

A Study on the Laws and Regulations for the Prevention of Vessel-Source Pollution in the Arctic Waters:

Focusing on International Code of Safety for Ships
Operating in Polar Waters(Polar Code)

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국문초록

극지해역은 지구온난화의 영향으로 해빙이 가속화되기 시작하면서, 새로운 해상교역로 제공 및 자원의 개발과 같이 극지해역이 제공하는 경제적 이점에 국제사회는 상당한 관심을 가져왔다. 특히, 오랫동안 탐험경로로만 인식되었던 북극해는 최근 유럽과 아시아를 횡단하는 상업적 횡단 항해가 이루어지면서 앞으로

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북극해를 통하는 선박 유입량이 상당히 늘어 날 것으로 전망하고 있다. 이들 항로 중 가장 대표적인 두 항로는 캐나다 북극해를 거쳐 유럽에서 아시아로 나오는 북서항로(Northwest Passage)와 러시아 북극해를 지나는 북동항로(Northeast Passage)이지만, 최근 들어 북극해의 얼음이 급속도로 녹아내리자 북극의 중앙을 가로지르는 북극중앙항로도 조만간 이용할 수 있을 것으로 예상하고 있다. 그에 반해, 북극해의 증가된 선박운항으로 인하여 선박기인 해양오염문제에 대한 국제사회의 우려의 목소리도 있다. 북극해의 지리적 특성으로 인하여 운항 중 해양오염물질 배출 및 사고로 기인하는 해양오염배출이 일어날 경우 즉각적인 대응 및 조치가 다른 해역보다 어려울 수 있어 해양오염에 상당히 취약한 편이다. 따라서 북극해를 이용하는 선박들은 특별한 주의를 기울여야 하며 선박기인 해양오염을 방지하기 위한 물적 및 인적분야의 사전예방조치가 무엇보다 중요할 것이다.

이에 따라 국제해사기구(IMO)는 2014년 11월 21일 해사안전위원회 제94차 회의에서 극지해역에서 운항하는 선박에 대한 국제코드 및 이를 의무적으로 적용하기 위한 해상인명안전협약의 개정안으로 새로운 부속서 제XIV장(극지해역에서 운항하는 선박의 안전조치)을 채택하였다. 또한 2015년 5월 15일 해양환경보호위원회 제68차 회의에서는 국제코드의 환경보호 규정인 Part II-A 및 II-B와 이를 강제화 하기 위한 해양오염방지협약 부속서 I(유류오염방지), II(유해액체물질오염방지), IV(오수오염방지) 및 V(폐기물오염방지)의 개정안을 채택하였다. 이 국제코드는 극지해역에서 안전한 선박운항과 극지해역 환경보호를 제공하는 것을 목적으로 하고 있으며, 해상인명안전협약과 해양오염방지협약의 개정안의 발효로 2017년 1월 1일에 본격적으로 발효하게 되었다. 극지해역 운항선박기준의 내용적 구성은 안전조치를 위한 Part I 과 오염방지조치를 위한 Part II로 이루어져있으며, 구조적 구성은 각 Part 별로 강행규범인 A편과 권고규범인 B편으로 이루어져있다.

이 논문에서는 선박의 새로운 항로로서의 북극해가 가지는 경제적 이점을 살펴본 후, 북극해의 선박기인 해양오염 방지를 위한 극지해역 운항선박기준의 중요성 및 이행문제에 대해 검토해보고자 한다. 나아가, 극지해역 운항선박기준의 제정경과 및 주요 내용을 검토하여 앞으로 북극해의 선박기인 해양오염 방지를

위한 극지해역 운항선박기준의 발전방향을 제시하고자 한다.

주제어 : 극지해역 운항선박기준, 북극해, 해양오염방지협약, 해상인명안전협약, 북극이사회, 선박기인 해양오염

I . Introduction

Voyages of the Arctic have long been considered to be only expedition routes.¹⁾ In recent years, with the development of technology and change in the Arctic environment, however, commercial vessels and passenger ships can access Arctic shipping routes, notably the Northwest Passage (“NWP”) and the Northern Sea Route (“NSR”). Arctic shipping routes have economic benefits by reducing the transportation distance. Hence, shipowner can cut operational costs. For this reason, the attraction of operating in the Arctic continues to grow in the shipping industry. However, despite the melting glaciers in the Arctic due to global warming, which are giving commercial vessels a new opportunity to pass through Arctic waters, Arctic experts are concerned about the deterioration of the marine environment resulting from oil pollution and operational discharge from ships. As the number of ships navigating in Arctic waters increase, the Arctic will face environmental damage originating from vessel-source pollution such as operational and accidental discharges. Against this background, there is a need for global regulations to prevent marine pollution from ships in Arctic waters.

This study explores an international legal regime regarding the prevention of marine pollution from ships in Arctic waters. First, it describes Arctic shipping routes and the marine environmental considerations of the Arctic.

1) Donald R. Rothwell, ‘International Law and Arctic Shipping’ Michigan State International Law Review22 (2013), p.67.

Then, this study examines the international legal regime concerning the prevention of marine pollution from ships in the Arctic by referring to the United Nations Convention on the Law of the Sea 1982 (“LOSC”), the International Convention for the Safety of Life at Sea (“SOLAS”), the International Convention for the Prevention of Pollution from Ships and its 1978 Protocol (“MARPOL73/78”) and the efforts of the Arctic Council as well as the domestic laws of the Arctic regions. In the next step, the International Code for Ships Operating in Polar Waters (“Polar Code”) is specifically discussed to analyse its pollution regulations. Finally, the concluding remarks suggest some recommendations to improve the contribution of the Polar Code to combat marine pollution from ships in Arctic waters in the future.

II . Arctic Regions and International Shipping

1. Physical Features of the Arctic

The Arctic is located in the northernmost region of Earth. It can be regarded as a semi-enclosed sea. In addition, the Arctic is isolated from landmasses and totally covered by frozen water such as glaciers and icebergs.²⁾ Such frozen waters consist of approximately 20% of Earth’s supply of freshwater. Most scientists describe the Arctic as “the area within the Arctic Circle, a line of latitude about 66.5° north of the Equator”.³⁾ At present, five coastal states, namely Canada, Denmark (for Greenland),

2) National Geographic Society, ‘Arctic’ <<https://www.nationalgeographic.org/encyclopedia/arctic/>> accessed 29 August 2017.

3) Louise Angélique de La Fayette, ‘Oceans Governance in the Arctic’ *The International Journal of Marine and Coastal Law* 23 (2008), p.533.

Norway, Russia and the United States, have the sovereignty of the Arctic.⁴⁾ The Arctic has by far the widest continental shelf in the world, which extends about 1,200 km seaward from Siberia. There are a number of islands in the continental shelf of the Arctic such as the Arctic Archipelago, Novaya Zemlya, the New Siberian Islands and Wrangel Island. Indigenous peoples live along the coastline of the Arctic. Approximately 155,000 Inuit live in Alaska, Canada, Greenland and Russia; 70,000 *Saami inhabit* Norway, Sweden, Finland and Russia; 55,000 *Athabaskans* and *Gwich'in* live in Alaska and Canada; 15,000 *Aleut* live in Alaska and Russia; and 250,000 members of other indigenous groups live in northern Russia.⁵⁾

Importantly, according to the 2008 US Geological Survey Report, approximately 13% of the undiscovered oil and 30% of the undiscovered natural gas in the world is deposited in the Arctic.⁶⁾ Moreover, it has valuable minerals such as nickel, copper ore and gemstones. The exploration for and exploitation of natural gas and oil is indispensable for the Arctic region to obtain financial benefits,⁷⁾ leading to diplomatic conflicts (“Cold War” or “race for the Arctic”).⁸⁾

2. Environmental considerations of the Arctic

Climate change has affected the Arctic ecosystems and environment considerably. The increase in temperatures has quickened the melting of the glaciers in the Arctic, resulting in sea level rises around the world.⁹⁾ The

4) Fayette, *Ibid.* Michael Byers, International Law and the Arctic (Istedn, Cambridge University Press 2013), p.26.

5) Byers, *Ibid.* p.217.

6) H. Edwin Anderson, ‘Polar Shipping, The Forthcoming Polar Code and Implications for the Polar Environments’ *Journal of Maritime Law & Commerce* 43 (2012), p.59.

7) *Ibid.* p.60.

