T 403 G – Skating on thin ice: The IMO Polar Code

Biography
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Description
Exploration for natural resources and navigation in polar waters have advanced rapidly in recent years. The quest for seabed petroleum, shorter navigation routes, distant water fisheries and cruise ship tourism have all contributed. The particular challenges of vessel design, construction and operation in ice covered waters have only started to be considered by our industry. A significant advance in uniform standards and ostensible efficiencies for shipbuilders and vessel owners will be the International Maritime Organization’s Polar Code.

This paper considers the desirability of common international regulation of polar vessel design and construction standards, the role of the IMO in assuring such standards, and the implications for commercial industry. A particularly Canadian view of the expansion of northern shipping activities and the requirement to regulate risk management in ice covered areas will be taken. The drafting of the Polar Code, the areas as yet left undeveloped in the regulation of polar shipping, and the economic impacts of the Code for industry will be canvassed. The roles and need for cooperation among stakeholders will be assessed, including designers, government regulators, classification societies, underwriters, and vessel owners.
Skating on thin ice: The IMO Polar Code

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Abstract: The exploration for natural resources and navigation in polar waters has advanced rapidly in recent years. The quests for seabed petroleum, shorter navigation routes, distant water fisheries and cruise ship tourism have all contributed. The particular challenges of vessel design, construction and operation in ice-covered waters have only started to be considered by the commercial shipping industry. A significant advance in uniform standards and efficiencies for shipbuilders and vessel owners will be the International Maritime Organization’s Polar Code.

This paper considers the desirability of common international regulation of polar vessel design and construction standards, the role of the IMO in assuring such standards, and the implications for commercial industry. A Canadian view of the expansion of northern shipping activities and the requirement to regulate risk management in ice covered areas is taken. The drafting of 2002 and 2009 Guidelines toward a Polar Code, the areas as yet left undeveloped in the regulation of polar shipping, and the economic impacts of a Code for industry are canvassed. The roles of stakeholders are also assessed, including government regulators, classification societies, underwriters, and vessel owners.

THREE CENTURIES after Europe’s search for the northwest passage began in earnest, the commercial shipping industry’s last frontier has opened up. The age of exploration, development, fishing and transit passage in polar waters has started. That has important implications for oceans governance, state regulation, the efficient construction and operation of vessels, and safety of life at sea. Are polar waters so much different that that safe navigation must be a matter of specific legislation and uniform standards? The industry, government and international consensus has been strongly in favour of a specific geographic approach in ice-covered waters. The emerging vehicle for this governance-regulation has been the Code of Safety for Ships operating in Polar waters of the International Maritime Organization.1 This paper considers the governance policy requirement for the Polar Code, its development and implications for the industry and states concerned.

In recent decades, several developments have led to an increase in shipping in polar waters, defined generally as waters north of 60° north, and south of 60° south. The

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developments have been geographically distinguishable between the Arctic and the Antarctic, but they commonly include the improvement in ship design and construction allowing vessels to operate more safely in such areas, the increase in distant water fisheries, the stable global oceans economic development regime that has resulted from the 1982 United Nations Convention on the Law of the Sea, natural resources exploration, and climate change, notably in the Arctic basin area. The growing presence of passenger cruise ships especially in Antarctic waters has been an impetus, although it should be recalled that the Antarctic Treaty system has effectively prevented the development of seabed petroleum south of 60° south. In contrast, oil exploration in the Arctic continental shelf has resumed, spurred in part by retreating sea ice and the deadline for circumpolar states to file claims to extended continental shelf areas beyond 200 nautical miles from their coastlines. As with all regulation - something to be reminded of at the centenary of the Titanic sinking - there is a remedial aspect underpinning an increased and special regulation of polar shipping. And, if a further factor needs to be identified, it is the emergence of the central, coordinating role of the IMO itself, with an ability to achieve uniformity of regulation by obtaining the consensus of the states concerned.

