

3. Law of the Sea and Governance of Shipping in the Arctic and Antarctic

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3.1 Introduction

The 1982 UN Law of the Sea Convention (LOSC), which came into force in November 1994, might be described as setting the legal foundations for marine environmental protection and controlling marine resource exploitations in all the world's oceans, including the Polar seas. Having 320 articles and nine Annexes, the Convention sets out a basic requirement for all states to protect and preserve the marine environment (Art. 194) and to cooperate in developing global standards for shipping (Art. 211) and global and regional standards for land-based marine pollution (Art. 207), ocean dumping (Art. 210) and seabed activities (Art. 208). States also have an obligation to subject all activities under their jurisdiction or control which may cause substantial pollution or significant harmful changes to the marine environment to environmental impact assessment procedures (Art. 206).

While LOSC clearly applies to both the Arctic and Antarctic marine areas, two major differences in application stand out in light of the presence of recognised coastal states and port states in the Arctic but not in the Antarctic. Many of the Convention's provisions focus on clarifying the rights and responsibilities of coastal states in the five zones of national jurisdiction, internal waters, the territorial sea, a contiguous zone, the exclusive economic zone (EEZ) and a continental shelf. While five coastal states (Canada, Denmark/Greenland, Norway, the Russian Federation and the United States) surround the Arctic Ocean and thus those states are clearly bestowed powers to pass and enforce national laws in those zones, the Antarctic does not have generally recognised coastal states. Seven states (Argentina, Australia, Chile, France, New Zealand, Norway and the United Kingdom) have historic territorial claims on the continent which have been "frozen" by the Antarctic Treaty (Art. IV). The LOSC also recognises the powers of port states over ships choosing to enter their ports, such as the right to inspect vessels for their seaworthiness and to prevent unseaworthy ships from sailing before being re-

paired. While all five Arctic coastal states are clearly port states with corresponding inspection and enforcement powers, the Antarctic continent does not have generally recognised port states in the actual region.

Shipping is a growing concern in both Polar Regions. Cruise ship visits have been on the increase with corresponding human safety and environmental concerns. The Arctic appears to be on the verge of a new era in commercial shipping with vast hydrocarbon and mineral resources and growing interest in transpolar shipping that may substantially cut transport distances between Europe and Asia. Navigation in the Arctic by military vessels and other ships on governmental service is also expected to rise. For example, the Government of Canada has announced a commitment to build new Arctic patrol vessels and to construct a vessel refuelling facility in Nanisivik, Nunavut. Both Polar Regions are remote, raising special challenges for emergency responses and search and rescue in case of accident. Navigating in ice and freezing temperatures are common challenges although the Arctic may be even more treacherous in light of a greater proportion of thicker multi-year ice.

A key social and political difference between the Polar Regions is the presence of indigenous communities and an overall human population of about 4 million in the Arctic, while the Antarctic hosts scientific stations with temporary teams of scientists. The potential human impacts of shipping which are a special concern in the Arctic include the interference caused to traditional hunting and harvesting activities and the overwhelming of small communities with tourists. Indigenous rights over marine areas and resources have yet to be fully resolved in the Arctic adding another layer of political and legal complexity not present in the Antarctic.

This chapter provides a broad overview of the law of the sea and shipping governance arrangements applicable to the Arctic and the Antarctic. The realities and challenges connected with the LOSC are first described for each region. The similarities and differences in regional approaches to addressing shipping safety and vessel-source pollution, including related environmental threats, are then surveyed. The maritime safety and pollution “main sails” are highlighted, namely, the (1974) International Convention on Safety of Life at Sea (SOLAS) and the (1973) International Convention for the Prevention of Pollution from Ships, as modified by the (1978) Protocol Relating Thereto (MARPOL 73/78) as well as further supportive conventions and guidelines (‘jib sails’) to the two central agreements governing international shipping. The chapter concludes by summarising the differences and commonalities in law of the sea and shipping governance approaches in the Polar Regions and highlights the many issues still needing to be resolved such as the adoption of a mandatory code for shipping in Polar waters.

This chapter, by attempting to provide a broad overview of Polar law relating to law of the sea and shipping governance, by necessity omits detailed discussion of some legal topics. A review of international agree-

ments relating to liability and compensation in case of marine accidents, such as an oil spill, is therefore beyond the scope of this paper. The effort to address seafarer working and living conditions, such as food, medical care and wages, through a consolidated 2006 Maritime Labour Convention, is not discussed nor are the international customs and contractual practices of ship owners and commercial interests surveyed. For example, marine insurance contracts may be critical for ensuring Polar shipping ventures actually occur and the cost of insurance may be a major constraint. The International Maritime Organization (IMO) has developed over 50 treaty instruments and hundreds of other measures, including codes and guidelines, over the years to control shipping and only some of the most important and relevant documents to Polar shipping can be summarised.

3.2 Law of the Sea Realities and Challenges

3.2.1 Arctic Law of the Sea Realities

The law of the sea reality for the Arctic is at the same time both simple and complex. The LOSC provides an easy to understand division of rights to living and non-living marine resources. Arctic coastal states are given exclusive rights to exploit fisheries, minerals, hydrocarbons and energy resources within their 200-nautical mile (n.m.) EEZs. Where the natural prolongation of continental shelves extends beyond 200-n.m., coastal states have the right to exploit sedentary species, such as shellfish, and mineral resources on the seabed. In the high seas water column beyond national 200-n.m. zones, various freedoms of the sea apply whereby all states may have access to living resources and shipping routes. For the deep seabed beyond national jurisdiction, the International Seabed Authority, a management organisation established pursuant to the LOSC and based in Jamaica, would be responsible for licensing and regulating any mineral exploration or exploitation activity should it arise. The Agreement to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982, adopted in 1994, sets out further "rules of the game" in relation to deep seabed mineral policy including provisions on technology transfer and the financial terms of contracts.

