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Background Paper

Arctic Shipping

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LIST OF ABBREVIATIONS

ACIA	Arctic Climate Impact Assessment
AEPS	Arctic Environmental Protection Strategy
AIS	automatic identification systems
AMAP	Arctic Monitoring and Assessment Programme
AMSA	Arctic Marine Shipping Assessment
AMSP	Arctic Marine Strategic Plan
APM	associated protective measure
ATCM	Antarctic Treaty Consultative Meeting
CDEM	construction, design, equipment and manning (standards)
DAT	Double Acting Tanker
DE	Sub-Committee on Design and Equipment, of the MSC
EEZ	exclusive economic zone
EPPR	Emergency, Prevention, Preparedness and Response (working group)
GAIRES	generally accepted international rules and standards
IACS	International Association of Classification Societies
ICJ	International Court of Justice
IHO	International Hydrographic Organization
IMO	International Maritime Organization
LRIT	Long-range identification and tracking of ships
MEPC	Marine Environment Protection Committee
MOU	memorandum of understanding
MSC	Maritime Safety Committee
MSI	maritime safety information
NAV	Sub-Committee on Navigation
nm	nautical mile (1 nm = 1,852 meters)
PAME	Protection of the Arctic Marine Environment (working group)
PSSA	particularly sensitive sea area
SRS	ship reporting system
VTS	vessel traffic services

EXECUTIVE SUMMARY

This background paper focuses on intra-Arctic and trans-Arctic marine shipping in the Arctic marine area. Trans-Arctic marine shipping can take place by means of various routes and combinations of routes. Two of these routes are the Northwest Passage and the Northern Sea Route. As a consequence of the accelerated melting of Arctic sea-ice, however, the Central Arctic Ocean Route may soon be an option as well. The most suitable course of this latter route will probably vary greatly from year to year. These annual variations may lead to various combinations of the Central Arctic Ocean Route on the one hand and the Northwest Passage and Northern Sea Route on the other hand. It is finally important to note that all trans-Arctic marine shipping must pass through the Bering Strait, thus making it a 'choke point'.

Current Arctic marine shipping is mainly intra-Arctic. Since 2000, there have only been a small number of trans-Arctic voyages in summer for science and tourism across the Northwest Passage and the Northern Sea Route. The main consequence of climate change for Arctic marine shipping is contained in the Arctic Climate Impact Assessment (ACIA)'s Key Finding No. 6: "Reduced sea ice is very likely to increase marine transport and access to resources". Intra-Arctic and trans-Arctic shipping can be interesting alternatives for the much longer routes using the Panama and Suez Canals or Arctic routes that are partly terrestrial and partly marine. Summers without sea-ice in much or all of the Arctic Ocean may only be a few decades ahead in the future but sea-ice is still expected to be widespread during winters. While much or most of this will be relatively thin first-year sea-ice - and thus not too problematic to marine shipping - there may be other factors that could adversely affect shipping conditions.

The Arctic Marine Shipping Assessment (AMSA) that is currently carried out under the Arctic Council's Protection of the Arctic Marine Environment (PAME) working group, will provide projections of future Arctic marine shipping. This is facilitated by so-called 'scenarios'; plausible stories about the future. AMSA's Scenario Narratives of May 2008 are based on two variables (a) governance stability and (b) demand in resources and trade. These two variables lead to four scenarios referred to as (i) Arctic race, (ii) Arctic saga, (iii) Polar lows and (iv) Polar preserve. Each of these is potentially influenced by uncertainties or 'wildcards', for instance accelerated Arctic meltdown, major Arctic shipping disasters and technology breakthroughs.

At least in the near future, it seems that a high price for hydrocarbons will be an important driver, not only because of cost-benefits of shorter trans-Arctic shipping routes but also because the expected exploration and exploitation of hydrocarbon resources in the Arctic marine area will lead to increased shipping. Still, the risk-assessments of classification societies and the marine insurance industry are likely to be a crucial factor for the economic viability of all Arctic marine shipping. The future expansion of Arctic marine shipping is also likely to lead to more diverse stakeholders, which also do not necessarily have Arctic states as their main basis. Trans-Arctic marine shipping is expected to be an important driver for this development.

The actual and potential impacts of shipping on the marine environment and marine biodiversity in the Arctic marine area are not fundamentally different from elsewhere in the

world. They include, *inter alia*, shipping incidents, operational discharges and emissions, navigation impacts, introduction of alien organisms and anchoring impacts. However, the risk of some of these impacts, for instance shipping incidents, may be higher in some parts of the Arctic marine area due to the presence of ice(bergs) and insufficient experience in navigating in ice-covered areas and the lack of accurate charts. Moreover, the remoteness of much of the Arctic marine area, the limited available maritime safety information (MSI) data and the challenges of navigating therein mean that, once shipping incidents do occur, a response will take relatively long and may even then be inadequate to address impacts to the marine environment and marine biodiversity.

International regulation of vessel-source pollution is primarily done by global bodies and in particular by the International Maritime Organization (IMO). This is a direct consequence of the global nature of international shipping and the interest of the international community in globally uniform international regulation. The United Nations Convention on the Law of the Sea (LOS Convention) safeguards the latter interest by only allowing unilateral coastal state prescription in a few situations. Canada and the Russian Federation rely on one of these - Article 234 entitled 'Ice-covered areas' - for prescribing standards that are more stringent than generally accepted international rules and standards (GAIRAS). It should be noted, however, that the LOS Convention gives no guidance as to whether the regime of transit passage - for straits used for international navigation - trumps the regime of Article 234 or vice versa.

The Arctic states have also adopted several relevant bilateral and regional instruments on monitoring, contingency planning and preparedness for pollution incidents.

The relevant IMO instruments primarily have a global scope of application and therefore apply to the entire Arctic marine area. The only IMO instrument that is specifically tailored to the Arctic are the non-legally binding IMO Arctic Shipping Guidelines. These are currently under revision and may eventually become applicable to the Antarctic as well. Also worth mentioning are the International Association of Classification Societies (IACS) Unified Requirements concerning Polar Class, which complement the IMO Arctic Shipping Guidelines and other relevant IMO instruments.

All relevant output of the Arctic Council is non-legally binding and predominantly originates from within the PAME and Emergency, Prevention, Preparedness and Response (EPPR) working groups. PAME is currently engaged in the AMSA, which is to be released at the Arctic Council Ministerial Meeting in April 2009 in Norway.

As regards gaps, it should be noted that not all Arctic states are parties to relevant international instruments. For instance, the Russian Federation is not a party to OPRC 90. Furthermore, with respect to substantive standards or requirements, the international legal framework contains:

- no special IMO discharge, emission or ballast water exchange standards for the Arctic marine area;
- no comprehensive mandatory or voluntary IMO ships' routing system for the Arctic marine area in its entirety or a large part thereof; and
- no legally binding special construction, design, equipment and manning (CDEM) (including fuel content and ballast water treatment) standards for the Arctic marine area.

The extent in which the absence of these standards or requirements pose a threat to the marine environment or biodiversity in the Arctic marine area cannot be assessed in this context.

As regards the regional agreements on monitoring, contingency planning and preparedness for pollution incidents, it should be noted that these do not cover the entire Arctic marine area and that not all Arctic Ocean coastal states are parties to them. A related gap is the absence of a regional agreement on search and rescue.

In relation to compliance and enforcement, it can also be concluded that there is no regional approach by Arctic states or an alternative group of states specifically aimed at ensuring compliance with applicable international rules and standards and national laws and regulations. It is moreover uncertain to what extent the IMO Arctic Shipping Guidelines and the IACS Unified Requirements concerning Polar Class are complied with by states, ship-owners and operators, crew and IACS members.

The following are options for adjusting the current international legal framework relating to shipping in the Arctic marine area in case such adjustments are regarded as necessary in view of current or future threats of shipping to the marine environment and marine biodiversity in the Arctic marine area.

Options for action within IMO:

- Make the IMO Arctic Shipping Guidelines mandatory, for instance by incorporating them into SOLAS 74 and complement them with new elements such as training for ice navigators, which could be incorporated in STCW 78;
- Pursue the adoption of special standards, for instance
 - Special discharge or emission standards for all or part of the Arctic marine area under MARPOL 73/78;
 - Special fuel content or ballast water treatment standards;
 - One or more mandatory ships' routing systems, whether or not in the form of a comprehensive 'Arctic Sea Lanes' proposal;
 - Ship reporting systems;
 - Compulsory pilotage and ice-breaker or tug assistance; and
 - Special anti-fouling standards.
- Designate (part of) the Arctic as a PSSA, with a comprehensive package of APMs consisting of one or more of the special standards just mentioned above and other special standards such as special ballast water exchange standards.

Options for Arctic states at the regional level, in their capacities as coastal states:

- Agree on legally binding agreements on monitoring, contingency planning and preparedness for pollution incidents, as well as on search and rescue, including by designating places of refuge;
- Agree on a harmonized approach on enforcement and ensuring compliance, inter alia by means of shared platforms (e.g. 'shiprider agreements');
- Implement the BWM Convention individually or in concert; and
- Take other action under Article 234 of the LOS Convention, in particular if the IMO Arctic Shipping Guidelines are not made mandatory.

Background paper: Arctic Shipping

Options for Arctic states and other states at the regional level, in their capacities as port states:

- Develop a strategy for port state control in the Arctic, for instance by establishing an Arctic MOU on Port State Control or by adjusting the Paris and Tokyo MOUs on port state control to ensure that proper account is taken of intra-Arctic and trans-Arctic marine shipping;
- Implement Article 218 of the LOS Convention in concert; and
- Exercise port state residual jurisdiction in concert - relying in part on Article 234 of the LOS Convention - in case the IMO Arctic Shipping Guidelines are not made mandatory.

