
- .2 Arctic communities served by the port;
- .3 whether ships can refuel with HFO at the port;
- .4 capacity at each port; and
- .5 the goods, fuels and products imported and exported.

6 Arctic ship traffic in the study area should be summarized and regional traffic patterns identified using available literature and automatic identification system (AIS) data. Ship traffic may be broken down by ship type and by ship routes throughout the study area, including ships exercising the right of innocent passage. Arctic traffic projections may be applied to current ship traffic in the study area in order to estimate future ship populations for an appropriate time period. Ships not likely to be fuelled by HFO should be removed from the analysis of impacts of a ban on communities and industries. The number of ships using HFO may be validated against studies that have identified HFO-fuelled ships in the Arctic, shipping directories, and reports on changes to the Arctic fleet composition as reflected by new builds, ship retirements and changing market service patterns.

Step 2: Assessing costs to Arctic communities and industries

7 Impacts of an HFO ban on Arctic communities and industries would manifest themselves as increases in the cost of goods that are resupplied to communities by ships, and increases in operating expenses derived from use of ships, respectively. Therefore, the impacts resulting from an HFO ban are primarily derived from costs of a ban to ships, including:

- .1 fuel costs;
- .2 one-time costs; and
- .3 debunkering costs.

8 Once ship costs are estimated, the impact assessment should evaluate what portion of the pricing of goods or industry expenses would be affected by an HFO ban. Conclusions may include effects on the price of goods, and on employment, wages and profits for businesses. An analysis of ship costs should also address whether a ban on HFO would have a significant or disproportionate impact on small entities or other segments of the Arctic shipping industry.

9 Fuel costs to ships that use HFO will depend primarily upon their current fuel use behaviour. Care should be taken to account for ship fuel cost increases due solely to an HFO ban, and not increases incurred from other causes, e.g. switching to fuel that is compliant with the 2020 global sulphur standard. Current fuel use behaviours can be grouped into the following categories:

- .1 ships that use only HFO;
- .2 ships using HFO that use exhaust gas cleaning systems (scrubbers) in order to comply with air emissions standards; and
- .3 ships that currently switch fuels between HFO and non-HFO.

10 The cost of installing scrubbers to comply with MARPOL Annex VI should not be conflated with costs that would be passed on to communities as a direct result of an HFO ban, because the ban would not necessarily prevent ships with scrubbers from using other high sulphur fuels. In addition, it should be noted that current international shipping regulations do not prevent ships with open-loop scrubbers from discharging the effluent that they generate, and as such, ships equipped with scrubbers could discharge this effluent into Arctic waters.

11 Because many ships are already switching fuels between HFO and marine diesels, one-time costs incurred by owners or operators as a result of an HFO ban in the Arctic will not apply to all ships, but could include:

- .1 costs to install, clean or modify equipment;
- .2 costs of out of service days related to modifications; and
- .3 costs for crew training.

12 The costs of debunkering HFO may need to be included in the assessment because a ban would not allow HFO carriage in fuel tanks within the Polar Code Arctic. It should be noted that operators active in the Arctic would likely transition their vessels or fleet for summer

work; thus, debunkering, if needed, would be associated with normal seasonal preparations rather than individual voyages. HFO debunkering could be avoided by following requirements and recommendations under the Polar Code (chapter 11) for voyage planning. It should also be noted that the Polar Code (part II-B, section 1.1) encourages ships not to use or carry HFO in the Arctic.

13 If ship costs increase as a result of a ban, the increase may be passed on through raising prices of goods and ship-related industry expenses. Price increases that are attributable to an HFO ban should be distinguished from increased costs due to other factors. The following factors should be considered and where appropriate, separated out from the impacts of an HFO ban:

- .1 costs that are incurred each time goods are transferred to or from non-HFO-fuelled vessels should already be incorporated into current costs;
- .2 delivery costs for goods that are bought in bulk for the year (e.g. gasoline and residential fuel) are often prearranged well in advance of delivery and thus could reflect past fuel prices or multiple other factors. A review of past pricing for bulk goods and associated ship fuel costs could be used to establish how tightly bulk pricing tracks ship costs for each community; and
- .3 competition and alternative means of shipping goods (e.g. air) can influence price adjustments made by vendors.

Step 3: Assessing the benefits of an HFO ban to Arctic communities

14 The assessment should determine the value, both monetary and non-monetary, of benefits that would occur with an HFO ban in place. Potential benefits include the avoidance of the costs associated with:

- .1 response and clean-up of HFO spills;
- .2 loss of marine and coastal natural resources important to food security that could be affected by an HFO spill; and
- .3 loss of culturally important subsistence activities.

15 The assessment should include costs of response to spills in areas with Arctic conditions. People that live, hunt, gather and fish in or near remote Arctic communities are likely to be the first responders to an oil spill in the Arctic due to limited spill response capabilities of regional and national spill responders. Therefore, costs of response and clean up of HFO spills should also account for the cost of adverse health impacts, the time community members spend away from subsistence activities that contribute to their food security, and the strain of an HFO spill on local public resources.

16 Estimating the prominence of subsistence culture and lifestyle within Arctic communities may help to understand the impact that an HFO spill would have on Arctic communities. For this part of the assessment, consider the proportion of population in Arctic communities that are reliant on subsistence activities for household food security. The economic value of food obtained through subsistence activities likely varies from household to household. At a minimum, three types of costs or losses would be avoided with an HFO ban:

- .1 the loss of marine and coastal natural resources;

- .2 healthcare costs incurred from switching food sources from subsistence to purchased foods; and
- .3 loss of the economic buffer provided by food and materials obtained through subsistence activities against price fluctuations of other goods.

17 The importance of subsistence activities is twofold. As previously described, one value is monetary. However, subsistence activities are integrated more broadly in a cultural sense as an aspect of the underpinnings of social cohesion, language, public health and identity. Populations that may already be at risk economically can also face social threats that could be exacerbated by the effects of an HFO spill on coastal and marine resources and subsistence activities associated with them. As such, the important cultural value of subsistence activities that would be protected by an HFO ban should be considered, and cannot simply be reduced to monetary terms.

Step 4: Other factors

18 There may be other factors that could either ameliorate adverse impacts of a ban or accommodate specific situations. Some examples are:

- .1 delay implementation for ships engaged exclusively in trade between ports or terminals of a State;
- .2 delay implementation for ships routinely making voyages between specified ports or locations; and
- .3 adjust HFO phase out schedules to accommodate other factors, e.g. local availability of fuel compliant with the global sulphur cap and availability of ships that use fuels other than HFO.

19 If these factors are considered, the assessment should evaluate how impacts to communities and industries are reduced by adding them, as well as how they affect the efficacy of a ban.

Action requested of the Committee

20 The Committee is invited to consider this proposed methodology and to take action as appropriate.