8) National Geographic Society, *Supra note 2.*

2002 Arctic Monitoring and Assessment Programme report demonstrated that climatic change has impacted on the deterioration of the environment and ecosystems of the Arctic.¹⁰⁾ In September 2007, the US National Snow and Ice Data Centre (“NSIDC”) explained that “sea ice in September was at its lowest known level and 25% lower than the previous low set in 2005”. The scientists of the NSIDC estimated that the sea ice of the Arctic may have disappeared by 2030.¹¹⁾ At the same time, they also predicted that the NSR may be used for international shipping as well as the exploration for and exploitation of natural gas and oil by being “ice-free year-round.”¹²⁾ Thus, the changes in the environment and ecosystems of the Arctic as a result of global climate change mean that flora and fauna must adapt to these new circumstances to survive.¹³⁾ For instance, polar bears are expected to become extinct and seals, which are the main food of polar bears, are also likely to become close to extinction because it is difficult for them to breed without sea ice. In addition, caribou will die out as they cannot feed properly.¹⁴⁾ In other words, some animals, fish and vegetation will find it difficult to adapt to warmer temperatures. Bird migration will also disappear in the Arctic because of the lack of habitat

9) *Ibid.*

10) AMAP, ‘Arctic pollution 2002: Persistent organic pollutants, Heavy metals, Radioactivity, Human health, changing pathways, Arctic Monitoring and Assessment Program’(AMAP, 2002), p.122 available at <<https://www.amap.no/documents/doc/arctic-pollution-2002/69>> accessed 31 August 2017.

11) National Snow and Ice Data Centre, ‘Arctic sea ice maximum at record low for third straight year’(NSIDC, 22 March 2017) <<http://nsidc.org/news/newsroom/arctic-sea-ice-maximum-record-low-third-straight-year>> accessed 31 August 2017.

12) John Norton Moore, Alexander S Skaridov and Myron H Nordquist, Consequences of Rapid Arctic Climate Changes, p.277 in John Norton Moore, Alexander S Skaridov and Myron H Nordquist(eds) International Energy Policy, The Arctic and The Law of The Sea (Centre For Oceans Law And Policy : 9) (MartinusNijhoff Publishers 2005).

13) AMAP, *Supra note* 10; Fayette, *Supra note* 3, p.535.

14) *Ibid.*

and proper food.¹⁵⁾

3. International shipping in the Arctic

International shipping in the Arctic has been considered to be unsuitable due to the extreme environment and geographical features.¹⁶⁾ In recent years, voyages in Arctic waters have brought about dramatic changes in recognition for two reasons.¹⁷⁾ Firstly, with the development of technology for shipbuilding, vessels can now be equipped with ice-strengthened hulls and ice-breakers.¹⁸⁾ As a result, such vessels can easily access the Arctic without any problems. Secondly, owing to climatic change, the sea ice of the Arctic has become thinner, thereby allowing vessels the possibility to pass through Arctic waters by opening up the sea, particularly in the summer.¹⁹⁾ The more the Arctic becomes ice-free year-round, the more attention is paid to international shipping in the Arctic.²⁰⁾

In current, two shipping routes in the Arctic are available the NWP and the NSR.²¹⁾ In particular, by using the NSR, vessels can reduce the distance from Asia to Europe by approximately 5,000 miles compared with the route via the Suez Canal and Panama Canal.²²⁾ This shorter travel distance

15) AMAP, *Supra note* 10.

16) Rothwell, *Supra note* 1, p.67.

17) *Ibid.*

18) Arctic Council, 'Arctic Marine Shipping Assessment 2009', Report40 (2009).

19) Lawson W. Brigham, 'The Fast-Changing Maritime Arctic' 136 U.S. *Naval Institute Proceeding*, 54 (2010) available at <https://lisd.princeton.edu/sites/lisd/files/brigham_may2010.pdf> accessed 31 August 2017.

20) Rothwell, *Supra note* 1, p.68.

21) Tore Henriksen, The future of navigation in ice-covered areas: a view from the arctic, in Richard Caddell and Rhidian Thomas(ed), *Shipping, Law and the Marine Environment in the 21st Century* (Lawtext Publishing Limited, 2013), p.8.

22) A Chircop, "The Growth of International Shipping in the Arctic: Is a Regulatory Review Timely?" *The International Journal of Marine and Coastal Law* 24 (2009), p.355 ; H

is conducive to the improvement of fuel consumption and reduction of CO2 emissions.²³⁾ Hence, vessels aim to pass through the Arctic instead of the Suez and Panama Canals.²⁴⁾ While only five vessels used Arctic shipping routes in 2007, the number of cargo vessels transported through Arctic shipping routes in 2013 was 71.²⁵⁾ In the future, the Arctic will play a significant role as an attractive shipping route.

(1) The NWP

The NWP from the Atlantic to the Pacific Oceans passes through the Canadian Arctic Archipelago.²⁶⁾ Theoretically, while vessels can use the Canadian Arctic Archipelago shipping route, it is hard to navigate within the NWP due to the heavy ice and shallow draught.²⁷⁾ With respect to the legal status of the NWP, while the United States advocates that it is an international strait that enjoys the freedom of navigation under the LOSC, Canada claims that the NWP is their internal water by reason of historic title, “including thousands of years of use and occupation of the sea-ice by the Inuit, a largely maritime indigenous people.”²⁸⁾ In this light, Canada exercises full sovereignty over foreign vessels. That is, it does not allow foreign vessels to enter the NWP without the prior permission of the

Kitagawa, “Arctic Routing: Challenges and Opportunities” *WMU Journal of Maritime Affairs* 7 (2008), p.485.

23) Katerina Peterkova Mitkidis, “The Role of Private Actors in Regulation of Arctic Shipping”, *Lloyd’s Maritime and Commercial Law Quarterly* [2016], p.545.

24) *Ibid.*

25) Council on Foreign Relations, “The Emerging Arctic” (Council on Foreign Relations) <https://www.cfr.org/interactives/emerging-arctic?cid=otr_marketing_usearctic_Infoguide%2523!#/emergingarctic?cid=otr_marketing_usearctic_Infoguide%2523!> accessed 31 August 2017.

26) Byers, *Supra note 4*, p.131.

27) Rothwell, *Supra note 1*, p.82.

28) Byers, *Supra note 4*, p.131.

Canadian government. Only two vessels have ever passed through without the Canadian government's permission: the US-flagged *SS Manhattan* in 1969 and USCG *Polar Sea* in 1985. As a result of the voyage of *SS Manhattan* in 1969, Canada adopted the Arctic Waters Pollution Prevention Act, stipulating the extension of the territorial sea from 3 to 12 nautical miles, and applied special measures to protect the marine environment.²⁹⁾ After the voyage of USCG *Polar Sea* in 1985, the Canadian Parliament announced six new initiatives to clarify the legal status of the Arctic region. These initiatives contained that "the straight baselines around the islands make up the Canadian Arctic Archipelago, new legislation to enforce Canadian civil and criminal law in the waters enclosed within the baselines, and talks with the US on cooperation over Arctic waters."³⁰⁾

(2) The NSR

The NSR is a significant shipping route located in "the Arctic north of Russia extending from Novaya Zemlya in the west to the Bering Strait in the east".³¹⁾ Vessels can travel from the Pacific Ocean to the North Sea and the Atlantic Ocean by sailing through the NSR due to the longer ice-free seasons. International attention on navigation on the NSR has stemmed from the International Northern Sea Route Programme, which "was a Norwegian, Japanese, and Russian project that ran from 1993 to

29) Fayette, *Supra note 3*, p.546.

30) The Parliament of Canada, House of Commons, DEBATES, Sept. 10, 1985, at 6464 ; Nicholas C. Howson, 'Breaking the Ice: The Canadian-American Dispute over the Arctic's Northwest Passage', *Columbia Journal of Transnational Law* 337 (1987), p.341.

31) The Arctic Knowledge Hub, 'The Northeast Passage and Northern Sea Route'(The Arctic Knowledge Hub, 2010)(<<http://www.arctic-search.com/The+Northeast+Passage+and+Northern+Sea+Route+2>>accessed31 August 2017; Jan Jakub Solski, 'New developments in Russian regulation of navigation on the Northern sea route', *Arctic Review on Law and Politics* 4(2013), p.91.