From cold war to cold water: The impetus to regulate Arctic shipping

The 1989 Exxon Valdez accident was an important catalyst for the IMO’s work on safe shipping in polar waters. Two 1990s era international projects that studied commercial shipping the Arctic were also a foundation for the Organization to consider specific vessel design, equipment and operating requirements while in northern waters. They were the International Northern Sea Route Program (“INSROP”) sponsored by researchers in Norway, Russia and Japan, and the Arctic Operational Platform Project 1999-2005 (ARCOP). These were assessments of the risks of navigation in sea ice and the resulting performance requirements operating for part of their services in high Arctic waters. Consideration of the use of the Arctic as a “Northern Sea Route” was also joined by concerns about the Arctic environmental generally, and, within that, marine ecology. In 1991, the eight Arctic circumpolar states agreed to the Rovaniemi Declaration, committing themselves to a joint action plan for Arctic Environmental Protection. By 1998, the work evolved to the eight states, acting through their Arctic Council, to promote the

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3 States which have 10 years from their acceptance of UNCLOS to prepare and submit extended continental shelf (ECS) claims to the UN Commission on the Limits of the Continental Shelf. Russia was the first circumpolar state to present an ECS claim. The United States has not yet ratified UNCLOS. Canada’s claim is due in 2013.


5 See the INSROP archive pages online at: <www.fni.no/insrop/> On ARCOP, see online at: <www.transport-research.info/web/projects/project_details.cfm?id=38216>

6 See The Rovaniemi Declaration on the Protection of the Arctic Environment (14 June 1991) online at: <http://arcticcircle.uconn.edu/NatResources/Policy/rovaniemi.html> See the Arctic Council’s Arctic Monitoring and Assessment Programme (AMAP) online at: <www.amap.no/>
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development of guidelines for ships in Arctic waters, necessarily engaging the International Maritime Organization.\(^7\)

The IMO is well positioned to consider safer shipping in the Arctic. Created as a United Nations Organization in 1948 and having its first meeting of member states in 1959, the Organization successfully arrived at two comprehensive regimes for shipping, SOLAS 1974 and MARPOL 73/78.\(^8\) The first, known formally as the International Convention for the Safety of Life at Sea, was the culmination of 60 years of reforms and cooperation between maritime states and classification societies. SOLAS I was developed in the years immediately following the loss of the Titanic in 1912, although the regime was not put into effect until SOLAS II in the 1930s. The IMCO-IMO saw its first involvement in multilateral treaty-making for safe shipping in SOLAS III of 1960. SOLAS has had wide-ranging consequences for the maritime industry, affecting the design, construction, crewing and operation of cargo and passenger vessels in a uniform way across national regulatory regimes.\(^9\)

SOLAS IV of 1974 is the foundation for almost all other advances in modern maritime safety, allowing for consistent flag and coastal state regulation of the entire scope of technical and operating aspects of commercial vessels, from construction and navigation, to cargo handling and life-saving appliances.\(^10\) For example, the High Speed Craft Code, the ISM Code and the International Ship and Port Security Code (the ISPS Code) are part of SOLAS. The uniformity and national implementation of SOLAS standards is realized by what is known as the “tacit acceptance” procedure, by which amendments become binding on IMO member states unless one-third (or those states registering more than 50% of commercial vessel tonnage) reject them.\(^11\) SOLAS Chapter II (“Construction”) specifically binds maritime states to the role of classification societies:

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\(^7\) The eight states are Russia, the United States, Canada, Denmark (Greenland), Iceland, Norway, Finland and Sweden. See the Iqaluit Declaration 1998, available online at the Arctic Council website: <www.arctic-council.org>

\(^8\) IMCO was initially known as the Inter-Governmental Maritime Consultative Organization (IMCO). The IMCO treaty established a governing Council and a standing Maritime Safety Committee (the precursor to the IMO MSC). Six of 16 Council members were representatives of states having the largest “interest in providing international shipping services”: Greece, Norway, United Kingdom, Netherlands, Sweden and the United States. IMCO’s mandate was to provide a “machinery for co-operation among Governments in the field of governmental regulation and practices relating to technical matters of all kinds affecting shipping engaged in international trade, and to encourage the general adoption of the highest practicable standards in matters concerning maritime safety and efficiency of navigation ...”


\(^10\) While it is SOLAS 1974 that remains most cited, a comprehensive treaty regime for safe commercial shipping dates to SOLAS 1960, which became effective in 1965. It should be noted that SOLAS Chapter V, Safety of Navigation, applies to all vessels, commercial and private, as well as yachts at sea.

\(^11\) Article VIII(b)(vi) SOLAS Convention 1974, above note 9. The IMO reports that, as of March 31, 2011, there are 159 states signatory to SOLAS 1974, representing 99.04% of world tonnage. See: <www.imo.org/About/Conventions/StatusOfConventions/Pages/Default.aspx>
In addition to the requirements contained elsewhere in [SOLAS], ships shall be designed, constructed and maintained in compliance with the structural, mechanical and electrical requirements of a classification society which is recognized by [a national] Administration ...  