Other options for Arctic states in particular, individually or collectively:

- Address the need for hydrographic surveying and charting;
- Consider the need to develop a regional liability regime;
- Encourage self-regulation by the shipping industry - for instance the cruise industry - by means of positive and negative incentives (e.g. positive discrimination and limiting landings and access to ports to cooperating players);
- Urge IACS to restrict the margin of discretion that individual members have in relation to the IACS Unified Requirements concerning Polar Class; and
- Require the marine insurance industry to promote compliance with IACS Unified Requirements concerning Polar Class, for instance by linking the level of compliance to the height of premiums.

Other options for all states, individually or collectively, in their capacities as flag states:

- Impose standards on their vessels that are more stringent than GAIRES, for instance special discharge, emission and ballast water exchange standards or by implementing the IMO Arctic Shipping Guidelines into their legislation.

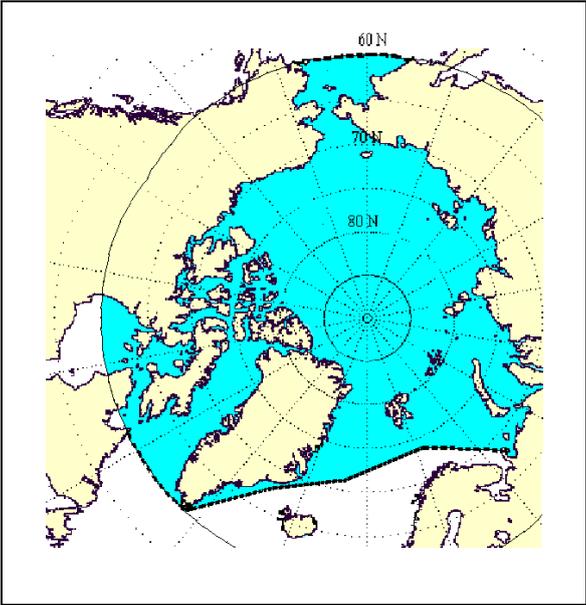
1. INTRODUCTION

This background paper starts with section 2 on its spatial scope and the type of shipping covered, followed by section 3 on the consequences of climate change for Arctic marine shipping. Next, section 4 focuses on current and potential future threats of Arctic marine shipping to the marine environment and marine biodiversity in the Arctic marine area. Section 5 then gives an overview of the international legal and policy framework with respect to Arctic marine shipping. The paper concludes with section 6 on the gaps in the international legal and policy framework and options for addressing them.

2. SPATIAL SCOPE AND TYPE OF SHIPPING

For the purpose of this paper, Arctic marine shipping is regarded as the shipping that occurs or could occur in the Arctic marine area (as defined in the Introduction to the background papers). The Arctic marine area has a broader spatial scope than the maximum scope of application of the International Maritime Organization (IMO)'s Arctic Shipping Guidelines¹ (see Figure 1).

Figure 1: Maximum scope of application IMO Arctic Shipping Guidelines



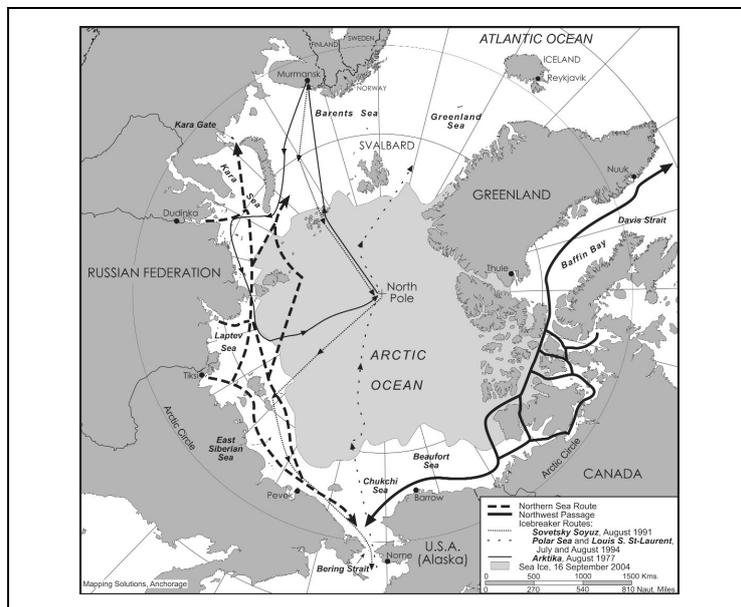
Source: IMO Arctic Shipping Guidelines, Annex, p. 7.

Arctic marine shipping can be trans-Arctic or intra-Arctic. Trans-Arctic marine shipping can take place by means of various routes and combinations of routes. Two of these routes are the Northwest Passage and the Northern Sea Route (see Figure 2). The official Northern Sea Route encompasses all routes across the Russian Arctic coastal seas from Kara Gate

¹ 'Guidelines for Ships Operating in Arctic Ice-Covered Waters', IMO Doc. MSC/Circ.1056 – MEPC/Circ.399, of 23 December 2002. See also note 32 infra and accompanying text.

(at the southern tip of Novaya Zemlya) to Bering Strait.² The Northwest Passage is the name given to the marine routes between the Atlantic and Pacific oceans along the northern coast of North America that span the straits and sounds of the Canadian Arctic Archipelago. As a consequence of the accelerated melting of Arctic sea ice, however, the Central Arctic Ocean Route may soon be an option as well. The most suitable course of this latter route will probably vary greatly from year to year. These annual variations may lead to various combinations of the Central Arctic Ocean Route on the one hand and the Northwest Passage and Northern Sea Route on the other hand. As Figure 2 (below) shows, some of the routes of which Northern Sea Route consists already pass through the high seas area of the Central Arctic Ocean. It is finally important to note that all trans-Arctic marine shipping must pass through the Bering Strait.

Figure 2: Locations of Northwest Passage and Northern Sea Route



Source: Final Report of the Arctic Marine Transport Workshop, 28-30 September 2004, Cambridge.³

As regards the type of shipping, this background paper covers all intra-Arctic and trans-Arctic marine shipping, including but not limited to:

- shipping for the purpose of tourism and for servicing installations used for the exploration and exploitation of offshore hydrocarbon resources;
- the larger fishing vessels that are covered by SOLAS 74⁴; and

² For a definition of the NSR, see L. Tymchenko, "The Northern Sea Route: Russian Management and Jurisdiction over Navigation in Arctic Seas" in A.G. Oude Elferink and D.R. Rothwell (eds.), *The Law of the Sea and Polar Maritime Delimitation and Jurisdiction* (Martinus Nijhoff Publishers: 2001), pp. 269-291.

³ Text available at <www.institutenorth.org> (viewed 9 February 2009).

⁴ International Convention for the Safety of Life at Sea, London, 1 November 1974. In force 25 May 1980, with protocols and regularly amended.

- warships and other government ships operated for non-commercial purposes.⁵

3. CONSEQUENCES OF CLIMATE CHANGE FOR ARCTIC MARINE SHIPPING

Current Arctic marine shipping is mainly intra-Arctic, which dominates summer operations in the Canadian Arctic and around the east and west Greenlandic coasts. Year-round Arctic marine transport in the Russian Arctic has been maintained since 1978-79 between the port of Dudinka on the Yenisey River and Murmansk. There have only been a small number of trans-Arctic voyages in summer for science and tourism across the Northwest Passage and the Northern Sea Route since 2000.⁶

The main consequence of climate change for Arctic marine shipping is contained in the Arctic Climate Impact Assessment (ACIA)'s Key Finding No. 6: "Reduced sea ice is very likely to increase marine transport and access to resources".⁷ Intra-Arctic and trans-Arctic shipping can be interesting alternatives for the much longer routes using the Panama and Suez Canals or Arctic routes that are partly terrestrial and partly marine. It is nevertheless important to realize that even though summers without sea-ice in much or all of the Arctic Ocean may only be a few decades ahead in the future, sea-ice is still expected to be widespread during winters. While much or most of this will be relatively thin first-year sea-ice - and thus not too problematic to marine shipping - there may be other factors that could adversely affect shipping conditions.⁸

The Arctic Marine Shipping Assessment (AMSA) that is currently carried out under the Arctic Council's Protection of the Arctic Marine Environment (PAME) working group, will provide projections of future Arctic marine shipping.⁹ This is facilitated by so-called 'scenarios'; plausible stories about the future. AMSA's Scenario Narratives¹⁰ of May 2008 are based on two variables (a) governance stability and (b) demand in resources and trade. These two variables lead to four scenarios referred to as (i) Arctic race, (ii) Arctic saga, (iii) Polar lows and (iv) Polar preserve. Each of these is potentially influenced by uncertainties or 'wildcards', for instance accelerated Arctic meltdown, major Arctic shipping disasters and technology

⁵ For a definition of 'warship' see Art. 29 of the LOS Convention, see note 23 infra.

⁶ Information kindly provided by L. Brigham, August 2008.

⁷ ACIA Overview Report, Executive Summary, at p. 10 (available at <www.acia.uaf.edu>; viewed 4 August 2008).

⁸ See also J. Kraska, "The Law of the Sea Convention and the Northwest Passage," 22 *International Journal of Marine and Coastal Law* 257-282 (2007), at p. 260.

⁹ See also D. VanderZwaag et al., *Governance of Arctic Marine Shipping*, Report prepared for the AMSA (Halifax, Nova Scotia: Marine & Environmental Law Institute, Dalhousie University, 2008; also available at <www.pame.is>).