1999 and focused on the viability of the waterway for international shipping”.³²⁾ In July 2009, two German cargo vessels, M/V *Beluga Fraternity* and M/V *Beluga Foresight*, completed the voyage though the NSR from Ulsan, South Korea to Rotterdam, the Netherlands, taking about two months.³³⁾ Generally, this route is used to transport natural resources from Russia to East Asia such as China, South Korea and Japan. The Russian government has stated that the NSR will become an alternative shipping route to the Suez and Panama Canals.³⁴⁾ Furthermore, the Russian government announced its Integrated Development Plan for the Northern Sea Route 2015–2030. The aim of this plan is to provide safer navigation on the NSR and reliable information on Russian natural resources. This plan also wishes to increase cargo transportation on the NSR in partnership with East Asian countries. In 2015, approximately 5.4 million tonnes of cargo was delivered via the NSR, up from 3.9 million tonnes in 2013.³⁵⁾ This cargo was transported to the port of Sebetta for the construction of the Yamal LNG plant. Russia is predicted to increase its cargo transportation exponentially by implementing hydrocarbon projects.³⁶⁾

However, there is a diplomatic dispute as to the legal position of the NSR between Russia and the United States. While Russia advocates that the Vil’kitskii, Shokal’skii, Dmitrii Laptev and Sannikov Straits are internal

32) Byers, *Supra note* 4, p.147.

33) Tony Halpin, “Cargo Ships Navigate Northeast Passage for the First Time,” *The Times* (London, 14 September 2009) September 14, 2009.

34) Gleb Bryanski, “Russia’s Putin Says Arctic Trade Route to Rival Suez” *Reuters* (London, 22 September 2011) available at <<http://www.reuters.com/article/us-russia-arctic/russias-putin-says-arctic-trade-route-to-rival-suezbidUSTRE78L5TC20110922>> accessed 2 September 2017.

35) Bjørn Gunnarsson, “Future Development of the Northern Sea Route” *The Maritime Executive* (London, 8 June 2015) available at <<http://www.maritime-executive.com/editorials/future-development-of-the-northern-sea-route>> accessed 2 September 2017.

36) *Ibid.*

waters of Russia, the United States claims that they are international straits; therefore, all vessels can enjoy the freedom of navigation by virtue of the LOSC. Whether these can be considered to be international straits is laid down by the criteria of the Corfu Channel Case by the International Court of Justice.³⁷⁾ An international strait “must connect two areas of the high seas” and be “used for international navigation”.³⁸⁾ With regard to the latter criterion, Rothwell stated that “since the 1960s, there has been little further attempt by the United States or any other state actively to assert a right of freedom of navigation for its ships through the Russian Arctic straits”. In addition, Rothwell described in respect to the legal position of the Northeast Passage³⁹⁾ that “given the relative infrequency of foreign-flagged vessels passing through these straits, which seems even less frequent when compared to similar voyages through the Northwest Passage, it would seem to be difficult to classify any of the major straits in the Northeast Passage as ‘international straits.’”⁴⁰⁾

4. Vessel-Source Pollution in the Arctic

With the increase in vessels using the Arctic, environmentalists and Arctic experts have great concerns about the deterioration of the marine environment and marine ecosystem resulting from marine pollution from ships. Generally,

37) *Corfu Channel Case* (United Kingdom v Albania) [1949] ICJ Rep 4.

38) *Ibid.*: Donald R. Rothwell and Tim Stephens, *The International Law of the Sea* (2nd edn, Hart Publishing 2016), p.247.

39) The Northeast Passage defined that “While the Northeast Passage includes all the East Arctic seas and connects the Atlantic and Pacific oceans, the Northern Sea Route does not include the Barents Sea, and it therefore does not reach the Atlantic” in Albert Buixadé Farré, Scott R. Stephenson et al, ‘Commercial Arctic Shipping Through The Northeast Passage: Routes, Resources, Governance, Technology, And Infrastructure’ *Polar Geography* 37 (2014), p.299.

40) Donald R. Rothwell, *The Polar Regions and the Development of International Law* (1stedn, Cambridge University Press 2006), p.206.

vessels are a large source of marine pollution such as oil pollution, air pollution and operational discharges. If a vessel frequently passes through Arctic shipping routes, vessel-source pollution may become an inevitable fact. In particular, oil pollution from ships results in considerable marine damage in the Arctic. In 1990, the M/V *Exxon Valdez* accident evoked an awareness of the importance of the prevention of marine pollution from ships in the Arctic. Thus, given the growth in vessels using Arctic shipping routes, the need for an effective way in which to prevent marine pollution from ships is rising for the international community as well as the Arctic region. Therefore, special measures are needed to prevent, control and reduce marine pollution from ships in the Arctic.

III. International Legal Regime for the Prevention of Vessel-Source Pollution in the Arctic Waters

1. LOSC

The LOSC plays a significant role as the major international legal framework in protecting the marine environment in Arctic waters. This principle, reaffirmed by the 2008 Ilulissat Declaration adopted by the five Arctic regions (Canada, Denmark (Greenland), Norway, the Russian Federation, and the United States), runs as follows: “The law of the sea provides for important rights and obligations concerning the delineation of the outer limits of the continental shelf, the protection of the marine environment, including ice-covered areas, freedom of navigation, marine scientific research, and other uses of the sea. We remain committed to this legal framework and to the orderly settlement of any possible overlapping claims.”⁴¹⁾ Furthermore, Articles 192 and 194 of Part XII of the LOSC prescribe the

state's general rights and duty to protect the marine environment and prevent, reduce and control marine pollution.⁴²⁾ For example, Article 194(5) of the LOSC refers to vulnerable seas: "The measures taken in accordance with this Part shall include those necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life." Article 197 of the LOSC emphasises the importance of regional cooperation to protect the marine environment. Article 194(3)(b) of the LOSC allows the state to take all measures to protect the marine environment relating to vessel-source marine pollution.⁴³⁾ In particular, with respect to the legal regime for the prevention of marine pollution from ships, this is primarily covered by Article 211 of the LOSC. According to this provision, the flag states and coastal state can enact domestic laws and regulations that "shall at least have the same effect as that of generally accepted international rules and standards established through the competent international organisation or general diplomatic conference."⁴⁴⁾

To prevent marine pollution from ships, the LOSC provides enforcement regulations such as enforcement by port states (Article 218), by flag states (Article 217) and by coastal states (Article 220). In addition, there is a provision about ice-covered areas relating to the prevention of marine pollution in Article 234 of the LOSC.⁴⁵⁾ In accordance with this provision,

41) The arctic waters Conference in Greenland, 'THE ILULISSAT DECLARATION'(2008) available at <http://www.oceanlaw.org/downloads/arctic/Ilulissat_Declaration.pdf> accessed 3 September 2017.

42) Tafsir Johansson and Patrick Donner, *The Shipping Industry, Ocean Governance And Environmental Law In The Paradigm Shift In Search of A Pragmatic Balance* (Springer Briefs in Law 2015), p.2.

43) *Ibid*, p.3.

44) Donald R. Rothwell, "Global environmental protection instruments and the polar marine environment" in Davor Vidas(ed), *Protecting The Polar Marine Environment* (Cambridge Univ Press, 2006), p.75.

states can enact domestic laws and regulations to prevent marine pollution from ships “in ice-covered areas within the limits of the exclusive economic zone”.⁴⁶⁾ However, there are limits when applying Article 234 of the LOSC as follows. Firstly, it should be applied “within the limits of the EEZ,” where there are “particularly severe climatic conditions and the presence of ice covering such areas for most of the year.” Secondly, it applies to the principle of “non-discriminatory” for the prevention, reduction and control of vessel-source marine pollution. Lastly, states should have “due regard to navigation” and the “protection and preservation of the marine environment based on the best available scientific evidence.”⁴⁷⁾ Hence, states may enact laws and regulations relating to design, construction equipment, crewing, discharge and safety standards for navigation.⁴⁸⁾ Thus, the relevant provisions of the LOSC relating to the prevention of marine pollution from ships allow states to adopt higher national laws and regulations.⁴⁹⁾ Therefore, the LOSC is a fundamental legal framework for protecting the marine environment in the Arctic. Hence, the International Maritime Organisation

45) Article 234 of the LOS Convention states that “Coastal States have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions or exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance. Such laws and regulations shall have due regard to navigation and the protection and preservation of the marine environment based on the best available scientific evidence.”

46) Article 234 of the LOSC

47) D. McRae and D. Goundrey, “Environmental Jurisdiction in Arctic Waters: The Extent of Article 234”, *University of British Columbia Law Review* 16(1982), pp. 215–222 ; R. Douglas Brubaker, Regulation of navigation and vessel-source pollution in the Northern Sea Route: Article 234 and state practice in Davor Vidas(ed), *Protecting The Polar Marine Environment* (Cambridge Univ Press, 2006), p.225.

48) Brubaker, *Ibid*, p.227.

49) Johansson and Donner, *Supra note* 42, p.9.