The 1982 Convention also clearly bestows substantial coastal state jurisdiction to undertake and control marine scientific research in Arctic waters. Coastal states have the exclusive right to conduct marine scientific research in their territorial seas and such research can only be undertaken with the express consent and under conditions set by the coastal state (Art. 245). Marine scientific research in the EEZ and on the continental shelf is also subject to coastal state consent which should be normally given (Art. 246(2)). Exceptions where consent may be refused

include where a project is of direct significance for the exploration and exploitation of natural resources or where a project involves drilling into the continental shelf, the use of explosives or the introduction of harmful substances into the marine environment (Art. 246(5)).

The LOSC is also straightforward in establishing various state responsibilities both within and beyond national zones of jurisdiction in the Arctic. For example, coastal states are obligated to ensure proper conservation and management measures so living resources in the EEZ are not endangered by over-exploitation and such measures must avoid seriously threatening the reproduction levels of associated or dependent species (Art. 61(2)(4)). States are required to cooperate directly or through sub-regional or regional organisations to ensure the conservation of fish stocks shared across national EEZs (Art. 63(1)) and stocks that straddle an EEZ and the high seas (Art. 63(2)). States must take all measures necessary to prevent, and control pollution of the marine environment from any source (Art. 194(1)) and seek to minimise to the fullest possible extent the release of toxic or noxious substances (Art. 194(3)(a)). States are required to protect and preserve rare or fragile ecosystems and the habitat of threatened or endangered species (Art. 194(5)). The intentional or accidental introduction of alien species to the marine environment which may cause significant harmful changes is to be avoided (Art. 196(1)). States are also required to cooperate in conserving and managing living resources in the high seas and to consider establishing sub-regional or regional fisheries organisations (Art. 118).

With broad acceptance that the Arctic Ocean is a semi-enclosed sea, Article 123 of LOSC urges states bordering such an area to cooperate in managing the conservation of living marine resources, in protecting and preserving the marine environment and in coordinating scientific research activities. Two key criteria must be met for the Arctic Ocean to be considered a semi-enclosed sea as defined in Article 122 of LOSC. First, the Arctic Ocean must be deemed a “sea,” a term that is not defined in the Law of the Sea Convention. Second, the Arctic Ocean must consist entirely or primarily of the territorial seas and EEZs of two or more coastal states.

A further overlay of cooperative obligations emanates from the 1995 UN Agreement on Straddling and Highly Migratory Fish Stocks (Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks). The Agreement urges the application of precautionary and biodiversity protective approaches to fisheries management (Art. 5). The Agreement also calls for the strengthening of existing regional fisheries management organisations and arrangements with management mandates for straddling or highly migratory fish stocks (Art. 13). Coastal states and states fishing on the high seas are to consider es-

tablishing a new regional fisheries management organisation or arrangement where no such organisation or arrangement exists (Art. 8(5)). This latter obligation might be described as a “prospective” for the Arctic as it remains to be seen whether viable commercial fish stocks exist in the high seas pocket in the central Arctic Ocean and whether states will wish to support the opening up of new fisheries areas.

The LOSC has cast a complex web of jurisdictional entitlements and limitations for the three categories of states concerned with Arctic shipping – coastal states, flag states, and port states. These categories are reviewed in turn.

3.2.1.1 Coastal State Jurisdiction and Control

Canada, Denmark (Greenland), Norway, the Russian Federation and the United States have coastal frontage on the Arctic Ocean and thus are considered as coastal states which can exert legislative and enforcement control over foreign ships in offshore waters. The amount of control varies with the zones of coastal state jurisdiction. The greatest powers exist in internal waters, the waters closest to the coastal state, and the powers become less according to the distance offshore with least control existing over foreign vessels navigating above an extended continental shelf beyond 200-n.m.

In internal waters, a coastal state has total sovereignty. Thus, if it wishes, the state may prohibit entry of certain ships, such as those carrying hazardous cargoes and may impose “zero discharge” limits on specific pollutants. The only limit on this maximum power is the customary duty to allow foreign ships in distress, such as those facing a major storm, to seek refuge in sheltered waters.

Internal water status can be claimed in various ways. LOSC recognises the right of coastal states to draw closing lines across mouths of geographical bays, ports and harbours and the marine areas on the landward side of the lines are considered internal. A coastal state is allowed to draw straight baselines around a deeply indented coastline or where there is a fringe of islands in the immediate vicinity of the coast, and the waters enclosed would be internal. Internal waters might also be claimed based upon their being recognised as such historically.

Within the territorial sea limit which may extend 12-n.m. from the low-water line along the coast or outside enclosed internal waters, the coastal state has full sovereignty but that sovereignty is subject to the right of foreign ships to enjoy innocent passage. Passage is considered innocent so long as it is continuous and expeditious and not prejudicial to the peace, good order, or security of the coastal state. The Convention lists various activities that are considered non-innocent including: carrying out of research or surveys, any fishing activities and any act of wilful or serious pollution in contravention of the Convention.