It was oil tanker sinkings of the 1960s and 1970s that prompted the IMO to develop MARPOL, the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).  

Annexes I (oil) and II (noxious substances carried in bulk aboard ships) must be accepted by states that accede to the MARPOL regime.  Annexes III (harmful substances carried in packaged form), IV (sewage), V (garbage) and VI (air pollution) are optional.  It is Annex VI that has taken time to implement.  In force for signatory states since May 2005, only half of all tonnage registering states had acceded to it by 2012, and its requirements for clean burning engines, air emissions and fuels were revised with amendments that came into effect on July 1, 2010.  

In recent years, the MARPOL scheme has been added to with operational or process regulation, namely, record keeping of ozone depleting substances in vessels (Annex 12) and the change-over to low sulphur fuels when a vessel is in an “emission control area”.  

If the SOLAS 1974-MARPOL 73/78 scheme is directed to the design, equipping and operating of ships, then the organizational requirements to achieve safer shipping are met by the International Safety Management Code (the ISM Code, which is Chapter IX of SOLAS 1974). The ISM Code had its origins in a 1993 IMO resolution meant “to provide an international standard for the safe management and operation of ships and for pollution prevention.”  

For the first time, there was a treaty-based system of assessing compliance with all maritime construction and safety standards, a process to ensure continuing adherence, one that was directed to vessel operations and shore based management alike. “The cornerstone of good safety management is commitment from the top. In matters of safety and pollution it is prevention, it is the commitment, competence, attitudes, and motivation of individuals at all levels that determines the result.”  

A ship owner must have a current ISM “Document of Compliance” obtained after an audit by national regulatory authorities “or other organization authorized” (i.e. a classification society). In Canada, the Safety Management Regulations of the Canada Shipping Act, 2001 make the

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12  SOLAS Convention 1974, ibid., Chapter II-1, Part A-1, Regulation 3-1.
15  Record keeping of the change to low sulphur fuels is inspected as part of port state control. Vessels in designated emission control areas must use fuel with not more than 1.00% sulphur after July 1, 2010 and 0.10% after January 1, 2015. The IMO designates emissions operating areas under Resolution MEPC.175(58), above.
16  IMO Resolution A.741(18) (4 November 1993). The ISM Code came into force 1 July 1998. In most cases, commercial shipping companies had until 1 July 2002 to implement the Code.
17  ISM Code, Preamble, para. 6.
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ISM Code applicable to Canadian flag vessels ships which are listed as having to comply with SOLAS.18

The ISM Code, now in its tenth year of application, encountered some initial resistance in the industry, being considered by some as too much of a structural reform and artificial within the culture of the marine industry.19 A comprehensive Finnish study in 2010 concluded that the Code was having an effect on maritime safety:

The literature reviewed showed us that the ISM Code has brought a significant contribution to the progress of maritime safety in recent years. Shipping companies and crews are more environmentally friendly and more safety-oriented than they were 12 years ago ... Nevertheless, the direct effects and influence of the ISM Code on maritime safety could not be specified very well.20

It was among these developments of the SOLAS-MARPOL scheme that the requirements for specific regulation of vessels operating in polar waters began to be appreciated.21 The 2002 Arctic Guidelines were straightforward, based on an approach of supplementing or adding to the existing IMO regulatory scheme, and not meant as a stand-alone code.22 There were three subjects in the 2002 Guidelines: design of ships, equipment, and operating practices, that is, navigation in ice-covered waters.

Shaken and stirred: The geography of ice

A first consideration in drafting the 2002 Arctic Guidelines was the geographic area in which they would apply. Each circumpolar state had a different view, and there was no clear categorization of the risks in a single overall area. A “presence of ice” approach was settled that was to include “polar waters where local ice conditions present a structural risk to a ship.”23 This is also meant to include areas where sea ice covers more than 1/10 of the

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18 SOR/98-348.


21 The two conventions are not the entirety of IMO-global shipping safety treaties. The Load Line, Tonnage and Bunkers Conventions, together with the 1979 Search and Rescue Convention (the International Convention on Maritime Search and Rescue) are important additional stand-alone treaties.