(“IMO”) Conventions in respect to the prevention, reduction and control of marine pollution from ships should be harmonised with the principle of the LOSC.

2. Arctic Council

The Arctic Council originated from the Arctic Environmental Protection Strategy. Although the Arctic Council has a considerable impact on the protection of the marine environment in the Arctic, it can be considered to be an intergovernmental forum, not an international organisation. The Ottawa Declaration defined the legal status of the Arctic Council as a “high-level forum intended to provide a means for promoting cooperation among Arctic states... on common Arctic issues, in particular issues of sustainable development and environmental protection in the Arctic.”⁵⁰⁾ The Arctic Council consists of eight countries: Canada, Denmark, Finland, Iceland, Norway, the Russian Federation, Sweden and the United States.⁵¹⁾ To implement the work of the Arctic Council relating to the protection of the marine environment and sustainable development, six working groups have been set up: The Arctic Contaminants Action Program, Arctic Monitoring and Assessment Programme, Conservation of Arctic Flora and Fauna Working Group, Emergency Prevention, Preparedness and Response Working Group, Protection of the Arctic Marine Environment (“PAME”) and Sustainable Development Working Group.⁵²⁾ In particular, the PAME working group

50) The Arctic Council, ‘Declaration on the Establishment of the Arctic Council,’ Paragraph 1(a) (1996); available at <http://library.arcticportal.org/1270/1/ottawa_decl_1996-3.pdf> accessed 3 September 2017.

51) The Arctic-council, <<https://www.arctic-council.org/index.php/en/about-us>> accessed 3 September 2017.

52) European Commission Maritime Affairs and Fisheries, ‘Legal Aspects of Arctic Shipping Summary Report – EU Law and Publications’ (European Union, 2010), p. 10; available

plays a major role in preventing marine pollution from ships in the Arctic. The PAME adopted the Arctic Marine Strategic Plan in 2004 and announced the Arctic Marine Shipping Assessment (“AMSA”) in 2009. The purpose of the AMSA is to assess the prediction of Arctic shipping and provide recommendations for ways in which to enhance the prevention of marine pollution from ships as follows: “(1) Making the voluntary Guidelines for Ships Operating in Arctic Ice-covered Waters a legally-binding code; (2) Augmenting existing IMO conventions on ship safety and pollution prevention with specific requirements for ship construction, design, equipment, crewing, training and operations; (3) Exploring the possible harmonization of national standards for regulating ship-source pollution; (4) Ratifying as soon as practical by all Arctic States of the IMO Ballast Water Convention and assessing the risks of invasive species introductions in the Arctic through ballast water; [and] (5) Developing further circumpolar environmental pollution response capabilities.”⁵³⁾

3. IMO Conventions

The LOSC allows states to exercise prescriptive jurisdiction to prevent marine pollution from ships in accordance with “generally accepted international rules and standards.”⁵⁴⁾ Moreover, the LOSC provides that states can exercise enforcement over vessels in the case of “the violation of applicable international rules and standards” to protect the marine environment and

at <https://publications.europa.eu/en/publication-detail/-/publication/c4fbcf5b-bb28-4035-bdfa06497fe8a36> accessed 3 September 2017.

53) The PAME of Arctic Council, ‘Arctic Marine Shipping Assessment 2009 Report’ (2009); available at https://www.pmel.noaa.gov/arctic-zone/detect/documents/AMSA_2009_Report_2nd_print.pdf accessed 3 September 2017.

54) Ho-Sam Bang, ‘Port State Jurisdiction and Article 218 of the UN Convention on the Law of Sea’ *Journal of Maritime Law & Commerce* 40 (2009), p.299.

ensure ships' safety.⁵⁵⁾ Generally, the "international rules and standards" under the LOSC can be regarded as several IMO Conventions such as SOLAS and MARPOL73/78.⁵⁶⁾ These conventions serve to prevent, reduce and control vessel-source marine pollution.⁵⁷⁾ Thus, this section looks at the application of SOLAS and MARPOL73/78 for preventing marine pollution in Arctic waters.

(1) SOLAS

Marine pollution from ships can stem from accidental discharge, which is connected to seaworthiness.⁵⁸⁾ Thus, to prevent marine pollution from ships, it is important to ensure the safety of ships such as construction, design, equipment and manning standards. In particular, the navigation of ships in the Arctic is difficult because of poor visibility and weather conditions, the lack of port facilities, communication systems, crew familiarisation and navigation aids. What is worse, if marine pollution from ships occurs in the Arctic, it is difficult to clean up operations, remove the wreck or rescue the ship. Thus, the most important precondition to prevent marine pollution from ships in the Arctic is to maintain ships' safety in compliance with international rules and standards.

SOLAS, the most significant treaty in respect to the safety of ships, was adopted by the IMO in 1914 in response to the S/S Titanic disaster. SOLAS only applies to "to ships engaged on international voyages". Hence, the following are excluded: "(1)Ships of war and troopships; (2)cargo ships of less than 500 tonnes gross tonnage; (3) ships not propelled by mechanical

55) European Commission Maritime Affairs and Fisheries, *Supra note 52*, p.11.

56) *Ibid.*

57) *Ibid.*

58) Donald R. Rothwell and Tim Stephens, *Supra note 38*, pp.386-387.

means; (4) wooden ships of primitive build; (5) pleasure yachts not engaged in trade; [and] (6) fishing vessels.”⁵⁹⁾ SOLAS consists of 14 chapters.⁶⁰⁾ The requirement regarding the navigation of the Arctic is provided by Chapter 5 of SOLAS before the adoption of the Polar Code.⁶¹⁾ Regulation 5 of Chapter 5 prescribes that “SOLAS Contracting Governments [must] encourage the collection of meteorological data by ships at sea and … arrange for their examination, dissemination and exchange in the manner most suitable for the purpose of aiding navigation.”⁶²⁾ Further, Regulation 6 articulates the following: “The Contracting Governments [must] undertake to continue an ice patrol and a service for study and observation of ice conditions in the North Atlantic. During the whole of the ice season, i.e. for the period from February 15th through July 1st of each year, the south-eastern, southern and south-western limits of the region of icebergs in the vicinity of the Grand Banks of Newfoundland shall be guarded for the purpose of informing passing ships of the extent of this dangerous region; for the study of ice conditions in general; and for the purpose of affording assistance to

59) SOLAS Convention, Chapter I, Regulation 3 – Exceptions

60) Chapter I – General Provisions; Chapter II-1 – Construction – Subdivision and stability, machinery and electrical installations; Chapter II-2 – Fire protection, fire detection and fire extinction; Chapter III – Life-saving appliances and arrangements; Chapter IV – Radio communications; Chapter V – Safety of navigation; Chapter VI – Carriage of Cargoes; Chapter VII – Carriage of dangerous goods; Chapter VIII – Nuclear ships; Chapter IX – Management for the Safe Operation of Ships; Chapter X – Safety measures for high-speed craft ; Chapter XI-1 – Special measures to enhance maritime safety; Chapter XI-2 – Special measures to enhance maritime security; Chapter XII – Additional safety measures for bulk carriers; Chapter XIII – Verification of compliance; Chapter XIV – Safety measures for ships operating in polar waters

61) Heike Deggim, ‘Ensuring Safe, Secure and Reliable Shipping in the arctic waters’, (Oct. 2010) NATO Advanced Research Workshop on Environmental security in the arctic waters, Cambridge, Scott Polar Research Institute, p. 5; available at <http://www.imo.org/en/MediaCentre/HotTopics/polar/Documents/ENSURING%20SAFE,%20SECURE%20AND%20RELIABLE%20SHIPPING%20IN%20THE%20ARCTIC%20OCEAN%20-%20Article.pdf> accessed 6 September 2017.

62) *Ibid.*

ships and crews requiring aid within the limits of operation of the patrol ships and aircraft. During the rest of the year the study and observation of ice conditions shall be maintained as advisable.”⁶³⁾ Regulation 31 refers to the obligation of ships concerning danger messages if the vessel meets with dangerous ice, a dangerous derelict, any other direct danger to navigation or a tropical storm.⁶⁴⁾

Vessels passing through the Arctic need strong hulls and engine machinery as well as safety equipment in consideration of the Arctic’s circumstances. For this reason, the need for a new legal regime concerning the safety of ships navigating in the Arctic has been raised. Finally, international standards and regulations on the safety of navigation in the Arctic, known as the Polar Code, have been adopted by the IMO and amended by SOLAS and MARPOL73/78.⁶⁵⁾ The Polar Code will be discussed below.