¹⁰ *The Future of Arctic Marine Navigation in Mid-Century. Scenario Narratives* (May 2008), prepared for the Arctic Marine Shipping Assessment (AMSA) (available at <www.pame.is> (viewed at 9 February 2009)).

breakthroughs.¹¹ An example of the last is the Double Acting Tanker (DAT), which has a stern designed for ice-breaking and a bow optimized for open water conditions.¹²

At least in the near future, it seems that a high price for hydrocarbons will be an important driver, not only because of cost-benefits of shorter trans-Arctic shipping routes but also because the expected exploration and exploitation of hydrocarbon resources in the Arctic marine area will lead to increased shipping. The risk-assessments of classification societies and the marine insurance industry are nevertheless likely to be a crucial factor for the economic viability of all Arctic marine shipping. The future expansion of Arctic marine shipping is also likely to lead to more diverse stakeholders,¹³ which also do not necessarily have Arctic states as their main basis. Trans-Arctic marine shipping is expected to be an important driver for this development.

4. CURRENT AND POTENTIAL FUTURE THREATS OF ARCTIC MARINE SHIPPING TO THE MARINE ENVIRONMENT AND MARINE BIODIVERSITY IN THE ARCTIC MARINE AREA

Marine shipping has the following actual and potential impacts on the marine environment and marine biodiversity:

- shipping incidents leading to accidental discharges of polluting substances (cargo or fuel) or physical impact on components of the marine ecosystem (e.g. on benthos and large marine mammals);
- operational discharges (cargo residues, fuel residues (sludge), (incineration of) garbage and sewage) and emissions;
- navigation impacts (noise pollution and other forms of impacts on, or interference with, marine species potentially causing, for instance, disruption of behavior, abandonment or trampling of the young by fleeing animals or displacement from normal habitat);
- introduction of alien organisms through ballast-water exchanges or attachment to vessel hulls (e.g. in crevices¹⁴); and
- anchoring impacts.

¹¹ Based on AMSA Scenario Narratives, note 10 supra, at p. 19 and the '20 Key AMSA Uncertainties' identified by L.W. Brigham, *Arctic Shipping: AMSA & Transatlantic Opportunities. Responses to a Changing Arctic Ocean* (presentation at May 2008 Arctic TRANSFORM meeting).

¹² Final Report of the Arctic Marine Transport Workshop, note 3 supra, at p. A.11.

¹³ Cf. the AMSA Scenario Narratives Report, note 10 supra, at p. 2. Attention can also be drawn to the participation of the Japanese-based Ship and Ocean Foundation in the International Northern Sea Route Programme (INSROP) (for information see <www.fni.no/insrop>).

¹⁴ See - in relation to the Antarctic - Doc. ATME 2004 (Antarctic Treaty Meeting of Experts on Tourism and Non-governmental Activities in Antarctica) No. 14 'Establishment of Effective Antarctic Quarantine Controls for Tourism and Non-Government Activities. Submitted by Australia', at p. 2; and Final Report of the XXVIIIth Antarctic Treaty Consultative Meeting (ATCM) (2004), at p. 23, para. 134, which *inter alia* refers to the fact that many vessels used in Antarctic tourism also operate in the Arctic. For a discussion see E.J. Molenaar, "Sea-Borne Tourism in Antarctica: Avenues for Further Intergovernmental Regulation", 20 *International Journal of Marine and Coastal Law* 1-49 (2005).

All these actual and potential impacts are also relevant for Arctic marine shipping. The likelihood of some of these impacts, for instance shipping incidents, may be higher in some parts of the Arctic marine area due to the presence of ice(bergs) and insufficient experience in navigating in ice-covered areas and the lack of accurate charts.¹⁵ In addition, cold temperatures may affect machinery and icing can create additional loads on the hull, propulsion systems and appendages.¹⁶ Moreover, the remoteness of much of the Arctic marine area, the limited available maritime safety information (MSI) data¹⁷ and the challenges of navigating therein mean that, once shipping incidents do occur, a response will take relatively long and may even then be inadequate to address impacts to the marine environment and marine biodiversity.

5. INTERNATIONAL LEGAL AND POLICY FRAMEWORK

5.1. Introduction

The aim of this section is to provide an overview of the international legal and policy framework with respect to Arctic marine shipping. The purpose of regulating Arctic marine shipping follows from the core focus of Arctic TRANSFORM, namely the protection and preservation of the marine environment and marine biodiversity of the Arctic marine area. This means that IMO's mandate over maritime safety and security in international shipping is in principle beyond this paper's scope.¹⁸ However, IMO rules and standards that are primarily aimed at ensuring maritime safety and security are still taken into account if they have a significant subsidiary purpose of pollution prevention.

5.2. Interests, rights, obligations and jurisdiction

The international legal and policy framework for vessel-source pollution balances the different interests of the international community as a whole with the interests of states that have rights, obligations or jurisdiction in their capacities as flag, coastal or port states or with respect to their natural and legal persons. While the term 'flag state' is commonly defined as the state in which a vessel is registered and/or whose flag it flies,¹⁹ there are no generally accepted definitions for the terms 'coastal state' or 'port state'. For the purpose of this background paper, however, the term 'coastal state' refers to the rights, obligations and jurisdiction of a state within its own maritime zones over foreign vessels. Conversely, the term 'port state' refers to the rights, obligations and jurisdiction of a state over foreign vessels

¹⁵ The lack of accurate charts is, *inter alia*, noted in IMO Assembly Resolution A.999(25), note 88 *infra* and accompanying text, at Annex, under 2.1.1; ATCM Resolution 5(2008), 'Hydrographic surveying and charting' which *inter alia* notes the role of the International Hydrographic Organization (IHO) and S.G. Borgerson, "Arctic Meltdown. The Economic and Security Implications of Global Warming", 87 *Foreign Affairs* 63-77 (2008), at p. 76.

¹⁶ Cf. VanderZwaag et al, note 9 *supra*, at p. 13. See also pp. 15-16.

¹⁷ This issue is addressed, *inter alia*, in the IMO Sub-Committee on Radiocommunications and Search and Rescue (COMSAR) and by means of a joint IMO/IHO/World Meteorological Organization (WMO) Correspondence Group on Arctic MSI Services.

¹⁸ For more attention to these issues see VanderZwaag et al, note 9 *supra*.

¹⁹ See e.g. Art. 91(1) of the LOS Convention.

that are voluntarily in one of its ports. The rights, obligations and jurisdiction of a port state do not overlap with those of a coastal state (e.g. port states would have jurisdiction over illegal discharges that have occurred beyond the coastal state's maritime zones,²⁰ as well as over violations of conditions for entry into port).²¹

The balance in the abovementioned framework is first of all between the socio-economic interests of flag states in unimpeded navigation and a minimum of globally uniform international regulation, and the environmental interests of the coastal state. The port state commonly seeks to balance its local environmental interests and the broader environmental interests that 'its' coastal state has over its maritime zones, against the socio-economic interests of the port and its 'hinterland'. The interests of the international community normally overlap with those of flag, coastal and port states but are usually broader and more general. The interests of some states, however, clearly undermine those of other states and the international community. For instance by not ensuring that their ships comply with international minimum standards or by allowing foreign vessels in their ports to be in non-compliance with international minimum standards. These states, vessels and ports thereby have a competitive advantage over states, vessels and ports that *do* comply with international minimum standards. Such 'free riders' clearly benefit from the consensual nature of international law - meaning that a state can only be bound to a rule of international law when it has in one way or another consented to that rule. As regards flag states this problem is aggravated due to the flag state's discretion in registering ships, the primacy of flag state jurisdiction over ships flying its flag on the high seas and the failure of the current body of international law to specify consequences for the absence of a genuine link between a ship and its flag state.²²

It should be realized that states generally have interests, rights, obligations and jurisdiction in more than one capacity. This often leads to a more balanced compromise position but occasionally also to contradictory positions of the same state within different fora. There is no reason or indication to assume that Arctic states are different in this regard. The definitions for 'port state' and 'coastal state' presented above are necessary for the legal analysis further below.

A common distinction with regard to jurisdiction is that between prescriptive jurisdiction - whereby a state prescribes (enacts) rules and standards - and enforcement jurisdiction - whereby a state enforces the rules and standards it has prescribed. The term regulation usually means prescription in this paper, but can also have a broader meaning to encompass enforcement. Jurisdiction is commonly restricted in terms of its spatial and substantive scope

²⁰ See e.g. Art. 218 of the LOS Convention.

²¹ It is acknowledged, however, that other definitions are used elsewhere. See, for instance, para. G-3.20 of the IMO Arctic Shipping Guidelines where port state is defined as "a State whose area of jurisdiction includes any destination port of a ship where such port lies within Arctic ice-covered waters".

²² See Arts. 91(1), 92(1) and 94 of the LOS Convention.

and the subjects that are covered. The next subsection devotes some more attention to the substantive scope of standards or requirements.

5.3. Substantive standards or requirements

In view of the jurisdictional framework for vessel-source pollution laid down in the LOS Convention and the types of standards agreed to within IMO so far, the following categories of substantive standards or requirements can be distinguished:

- discharge and emission standards, including standards relating to ballast water exchange;
- construction, design, equipment and manning (CDEM) standards, including fuel content specifications and ballast water treatment requirements;
- navigation standards, in the form of ships' routing measures, ship reporting systems (SRSs) and vessel traffic services (VTS);
- contingency planning and preparedness standards; and
- liability and insurance requirements.

This categorization is merely meant to facilitate the discussion below, however. It does not capture the entire spectrum of types of standards or requirements developed within IMO or applied by individual states acting in their various capacities. An Arctic Ocean coastal state may for instance require use of ice-breaker assistance and the payment of fees for such services.