22 The 2002 Arctic Guidelines, above note 1.

23 See Article G-3.2 “Arctic ice covered waters” in the 2002 Arctic Guidelines, above note 1. And see the 2009 Guidelines, above note 1 at Article G-3.5. Arctic waters in the 2009 Guidelines include “those waters which are located north of a line extending from latitude 58°00′00″ N, longitude 042°00′00″ W to latitude 64°37′00″ N, longitude 035°27′00″ W and thence by a rhumb line to latitude 67°03′00″ N, longitude 026°33′00″ W and thence by a rhumb line to Sorkapp, Jan Mayen and by the southern shore of Jan Mayen to the Island of Bjørnøya and thence by a great circle line from the Island of Bjørnøya to Cap Kanin Nos and thence by the northern shore of the Asian
sea surface. And so no precise limit or boundary can apply to define the Arctic area of application of the 2002 Guidelines or the 2009 version. In recent years, it has been contended that the 2009 Guidelines should apply to certain areas in the north Pacific ocean which are “ice prone” including near the Aleutian and Kiril Islands and into the Sea of Japan.\(^\text{24}\) That is a sensible approach given the possible uses of the Bering Strait for navigation and environmental protection concerns in the region. The effects of climate change, including the loss of multi-year ice in the Arctic basin area will require further consideration of the spatial limits of the 2009 Guidelines. An important feature of the current Guidelines is that, as multilateral instrument, they are intended to apply only to international voyages in the Arctic basin. Voyages within states, that is, between ports in a state, are not governed by the Code unless vessel owners voluntarily assume its obligations or the coastal requires compliance through its national legislation. No such exemption applies in Antarctic waters which, by definition, are entirely international.

The approach to establishing the Antarctic ocean (i.e. southern ocean) area to be governed under the 2009 Guidelines was straightforward. The limits of operation of the Antarctic Treaty, to the south of 60° south was adopted. While this seems a straightforward means of establishing an area for special regulation of ship construction, it did not account for the absence of sea ice in much of the southern ocean. However, apart from distant water fishing and whaling vessels operating south of 60° south, a large number of vessels, perhaps a majority of them, would be in transit to and from Antarctica and so acceptably caught by the Guidelines and an eventual Polar Code.\(^\text{25}\) There are suggestions that the particular protections under a Polar Code should be in areas that more closely match ecological regions which need particular protection. Such an area might extend to the “Antarctic Polar Front”, where the cold waters of southern latitudes meet those to the north “resulting in marine life south of the APF which is distinct from that to the north ...”\(^\text{26}\)

While the areas where ice is expected to be present is a consideration, so is the time a vessel will operated in differing ice conditions. The definition of seven categories of “Polar Class” vessels in the current Guidelines goes some way to meeting this. The categories, ranging from PC1 “year-round operation in all ice types” to PC7 “summer/autumn operation in thin first year ice” import into (an eventual) Code the structural standards prescribed by the International Association of Classification Societies (IACS). The IACS Unified Requirements for Polar Class Ships require structural strength to be provided for in the four areas of a new vessel; Bow, Bow Intermediate, Midbody and Stern.\(^\text{27}\) The design load parameters specific to each of the seven Polar Classes include “crushing failure”, “flexural failure”, “load patch dimensions”, displacement and longitudinal strength. The

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\(^\text{24}\) See “Development of a Mandatory Code for Ships Operating in Polar Waters: Polar Code Boundaries for the Arctic and Antarctic” (14 January 2011), IMO doc. DE/155/12X.

\(^\text{25}\) The 1980 Convention for the Conservation of Antarctic Living Marine Resources (in force 7 April 1982), part of the Antarctic Treaty system, is meant to regulate this fishery, but suffers from a lack of flag state and local controls.

\(^\text{26}\) Above note 24 at para. 9

crushing and flexural failure requirements for Polar Class 1 vessels are at least 10 times greater than those of summer season only Polar Class 7 vessels. The IACS Unified requirements also provide for machinery operating conditions, including propeller ice loads.\(^{28}\) 2010 revisions to the IACS Unified Standards will apply to all new construction after January 1, 2012.

A cold remedy: The Code

Two important things about the 2009 Guidelines must be recalled. The first is that the Guidelines are not yet binding. They are meant in the ongoing development of an eventual Polar Code to be part of the SOLAS scheme to be “recommendatory”. That owes itself as much to the interests of the states most concerned with polar shipping as it does the necessary transition period in the years to come to construct new vessels meeting all aspects of the Code. It remains open, of course, for flag states to adopt the Guidelines into national legislation, but there will first be more refinement and a gradual move by the IMO to an uniform application among all its member states. The second thing about the Code is that it is intended as a supplement in particular to the SOLAS-MARPOL scheme (as well as other IMO and multilateral shipping treaties, and national legislation) and not as a stand-alone body of requirements for the entirety of vessel design and operation in ice-covered waters.