(2) MARPOL73/78

As a global convention, MARPOL73/78 helps prevent marine pollution from ships. It provides regulations on various vessel-source marine pollution including regulations for the prevention of oil pollution from ships, the prevention of discharge waters from ships including garbage, the prevention of hazardous waste and chemicals and the prevention of air pollution from ships.⁶⁶⁾ MARPOL73/78 should be applied to all ships flying their flags.

MARPOL73/78 contains six annexes as follows: “The prevention of pollution by oil (Annex I); the control of pollution by noxious liquid substances in

63) SOLAS Convention, Chapter V, Regulation 6 Ice-Patrol service

64) Deggim, *Supra note* 61, p.5.

65) IMO, ‘Polar Code’ (IMO, 2017) (<<http://www.imo.org/en/MediaCentre/Hottopics/polar/Pages/default.aspx>> accessed 6 September 2017.

66) Patricia Birnie and Alan Boyle, *International Law and the Environment*, (Oxford University Press, 2002), p.363.

bulk (Annex II); the prevention of pollution by harmful substances in packaged forms (Annex III); the prevention of pollution by sewage from ships (Annex IV); the prevention of pollution by garbage from ships (Annex V); and the prevention of air pollution from ships (Annex VI).”⁶⁷⁾ In particular, to effectively prevent marine pollution from ships, Annexes I, II and V provide stringent regulations on discharges within “special areas” and “emission control areas”.⁶⁸⁾ However, with respect to the application of MARPOL73/78 in Arctic waters, there are fundamental difficulties.⁶⁹⁾ The major problem is that while Antarctica has been designated as a “special area” to prevent vessel-source marine pollution, the Arctic has not due to the lack of attention on Arctic waters.⁷⁰⁾ For instance, increasing navigation in Arctic waters is causing the discharge of garbage, bilge waters, sewage and Sox emissions.⁷¹⁾ As the Arctic is not a “special area” under Annexes I, II and V of MARPOL73/78, regulations on the prohibition of discharge to prevent vessel-source pollution do not apply.⁷²⁾ Furthermore, MARPOL73/78 refers to discharge “from [the] nearest land.” However, due to the ice cover of Arctic coastlines, it can be difficult to define “from [the] nearest land” by virtue of Annex I of Regulation 1(9).⁷³⁾ Thus, similar to SOLAS, there is a need to adopt a new legal regime to prevent marine pollution from ships in the Arctic.

67) Rothwell, *Supra note 44*, p.60.

68) Heike Deggim, ‘International Requirement for Ships Operating in Polars Waters’, Meeting of experts on the management of ship-borne tourism in the Antarctic Treaty Area in Wellington, New Zealand, (2009), pp.11-12 ; available at <<http://www.imo.org/en/KnowledgeCentre/papersandarticlesbyimostaff/documents/international%20requirements%20for%20ships%20operating%20in%20polar%20waters%20-%20h.%20deggim.pdf>> accessed 7 September 2017; *Ibid*, p.62; Johansson and Donner, *Supra note 42*, p.12.

69) Deggim, *Ibid*.

70) *Ibid*.

71) Johansson and Donner, *Supra note 42*, p.13.

72) Rothwell, *Supra note 44*, p.62.

73) *Ibid*.

(3) Municipal Laws in Arctic states

1) Canada

As mentioned above, in 1970, Canada enacted the Arctic Waters Pollution Prevention Act in response to the voyage of S/S Manhattan, which passed through the NWP without the permission of Canada.⁷⁴⁾ Canada proclaimed the extension of its jurisdiction thus: “Arctic waters’ 100 miles out into the Beaufort Sea and Arctic Ocean along the coastlines of the Yukon and Northwest Territories, including the islands of the Arctic Archipelago.”⁷⁵⁾ This Act was based on Article 234 of the LOSC. In particular, to prevent and control vessel-source marine pollution in Arctic waters, the Canadian government formulated the Arctic Shipping Pollution Prevention Regulations under the Arctic Waters Pollution Prevention Act.⁷⁶⁾ Thus, Canada imposes more stringent standards on vessel construction, navigation and operation than the “international standards and rules.”⁷⁷⁾ This regulation applies to all vessels including government vessels and warships, except for ships of 100 tonnes, gross tonnage, or less.⁷⁸⁾ Furthermore, the Arctic Shipping Pollution Prevention Regulations prescribe the relevant provisions to prevent marine pollution from ships in the Arctic as follows: “The construction of ships (certain construction requirements for different navigation zones); bunkering stations; Arctic Pollution Prevention Certificates; Ice Navigator issues (any vessel planning to use the Arctic Ice Regime Shipping System and every tanker

74) Byers, *Supra note 4*, p.134.

75) Section 3(2) of the Arctic Waters Pollution Prevention Act, Statutes of Canada, Vol. I, Chapter 47, 1970.

76) Donald R. Rothwell and Christopher C. Joyner, Domestic perspectives and regulations in protecting the polar marine environment: Australia, Canada and the United State in Davor Vidas(ed), *Protecting The Polar Marine Environment* (Cambridge Univ Press, 2006), p.151.

77) European Commission Maritime Affairs and Fisheries, *Supra note 52*, p. 14.

78) Section 3 of the Arctic Shipping Pollution Prevention Regulations, (C.R.C., c. 353), 1994.

must have a qualified Ice Navigator on board); fuel and water concerns (enough of both on board before entering a zone); sewage deposit and oil deposit mishaps (unavoidable deposit only, that is, to save a life; or from damage to a ship from stranding, collision, or foundering if all reasonable precautions were taken).”⁷⁹⁾ Furthermore, in respect to the statutory civil liability and compensation resulting from vessel-source marine pollution, this is provided by Part 6 of the Marine Liability Act.⁸⁰⁾

2) United States

As the United States is not party to the LOSC, the general principle of the LOSC regarding navigation regimes and the protection of the marine environment does not apply. Alternatively, this principle of the LOSC can be observed in US federal and state legislation. The first Arctic policy was declared in National Security Decision Memorandum 144 of 1971, which advocates that “the President has decided that the United States will support the sound and rational development of the Arctic, guided by the principle of minimizing any adverse effects to the environment; will promote mutually beneficial international cooperation in the Arctic; and will at the same time provide for the protection of essential security interests in the Arctic, including preservation of the principle of freedom of the seas and superjacent air space.”⁸¹⁾

79) The Government of Canada, Transport of Canada, ‘Arctic Shipping Pollution Prevention Regulations’ (<https://www.tc.gc.ca/eng/marine-arctic-acts-regulations-asppr-421.htm>) accessed 8 September 2017.

80) David VanderZwaag et al, ‘Governance of Arctic Marine Shipping’, A Report to Transport Canada for the Arctic Marine Shipping Assessment, (Halifax, 2008), p.56; available at (https://www.dal.ca/content/dam/dalhousie/pdf/law/MELAW/MELAW_AMSA_Governance_of_Arctic_Marine_Shipping_Final_Report_AUG1.pdf) accessed 8 September 2017.

81) National Security Decision Memorandum 144, Dec. 22, 1971; Christopher C. Joyner, ‘United States Legislation and the Polar Oceans’, *Ocean Development & International Law* 29 (1998), p.266.

With regard to regulations on the prevention of marine pollution from ships in the Arctic, this is subject to the Federal Clean Water Act, which stipulates the standards of discharge and emissions in a manner consistent with MARPOL73/78 and Part VII of the LOSC. In addition, the Oil Pollution Act of 1990, enacted in response to the M/V *Exxon Valdez* incident, is applied.⁸²⁾

3) Russian Federation

Russia's Arctic policy concentrates on the NSR. Concerning the domestic laws of Arctic shipping, especially the protection of the marine environment, it applies the Regulations for Navigation on the Seaways of the NSR adopted in 1990. Moreover, three regulations regarding ships' safety and the prevention of marine pollution in the Arctic were adopted in 1996: the 1996 Guide to Navigation, the 1996 Regulations Concerning Icebreaking and Pilot Guidance and the 1996 Requirements Relating to the Design, Equipment and Supply of Ships.⁸³⁾

4) Greenland(Denmark)

Greenland is considered to be a self-governing unit within the Danish realm rather than a sovereignty state under international law. While Greenland is generally governed by Danish law, the regulations of special areas can be enacted by its legislation subject to the Self Government Act, for instance, "radio based maritime emergency services and security services", "shipwreck, wreckage and degradation of depth", "security at sea", "ship registration and maritime matters", "charting", "the buoyage, lighthouse and pilotage areas" and the "marine environment."⁸⁴⁾ In particular, shipping regulations

82) Johansson and Donner, *Supra note* 42, p.34.