While the LOSC allows coastal states to adopt pollution control and navigational safety laws applicable to foreign ships transiting through the territorial sea, it places key limits on this authority. Coastal states cannot impose design, construction, crewing or equipment standards on foreign ships unless giving effect to generally accepted international rules or standards. Coastal states are also prohibited from imposing requirements on foreign ships which have the practical effect of denying or impairing the right of innocent passage. Coastal states can require foreign ships to use designated sea lanes or traffic separation schemes, but before doing so the state must consider the recommendations of the IMO and take into account any channels customarily used for international navigation.

Coastal states may also claim a 12 n.m. contiguous zone adjacent to the territorial sea to a seaward limit of 24 n.m. In a contiguous zone a coastal state may exercise necessary control over foreign ships to prevent infringement of its customs, fiscal, immigration or sanitary laws and to punish infringement of such laws committed within its territory or territorial sea. For example, a state might seek to enforce a law prohibiting any garbage disposal in its territorial sea against a foreign ship navigating within the contiguous zone that had previously disposed of garbage in the territorial sea.

In a coastal state's 200-n.m. EEZ, legislative and enforcement jurisdiction over foreign vessels is substantially curtailed. A coastal state cannot impose its own pollution standards on such vessels but is restricted to only imposing international pollution standards. Actual arrests and detention of a foreign ship is only allowed if there is a discharge causing or threatening major damage to the coastline, interests or resources of the coastal state. Monetary penalties may only be imposed for such EEZ pollution infringements.

Where the natural prolongation of a coastal state's continental shelf extends beyond 200-n.m. from the baselines from which the territorial sea is measured, the coastal state has very limited control over foreign shipping activities occurring in waters above the extended continental margin. A coastal state may establish safety zones around artificial islands or structures involved in seabed exploration or exploitation activities, and no such activities may be carried out without the coastal state's consent. A coastal state in exercising its rights over the continental shelf must not cause any unjustifiable interference with navigation or with other freedoms such as fishing.

A coastal state bordering a strait used for international navigation is severely restricted in controlling foreign shipping because of the right of all ships to transit passage. A coastal state may only impose international pollution control standards, not stricter national regulations. Sea lanes and traffic separation schemes may be established but only with IMO approval. A submarine exercising transit passage may remain submerged

whereas an innocent passage through the territorial sea a submarine is required to navigate on the surface and to show its flag.

While the various national zones of jurisdiction are applicable to all the world's oceans including the Arctic, the LOSC has recognised special hazards of navigation in ice-covered waters and has given extra powers for coastal states to pass and enforce laws for control of vessel source pollution for those waters. A coastal state may adopt stricter than international pollution standards normally applicable in the EEZ. Article 234 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 and be based on the best available scientific evidence.

Article 234 leaves open many questions of interpretation. For example, what is the significance of recognising special coastal state powers specific to the EEZ? One interpretation is that coastal states are given no greater powers than those granted for the territorial sea and thus no unilateral right exists to adopt special ship construction, crewing and equipment standards. What extent of ice coverage is required to invoke this article? The application of Article 234 to straits used for national navigation may also be questioned, although the LOSC does not explicitly exempt straits from application.

3.2.1.2 Flag State Jurisdiction and Control

A flag state, referring to the country granting its nationality to a ship and allowing a ship to fly its flag, has extensive jurisdictional control over its vessels. The flag state's national laws including criminal laws, apply to those aboard its ships. The flag state has exclusive jurisdiction over its vessels on the high seas with limited exceptions, for example, if the state consents to boarding and inspection by officials from other states pursuant to a regional fisheries enforcement agreement. A flag state has a duty to ensure that its ships conform to international standards in relation to safety at sea, pollution control and communications.

Two potential "weak links" in the flag state control approach stand out. First is the "flag of convenience" challenge where some states continue to register ships without having adequate capacity and political will to ensure their vessels live up to international standards and commitments. The International Transport Workers' Federation lists over 30 countries, including Antigua and Barbuda, Bahamas, Belize, the Cayman Islands, Liberia and Panama, that are considered flags of convenience

where vessels are registered for the purposes of reducing operating costs and avoiding strict regulations. Second is the sovereign immunity reality. Article 236 of the LOSC exempts warships and government owned or operated ships used for non-commercial service from the marine and environmental protection provisions of the Convention. States are merely required to ensure such vessels act consistent “as far as is reasonable and practicable” with the Convention’s provisions.

3.2.1.3 Port State Jurisdiction and Control

When a vessel is voluntarily within a port or off-shore terminal of a state, the state possesses broad powers of inspection and enforcement. Article 218 of the LOSC recognises the right of a port state to investigate and institute proceedings regarding illegal pollution discharges even if outside its own maritime zones, specifically on the high seas or within the jurisdictional zones of other states (if they request institution of proceedings). Article 219 of the LOSC requires port states to prevent unseaworthy ships from sailing and authorises port states to require a vessel to proceed to the nearest repair yard.

Most marine regions around the globe are covered by memorandums of understanding (MOU) on port state control, including the Paris MOU covering Europe and the North Atlantic and the Tokyo MOU applicable to Asia and the Pacific, whereby maritime administrations agree to cooperate in undertaking inspection of ships visiting their ports to ensure compliance with key international conventions relating to maritime safety and pollution. With the projected increase in Arctic commercial shipping the question arises as to whether the maritime authorities of the Arctic states should develop a new MOU specific to port state control in the Arctic.