5.4. Intergovernmental and other relevant international bodies

International regulation of vessel-source pollution is primarily done by global bodies. This is a direct consequence of the global nature of international shipping and the interest of the international community in a minimum of globally uniform international regulation. The LOS Convention²³ safeguards the latter interest by only allowing unilateral coastal state prescription in a few situations.²⁴ The regional bodies or groupings of states that nevertheless exercise prescriptive or enforcement jurisdiction over vessel-source pollution commonly do this in their capacities as flag or port states.²⁵ For instance, Annex IV, entitled 'Prevention of Marine Pollution' of the Environmental Protocol to the Antarctic Treaty²⁶ is

²³ United Nations Convention on the Law of the Sea, Montego Bay, 10 December 1982. In force 16 November 1994, 1833 *United Nations Treaty Series* 396; <www.un.org/Depts/los>.

²⁴ See subsection 5.5 infra.

²⁵ Art. 211(3) of the LOS Convention explicitly acknowledges the right of port States to prescribe – individually or in concert – more stringent standards than generally accepted international rules and standards (GAIRAS).

²⁶ Protocol on Environmental Protection to the Antarctic Treaty; Annexes I-IV, Madrid, 4 October 1991. In force 14 January 1998; Annex V (adopted as Recommendation XVI-10), Bonn, 17 October 1991. In force 24 May 2002; Annex VI (adopted as Measure 1(2005)), Stockholm, 14 June 2005. Not in force. All texts available at <www.ats.aq>.

largely a flag state approach²⁷ and regional agreements on port state control such as the Paris MOU²⁸ and the Tokyo MOU²⁹ are examples of a port state approach.

The IMO bodies of most relevance to this background paper are the Marine Environment Protection Committee (MEPC), the Maritime Safety Committee (MSC) and the latter's Sub-Committee on Navigation (NAV), its Sub-Committee on Design and Equipment (DE) and its Sub-Committee on Radiocommunications and Search and Rescue (COMSAR). Amendments to MARPOL 73/78³⁰ are adopted by the MEPC and amendments to SOLAS 74 by the MSC. The MEPC also has a coordinating role in relation to particularly sensitive sea areas (PSSAs) and the MSC has the authority to adopt mandatory SRSs, ships' routeing systems and VTS pursuant to SOLAS 74 and COLREG 72³¹. Proposals for many of the associated protective measures (APMs) that are made applicable within PSSAs are first discussed in the NAV. The DE is currently undertaking a complete revision of the IMO Arctic Shipping Guidelines, including by broadening its spatial scope to Antarctic waters.³²

Of the Arctic Council bodies, the efforts of the PAME and the Emergency, Prevention, Preparedness and Response (EPPR) working groups are the most relevant to this background paper.

Other international bodies that are relevant include:

- the OSPAR Commission established under the OSPAR Convention;³³
- the joint Norwegian-Russian Federation Commission on Environmental Protection established pursuant to a 1992 bilateral Agreement.³⁴ Its Working Group on

²⁷ Cf. Art. 2. See also the acts of the OSPAR Commission in note 97 *infra* and accompanying text.

²⁸ Memorandum of Understanding on Port State Control, Paris, 26 January 1982. In effect 1 July 1982, as regularly amended. Most recent text at <www.parismou.org>.

²⁹ Asia-Pacific Memorandum of Understanding on Port State Control in the Asia-Pacific Region, Tokyo, 1 December 1993. In effect 1 April 1994, as regularly amended. Most recent text at <www.tokyo-mou.org>.

³⁰ International Convention for the Prevention of Pollution from Ships, London, 2 November 1973, as modified by the 1978 Protocol (London, 1 June 1978) and the 1997 Protocol (London, 26 September 1997) and as regularly amended. Entry into force varies for each Annex. At the time of writing Annexes I-VI were all in force. At the 58th Session in October 2008, the MEPC adopted a revised Annex VI and its associated NOx Technical Code. These will enter into force on 1 July 2010 in accordance with the tacit amendment procedure (information obtained from <www.imo.org> on 10 February 2009).

³¹ Convention on the International Regulations for Preventing Collisions at Sea, London, 20 October 1972. In force 15 July 1977, as regularly amended.

³² At the 51st Session of the DE in February 2008 it was agreed that a complete revision was necessary. A correspondence group was established to prepare draft revised guidelines for submission to the next Session of the DE in March 2009 (information obtained from <www.imo.org> on 10 February 2009).

³³ Convention for the Protection of the Marine Environment of the North-East Atlantic, Paris, 22 September 1992. In force 25 March 1998, <www.ospar.org>. Annex V, Sintra, 23 September 1998. In force 30 August 2000; <www.ospar.org>. Note that the efforts of the OSPAR Commission under Annex V on the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area is addressed in the background paper on Environmental Governance.

³⁴ Agreement Between the Governments of the Kingdom of Norway and the Russian Federation on Cooperation in Environmental Matters, Oslo, 3 September 1992. In force same day;

Protection of the Marine Environment - established in 2005 - has to a certain degree dealt with issues related to transshipment of oil at sea, but not as one of its main themes.³⁵ Its predecessor - the Working Group on Marine Protection - dealt among other things with the implementation of a 1994 bilateral Agreement^{36, 37}. The Russian Federation has recently proposed to establish a new working group on 'Ecological Safety regarding Marine Transportation of Oil along the coasts of Norway and Russia'. This proposal may have been discussed at the Commission meeting in November/ December of 2008;³⁸

- the Port State Control Committees set up under the Paris and Tokyo MOUs; and
- the International Association of Classification Societies (IACS), in particular on account of its Unified Requirements concerning Polar Class³⁹.

5.5. International instruments

LOS Convention

Most of the LOS Convention's provisions on vessel-source pollution are laid down in its Part XII, entitled 'Protection and Preservation of the Marine Environment'. This part begins with Section 1, entitled 'General Provisions' and applies to all sources of pollution. Its first provision - Article 192 - lays down the general obligation for all states - in whatever capacity therefore - "to protect and preserve the marine environment". This is elaborated in Article 194 with regard to measures to prevent, reduce and control pollution of the marine environment; aimed specifically at vessel-source pollution in paragraph (3)(b). Other relevant general obligations relate to rare or fragile ecosystems and the habitat of endangered species (Article 194(5)), introduction of alien species (Article 196), co-operation on a global or regional basis (Article 197), contingency plans against pollution (Article 199), monitoring of the risks or effects of pollution (Article 204) and assessment of potential effects of activities (Article 206).

Overenskomst med fremmede makter (Oslo, Norwegian Ministry of Foreign Affairs: 1992), pp. 1,532-1,535. This agreement replaces a narrower 1988 under the same name. See also O.S. Stokke, "Sub-regional Cooperation and Protection of the Arctic Marine Environment: the Barents Sea" in: D. Vidas (ed.) *Protecting the Polar Marine Environment - Law and Policy for Pollution Prevention* (Cambridge, Cambridge University Press: 2000), pp. 124-148, at p. 125.

³⁵ Information provided by M. Nyborg, Department for International Cooperation, Section for Polar Affairs and Cooperation with Russia, Norwegian Ministry of the Environment, September 2008.

³⁶ Agreement between Norway and the Russian Federation Concerning Cooperation on the Combating of Oil Pollution in the Barents Sea, Moscow, 28 April 1994. In force 30 January 1996; Overenskomst med fremmede makter (Oslo, Norwegian Ministry of Foreign Affairs: 1996), pp. 94-98.

³⁷ Information provided by M. Nyborg, note 35 supra. Cf. also Stokke, note 34 supra.

³⁸ Information provided by M. Nyborg, note 35 supra.

³⁹ These are Unified Requirement (UR) I1 'Polar Class Descriptions and Application' (Corr.1, Oct. 2007), UR I2 'Structural Requirements for Polar Class Ships' (Corr.1, Oct. 2007) and UR I3 'Machinery Requirements for Polar Class Ships' (Corr.1, Oct. 2007). All texts are available at <www.iacs.org.uk>. Mention should here also be made by initiatives of individual classification societies such as the American Bureau of Shipping (ABS) 'Guide for Vessels Operating in Low Temperature Environments', which was updated in December 2008 (see <www.eagle.org>) as well as the joint initiatives between ABS and the Russian Maritime Register of Shipping (RS) on Arctic LNG (liquid natural gas) carriers (see press release of 13 October 2008 at <www.eagle.org>).

Sections 5 and 6 contain separate provisions on prescription and enforcement for all each of the sources of pollution.

The jurisdictional framework relating to vessel-source pollution laid down in the LOS Convention is predominantly aimed at flag and coastal states. Apart from one explicit provision (Article 218), port state jurisdiction is only implicitly dealt with (see further below). As a general rule, prescriptive jurisdiction by flag and coastal states is linked by means of rules of reference to the notion of ‘generally accepted international rules and standards’ (GAIRAS). These refer to the technical rules and standards laid down in instruments adopted by regulatory organizations, in particular IMO. It is likely that the rules and standards laid down in legally binding IMO instruments that have entered into force can at any rate be regarded as GAIRAS.⁴⁰ The LOS Convention stipulates that flag state prescriptive jurisdiction over vessel-source pollution is mandatory and must have at least the same level as GAIRAS.⁴¹ Flag states can therefore choose to require their vessels to comply with more stringent standards than GAIRAS, for instance by implementing the IMO Arctic Shipping Guidelines in their legislation. Conversely, coastal state prescriptive jurisdiction over vessel-source pollution is optional under the LOS Convention but, if exercised, cannot be more stringent than the level of GAIRAS.⁴² This is the general rule even though it is subject to some exceptions (see below).