83) VanderZwaag et al, *Supra note* 80, p.62.

84) Act on Greenland Self-Government, Act no. 473 of 12 June 2009, available at <<http://>

apply to the ‘Order for Greenland on the safe navigation, etc. of ships’ issued by the Danish Maritime Authority in 2014. The purpose of this order is to ensure ships’ safety and prevent marine pollution from ships.⁸⁵⁾

IV. Potential effect of the Polar Code in the Arctic Waters

1. The Enacting Process of the Polar Code

The IMO deals with international standards and regulations for ships navigating in Arctic waters according to Russian and German proposals in the early 1990s.⁸⁶⁾ In 2002, the Guidelines for Ships Operating in Arctic Ice-Covered Waters were adapted by the Marine Safety Committee (“MSC”) and Marine Environmental Protection Committee (“MEPC”) of the IMO after a long discussion.⁸⁷⁾ At the 79th MSC session in 2004, South Africa, on behalf of the Antarctic Treaty Consultative Party, proposed an amendment to the 2002 guidelines to involve the Antarctic Treaty Area, and the IMO approved its proposal.⁸⁸⁾ At the 86th MSC session in 2009, Denmark, the

naalakkersuisut.gl/~media/Nanoq/Files/Attached%20Files/Engelsketekster/Act%20on%20Greenland.pdf accessed 8 September 2017; European Commission Maritime Affairs and Fisheries, *Supra note* 52, p.1.

85) Section 1 of Order for Greenland on the safe navigation, etc. of ships, Order no. 1697 of 11 December 2015 ; available at <<https://www.dma.dk/Vaekst/Rammevilkaar/Legislation/Orders//Order%20for%20Greenland%20on%20the%20safe%20navigation,%20etc%20of%20ships.pdf>> accessed 8 September 2017.

86) Dorottya Bogner, ‘Russian Proposals on the Polar Code: Contributing to Common Rules or Furthering State Interests?’, *Arctic Review on Law and Politics* 7 (2016), p.113.

87) Richard O. G. Wanerman ‘Freezing out Noncompliant Ships: Why the Arctic Council Must Enforce the Polar Code’, *Case Western Reserve Journal of International Law* 47 (2015), P.438 ; IMO, Guidelines for Ships Operating in Arctic Ice-Covered Waters, 23 December 2002, IMO doc. MSC/Circ.1056/MEPC/Circ.399, available at <http://www.imo.org/includes/blastDataOnly.asp/data_id%3D6629/1056-MEPC-Circ399.pdf> accessed 9 September 2017.

88) IMO, Maritime Safety Committee, 79th session, Agenda item 23, Report of the Maritime

United States and Norway asserted the “development of a mandatory Code for ships operating in polar waters.”⁸⁹⁾ This argument was supported by non-governmental organisations such as Greenpeace, the World Wildlife Fund and Friends of the Earth International.⁹⁰⁾ As a result, apart from the development of new guidelines, the IMO agreed the Polar Code until 2012.⁹¹⁾ Afterwards, the IMO Sub-Committee on Ship Design and Equipment (“DE”) agreed to the application of goal-based standards, as proposed by Germany, when developing the Polar Code at the 54th session in 2010.⁹²⁾ On that basis, the IMO assembly adopted the new Guidelines for Ships Operating in Polar Waters in 2010.⁹³⁾ The 2010 guidelines extend the scope of application by including Antarctic waters and improve the 2002 guidelines relating to the “technical, technological and regulatory developments since their approval.” They also refer to the qualification and training of the ice navigator to prevent vessel-source marine pollution in polar waters.⁹⁴⁾

The 57th DE session decided to classify ships operating in polar waters (category A, B and C) and developed Polar Ship Certificates and the Polar Waters Operational Manual.⁹⁵⁾ As neither the 2002 nor the 2009 guidelines

Safety Committee on its seventy-ninth session, IMO DOC. MSC 79/23, 15 December 2004.

89) IMO, Maritime Safety Committee, 86th session, Agenda item 23, 24 February 2009, Mandatory application of the polar guidelines, Submitted by Denmark, Norway and the United States ; Lilly Weidemann, *International Governance of The Arctic Marine Environment* (Springer, 2014), p.113.

90) Weidemann, *Ibid.*

91) IMO, *Supra note 89; Ibid*, p.114.

92) IMO, Sub-Committee on Ship Design and Equipment, 54th session, Agenda item 13, 27 July 2010, Risk-based concept, Submitted by Germany, IMO Doc. 54/13/1

93) IMO Assembly “Guidelines for Ships Operating in Polar Waters”, Resolution A.1024(26), available at <[http://www.sofartsstyrelsen.dk/SiteCollectionDocuments/CMR/Sejladssikkerhed,%20GMDSS%20og%20SAR/A.1024\(26\)%20Guidelines%20for%20ships%20operating%20in%20polar%20waters.pdf](http://www.sofartsstyrelsen.dk/SiteCollectionDocuments/CMR/Sejladssikkerhed,%20GMDSS%20og%20SAR/A.1024(26)%20Guidelines%20for%20ships%20operating%20in%20polar%20waters.pdf)> accessed 9 September 2017.

94) Weidemann, *Supra note 89*, p.112.

95) IMO, Sub-Committee on Ship Design and Equipment, 57th session, Polar Code Operating

are mandatory, the IMO recognised the need for mandatory regulations. In this regard, at the 94th MSC session, the amendment of SOLAS concerning the adoption of Chapter XIV was passed by Resolutions MSC 385(94) and MSC 386(94) on 21 November 2014 to establish a mandatory framework for the Polar Code with regard to ships' operation, construction and safety.⁹⁶⁾ With respect to environmental provisions, the amendment of MARPOL73/78 was adopted by the 68th MEPC session in 2015.⁹⁷⁾ The Polar Code entered into force on 1 January 2017 following amendments to SOLAS and MARPOL73/78.⁹⁸⁾

2. Overview of the Polar Code

The Polar Code consists of an Introduction and two parts. Part I provides the international standards and regulations on ships' safety and Part II deals with the prevention of marine pollution from ships.⁹⁹⁾ While Part I-A and Part II-A of the Polar Code are mandatory regulations, Part B comprises

Manual, DE 57//11/22 and DE 57/11/19

96) IMO, Maritime Safety Committee, 94th session, Resolution MSC.380(94) on 21 November 2014, 'Amendments to The International Convention for the Safety of Life at Sea(SOLAS), 1974, as Amended', Available at <<http://www.imo.org/en/MediaCentre/HotTopics/polar/Documents/POLAR%20CODE%20TEXT%20AS%20ADOPTED%20BY%20MSC%20AND%20MEPC.pdf>>

97) IMO, Maritime Environmental Protection Committee, 68th session, Resolution MEPC. 265(68) on 15 May 2015, Amendments to the Annex of the Protocol of 1978 relating to the International Convention for the prevention of Pollution from ships, 1973, available at <[http://www.imo.org/en/KnowledgeCentre/indexofIMOResolutions/Marine-Environment-Protection-Committee\(MEPC\)/Documents/MEPC.265\(68\).Pdf](http://www.imo.org/en/KnowledgeCentre/indexofIMOResolutions/Marine-Environment-Protection-Committee(MEPC)/Documents/MEPC.265(68).Pdf)> accessed 9 September 2017.

98) IMO, *Supra note* 93 ; See also <<http://www.imo.org/en/MediaCentre/HotTopics/polar/Pages/default/polar/Pages/default.aspx>>

99) ØØ. Jensen. "The International Code for Ships Operating in Polar Waters: Finalization, Adoption and Law of the Sea Implications." *Arctic Review on Law and Politics* 7 (2016), p.64.

recommended regulations; that is, it is not legally binding.¹⁰⁰⁾ Based on the approach of goal-based standards, the structure of each chapter of the Polar Code is composed sequentially of the goal, functional requirements and regulations. Ships' safety provisions follow a manner consistent with SOLAS, while the provisions relevant to the prevention of marine pollution apply to all ships in accordance with MARPOL73/78.¹⁰¹⁾

The Polar Code classifies ships on the basis of the ice conditions as follows: "Category A ship means a ship designed for operation in polar waters in at least medium first-year ice, which may include old ice inclusions; Category B ship means a ship not included in category A, designed for operation in polar waters in at least thin first-year ice, which may include old ice inclusions;[and] Category C ship means a ship designed to operate in open water or in ice conditions less severe than those included in Categories A and B."¹⁰²⁾ The Polar Code requires that "every ship to which this Code applies shall have on board a valid Polar Ship Certificate." In addition, the Polar Code articulates the establishment of a Polar Water Operational Manual "to provide the owner, operator, master and crew with sufficient information regarding the ship's operational capabilities and limitations in order to support their decision-making process."¹⁰³⁾

Furthermore, it deals with the requirement of crew training. Paragraph 12.2 of Part I-A provides that "companies shall ensure that masters, chief

100) *Ibid*, p.65.