3.2.2 Arctic Law of the Sea Challenges

At least four main “law of the sea” challenges can be seen to directly concern Arctic waters. First, two ocean boundary disputes continue to fester in the region. Canada and the United States disagree over the maritime boundary in the Beaufort Sea. Canada and Denmark (Greenland) contest a small area of jurisdiction in the Lincoln Sea. Until such disputes are resolved, ship operators may face uncertainty over which national shipping laws are applicable in a contested zone. While Norway and the Russian Federation had a long-standing ocean boundary dispute in the Barents Sea, they reached a preliminary agreement in April 2010 to finally delineate their maritime border.

Second, the five coastal states of the Arctic Ocean have yet to finally determine the outer limits of their continental shelves. The Russian Federation, made its initial submission for an extended continental shelf to the Commission on the Limits of the Continental Shelf in December 2001, but was requested to submit a revised submission as to a possible

Arctic extension and that submission is expected in 2010 or possibly later. Norway, filing its submission to the Commission in November 2006, received recommendations from the Commission in March 2009 and at the time of writing had yet to formally establish the outer limits. Canada, Denmark (Greenland) and the United States are still in the process of collecting scientific and technical data in order to establish their claims. The United States has not yet acceded to the LOSC and there is increasing pressure on it to become a Party in order to legitimise its potential extended continental shelf through the Commission on the Limits of the Continental Shelf.

Resolving disagreements over the jurisdictional status of some marine waters in the Arctic is a third challenge. For example, the United States and other states have objected to Canada's enclosure of its Arctic Archipelago with straight baselines and the status of those waters as internal. The United States considers the Northwest Passage and parts of the Northern Sea Route off the Russian Federation as straits used for international navigation where the right of transit passage would apply, while Canada and the Russian Federation vehemently contest such status.

The status of maritime zones off Svalbard is also open to contention. While the Treaty of Spitsbergen (Svalbard) adopted in 1920, recognises Norwegian sovereignty over the archipelago subject to equal rights of access, fishing and hunting for other parties, the application of the treaty beyond the territorial sea is disputed. Norway maintains the treaty's application ends at the territorial sea limit and, therefore, Norway is entitled to an EEZ and continental shelf off Svalbard. Tensions over the legal status of waters seaward of the territorial sea have been partly quelled by Norway's restraint in only establishing in 1977 a Fisheries Protection Zone out to 200 n.m., and granting fisheries access to contracting parties to the treaty founded on historical fishing patterns.

A fourth challenge is the need to consider possible future directions for strengthening international cooperation in protecting the marine environment in the large pocket of high seas beyond natural jurisdiction in the central Arctic Ocean. With various freedoms of the sea, including fishing and navigation, a looming challenge is to initiate international discussions on future development and conservation objectives and options for providing further protective measures. Various governance options have been proposed by various authors including the establishment of a regional ocean management organisation (ROMO), the creation of a regional fisheries management organisation (RFMO) and the negotiation of a high seas marine protected area.

Future directions for high seas governance for all the world's oceans, including the Arctic, has become an international cauldron of controversy. The UN General Assembly has established an Ad Hoc Open-ended Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction.

tion (ABNJ Working Group). The ABNJ Working Group has met three times, most recently in February 2010, and has not been able to resolve deep divisions of opinion over such issues as whether an Implementation Agreement on High Seas Marine Biodiversity should be forged and whether bio-prospecting for genetic resources on the high seas should be subject to a special access and benefit sharing arrangements supportive of developing countries.

3.2.3 Antarctic Law of the Sea Realities and Challenges

With no generally recognised coastal states in the Antarctic region with national zones of jurisdiction and concomitant control over the activities of foreign vessels, the Antarctic law of the sea reality is the primacy of flag state jurisdiction. Each state authorising ships to fly its flag is responsible for ensuring its vessels operating in the Antarctic comply with international treaty and customary law obligations relating to such areas as shipping, fishing, ocean dumping and marine biodiversity conservation. For example, the Basel Convention on the Trans-boundary Management of Hazardous Wastes and Their Disposal requires parties to prohibit the export of hazardous wastes for disposal within the area south of the 60° South latitude, and it is the flag state that bears prime responsibility for ensuring its flagged vessels do not undertake such shipments. While ocean dumping in most regions would be strictly regulated by coastal states, in the Antarctic control measures for potential dumping from outside the region would fall on the shoulders of flag states.

Two main law of the sea challenges continue to hover over Antarctic waters. First is the potentially frayed regulatory nets opened by reliance on flag state jurisdiction as the prime means of controlling human uses. Flag states may not become party to key multilateral environmental or fisheries agreements aimed at protecting Antarctic waters. For example, the Madrid Protocol on Environmental Protection to the Antarctic Treaty, which sets out environmental impact assessment obligations for contracting parties authorising activities in the Antarctic, has only 34 parties. Thus, the danger exists that states not party might allow their flagged vessels to undertake tourism visits to the region without imposing any environmental impact assessment (EIA) requirements.