There are four parts to the 2009 Guidelines: A - construction standards; B – equipment; C - operational arrangements; and D - environmental protection and damage control. While the requirements of each part are discrete or stand-alone without much complimentary to other parts, the value of the Guidelines lies in their whole application toward the goals of safe navigation and pollution prevention. The risk of sea ice as “a serious structural hazard to all ships” is the main theme of the Guidelines and the reason why provisions at Part A are extensive.\(^{29}\) Key provisions stipulate that only Polar Class or appropriately ice-strengthened vessels should operate in polar areas, that acceptable structural design should minimize most navigational risks, and that navigation and communications equipment must be reliable for use at high latitudes given “limited infrastructure and unique information transfer requirements.” There is also the curious - if necessary – stand-alone principle that “sea suctions should be capable of being cleared of accumulation of slush ice.”\(^{30}\) The general provisions of the current Guidelines include the recommendation that ships have an Ice Navigator embarked, defined as someone who is STCW qualified and “specially trained and otherwise qualified to direct the movement of a ship in ice-covered waters.”\(^{31}\)

The Part A construction provisions of the 2009 Guidelines are premised on owners identifying and ensuring the appropriate use of vessel Polar Classes. That is a matter to fall to classification societies and so the IACS Unified Requirements should, in being the level playing field where there is no ability for ship owners to escape an a priori Polar Class designation, ensure broad cross-market acceptance of the Classes scheme. The issue is whether owners will construct standards to the least rigorous (i.e. structural strength)

\(^{28}\) Ibid. at pp. 13 ff.


\(^{30}\) Ibid. at section G-2 (“Key Provisions”).

\(^{31}\) Ibid. at paras. G-3.12 and 1.2.
A requirement available in the predicted or envisioned operating areas for a vessel and, related to this, how long a vessel will be able to remain within a particular Polar Class category when its structures degrade. The Part A construction provisions rely substantially on the use of the IACS Unified Requirements. The remainder of provisions for stability, accommodation and escape measures, steering (“directional control”), anchoring and towing arrangements, main and auxiliary machinery and electrical systems – all general in nature – should be considered in this light.

The innovative development of the Guidelines toward an eventual Polar Code can be seen in Part B – equipment. Here, the requirements for life-saving appliances and survival equipment are detailed, with recommendations for training of passengers and crew, and the suggested contents of group and personal survival kits. A brief period for on-ice survival is contemplated in the design of the kits. Lifeboats are to be partially or completely enclosed. Navigation equipment for operation in polar latitudes is meant to complement the requirements detailed at SOLAS Chapter V. In general, the approach is that of redundancy in navigation systems, such as two means to speed measurement, two navigational radars, two depth-sounding devices, and the use of automatic identification systems at all times.

In Part C the Guidelines move into operational arrangements for working in ice-covered waters. Contingency planning and an operations manual specifically tailored to the risks of polar navigation are prescribed, including the need to consider damage control measures, evacuation onto ice and water, and “procedures for checking the integrity of hull structure.” Crew competency for ice recognition, navigation in ice and ice-breaking escort of the vessel is to be detailed in a training manual. Drills and emergency instructions are also an important subject in this Part.

Part D prescribes environmental protection measures in a general way, adding little to MARPOL 73/78 requirements, for example, for the adaptation of shipboard oil pollution emergency plans. The advice that crews be capable of minor hull repair and that ships in Polar Classes 1-5 have additional hull repair equipment is sensible enough, if somewhat simplistic. The advice for environmental protection is also straightforward if general in nature:

Procedures for the protection of the environment under normal conditions should take into account any applicable national and international rules and regulations and industry best practices related to operational discharges and emissions from ships, use of heavy grade oils, strategies for ballast water management, use of anti-fouling systems, and related measures.32

Getting to yes: A mandatory Code

Arriving at a binding Polar Code means a careful balancing of interests. These include the particular requirements of flag states and industry, classification societies and marine underwriters. The concerns of coastal states in the Arctic in particular have been an additional complicating factor to imposing mandatory compliance on vessel operators. Three approaches to developing a mandatory code have been considered by the IMO,

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32 Ibid. at para. 16.3.
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namely: (i) amending SOLAS and related conventions; (ii) negotiating a stand-alone Polar Code convention; and (iii) simply making the Code obligatory as a matter within SOLAS. Each approach has its merits and drawbacks. An entirely new convention seems attractive, but will require a treaty-making process all its own that will be protracted and perhaps inefficient to administer. Amendments to SOLAS and MARPOL may be readily done, although the trend of state accession in response to MARPOL Annex VI (air emissions standards) has been slow. Arguably the entire SOLAS scheme is becoming unwieldy and difficult to amend in a timely way. The preferred approach – as with the ISM Code is the 1990s – may be to engraft the Polar Code into SOLAS as an additional chapter, making consequential amendments elsewhere as needed.