101) Skachakov, 'International Code of Safety for Ships Operating in Polar Waters (Polar Code)' (Marine Ships, 2017); available at <<http://www.marineships.net/maritime-law/international-code-of-safety-for-ships-operating-in-polar-waters-polar-code/>> accessed 9 September 2017.

102) Polar Code, Part I-A, Introduction, Paragraph 2.1/2.2/2.3 ; available at <[http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Maritime-Safety--\(MSC\)/Committee Documents /MSC.385\(94\).pdf](http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Maritime-Safety--(MSC)/Committee Documents /MSC.385(94).pdf)> accessed 9 September 2017.

103) Polar Code, Part I-A, Chapter 2-Polar Water Operational Manual (PWOM), Paragraph 2.1-Goal.

mates and officers in charge of a navigational watch on board ships operating in polar waters shall have completed training to attain the abilities that are appropriate to the capacity to be filled and duties and responsibilities to be taken up, taking into account the provisions of the STCW Convention and the STCW Code, as amended”.¹⁰⁴⁾ Thus, Paragraph 12.3 of Part I-A indicates the specific functional requirements for the qualification of crew (see Figure 1).

Figure 1. Polar Code Training Requirements

| Ice conditions | Type of Vessel | | |
|----------------|--|--|--|
| | Tankers | Passenger ships | Other |
| Ice-free | Not applicable | Not applicable | Not applicable |
| Open waters | Basic training for master, chief mate and officers in charge of a navigational watch. | Basic training for master, chief mate and officers in charge of a navigationa watch. | Not applicable. |
| Other waters | Advanced training for master and chief mate. Basic training for officers in charge of a navigational watch. | Advanced training for master and chief mate. Basic training for officers in charge of a navigational watch. | Advanced training for master and chief mate. Basic training for officers in charge of a navigational watch. |

Source: Polar Code, Chapter 12 Manning and Training, Paragraph12.3.1; see available at <[http://www.imo.org/en/KnowledgeCentre/IndexofMOResolutions/Maritime-Safety\(MSC\)/CommitteeDocuments/MSC.385\(94\).pdf](http://www.imo.org/en/KnowledgeCentre/IndexofMOResolutions/Maritime-Safety(MSC)/CommitteeDocuments/MSC.385(94).pdf)>

As stated above, Part II of the Polar Code focuses on the provisions relevant to the prevention of marine pollution from ships. Generally, Part II

104) Polar Code, Part I-A, Chapter12 -Manning and Training, Paragraph-12.2 Functional requirements.

of the Polar Code provides more stringent provision than Annexes I, II, IV and V of MARPOL73/78.¹⁰⁵⁾ With regard to the geographical scope, the IMO states that Arctic waters “cover the areas north of 60° N or south of 60° S although there are slight deviations for Arctic waters intended to include the entire southern exposure of Greenland while excluding Iceland and the Norwegian coastline.”¹⁰⁶⁾ In this regard, Part II of the Polar Code applies to all ships operating in Arctic waters.

With respect to the specific pollution provisions of the Polar Code, while Annex I of MARPOL73/78 allows vessels to discharge bilge waters through an oily bilge water separator, except for within designated special areas, every ship prohibits a discharge of bilge waters in Arctic waters as well as a discharge of waters generating from the engine machinery space.¹⁰⁷⁾ Given that there are insufficient reception facilities to discharge oily bilge waters in the Arctic, vessels must have sufficient oily bilge water holding tanks available to collect bilge waters during navigation in Arctic waters.

In addition, to prevent marine pollution from ships in the Arctic, Paragraph 1.2.4 of Part II-A refers to the construction requirements for double bottom tanks (e.g. engine room tanks such as bilge holding tanks and sludge tanks).¹⁰⁸⁾ In Arctic waters, ships are allowed to discharge sewage that is

105) Nengye Liu, ‘Can the Polar Code Save the Arctic?’, American Society of International Law 20(2016) available at <<https://www.asil.org/insights/volume/20/issue/7/can-polar-code-save-arctic>> accessed 10 September 2017; see also <<http://www.imo.org/en/MediaCentre/HofTopics/polar/Pages/default.aspx>> accessed 10 September 2017.

106) American Bureau of Shipping, IMO Polar Code Advisory(ABS, 2016), p.12; available at <https://ww2.eagle.org/content/dam/eagle/publications/2016/PolarCodeAdvisory_15239.pdf> accessed 10 September 2017 ; H. Edwin Anderson, *Supra note* 6, p.76.

107) IMO, Marine Environment Protection Committee, 68th session, ResoulutionMEPC.265(68) (on 15 May 2015), ‘Amendments to the Annex of the Protocol of 1978 relating to the International Convention for the prevention of Pollution from Ships, 1973’ ; available at <[http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Marine-Environment-ProtectionCommittee\(MEPC\)/Documents/MEPC.265\(68\).pdf](http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Marine-Environment-ProtectionCommittee(MEPC)/Documents/MEPC.265(68).pdf)> accessed 10 September 2017.

108) Polar Code, Part II-A, Chapter 1-Prevention of Pollution by oil from ships, Paragraph

“not comminuted or disinfected” at “a distance of more than 12 nautical miles from any ice-shelf or fast ice and from the areas of ice concentration exceeding 1/10.”¹⁰⁹⁾ However, vessels can discharge “comminuted and disinfected sewage” at “distance of more than three nautical miles from any ice-shelf or fast ice and from the areas of ice concentration exceeding 1/10.”¹¹⁰⁾ In addition, all passenger ships and A- and B-classified vessels are allowed to discharge sewage through a “sewage treatment plant certified by the Administration” and “shall be as far as practicable from the nearest land, any ice-shelf, fast ice or areas of ice concentration exceeding 1/10.”¹¹¹⁾

The construction requirement of double bottom tanks particularly applies to category A and B oil tankers of less than 5,000 tonnes deadweight and all vessels carrying oil.¹¹²⁾ Lastly, while the discharge of food waste is allowable in Arctic waters, the discharge of animal carcasses is prohibited.¹¹³⁾ In particular, if the vessel fulfills the requirement of discharges concerning cargo residues subject to Paragraph 5.2.1.5 of Part II-A, the ship can discharge cargo residues into Arctic waters.¹¹⁴⁾

3. The way forward

The Polar Code is expected to play a significant role in ensuring ships’ safety and preventing marine pollution from ships in polar waters. To do

1.2.4

109) Polar Code, Part II-A, Chapter 4-Prevention of Pollution by sewage from ships, Paragraph 4.2.1

110) *Ibid.*

111) *Ibid.*

112) Polar Code, Part II-A, Chapter 1-Prevention of Pollution by oil from ships, Paragraph 1.2.3

113) Polar Code, Part II-A, Chapter 5-Prevention of Pollution by garbage from ships, Paragraph 5.2.1.1 and 5.2.1.4

114) *Ibid.*, Paragraph 5.2.1.5

so, further considerations are needed to enhance the Polar Code as follows. Above all, non-SOLAS ships such as fishing vessels and pleasure crafts should be applied under Part I-A of the Polar Code. This argument was already suggested by Iceland, New Zealand and South Africa at the 95th MSC session in 2015.¹¹⁵⁾ Ensuring ships' safety is directly concerned with the prevention of marine pollution. Therefore, the IMO will take into account the application of non-SOLAS ships under the ships' safety provisions of the Polar Code.

Secondly, Part II-A of the Polar Code should deal with Annex VI of MARPOL73/78, which provides for the prevention of air pollution from ships. Annex VI of MARPOL73/78 controls emissions from ships such as ozone-depleting substances, nitrogen oxides and sulphur oxides by designating an "emission control area". These emissions lead to environmental concerns such as acid rain, the oxygen depletion of inland and coastal waters, the creation of ground-level ozone, the depletion of atmospheric ozone and the accumulation of PCBs and heavy metals in the food chain.¹¹⁶⁾ Accordingly, to help prevent air pollution from ships in Arctic waters, Part II-A of the Polar Code should consider the inclusion of Annex VI of MARPOL73/78 and Arctic waters should be established as an "emission control area."