A second challenge is ensuring territorial claimant states in the Antarctic do not “rock the boat” in relation to contested offshore jurisdiction. For example, while Australia has passed national legislation prohibiting the taking of whales in its 200 EEZ declared off its claimed Antarctic Territory, it has thus far chosen not to enforce the legislation against foreign vessels. Political pressures continue within Australia for the government to take effective action against Japanese whaling allegedly undertaken for scientific research purposes. Potential extended continental shelf claims by territorial claimant states is a further jurisdictional issue.

For example, Australia in making its extended continental shelf claims to the Commission on the Limits of the Continental Shelf gave notice of its potential claim off Antarctica but requested the Commission not to consider the submission relating to the continental shelf appurtenant to Antarctica.

Numerous issues lurk in the background regarding maritime claims in the Antarctic. They include: how to determine baselines for measuring maritime zones where the normal “low-water line along the coast” may not be possible to determine due to ice-cover; whether ice shelves can be equated with land and be used as base points; and how to treat ice for maritime boundary delimitation purposes if claimant states in Antarctica choose to delimit boundaries between themselves.

The legal status of icebergs, which have potential for commercial exploitation, is a further looming issue. Whether coastal claimant states might eventually exert “ownership” rights over icebergs within 200 n.m. zones remains to be seen. A freedom of the high seas approach is also possible where “harvesting” would be open to anyone, but a common heritage of humankind approach whereby exploitation would be subject to equitable sharing of benefits through an international management scheme might also be considered.

3.3 Governance of Polar Shipping: Similarities and Polarities

3.3.1 *Similarities*

Shipping standards for the two Polar Regions are common on many fronts. Global conventions relating to maritime safety apply to both the Arctic and Antarctic as do some vessel-source pollution and marine environmental protection provisions. Various guidelines, some specifically tailored to address the special challenges of Polar shipping, have also been forged.

3.3.1.1 *Maritime Safety Agreements*

The “main sail” agreement setting out international safety standards for shipping in all oceans, including Polar seas, is the (1974) Safety of Life at Sea Convention, (SOLAS) as amended. The Convention casts a broad net of rules and standards in such areas as construction, steering gear requirements, fire detection and extinction, life-saving equipment including lifeboats and life jackets, radio communications, carriage of dangerous goods and maritime security. Chapter V of SOLAS addresses safety of navigation in various ways: by imposing navigational equipment requirements like radar and eco-sounding devices (to display available water depth); by requiring vessels to carry adequate and up-to-date nautical

charts; and by providing for the imposition of mandatory ships routeing systems through application to the IMO.

Four other maritime safety “jib sails” are also particularly important. The (1966) International Convention on Load Lines, is aimed at ensuring ships are not overloaded by requiring adequate freeboard, that is, the distance between the ship’s deck and the waterline. The (1972) Convention on the International Regulations for Preventing Collisions at Sea, (COLREGS) sets out various speed, lookout and navigational rules to help avoid collisions and also requires various lighting arrays and sound signals. The (1979) International Convention on Maritime Search and Rescue provides the legal umbrella for countries to cooperate in ensuring that adequate search and rescue capabilities are in place in all marine regions. The (1978) International Convention on Standards of Training, Clarification and Watch-keeping for Seafarers, significantly amended in 1995 and again in June 2010, establishes training and competency requirements for ship officers and crew and covers hours of work and rest.

3.3.1.2 Vessel-source Pollution and Marine Environmental Protection Provisions

The International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), the “main sail” for addressing vessel-source pollution, is applicable to both Polar Regions and establishes detailed marine pollution and protection standards through six annexes. Annexes I (oil) and II (noxious liquid substances) are mandatory for all parties to the Convention while the others Annexes III (harmful substances in packaged form), IV (sewage), V (garbage) and VI (air emissions) are optional.

While substantial differences in vessel discharge standards for the Arctic and Antarctic exist in relation to oil, noxious liquid substances, and garbage as discussed below, two major commonalities stand out. First, Annex VI of the MARPOL 77/78 which seeks to control air emissions such as ozone-depleting substances, nitrogen oxides and sulphur oxides, applies uniformly to ships operating in both Polar Regions. One of the key control mechanisms is to generally limit the sulphur content of ship fuels at 4.5 percent, but special Emission Control Areas can be established where the sulphur content would be capped at 1.5 percent. Amendments to Annex VI in 2008 will gradually decrease the general cap from 4.5 percent to 0.5 percent (effective from 1 January 2020) and the Emission Control Areas standard from 1.5 percent to 0.1 percent (effective from 1 January 2015). The revised Annex VI allows an Emission Control Area to be designated not to just control sulphur oxides but also nitrogen oxides. Neither Polar Region has yet been proposed for special emissions status, thus the general sulphur content standards will apply.

While some differences do exist over how the Antarctic and Arctic regions address sewage discharges from ships, such as which ships are subject to controls, the two regions are also subject to quite similar sew-

age discharge standards. Annex IV to the Protocol on Environmental Protection to the Antarctic Treaty in Article 6 allows untreated sewage from a holding tank to be discharged beyond 12 n.m. from land or ice shelves at a moderate rate while the ship is *en route* at a speed of no less than 4 knots. This is consistent with Regulation 11 of MARPOL's Annex IV which sets a global standard from sewage discharges also applicable to the Arctic so long as coastal states do not adopt stricter standards.