The general rule is also applicable to marine areas where the regime of transit passage laid down in Part III, Section 2 of the LOS Convention applies.⁴³ This regime was developed for narrow straits that would no longer have a high seas corridor once the strait states would extend the breadth of their territorial seas to 12 nautical miles (nm). The applicability of the regime of transit passage is nevertheless dependent on various conditions. One of these is laid down in Article 37 and is of particular relevance for this paper because it stipulates that the regime of transit passage only applies to “straits which are used for international navigation”. Canada and the Russian Federation appear to interpret these words as requiring an actual degree of usage while rejecting potential usage and thereby conclude that the Northwest Passage and the Northern Sea Route are not subject to the regime of transit passage.⁴⁴ Provided Canada and the Russian Federation are not able to block transits too much, climate change may soon make it difficult to rely on actual usage. The United States regards the Northwest Passage and parts of the Northern Sea Route as straits used for

⁴⁰ For a discussion see E.J. Molenaar, *Coastal State Jurisdiction over Vessel-Source Pollution* (The Hague/Boston/London, Kluwer Law International: 1998), pp. 140-167.

⁴¹ Cf. Art. 211(2) of the LOS Convention.

⁴² Cf. Arts 21(2), 39(2) and 211(5) of the LOS Convention.

⁴³ Cf. Arts 41 and 42(1)(a) and (b) of the LOS Convention.

⁴⁴ See, *inter alia*, D.R. Rothwell, *The Polar Regions and the Development of International Law* (Cambridge, Cambridge University Press: 1996), at pp. 189-212 and Molenaar, note 40 supra, at p. 306. Other important issues are whether or not the straight baselines drawn by Canada around its Arctic islands are consistent with international law (see Introduction to the background papers). Arguably, even if this would be the case, pursuant to Art. 8(2) of the LOS Convention the regime of innocent passage would still apply.

international navigation subject to the regime of transit passage.⁴⁵ States with large fleets engaged in international shipping - in particular those relatively near the Arctic, such as China, Japan, Norway, South Korea and several EU Member States - are likely to share this view. Strangely enough, the European Commission's Arctic Communication fails to articulate a clear position.⁴⁶

General exceptions

The abovementioned general rule only relates to pollution of the marine environment by vessels. The term 'pollution of the marine environment' is defined in Article 1(1)(4) of the LOS Convention as

the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities

As neither anchoring nor discharges of ballast water seem to fall within this definition, the abovementioned restriction on coastal state jurisdiction over vessel-source pollution does not apply either. As regards anchoring, this view seems to be supported by the practice of the United States in regulating anchoring beyond its territorial sea without seeking IMO approval and without any apparent objection by other states. In pursuing this practice, the United States apparently relies on its sovereign rights as a coastal state over resources.⁴⁷ As regards ballast water discharges, the above view is supported by the fact that, instead of an Annex to MARPOL 73/78, IMO decided to deal with ballast water management in a stand-alone treaty, namely the BWM Convention⁴⁸. Moreover, the BWM Convention allows states individually or in concert to regulate more stringently above the minimum ballast water exchange level laid down in the Convention.⁴⁹

More stringent standards can also be adopted for special areas pursuant to Article 211(6) of the LOS Convention. But as this requires at any rate IMO approval, it gives coastal states no

⁴⁵ See the United States Arctic Region Policy (National Security Presidential Directive/NSPD-66 & Homeland Security Presidential Directive/HSPD-25, of 9 January 2009. In effect same day; text at <www.whitehouse.gov> (press release of 12 January 2009)), at Section III(B)(5).

⁴⁶ COM (2008) 763, of 20 November 2008, 'Communication from the Commission to the European Parliament and the Council on The European Union and the Arctic Region'. On p. 8 mention is made of the need to "defend the principle of freedom of navigation and the right of innocent passage in the newly opened routes and areas" without referring to the more liberal regime of transit passage.

⁴⁷ Probably primarily in relation to the EEZ pursuant to Art. 56 of the LOS Convention but Art. 77 may also provide a basis in relation to the (outer) continental shelf.

⁴⁸ International Convention for the Control and Management of Ships' Ballast Water and Sediments, London, 13 February 2004. Not in force, IMO Doc. BWM/CONF/36, of 16 February 2004.

⁴⁹ Cf. Art. 2(3) and Section C of the Annex. See note 69 *infra* and accompanying text.

unilateral prescriptive authority. The PSSA Guidelines⁵⁰ developed by IMO also implement Article 211(6)⁵¹ and are clearly inspired by, and consistent with, that provision. It should also be realized that PSSA status is not a precondition for obtaining the majority of possible APMs. For instance, mandatory ships' routing measures, SRSs or VTS can be made applicable to the maritime zones of a coastal state upon its request by means of IMO approval.

Individual coastal state prescription

There are two exceptions to the abovementioned general rule. First, a coastal state is entitled to prescribe more stringent (unilateral) standards for the territorial sea, provided they "shall not apply to the design, construction, manning or equipment of foreign ships unless they are giving effect to generally accepted international rules or standards".⁵² The rationale of this provision is to safeguard the objective of uniformity in the regulation of international shipping, which would be undermined if states unilaterally prescribe standards that have extra-territorial effects. Unilateral fuel requirements affect this objective for the reason that compliance seems to require substantial and costly adjustments to vessels. Such requirements should therefore be treated analogous with CDEM standards.⁵³ The exception provided by this provision does not apply in marine areas where the regime of transit passage laid down in Part III, Section 2 of the LOS Convention applies.

A second exception is laid down in Article 234 of the LOS Convention. It is entitled 'Ice-covered areas' and provides:

Coastal States have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions or exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance. Such laws and regulations shall have due regard to navigation and the protection and preservation of the marine environment based on the best available scientific evidence.

Article 234 was included in the LOS Convention as a result of in particular the efforts of Canada, which sought to ensure that its 1970 Arctic Waters Pollution Prevention Act (AWPPA)⁵⁴ and underlying regulations and orders would no longer be regarded as

⁵⁰ IMO Assembly Resolution A.982(24), of 1 December 2005, 'Revised Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas' (IMO doc. A 24/Res.982, of 6 February 2006).

⁵¹ See para. 7.5.2.3(iii) of the PSSA Guidelines.

⁵² Art. 21(2) of the LOS Convention.

⁵³ For a concrete example see E.J. Molenaar, "Port State Jurisdiction: Towards Comprehensive, Mandatory and Global Coverage", 38 *Ocean Development & International Law* 225-257 (2007), at p. 250, n. 50.

⁵⁴ R.S., 1985, c. A-12; text available at <laws.justice.gc.ca>).

inconsistent with international law.⁵⁵ Article 234 gives coastal states broad prescriptive and enforcement jurisdiction in ice-covered areas, even though for a limited purpose and subject to several restrictions.⁵⁶ One such restriction follows from the words “for most of the year”.⁵⁷ However, decreasing ice-coverage means that fewer states will be able to rely on Article 234 in fewer areas. In addition to Canada, the Russian Federation also relies on Article 234 for prescribing standards that are more stringent than GAIRAS. The LOS Convention gives no guidance as to whether the regime of transit passage trumps the regime of Article 234 or vice versa,⁵⁸ but the views of Canada and the Russian Federation can be expected to be the opposite of the views of the United States, other relevant states and the EU. Analyses by commentators of relevant legislation and enforcement by Canada and the Russian Federation indicate that navigation in the parts of the Northwest Passage and the Northern Sea Route that are within national jurisdiction is much more constrained than elsewhere.⁵⁹ As usage of the Northern Sea Route by foreign vessels is scarce, it is difficult to determine the precise scope and extent of the latter legislation.

Port state jurisdiction

It was already stated above that port state jurisdiction is only explicitly referred to in Article 218. This innovative provision gives a port state enforcement jurisdiction over illegal discharges beyond its own maritime zones, namely the high seas and the maritime zones of other states.

More generally, however, the point of departure for port state jurisdiction is that as ports lie wholly within a state’s territory and fall on that account under its territorial sovereignty, customary international law acknowledges a port state’s wide discretion in exercising jurisdiction over its ports. This was explicitly stated by the International Court of Justice (ICJ) in the *Nicaragua* case where it observed that it is “by virtue of its sovereignty, that the coastal state may regulate access to its ports”.⁶⁰ While there may often be a presumption that access to port will be granted, customary international law gives foreign vessels no general right of

⁵⁵ See R. Huebert, “Article 234 and Marine Pollution Jurisdiction in the Arctic” in A.G. Oude Elferink and D.R. Rothwell (eds), *The Law of the Sea and Polar Maritime Delimitation and Jurisdiction*, (The Hague/New York/London, Martinus Nijhoff Publishers: 2001), pp. 249-267, at p. 249. See also the 1988 Agreement referred to in note 101 infra and accompanying text.

⁵⁶ See, *inter alia*, Molenaar, note 40 supra, at pp. 419-421.

⁵⁷ Note also that the spatial scope of the IMO Arctic Shipping Guidelines could be regarded as an interpretation of some of the elements of Art. 234 of the LOS Convention.

⁵⁸ See, *inter alia*, Molenaar, note 40 supra, at pp. 289-290 and 307.

⁵⁹ E.g. VanderZwaag et al, note 9 supra, at pp. 49-67 and 72; Rothwell, note 44 supra, at pp. 189-212; Huebert, note 55 supra; Tymchenko, note 2 supra; Molenaar, note 40 supra, at pp. 421-425; R.D. Brubaker, “Jurisdiction Governing the Straits in Russian Arctic Waters”, *INSROP Working Paper* No. 52-1996, IV.3.1, 1996; R.D. Brubaker, *The Russian Arctic Straits*, (Leiden, Martinus Nijhoff: 2005); and E. Franckx, *Maritime Claims in the Arctic. Canadian and Russian Perspectives*, (Dordrecht/London/Boston, Martinus Nijhoff Publishers: 1993).