Creating a mandatory Polar Code presents two further issues: certification of compliant vessels and the regulatory role of Arctic coastal states, accepting for a moment that member states of the Antarctic Treaty do not have the same legal capacity (that is, competency) to regulate shipping south of 60° south. The desired safety regime for ships operating at high latitudes and in ice-covered waters is meant to be the same as all vessels in all other regions of the world. However, a Polar Code will entail unique coordinate roles for the principal regulatory actors: flag and coastal states, classification societies and the IMO. What, therefore, should the process and form of compliance be? Should there be any role for the flag state to register vessels and ensure their structural compliance within the seven stated Polar Classes? Is the ISM Code “Document of Compliance” scheme sufficient for certification of all aspects of seaworthiness (and crew training) for vessels in polar areas? Undoubtedly, there is a significant role to be enjoyed by classification societies in reconciling the various interests and potential gaps between the regulatory actors. This suggests the states most involved (shipping and Arctic coastal states) should consider uniform approaches to classification society delegation of certification and maintenance of ships in “polar class”.

When it comes to the particular role and concern of coastal states, it must be recalled that the 2009 Guidelines and an eventual Polar Code will not replace national control of sea lanes passage. That will mean circumpolar states will need to consider vessel traffic routing schemes, navigational aids, and the adequacy of charts they publish. They will also have to review national pollution control regulations and how they will fit with the SOLAS-MARPOL regime. There are some further, ancillary obligations that will fall to Arctic coastal states as a result of contemplating additional shipping uses of Arctic waters, including search and rescue capacity, ice monitoring and information delivery, and pollution response measures. A recent example of one national concern is Norway’s suggestion in January 2011 of a consideration of measures in a Polar Code for ships to avoid striking whales. The IMO was asked to consult with the International Whaling Commission about the matter.


34 Consider Canada’s Arctic Waters Pollution Prevention Act, RSC 1985, c. A-12, available online: <http://laws-lois.justice.gc.ca/eng/acts/A-12/> See also the sailing plan and position reporting requirements for vessels in Canada’s Arctic waters under the “NORDREGS” scheme of the Northern Canada Vessel Traffic Services Zone Regulations, SOR/201-127 (in force 1 July 2010), available online: <http://laws-lois.justice.gc.ca/eng/regulations/SOR-2010-127/FulText.html>

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An IMO Marine Safety Committee group met in March 2011 to consider development of the Polar Code. After discussing how to define an ice certificate for ships, the meanings of polar class, ice class and polar ship the Sub-Committee on Ship Design and Equipment determined that three categories of ships could be identified for regulation in an eventual Code:

A - Polar ice covered: Ships that may operate in ice-covered waters with 10% or more of ice;

B - Polar open water: Ships that may operate in ice-covered waters with less than 10% ice, where it may pose a structural risk, and

C - Polar open water including ice-free waters: Ships that may operate in waters with zero to 10% ice cover, where it does not pose a structural risk.

In arriving at these proposed categories, the Sub-Committee received advice from IMO member states on the identification of particular hazards that could inform the drafting of the Code. Germany presented a reconciliation of the information received by the Sub-Committee about hazardous sources, hazards, consequences and risk control while presenting a draft Code adopting the IMO’s “Goal-Based Standards” for the construction of ships. Denmark called for consideration of passenger evacuation and the possible pairing of vessels in remote areas. Ship powering in polar waters also emerged as an ongoing matter for development, with the aim of ensuring vessels are adequately designed to not stop in ice. The Sub-Committee entertained wide-ranging submissions for environmental protection in a Code, notably from several non-governmental organizations, on subjects ranging from the monitoring of vessels, the taking of an “ecosystem-based approach to managing shipping in polar waters” and expanding the definition of pollutants. The Sub-Committee decided that the Code will contain an environmental part but without likely changes or requirements additional for vessel discharges under the MARPOL regime. The Sub-Committee also concluded that the current Arctic and Antarctic polar areas, discussed above, should not be changed.