Other global "jib sails" aimed at protecting the marine environment are also applicable to both Polar Regions. The (1972) Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, permits ocean dumping if authorised pursuant to a national ocean dumping permit but prohibits disposal of wastes listed on a global prohibited list, such as industrial and radioactive wastes. A 1996 Protocol to the Convention adopts a precautionary approach whereby only wastes listed on a global "safe list"; such as dredged materials and organic wastes of natural origin, may be disposed of subject to a waste assessment review and a national permit.

The International Convention on the Control of Harmful Anti-fouling Systems on Ships, which came into force on September 17, 2008, requires ships to either not use organotin compounds on their hulls by January 1, 2008 or to have a protective coating to prevent leaching of organotin compounds. Organotin compounds, such as tibutyltin (TBT), act as biocides to prevent marine life such as algae and molluscs from attaching themselves to ship hulls and TBT has been shown to cause sex changes in whelks and deformities in oysters.

The International Convention for the Control and Management of Ships' Ballast Water and Sediments, adopted in 2004 but not yet in force, seeks to avoid transfer of invasive alien species across marine regions through ballast water exchange obligations (whenever possible conducting exchanges at least 200 n.m. from the nearest land in water at least 200 metres in depth) and ballast water management systems. Shifting from ballast water exchange to treatment systems to control the levels of viable organisms is to occur for all ships by 2016.

Two global agreements seek to ensure adequate preparations for preventing and responding to pollution incidents. The (1990) International Convention on Oil Pollution Preparedness, Response and Co-operation, requires contracting parties to require ships flying their flags to have on board a shipboard oil pollution emergency plan, to provide a minimum level of pre-positioned oil combating equipment, and to cooperate upon the request of any party in responding to an oil pollution incident. The (2000) Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, extends the obligations to cover carriage and spills of hazardous and noxious substances.

3.3.1.3 Shipping Guidelines

Three key sets of guidelines, adopted under the auspices of the IMO, seek to address the special conditions posed by shipping in Polar waters including remoteness and the dangers posed by ice. First, the Maritime Safety Committee in May 2006 adopted a Circular (MSC. 1/Circ. 1184) on Enhanced Contingency Planning Guidance for Passenger Ships Operating in Areas Remote from SAR Facilities. The guidance document urges companies operating passenger ships in areas remote from search and rescue facilities to develop contingency plans in case of emergencies which should consider, among other things, the possibility of voyage "pairing" where other passenger ships operating in the same area might be used as a search and rescue facility.

Guidelines on Voyage Planning for Passenger Ships Operating in Remote Areas, adopted by the IMO Assembly in November 2007, further urge passenger ships to develop detailed voyage and passage plans. Such plans for ships operating in the Arctic or Antarctic waters should address such factors as safe distance from icebergs, safe speeds in the presence of ice, no entry areas and special preparations necessary before entering waters where ice may be present, such as abandoning ship drills.

A third set of guidelines was adopted by the IMO Assembly in December 2009 which revised Guidelines for Ships Operating in Arctic Ice-Covered Waters (2002) and extended coverage to both the Arctic and Antarctic waters (See Figures 1 and 2). The Guidelines for Ships

Operating in Polar Waters provide a four-part overlay to existing international maritime agreements in order to address the special situation of ships operating in Polar waters. The Guidelines are applicable to ships subject to regulations under the SOLAS Convention which generally covers passenger ships and cargo ships of 500 gross tonnage or more when engaged on international voyages but not warships, pleasure yachts or fishing vessels. Part A of the Guidelines provides construction, stability and other technical requirements for new Polar Class Ships. The Guidelines, adopting the seven Polar classes recognised by the International Association of Classification Societies (IACS), seek to ensure ships can withstand flooding

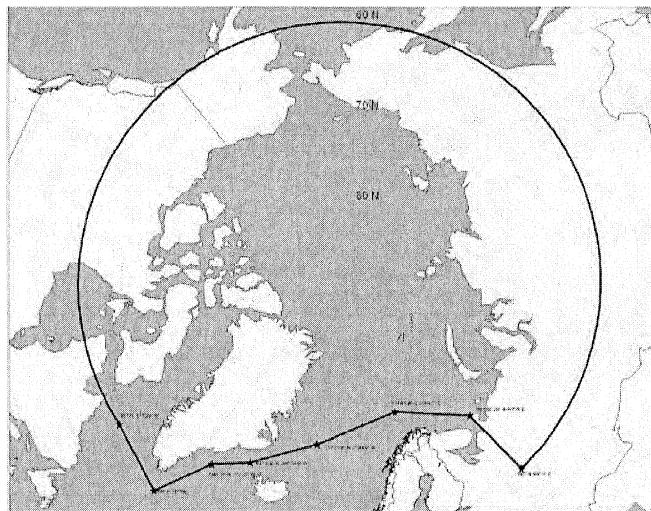


Figure 1: Maximum extent of Arctic waters application

Source: IMO, Guidelines for Ships Operating in Polar Waters, Assembly Res. A. 1024(26) (2009), p. 9