⁶⁰ Case concerning Military and Paramilitary Activities In and Against Nicaragua (Nicaragua v. United States of America), Judgment of 27 June 1986, *ICJ Reports* 1986, p. 14, at p. 111, para. 213.

access to ports.⁶¹ Articles 25(2), 211(3) and 255 of the LOS Convention implicitly confirm the absence of a right of access for foreign vessels to ports as well as the port state's wide discretion in exercising jurisdiction under customary international law. A port state's residual jurisdiction, namely its competence to prescribe more stringent standards than those agreed to within competent international organizations such as IMO, is not affected by adherence to IMO instruments as such. The implications of international trade law on a port state's residual jurisdiction are unclear, however. Finally, the legality or justifiability of extra-territorial port state jurisdiction depends not only on a sufficient jurisdictional basis but also on the type of enforcement action taken.⁶² Most importantly, international law only very rarely authorizes port states to impose enforcement measures that are more stringent than denial of access or use of port (services) for extra-territorial behavior. Article 218 of the LOS Convention is one of these instances.

In the context of this background paper, port states within or beyond the Arctic marine area could for example deny access to certain types of ships or impose conditions for entry into port that are more stringent than GAIRES, for instance by incorporating the IMO Arctic Shipping Guidelines into their legislation.⁶³

IMO instruments

Discharge and emission standards

MARPOL 73/78⁶⁴ and the BWM Convention⁶⁵ are the only IMO instruments that contain discharge and emission standards. The Annexes to MARPOL 73/78 contain discharge standards for oil (Annex I), noxious liquid substances (Annex II), sewage (Annex IV) and garbage (Annex V) and emission standards for ozone depleting substances, nitrogen oxides (NO_x), sulphur oxides (SO_x) and volatile organic compounds (VOCs) (Annex VI). Annexes I, II and V make use of so-called 'special areas' where more stringent discharge standards apply. Annex VI currently uses so-called 'SO_x Emission Control Areas', but this will be broadened with 'particulate matter' and NO_x.⁶⁶ Rather than emission standards, SO_x Emission Control Areas have maximum limits of the sulphur content in fuel and requirements relating to exhaust gas cleaning systems, which should either be regarded as CDEM standards or must be treated analogous with them. No part of the Arctic marine area currently falls within either a special area or a SO_x Emission Control Area. By contrast, the Antarctic area has been designated as a special area under Annexes I, II and V and the special discharge standards therein are currently also in effect.⁶⁷ Specific criteria and

⁶¹ Cf. A.V. Lowe, "The Right of Entry into Maritime Ports in International Law", 14 *San Diego Law Review* 597-622 (1977), at p. 622.

⁶² Cf. Molenaar, note 53 supra, at p. 246.

⁶³ In view of the definitions for 'port state' and 'coastal state' in subsection 5.2, jurisdiction based on Art. 234 is regarded as coastal state jurisdiction.

⁶⁴ See note 30 supra.

⁶⁵ See note 48 supra.

⁶⁶ See note 30 supra.

⁶⁷ Cf. Molenaar, note 40 supra, at p. 434. Ø. Jensen, "The IMO Guidelines for Ships Operating in Arctic Ice-covered Waters. From Voluntary to Mandatory Tool for Navigation Safety and Environmental Protection?", *FNI Report 2/2007* (available at <www.fni.no>) notes on p. 10 that an

procedures have been developed for the designation of special areas and SOx Emission Control Areas.⁶⁸

The BWM Convention stipulates that vessels using the ballast water exchange method should not discharge ballast water within 200 nm from the nearest land or in waters less than 200 meters deep and must meet an efficiency of at least 95% volumetric exchange.⁶⁹ It has also been noted above that the BWM Convention allows states individually or in concert to regulate more stringently above this minimum level.

CDEM standards

CDEM standards are contained in many of the main legally binding IMO instruments, in particular SOLAS 74⁷⁰ and STCW 78⁷¹. The well-known double-hull standard - which was triggered by the *Exxon Valdez* disaster in 1989 - is laid down in Annex I to MARPOL 73/78. It was also mentioned above that the fuel content requirements in Annex VI to MARPOL 73/78 (within and beyond SOx Emission Control Areas) and the ballast water treatment requirements in the BWM Convention must be regarded as, or treated analogous with, CDEM standards. A similar argument could be made for prescriptions on the use of certain paints or coatings pursuant to the Anti-Fouling Convention⁷².

The current IMO Arctic Shipping Guidelines contain only CDEM standards and no discharge, emission, navigation or contingency⁷³ standards, or liability or insurance requirements. However, several CDEM standards are explicitly aimed at preventing or controlling vessel-source pollution. It is also noteworthy that the Guidelines only apply to international voyages and follow the definition of 'ship' used in SOLAS 74, which excludes for instance fishing and cargo vessels below a certain size or length and all naval vessels. Several provisions of the Guidelines contain linkages with the IACS Unified Requirements concerning Polar Class.⁷⁴ As already noted above, the Arctic Shipping Guidelines are currently under review.

earlier draft of what was to become the IMO Arctic Shipping Guidelines envisaged the Antarctic to be designated as a special area under one or more Annexes of MARPOL 73/78.

⁶⁸ As regards special areas see the 'Guidelines for the Designation of Special Areas under MARPOL 73/78', as set out in Annex 1 to IMO Assembly Resolution A.927(22), of 2001; as regards SOx Emission Control Areas see Appendix III to Annex VI to MARPOL 73/78.

⁶⁹ Regulations B-4 and D-1.

⁷⁰ See note 4 supra.

⁷¹ International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, London, 1 December 1978. In force 28 April 1984, as amended and modified by the 1995 Protocol.

⁷² International Convention on the Control of Harmful Ant-fouling Systems on Ships, London, 5 October 2001. In force 17 September 2008, IMO Doc. AFS/CONF/26, of 18 October 2001.

⁷³ Para. 13.3.1 requires operating manuals to conform to Assembly Resolution A.852(20), of 27 November 1997, 'Guidelines for the Structure of an Integrated System of Contingency Planning for Shipboard Emergencies'.

⁷⁴ E.g. paras 1.1.4 and P-2.7.

Navigation standards

In subsection 5.3 above, the category of navigation standards includes ships' routing measures, SRSs and VTS. These navigation standards can be adopted by the MSC based on their authority under SOLAS 74 and COLREG 72⁷⁵. As regards ships' routing measures, reference should be made to the General Provisions on Ships' Routing.⁷⁶ Examples of routing measures are: traffic separations schemes, deep-water routes, precautionary areas, areas to be avoided and no anchoring areas. Apart from the regulation of anchoring for the purpose of the conservation of living resources, the LOS Convention does not authorize coastal states to adopt mandatory navigation standards seaward of its territorial sea. In 1998, the General Provisions on Ships' Routing were amended by adding Annex 2 entitled 'General Provisions for the Adoption, Designation and Substitution of Archipelagic Sea Lanes (ASLs Provisions).⁷⁷ Archipelagic sea lanes are thereby essentially equated with ships' routing systems.

While it is likely that there are currently several IMO navigation standards that apply within the Arctic marine area, it is not possible to provide an overview of these in the context of this paper. However, it is clear that there is no comprehensive mandatory or voluntary IMO ships' routing system for the Arctic marine area in its entirety or a large part thereof. So far, the Arctic marine area or the Arctic Ocean may not have been viewed or addressed as a unity for shipping. Arguably, the imminent significant expansion of Arctic marine shipping makes such an approach necessary. It is submitted that the routes depicted in Figure 2 above - which show possible future shipping routes of the Arctic marine area - resemble somewhat archipelagic sea lanes established pursuant to Article 53 of the LOS Convention. The procedure laid down in this provision - implemented by Annex 2 to the IMO General Provisions on Ships' Routing - may be suitable as a model for submitting an 'Arctic Sea Lanes' proposal to IMO. The circumstance that some sea lanes may be situated in the high seas would not seem to be a problem as such.⁷⁸

⁷⁵ See note 31 supra.

⁷⁶ IMO Resolution A.572(14), 'General Provisions on Ships' Routing'. Adopted on 20 November 1985, amended among other things by Resolution MSC.71(69), Resolution MSC.165(78) and Resolutions adopted by MSC 70, MSC 73 and MSC 79 (see IMO Doc. SN/Circ.204, of 8 January 1999, IMO Doc. SN/Circ.215, of 19 January 2001 and IMO Doc. SN/Circ.241, of 14 December 2004). At its 54th Session in 2008, NAV adopted amendments to the General Provisions on Ships' Routing. These still have to be adopted by the MSC and confirmed by the IMO Assembly (info obtained from <www.imo.org> at 25 August 2008).

⁷⁷ These are laid down in Resolution MSC.71(69) of 19 May 1998.

⁷⁸ Note that paras 3.11, 3.14 and 3.16 of the IMO General Provisions on Ships' Routing only provide exceptions for routing systems "no part of which lies beyond their territorial sea or in straits used for international navigation". See also the observations of the role accorded to IMO under the LOS Convention by Molenaar, note 40 supra, at pp. 526-528.

Contingency standards

The contingency standards adopted within IMO are mainly laid down in OPRC 90⁷⁹ and its 2000 HNS Protocol^{80, 81}.

Liability and insurance requirements

The liability and insurance requirements adopted within IMO are those laid down in the 1969 Civil Liability Convention,⁸² the 1971 Fund Convention⁸³ (each modified by several protocols), the 1996 HNS Convention⁸⁴ and the 2001 Bunker Oil Convention⁸⁵.