Canada was active in the Sub-Committee, leading the discussion of the application of a Code to new and existing and SOLAS and non-SOLAS ships, and even advancing a draft Code which incorporated the 2008 Intact Stability Code. For its part, Russia noted the legal right of Arctic states to ensure environmental protection in ice-covered waters under Article 234 of the UN Convention on the Law of the Sea.  

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36 The United Kingdom has more recently suggested that category B ships should have a minimum of IACS Polar Class 7. See IMO doc. DE/56/10.

37 See the IMO’s summary page for the standards online: <www.imo.org/OurWork/Safety/SafetyTopics/Pages/Goal-BasedStandards.aspx>


39 International Code on Intact Stability, 2008 (in force 1 July 2010), IMO doc. MSC/83/12/Add. 2

40 Above note 2: “Ice-Covered Areas: 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
The IMO group now responsible is the Working Group on the Development of a Mandatory Polar Code. Its mandate includes continuing the work of hazard identification, to review and consider environmental provisions for inclusion in a Code and to further develop the draft Code. The Sub-Committee itself met most recently in February 2012. The applicability of a Code is an important threshold consideration and the consensus is that it will or must apply to SOLAS shops operating in polar areas. Work continues to assess whether the Code should apply to naval ships, yachts and fishing vessels.\(^{41}\) Once again, environmental groups were invited to present submissions, making recommendations to ban heavy fuel oil use in Arctic waters (further to a voluntary ban in the Antarctic area), to introduce the concept of a safe speed for vessels in polar regions, to restrict incinerator use and to more closely control the use of anti-fouling coatings.

Canada was active in this latest round of Code development. It called for additional training and experience for mariners in understanding sea ice conditions, and that the requirements of an eventual operations manual for Polar vessels needed details about the types of in-ice escort services that might be provided to vessels.\(^{42}\) In raising the latter issue, Canada clearly had in mind the escort services that could be demanded of the Canadian Coast Guard.

Search and rescue planning and availability also continue to be considered in the making of a Polar Code. The United States has called for specifics in ship operating manuals, including the need for proper notice to search and rescue coordination centres, the steps to be taken when a ship is ordered abandoned, and measures in responding to a vessel in distress in ice-covered waters. (Iceland has observed that the availability of search and rescue services in Arctic waters is the same as that for the mid-Atlantic.)

Life-saving equipment and its deployment is a subject of significant ongoing development. A detailed consideration of how lifeboats should be built for polar use is underway, with concerns extending to low temperature operation, the extent of enclosure and habitability, launching into ice, and survivability over long periods until rescue. In many respects, the work for polar life-saving equipment is pioneering and will carry over lessons into the progress of more routine SOLAS measures for passenger evacuation.

The greatest single challenge is developing a Polar Code is that of the relationship between construction standards (and structural integrity) and the ice operating conditions to be experienced by vessels. The IACS Polar Class requirements have been the cornerstone of vessel design. No one seriously suggests the requirements should be changed or avoided in the making of a Polar Code. However, they need to be built upon 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.” The United States opposes the extent of Canada’s and Russia’s purported regulation of Arctic environmental protection.

\(^{41}\) Iceland has proposed that further Code requirements for fishing vessels be in addition to the provisions of the *Torremolinos Convention*, superseded by its 1993 Protocol. See: <http://www.imo.org/About/Conventions/ListOfConventions/Pages/The-Torremolinos-International-Convention-for-the-Safety-of-Fishing-Vessels.aspx>

\(^{42}\) It is Finland that has introduced the concept of a *Polar Waters Operations Manual* (PWOM). It proposes the Manual be a supplement to a ship’s Polar Code certificate. The United States has added to this in suggesting there be route planning measures in such a manual, including ways to avoid cetacean strikes.
when contemplating the entire survivability of a vessel, beyond its structural strength and integrity. In the recent work of the Sub-Committee Russia commented on the matter, calling for a more nuanced appreciation of hazards in actual operation. Argentina and Chile, likewise, in a paper for the February 2012 session cautioned against an overly vague application of the IMO’s Goal-Based Construction Standards.

**Pollyanish about polynyas: What next for the Polar Code**

A Polar Code, although eventually to be applied by only a small fraction of the global shipping industry (and government fleets), is the most ambitious regulatory undertaking in six decades of IMO work. That is because the Polar Code has the goal of overall vessel safety and environmental protection on a continuum ranging from construction to crew training to certification standards. And it is also because the various parties concerned with shipping in Arctic and Antarctic waters have conflicting interests. There could be no more complex inter-disciplinary exercise.