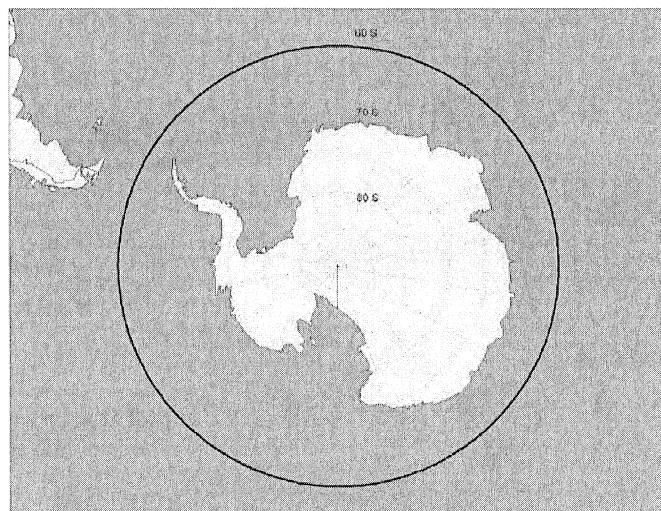


Figure 2: Maximum extent of Antarctic Waters application

Source: IMO, Guidelines for Ships Operating in Polar Waters, Assembly Res. A. 1024(26) (2009), p. 9.

Resulting from hull penetration due to ice impacts, advocate against Polar Class ships carrying any pollutant against the outer shell, urge appropriate anchoring and towing arrangements, and call for all equipment on a ship to not be susceptible to brittle fracture.

Part B, applicable to Polar Class and other ships, sets out various equipment suggestions. These include, among others, the design and location of fire detection and extinguishment systems to avoid freezing temperatures, the provision of personal survival kits capable of protecting against severe weather conditions, the carrying of partially or totally en-

closed lifeboats, and redundancy in key navigational systems such as radar and depth sounding devices.

Part C, also applicable to Polar Class and other ships, sets out various operational suggestions. A checklist of what crew members should consider in an evacuation drill is provided. Carriage of at least one qualified Ice Navigator aboard all ships operating in Polar ice-covered waters is advocated, but with no detail on what would constitute adequate on-the-job training or simulation training. Reserve supplies of fuel and lubricants are urged in light of heavy fuel consumption in heavy ice.

Part D encourages the equipment and preparation for Polar Class and other ships navigating in Polar waters to control damage to the marine environment. Proper equipment and training to ensure minor hull repairs is urged along with the capability to contain and clean up minor deck or over side spills.

A process is currently underway within the IMO to make the voluntary Guidelines for Ships Operating in Polar waters mandatory with 2012 being a target completion date. Various issues are being discussed including the geographic scope of application, appropriate classroom and practical experiences that should be required for ice navigators, possible extension of coverage to barges, fishing vessels and pleasure craft, phase-in requirements for existing ships, and possible expansion to cover ballast water and hull-fouling.

A more general set of IMO guidelines also has potential to be applied to Polar waters. Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas (PSSAs), undergoing substantial revision in 2005, provide for the designation of PSSAs for areas particularly vulnerable from international ship traffic where special associated protective measures may be imposed such as areas to be avoided, traffic routeing, mandatory ship reporting, and discharge restriction. However, to date PSSA designations have not been applied to either Polar Region.

3.3.2 Polarities

With the Antarctic listed as a special area under Annexes I (oil), II (noxious liquid substances) and V (garbage) of MARPOL, stricter than global discharge standards have been established for the marine region south of the 60° South latitude. These stricter standards have been further solidified by inclusion in Annex IV to the Madrid Protocol on Environmental Protection. Article 3 of Annex IV prohibits the discharge into the sea of oil or oily mixtures from ships with limited exceptions such as a discharge relating to accidental damage to the ship or equipment. Article 4 prohibits the discharge of any noxious liquid substance and any other chemical substances in quantities or circumstances harmful to the marine environment. Article 5 prohibits disposal of all plastics into the sea from vessels and most other garbage with the exception of ground up food

wastes if disposed of 12 n.m. or more from the nearest land or ice shelf. The question of whether the Antarctic special area designations should be extended northward from the present area south of the 60° South latitude to the Antarctic convergence is under discussion by Antarctic Treaty Consultative Parties.

The MARPOL Convention provides special reception facility requirements to support Antarctic special area designations in relation to oil and garbage. Parties to MARPOL at whose ports ships depart *en route* to or arrive from the Antarctic area must ensure adequate facilities for the reception of oily residues and garbage from all ships. Each Party to MARPOL is also required to ensure that all ships entitled to fly its flag, before entering the Antarctic area, have sufficient capacity on board for the retention of oily residues and garbage and have concluded arrangements for the discharge of oily residues and garbage at a reception facility after leaving the area.

With no area of the Arctic Ocean having been designated as a special area under MARPOL, the pollutant discharge standards for some areas of the Arctic are less strict than for the Antarctic. Unless coastal states choose to impose stricter than global standards pursuant to the special legislative and enforcement powers granted by Article 234 of the LOSC, global standards will apply. Annex I of MARPOL allows oily ballast water discharges from tankers if they are over 50 n.m. offshore at a rate of 30 litres per nautical mile while *en route*, and the Annex also allows oily bilge waste discharges from oil tankers and other ships with a 15 parts per million (ppm) limitation. Annex II allows some discharge of noxious liquid substance residues based on the level of toxicity. Annex V allows considerable garbage deposits, other than plastics, including packing materials if more than 25 n.m. from the nearest land and glass, metal, paper products, rags and similar refuse if more than 12 n.m. from the nearest land.

Canada and the Russian Federation exemplify how coastal states may choose to impose stricter than global discharge standards. Canada prohibits all oil discharges from ships in Arctic waters with limited exceptions, as well as garbage and other waste deposits. The Russian Federation has prohibited the discharge of oily ballast water from tankers and the deposit of garbage for the Northern Sea Route.