PSSA Guidelines

Designation of an area as a PSSA pursuant to the PSSA Guidelines⁸⁶ does not bring about regulation of shipping within that area as such. This requires adoption of one or more APMS. Attention can in this context be drawn to the possibility to have special discharge standards within PSSAs (other than by means of designation as special area under MARPOL 73/78) and “other measures aimed at protecting specific sea areas against environmental damage from ships, provided that they have an identified legal basis”.⁸⁷ Innovative standards are therefore not ruled out.

Other

Reference should also be made to IMO Assembly Resolution A.999(25), ‘Guidelines on voyage planning for passenger ships operating in remote areas’,⁸⁸ that was adopted a week

⁷⁹ International Convention on Oil Pollution Preparedness, Response and Co-operation, London, 30 November 1990. In force 13 May 1995, 30 *International Legal Materials* 733 (1990).

⁸⁰ Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, London, 15 March 2000. In force 14 June 2007, IMO Doc. HNS-OPRC/CONF/11/Rev.1, of 15 March 2000.

⁸¹ See also Assembly Resolution A.852(20), note 73 supra.

⁸² International Convention on Civil Liability for Oil Pollution Damage, Brussels, 29 November 1969. In force 19 June 1975, 9 *International Legal Materials* 45 (1970).

⁸³ International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, Brussels, 18 December 1971. In force 16 October 1978, 11 *International Legal Materials* 284 (1972).

⁸⁴ International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, London, 3 May 1996. Not in force.

⁸⁵ International Convention on Civil Liability for Bunker Oil Pollution Damage, London, 23 March 2001. In force 21 November 2008.

⁸⁶ See note 50 supra.

⁸⁷ Para. 6.1.3 of the PSSA Guidelines.

⁸⁸ Adopted on 29 November 2007, IMO Doc. A 25/Res.999, of 3 January 2008. Note that the rationale for adopting the Resolution, as set out in its Preamble, refers to the need to “prevent incidents of groundings and collisions, and thereby enhance safety of life at sea” but not to marine environmental protection.

after the tragic sinking of the *MS Explorer* - a purpose-built, ice-strengthened tourist vessel originally named *MS Lindblad Explorer* - on 23 November 2007 in Antarctic waters. IMO Assembly Resolution A.999(25) complements the more general IMO Assembly Resolution A.893(21), 'Guidelines for voyage planning'.⁸⁹ Resolution A.999(25) refers, *inter alia*, to the need to take account of shortcomings in available hydrographic data, the presence of places of refuge⁹⁰ and the need of experience in navigating in ice-covered areas.

Also noteworthy is Regulation V/6 of SOLAS 74 on the Ice Patrol Service and the 'Rules for the management, operation and financing of the North Atlantic Ice Patrol' contained in an Appendix to Chapter V.

Finally, in view of the remoteness of the Arctic marine area, particular account should be taken of the requirement for ships to carry an automatic identification system (AIS) under Regulation V/19 of SOLAS 74 and the more recent requirements relating to Long-range identification and tracking of ships (LRIT) under Regulation V/19-1 of SOLAS 74.⁹¹ Regulation V/19-1 not only entitles port states to receive certain information prior to entry into port but also coastal states in relation to ships navigating within a distance of 1000 nm off their coast, subject to some exceptions.⁹²

Arctic Council instruments

General

As was pointed out in the Introduction to the background papers, the Arctic Council Members have committed themselves to implementing the AEPS in conformity with the LOS Convention. It can be assumed that this also includes respect for the mandate and work of the IMO. In 2000, the Arctic Council adopted the Action Plan to Eliminate Pollution in the Arctic (ACAP) and determined that the ACAP would be a basis for developing and implementing actions under the Council's auspices with respect to pollution prevention and remediation.

Output of PAME

⁸⁹ Adopted on 25 November 1999, IMO Doc. A 21/Res.893, of 4 February 2000.

⁹⁰ See in this context also the IMO Assembly Resolution A.949(23), of 5 December 2003, 'Guidelines on Places of Refuge for Ships in Need of Assistance', adopted in the aftermath of the disaster with the *Prestige* in 2002.

⁹¹ Regulation V/19-1 was adopted by Resolution MSC.202(81), of 19 May 2006 (contained in IMO Doc. MSC 81/25/Add.1, of 1 June 2006, 'Report of the Maritime Safety Committee on its Eighty-First Session', Annex 2; see also Annexes 13 and 14, containing Resolutions MSC.210(81) and MSC.211(81)) entered into force on 1 January 2008 and will apply to ships constructed on or after 31 December 2008, with a phased implementation schedule for ships constructed before 31 December 2008. The LRIT system is intended to be operational with respect to the transmission of LRIT information by ships from 30 December 2008 (see also IMO Doc. MSC 81/25, of 24 May 2006, 'Report of the Maritime Safety Committee on its Eighty-First Session', paras 5.74-5.122).

⁹² See Reg. V/19-1(8.1).

In addition to its efforts in monitoring the IMO Arctic Shipping Guidelines,⁹³ mention can be made of the Arctic Marine Strategic Plan (AMSP) and the Guidelines for Transfer of Refined Oil and Oil Products in Arctic Waters (TROOPS)⁹⁴. As explained in section 2, PAME is currently engaged in the AMSA. While the AMSA is to be released at the Arctic Council Ministerial Meeting in April 2009 in Norway, the actual negotiation by the Arctic states of the AMSA findings and recommendations began at a PAME meeting in Helsinki, October 2008 and will continue in the context of other meetings prior to April 2009. The lead countries for AMSA are Canada, Finland and the United States.

Output of EPPR

The main products of the EPPR Working Group are

- Arctic Guide for Emergency Prevention, Preparedness and Response (updated annually), containing information on emergency systems and contact points, overview of environmental risks, and applicable agreements;
- Field Guide for Oil Spill Response in Arctic Waters (1998);
- Environmental Risk Analysis of Arctic Activities (1998);
- Circumpolar Map of Resources at Risk from Oil Spills in the Arctic (2002), which includes a series of GIS-based circumpolar maps showing areas of highest risk because of sensitive natural resources and subsistence communities⁹⁵; and
- Shoreline Clean-up Assessment Technique (SCAT) Manual (2004).

Acts of the OSPAR Commission

While competence for the regulation of shipping lies first of all with IMO, action under the OSPAR Convention is not entirely precluded. As with fisheries, the OSPAR Commission must first bring questions to the attention of the IMO, if it considers that action is desirable. Contracting Parties who are IMO members must endeavor to cooperate “in order to achieve an appropriate response, including in relevant cases that Organisation’s agreement to regional or local action ...”.⁹⁶ The OSPAR Commission has already taken some supplementary action. This includes for example the adoption of regional voluntary guidelines to reduce the risk of the introduction of non-indigenous species through ships’ ballast water,⁹⁷ as an interim measure pending the entry into force of the BWM Convention. These guidelines recommend all vessels that fall within the scope of the BWM Convention entering the North East Atlantic to have a Ballast Water Management Plan, to record all ballast water operations and to exchange ballast water at least 200 nm from the nearest land

⁹³ See Huebert, note 55 supra, at p. 260. See also Jensen, note 67 supra, at pp. 8-15.

⁹⁴ Text available at <arcticportal.org/en/pame>.

⁹⁵ Cf. T. Koivurova and D.L. VanderZwaag, “The Arctic Council at 10 Years: Retrospects and Prospects” 40 *University of British Columbia Law Review* 121-194 (2007), at p. 146.

⁹⁶ Art. 4(2) of Annex V to the OSPAR Convention.

⁹⁷ General Guidelines on the voluntary interim application of the D-1 Ballast Water Exchange Standard in the North-East Atlantic (Summary Record OSPAR 2007, OSPAR 07/24/1-E, Annex 9).

in water at least 200 meter deep. These voluntary guidelines are recommended for all vessels, including those of non-contracting parties to the OSPAR Convention.

Other

Other relevant instruments are⁹⁸:

- the 1983 bilateral agreement between Canada and Denmark,⁹⁹ which relates to the prevention, reduction and control of pollution of the marine environment resulting from activities within the area covered by the agreement, including pollution incidents resulting from shipping¹⁰⁰;
- the 1988 bilateral agreement between Canada and the United States,¹⁰¹ by which, *inter alia*, the “Government of the United States pledges that all navigation by U.S. icebreakers within waters claimed by Canada to be internal will be undertaken with the consent of the Government of Canada”¹⁰²;
- the 1992 bilateral agreement between Norway and the Russian Federation¹⁰³ pursuant to which the Joint Norwegian-Russian Commission on Environmental Protection operates;
- the 1993 Agreement Between Denmark, Finland, Iceland, Norway and Sweden Concerning Cooperation in Measures to Deal with Pollution of the Sea by Oil or Other Harmful Substances.¹⁰⁴ The Agreement deals with a range of measures, including monitoring maritime zones and abatement in case of pollution incidents;
- the 1994 bilateral Agreement between Norway and the Russian Federation Concerning Cooperation on the Combating of Oil Pollution in the Barents Sea,¹⁰⁵ containing requirements on notification and contingency planning;
- the Joint Contingency Plan of the United States and the Russian Federation on Combating Pollution in the Bering and Chukchi Seas,¹⁰⁶

⁹⁸ The Agreement between the Government of Canada and the Government of the Russian Federation on Cooperation in the Arctic and the North (with Annex) (Ottawa, 19 June 1992. In force 19 June 1992, 1884 *United Nations Treaty Series* 179 (1995)) would not seem directly relevant, even though the Annex includes “transportation” as an item.

⁹⁹ Agreement Between the Government of Canada and the Government of the Kingdom of Denmark for Cooperation relating to the Marine Environment, Copenhagen, 26 August 1983. In force 26 August 1983, 1348 *United Nations Treaty Series* 121 (1984)

¹⁰⁰ See, *inter alia*, Art. VII entitled “Vessel Traffic” and Annex B entitled “Joint Contingency Plan concerning pollution incidents resulting from shipping activities”.