The Polar Code has advanced far enough for a few predictions to be ventured. To begin with, the number of state and commercial actors will continue to be limited. They include classification societies, the IMO, the Arctic Council and the coastal states (notably in the Arctic area) concerned, along with industry and some flag states. It is the IMO that must inevitably balance their interests and so a Polar Code will reflect some compromises. We can see this result in the current discussion of mandatory and optional parts to the Code. In the Arctic in particular, there will continue to be divergent interests between the industry and coastal states. It can also be predicted that a binding, enforceable Code will be a few years yet in the making. The range of subjects to be dealt with, and especially vessel certification and crew training, to be properly workable in the industry, will take careful effort.

The Polar Code engages diverse and complex subjects, ones that have had the benefit of development generally within international law and in particular through the work of the IMO, here SOLAS, MARPOL and the ISM Code. They include the advance of commerce in polar areas (cruise ship tourism, use of the Northern Sea Route, seabed petroleum development), the environmental protection concerns of costal states and non-governmental organizations, the engagement and results for indigenous peoples of the high north, security and navigational safety. The reconciliation of such matters may be too much to ask of a Polar Code, in a single instrument that is meant to be binding between states and upon vessel owners. In a world of international regulation and ever-greater uniformity, a Polar Code as it is now being conceived is a useful advance. Its successes, however, will be achieved by strong cooperation between the actors involved and continued work at the basics of safe shipping.
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Skating on thin ice: The IMO Polar Code

by

Jeffrey Smith
The “why” of a Polar Code

• Impetuses to development:
• A complex risk and risk managed environment
• A low tolerance for accidents
The background

- RMS Titanic, 1912
- SOLAS I, SOLAS II
- IMCO
- IMO
- SOLAS III
- SOLAS IV
- MARPOL 73/78
- The ISM Code
The background, continued

- End of the cold war
- The *Exxon Valdez*
- The reconsideration of a Northern Sea Route
- The UN *Law of the Sea Convention*
- Arctic Council cooperation
- The enduring *Antarctic Treaty*
- Anthropogenic climate change in polar regions
Maritime jurisdiction and boundaries in the Arctic region
The drafting efforts

- 2002: Arctic Guidelines
- 2009: Antarctic addition to the Guidelines
- The work of the IMO’s DE Committee: DE 55 & 56
Figure 1 – Maximum extent of Arctic waters application (see paragraph G-3.3)
Contents of the Polar Code

Preamble

• Chapter 1. General [Introduction]
• Chapter 2. [Operational Limitations] [Boundary Conditions]
• Chapter 3. Certificate and survey
• Chapter 4. [Polar / Ice] operational manual
Contents of the Polar Code

Part A

• Chapter 1. General
• Chapter 2. Structural integrity (ship structure)
• Chapter 3. Stability and floatability (intact and damage)
• Chapter 4. Watertight and weathertight integrity
• Chapter 5. Manoeuvrability (steering)
• Chapter 6. Propulsion (including auxiliary systems)
• Chapter 7. Habitability (accommodation and escape measures)
• Chapter 8. Anchoring and towing measures
• Chapter 9. Fire safety/protection
• Chapter 10. Life-saving appliances and arrangements
EXTENT OF HULL AREAS

For PC 1, 2, 3 & 4  \( x = 1.5 \text{ m} \);
For PC 5, 6, 7  \( x = 1.0 \text{ m} \);
with "x" measured at aft end of bow region

\[ \frac{0.04L}{s} \text{ of WL Angle} = 0 \text{ degrees at UIWL} \]

\[ \text{WL Angle} = 10 \text{ degrees at UIWL} \]

\[ \text{WL Angle} = 0 \text{ degrees at UIWL} \]

For the purpose of this diagram, the distance from the AP to the maximum half breadth at UIWL is denoted as \( d \).

**Midbody**
Contents of the Polar Code

• Chapter 11. Navigation
• Chapter 12. Communications
• Chapter 13. Operational requirements
• Chapter 14. *Emergency control*
• Chapter 15. Environmental protection
• Chapter 16. Alternative design

• **Part B**  [Additional guidance regarding the provisions of Part A]
Conclusions

• A significant balancing of interests
• A regulation that must account for technology and crew training, and operating standards, and flag and coastal state interests
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