Thirdly, in Antarctic waters, there is a special requirement for the carriage and use of heavy fuel oil under the amendment to MARPOL73/78 Annex I, 2010. This regulation prohibits the use and carriage of heavy fuel oil when a vessel is passing through Antarctic waters.¹¹⁷⁾ The purpose of

115) IMO, Maritime Safety Committee, 95th session, Agenda item 21, Request for data on incidents within polar waters Submitted by Iceland, New Zealand and South Africa, MSC/95/21/3,2015; available at <<http://www.usmsa.org/wp-content/uploads/2015/04/MS-C-95-21-3.pdf>> accessed 10 September 2017.

116) Anderson, *Supra note* 6, p.80.

117) Amendments to MARPOL73/78 Annex I (2010), Chapter 9 – Special Requirements for the use or carriage of oils in the Antarctic Area, Regulation 43.

this provision is to prevent the marine environment from vessel-source oil pollution and restrict SOx emissions, a major source of the worsening air pollution. Therefore, additional regulations on the prohibition of the use and carriage of heavy fuel oil in Arctic waters are required to prevent marine environment from vessel-source pollution. This reference can be observed in the European Parliament. In 2017, the European Parliament 483/100 plenary adopted a resolution on the Arctic, including “on the Commission and the Member States to actively facilitate the ban on the use of heavy fuel oil and carriage as ship fuel in vessels navigating the Arctic seas through MARPOL73/78 of IMO.”¹¹⁸⁾ Given this trend, the IMO should establish a provision concerning the prohibition of the use and carriage of heavy fuel oil in Arctic waters to unify the rules for both Antarctic waters and Arctic waters.

Finally, while the Polar Code allows vessels to discharge food waste and sewage from ships in accordance with special requirements, the IMO should prohibit the discharge of both food waste and sewage during the navigation of Arctic waters in the future. Simply put, these considerations would be conducive to the enhancement of the Polar Code associated with the prevention of marine pollution from ships.

V. Conclusion and Recommendations

With the increasing attention of the shipping industry on ships operating in Arctic waters, the number of vessels that pass through Arctic waters is

118) European Parliament, Integrated European Union policy for the Arctic, 2016/2228(INI) (8 February 2017); available at <<http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-%2f%2fEP%2f%2fTEXT%2bREPORT%2bA82017-0032%2b0%2bDOC%2bXML%2bV0%2f%2fEN&language=EN>> accessed 10 September 2017.

predicted to consistently increase. Arctic experts and environmentalists are concerned about marine environmental damage arising from vessel-source pollution (oil pollution, sewage, air pollution). Hence, we need an international legal regime concerning the prevention of vessel-source pollution in Arctic waters. Above all, Article 234 of the LOSC provides for the specific provision of “ice-covered areas”. Under this provision, the Arctic region can enact and enforce domestic laws and regulations regarding ships’ safety and the prevention, control and reduction of marine pollution from ships in Arctic waters. However, the LOSC does not provide detailed provisions on the prevention of marine pollution from ships in Arctic waters. Although the Arctic Council is trying to protect the marine environment in Arctic waters through six working groups, these lack legal force. Furthermore, while the domestic laws of Arctic regions such as Canada and the Russian Federation provide more stringent regulations on the prevention of marine pollution from ships than generally accepted international standards and rules, it is difficult to enforce their laws and regulations if marine pollution incidents from ships occur on the high seas. In consideration of the need for an international legal regime to prevent, control and reduce marine pollution from ships in Arctic waters, the Polar Code was finally adopted by the IMO at the 94th MSC session and the 68th MEPC session in 2015. The Polar Code entered into force on 1 January 2017.

The legal force of the Polar Code arises from the SOLAS and MARPOL73/78 amendments. The pollution regulations of the Polar Code are in Annexes I, II, IV and V of MARPOL73/78. Under the Polar Code, while vessels are prohibited from discharging oily bilge waters when navigating in Arctic waters, the discharge of food waste and sewage is allowed in the case of the fulfillment of special requirements. We expect the Polar Code to help prevent marine pollution from ships in Arctic waters. To do so, this study suggested recommendations to enhance the role and

function of the Polar Code with regard to the prevention of vessel-source pollution. Such recommendations are briefly summarised as follows. Firstly, with reference to the suggestion of Iceland, New Zealand and South Africa at the 95th MSC session in 2015, non-SOLAS ships should apply to the Polar Code to ensure ships' safety. Secondly, the Polar Code does not refer to Annex VI of MARPOL73/78, which provides relevant regulations to prevent air pollution from ships. Given that Arctic waters have environmental importance and need protecting, the Polar Code should deal with Annex VI of MARPOL73/78 before growing numbers of vessels wish to pass through Arctic waters. Thirdly, to unify the regulations on the prohibition of the use and carriage of heavy fuel oil in Antarctica waters under Regulation 43 of MARPOL73/78 Annex I, the IMO should take into account the amendment of Regulation 43 of MARPOL73/78 Annex I regarding the inclusion of Arctic waters given the importance of the prevention of oil pollution from oil tankers. Lastly, there is a need to gradually prohibit the discharge of sewage and food waste when vessels are passing through Arctic waters.

In addition, specific guidelines for Port State Control in the Polar Code by the IMO are required to prevent marine pollution from ships. This guideline would help states inspect whether ships comply with the Polar Code by providing a procedure of port state control. Moreover, it would play an important role in encouraging states to adopt domestic law. The Polar Code is considered to be the first and most significant international legal framework to ensure ships' safety and prevent marine pollution from ships. In the future, the international community such as the IMO and the Arctic Council must pay constant attention to the enhancement of the Polar Code to protect the marine environment.

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[Abstract]

A Study on the Laws and Regulations for the Prevention
of Vessel-Source Pollution in the Arctic Waters:
Focusing on International Code of Safety for Ships Operating in
Polar Waters(Polar Code)

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With the acceleration of the throwing of polar's sea ice due to the global warming, international community has been interested in the economic benefits of polar waters such as the new sea lane and the exploitation and exploration of oil and gas resources. In particular, the arctic waters, which has been long recognised as the path of expedition, is predicted to increase a number of vessels that wish to pass through its waters due to recent success of commercial voyages that sail across from Europe to Asia by using the Arctic Waters. Although the most popular passages are the Northwest Passage, which is from the Atlantic to the Pacific Oceans passes through the Canadian Arctic Archipelago, and the Northeast Passage which cross the Arctic north of Russia, the North-centre Passage is expected to be sooner used as the shipping route by reason of dramatically melting of the arctic's sea-ice. Meanwhile, with the increasing numbers of vessels sailing across in the Arctic waters, international community has voices of concern regarding vessel-source pollution. Due to physical features of the arctic waters, this area is vulnerable to vessel-source pollution considering

that it may be difficult to promptly response or take measures in case of accidental discharges and operational discharges of ships than other seas. Hence, the vessels that is using the arctic waters not only have a special attention to prevent vessel-source pollution, but there also is important to take protective measures concerning the international safety requirement for design, construction, equipment, operation and manning of vessels.

As a result, the Maritime Safety Committee of International Maritime Organisation has been adopted 'International Code for Ships Operating in Polar Waters(Polar Code)' and new chapter XIV(Safety Measures for Ships Operating in Polar Waters) of the SOLAS for the purpose of authorizing legal binding of Polar Code. In addition, at the sixty eighth session of Marine Environment Protection Committee on 15 May 2015 has been adopted the parts II-A and II-B of the Polar Code and the related amendments to MARPOL73/78 Annexes I (Prevention of Pollution by Oil), II (Control of Pollution by Noxious Liquid Substances in Bulk), IV (Prevention of Pollution by Sewage), and V (Prevention of Pollution by Garbage). The purpose of the Polar Code is to offer the safety operation and protection of the polar environment. The Polar Code already entered into force 1 January 2017 upon along with the entry into force the associated amendments to MARPOL73/78 and SOLAS. The content of Polar Code consist of Part I and Part II and the structure of its Code constitute that while Part A is mandatory provisions, Part B is recommendatory provisions.

This study will look at the economic advantages of the arctic waters as new shipping's route. Afterwards, this study will examine the significance and the issues of implementation of the Polar Code to prevent vessel-source pollution in the arctic waters. Further, after analysing the enacting progress and the main contents of the Polar Code, it will suggest the recommendations and the improvement for the Polar Code to combat vessel-source pollution in the arctic waters.

Key words : International Code of Safety for ships Operating in Polar Waters, the Arctic Waters, MARPOL73/78, SOLAS, the Arctic Council, Vessel-Source Pollution