¹⁰¹ Agreement between the Government of Canada and the Government of the United States of America on Arctic Cooperation, 11 January 1988. In force 11 January 1988, *Canada Treaty Series* 1988, No. 29.

¹⁰² Clause 3. See also the analysis by Rothwell, note 44 *supra*, at pp. 158-159 and 191-196 and by Kraska, note 8 *supra*, at pp. 266-267, who puts this Agreement in the context of marine scientific research.

¹⁰³ See note 34 *supra*.

¹⁰⁴ Copenhagen, 29 March 1993. In force 16 January 1998, 2084 *United Nations Treaty Series* I-36173.

¹⁰⁵ See note 36 *supra* and accompanying text.

¹⁰⁶ As noted on p. 88 of the United States National Response Plan, of August 2004, at ([available at <www.usda.gov/documents/NRPallpages.pdf>](http://www.usda.gov/documents/NRPallpages.pdf)). It also observes that this plan was updated and signed in March 2001.

- the Canada-United States Joint Marine Contingency Plan,¹⁰⁷ which provides for a coordinated system for planning, preparedness, and responding to harmful substance incidents in the contiguous waters of Canada and the United States. This plan is supported by five geographic annexes;
- the Basel Convention¹⁰⁸;
- IACS Unified Requirements concerning Polar Class, which complement the IMO Arctic Shipping Guidelines and other relevant IMO instruments¹⁰⁹; and
- Port State Control MOUs.

6. GAPS IN THE INTERNATIONAL LEGAL AND POLICY FRAMEWORK AND NATIONAL REGULATION AND OPTIONS FOR ADDRESSING THEM

6.1. Introduction

This subsection identifies gaps in the international legal and policy framework and national regulation relating to Arctic marine shipping in light of current and future threats to the marine environment and marine biodiversity in the Arctic marine area and options to address these gaps.

6.2. Gaps

Not all Arctic states are parties to relevant international instruments. For instance, the Russian Federation is not a party to OPRC 90. As regards substantive standards or requirements, the international legal framework contains:

- no special IMO discharge, emission or ballast water exchange standards for the Arctic marine area;
- no comprehensive mandatory or voluntary IMO ships' routing system for the Arctic marine area in its entirety or a large part thereof; and
- no legally binding special CDEM (including fuel content and ballast water treatment) standards for the Arctic marine area.

These are factual conclusions and do not imply a need to address these in light of threats posed to the marine environment or biodiversity in the Arctic marine area. However, reference can be made here to a commentator who has made several suggestions to address some aspects of the IMO Arctic Shipping Guidelines that are in his view shortcomings.¹¹⁰

As regards the regional agreements on monitoring, contingency planning and preparedness for pollution incidents, it should be noted that these do not cover the entire Arctic marine area

¹⁰⁷ Ibidem.

¹⁰⁸ Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Basel, 22 March 1989. In force 5 May 1992, 28 *International Legal Materials* 657 (1989); <www.basel.int>.

¹⁰⁹ See note 74 supra and accompanying text.

¹¹⁰ See Jensen, note 67 supra, at pp. 15-16.

and that not all Arctic Ocean coastal states are parties to them. A related gap is the absence of a regional agreement on search and rescue.

In relation to compliance and enforcement, it can also be concluded that there is no regional approach by Arctic states or another group of states specifically aimed at ensuring compliance with applicable international rules and standards and national laws and regulations. It is moreover uncertain to what extent the IMO Arctic Shipping Guidelines and the IACS Unified Requirements concerning Polar Class are complied with by states, ship-owners and operators, crew and IACS members.¹¹¹

6.3. Options

This subsection contains various options for adjusting the current international legal framework relating to shipping in the Arctic marine area in case such adjustments are regarded as necessary in view of current or future threats of shipping to the marine environment and marine biodiversity in the Arctic marine area. The options are grouped together as: options for action within IMO; options for Arctic states at the regional level, in their capacities as coastal states; options for Arctic states and other states at the regional level, in their capacities as port states, other options for Arctic states, individually or collectively and, finally, other options for all states, individually or collectively, in their capacities as flag states. While the Arctic Council is not listed as a separate category, some of these options could be pursued there as well, with the important qualification that the output cannot be legally binding.

Options for action within IMO¹¹²:

- Make the IMO Arctic Shipping Guidelines mandatory, for instance by incorporating them into SOLAS 74 and complement them with new elements such as training for ice navigators, which could be incorporated in STCW 78¹¹³;
- Pursue the adoption of special standards, for instance
 - Special discharge or emission standards for all or part of the Arctic marine area under MARPOL 73/78;
 - Special fuel content¹¹⁴ or ballast water treatment standards¹¹⁵;

¹¹¹ According to Jensen, note 67 supra, at p. 17 “As of today, no state has implemented the regulations through binding legislation”. At p. 16 he also observes that the IACS Unified Requirements for Polar Class allow individual members a margin of discretion which interferes which the goal of uniformity.

¹¹² As recommended by the Arctic Marine Strategic Plan, at p. 10. Note also the commitment by the five Arctic Ocean coastal states to work within IMO as expressed in the Ilulissat Declaration (Ilulissat, 28 May 2008 (available at <arctic-council.org>)).

¹¹³ Cf. D. VanderZwaag et al, note 9 supra, at p. 68.

¹¹⁴ See also the decisions made at recent Antarctic Treaty Consultative Meetings (ATCMs), for instance Decision 8 (2005) ‘Use of Heavy Fuel Oil’, Decision 2 (2006) ‘Ballast Water Exchange: Referral to IMO’ and Resolution 3 (2006) ‘Ballast Water Exchange’, with the Practical Guidelines for Ballast Water Exchange in the Antarctic Treaty area annexed thereto (all available at <www.ats.aq>; see also note 115 infra on the subsequent action by IMO). See also the discussion on ‘Antarctic area vessel issues’ in IMO Doc. MEPC 57/21, of 7 April 2008, paras 20.16-20.19, which inter alia notes that the issue of “use and carriage of heavy grade oil (HGO) on ships in the Antarctic area” will be dealt with by the Sub-Committee on Bulk Liquids and Gases (BLG) during its 13th Session in March 2009.

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- One or more mandatory ships' routing systems, whether or not in the form of an comprehensive 'Arctic Sea Lanes' proposal;
- Ship reporting systems;
- Compulsory pilotage and ice-breaker or tug assistance; and
- Special anti-fouling standards.
- Designate (part of) the Arctic as a PSSA, with a comprehensive package of APMs consisting of one or more of the special standards just mentioned above and other special standards such as special ballast water exchange standards¹¹⁶.

Options for Arctic states at the regional level, in their capacities as coastal states:

- Agree on legally binding agreements on monitoring, contingency planning and preparedness for pollution incidents, as well as on search and rescue,¹¹⁷ including by designating places of refuge;
- Agree on a harmonized approach on enforcement and ensuring compliance, inter alia by means of shared platforms (e.g. 'shiprider agreements'¹¹⁸);
- Implement the BWM Convention individually or in concert; and
- Take other action under Article 234 of the LOS Convention, in particular if the IMO Arctic Shipping Guidelines are not made mandatory.

Options for Arctic states and other states at the regional level, in their capacities as port states:

- Develop a strategy for port state control in the Arctic, for instance by establishing an Arctic MOU on Port State Control or by adjusting the Paris and Tokyo MOUs on port state control to ensure that proper account is taken of intra-Arctic and trans-Arctic marine shipping;
- Implement Article 218 of the LOS Convention in concert; and
- Exercise port state residual jurisdiction in concert - relying in part on Article 234 of the LOS Convention - in case the IMO Arctic Shipping Guidelines are not made mandatory.

Other options for Arctic states in particular, individually or collectively:

- Address the need for hydrographic surveying and charting¹¹⁹;
- Consider the need to develop a regional liability regime¹²⁰;
- Encourage self-regulation by the shipping industry - for instance the cruise industry¹²¹ - by means of positive and negative incentives (e.g. positive discrimination and limiting landings and access to ports to cooperating players¹²²);

¹¹⁵ See Resolution MEPC.163(56), of 13 July 2007, 'Guidelines for ballast water exchange in the Antarctic Treaty Area'.

¹¹⁶ See also note 114 supra.

¹¹⁷ See also ATCM Resolution 4 (2007), 'Ship-based tourism' and ATCM Resolution 6 (2008), 'Maritime Rescue Coordination Centres and Search and Rescue in the Antarctic Treaty Area'.

¹¹⁸ For a discussion see E.J. Molenaar, "Multilateral Hot Pursuit and Illegal Fishing in the Southern Ocean. The Pursuits of the *Viarsa 1* and the *South Tomi*", 19 *International Journal of Marine and Coastal Law* 19-42 (2004), at pp. 34-35.

¹¹⁹ See also ATCM Resolution 5(2008), note 15 supra.

¹²⁰ Note in this regard Annex VI to the Madrid Protocol, note 26 supra.

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- Urge IACS to restrict the margin of discretion that individual members have in relation to the IACS Unified Requirements concerning Polar Class; and
- Require the marine insurance industry to promote compliance with IACS Unified Requirements concerning Polar Class, for instance by linking the level of compliance to the height of premiums.

Other options for all states, individually or collectively, in their capacities as flag states:

- Impose standards on their vessels that are more stringent than GAIRAS, for instance special discharge, emission and ballast water exchange standards or by implementing the IMO Arctic Shipping Guidelines into their legislation.

¹²¹ See in this regard the Association of Arctic Expedition Cruise Operators (AECO; <www.aeco.no>).

¹²² For some suggestions in relation to Antarctic sea-borne tourism, see Molenaar, note 14 supra, at p. 47.

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