Regional differences have also emerged in relation to the carriage of heavy grade oil and the control of ballast water in Polar Regions. A proposal to prohibit the use of carriage of heavy grade oil in the Antarctic was adopted by the IMO's Marine Environment Protection Committee in March 2010 and the ban on the use and carriage of heavy fuel oil by vessels operating in Antarctic waters will take effect from 1 August 2011 through a regulatory amendment to Annex I of MARPOL. In 2007, non-binding Guidelines for Ballast Water Exchange in the Antarctic Treaty Area were adopted by the IMO with various control measures suggested

including the exchange of ballast water before arrival in Antarctic waters. To date regional approaches to addressing heavy grade oil carriage and ballast water controls have not been developed for the Arctic region.

3.4 Conclusion

As this chapter has sought to highlight the Arctic and Antarctic are in many ways “poles apart” in relation to law of the sea contexts and shipping discharge standards. While the Arctic, being an ocean surrounded by continents, is largely subject to the jurisdiction of five coastal states, the Antarctic, constituting a continent surrounded by an ocean, remains in a law of the sea “twilight zone” with no generally recognised coastal state offshore jurisdiction and thus the primacy of flag state legislative and enforcement controls. While the Antarctic has been designated as a special area under three of MARPOL’s annexes where stricter than general international vessel-source discharge standards apply for oil, noxious liquid substances and garbage, the Arctic has not yet been globally designated for special pollution control measures.

However, shared commonalities in the areas of maritime safety, vessel discharge standards and marine environmental protection obligations have emerged. For example, The Guidelines for Ships Operating in Polar Waters (2009) establish a common framework for construction and operational requirements for ships in the Arctic and Antarctic. Consistent air emission and sewage discharge standards for ships have been adopted for the two regions. International agreements relating to ocean dumping, anti-fouling agents, ballast water management and emergency preparedness are also applicable to both regions.

The quest for effective governance in both Polar regions is thus far from over. The Guidelines for Ships Operating in Polar Waters have yet to be made mandatory and numerous issues remain to be resolved, such as the geographical scope of applications, the types of vessels covered and the strength of regulatory measures. Efforts continue within the IMO to further tighten controls on sewage and garbage from ships. The regulation of greenhouse gas emissions from ships has become a topic of important but unresolved debate. Pressures to better control vessel noise in order to protect marine mammals have also not abated.

Both Polar Regions are currently experiencing increased attention in respect of the inadequacies of existing shipping governance measures and the need to strengthen international and regional rules and standards. The Arctic Council’s comprehensive Arctic Marine Shipping Assessment (AMSA), published in April 2009, offered numerous recommendations under three themes. For example, to enhance Arctic marine safety, AMSA urged Arctic states: to work through the IMO to augment global ship safety and pollution prevention conventions with specific mandatory requirements for ship

construction, design, equipment, crewing, training and operations aimed at Arctic shipping safety; to explore harmonisation of national Arctic shipping regulatory regimes; and to develop a multi-national Arctic Search and Rescue (SAR) instrument including aeronautical and maritime SAR. To protect Arctic people and the environment, AMSA recommends that Arctic states: identify areas of heightened ecological and cultural significance and implement protective measures from marine shipping impacts; explore the need for specially designated Arctic marine areas as “special areas” or “particularly sensitive sea areas” through the IMO; enhance cooperation in oil spill prevention; and support reduction of air emissions of greenhouse gases, nitrogen oxides, sulphur oxides and particulate matter. To build Arctic marine infrastructure, the third theme, AMSA urges Arctic states: to improve infrastructure in the areas of ice navigation training, navigational charts, communication systems, port services, reception facilities for ship-generated waste, and icebreaker assistance; develop circumpolar pollution response capabilities; and increase investments in securing adequate hydrographic, meteorological and oceanographic data to support safe navigation. At the Sixth Ministerial Meeting of the Arctic Council in Tromsø, Norway, April 29, 2009, Ministers approved the actual establishment of a task force to negotiate an international SAR instrument for the Arctic by the next Ministerial meeting in 2011.

The Antarctic Treaty Meeting of Experts on Ship-borne Tourism in the Antarctic Treaty Area, hosted by New Zealand in December 2009, also produced a set of recommendations to be forwarded to the next Antarctic Treaty Consultative Meeting. For example, Antarctic Treaty Parties are urged to: consider the development of a specific checklist for inspections of tourist vessels in Antarctica; contribute to hydrographic and charting information in the Antarctic Treaty Area; proactively apply port state control regimes to tourist vessels bound for the Antarctic; exchange information on contingency planning preparedness; and consider mechanisms for enhancing coordination with respect to Antarctic-related matters within the IMO.

The time is ripe for the further strengthening of shipping governance and cooperative arrangements to protect the marine environment in both Polar Regions. However, it remains to be seen how far the vested social and economic interests of states and their constituents will constrain progress. The voyage towards safe and sustainable seas in both regions is thus likely to be a long and arduous.

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Questions:

1. What are the main differences in the Law of the Sea contexts for the Arctic and the Antarctic?
2. What is the main Law of the Sea challenge for each Polar region?
3. Are shipping activities in the Arctic and Antarctic adequately controlled?
4. What governance strengthening, if any, would you recommend for the Arctic? For the Antarctic?