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## A research on the Polar Code

Xiao Lv

Ph.D. candidate of China University of Political Science and Law, Beijing, China

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### Abstract

As global warming melts glaciers, new shipping routes in the polar areas begin to receive more and more attention. However, shipping in the polar areas also has specific difficulties on safety and may cause environmental problems to the pure original face. Thus, many countries and international organizations start to make efforts on addressing these issues and relevant rules come out, especially the Polar Code.

### Keywords

Polar Code, shipping safety, environmental protection, development.

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Under the affection of climate change, the sea ice of Arctic Ocean decrease 3% every 10 years, in the results, in September by the middle of this century the Arctic Ocean is project to be ice-free.<sup>1</sup> The retreat of the sea ice is opening the region to new and expanded human activities (fishing, petroleum activities, marine scientific research, transport, tourism, naval activities) exposing the Arctic marine environment to extra pressure.<sup>2</sup> As the trans-Arctic navigation routes reduces the distance between Europe and Asia by more than 40%, Arctic shipping is most likely to increase during the next few years.<sup>3</sup> However, increased Arctic shipping activities (e.g. operational discharges, accidents, ballast water exchange) inevitably means more risk of pollution.<sup>4</sup> The risk of environmental damage in Arctic waters is even higher than other areas and the pollution may have greater impact on the surroundings for the degrading capability of pollutant is weaker in cold water.

This article is based on the environmental condition and maritime transport, shipping safety in Polar area, to discuss some efforts on developing the Polar code.

As voyage comes to be a more and more important human activity in polar world, some problems have arisen, for example, what rules or standards could be used to govern the safety of shipping in polar areas, what are the certifications for polar ship operators and what is the standard of the shipping capacity in Arctic and Antarctic waters.<sup>5</sup> ‘Since 1993, an international initiative led by Canada has been underway to harmonize the existing plethora of rules and standard for ships operating in polar waters.’ From then on, various meetings have been held in Canada, Finland, Norway, Sweden, Russia, and the United States to discuss the following issues: national polar ship operators, national maritime

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<sup>1</sup> *Polar code*, <<http://www.docin.com/p-788051140.html>>, accessed 24 June 2015

<sup>2</sup> Tore Henriksen, *the Polar Code Ships in Cold Water-Arctic Issues Examined*, IMI\_Yearbook\_2014

<sup>3</sup> *Arctic Marine Shipping Assessment 2009 Report*. Arctic Council, April 2009, second printing

<sup>4</sup> Ibid

<sup>5</sup> An international polar navigation code for the twenty-first century, <http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=5425972&fileId=S0032247400025377>, accessed 7<sup>th</sup> December 2015

regulatory officials, ship-classification society representatives, ship engineering and so on. Arctic Council members have played an active part in the improvement of the Polar Code by their works in the International Maritime Organization.<sup>6</sup> The Council has helped to promote safe and secure shipping in the Arctic area, especially the contribution of the Arctic Marine Shipping Assessment 2009 Report.<sup>7</sup> All of these efforts were made to develop a comprehensive and unified code for ships navigating in the Arctic as well as the Antarctic.<sup>8</sup>

In the next decade, the Arctic Marine Strategic Plan 2015-2025 (AMSP) will guide the Arctic Council's work on marine issues.<sup>9</sup> The AMSP takes account of environmental changes, new knowledge and recent assessment, provides more coordinated and integrated approaches as well as positive policy decisions on the local, national, regional, and international levels.<sup>10</sup> The AMSP recognizes the very importance of respecting the people living in the Arctic, thus enhancing the economic, social and cultural well-being of Arctic inhabitants, including Arctic indigenous people, strengthening their capacity to adopt changes in the Arctic environment.<sup>11</sup>

While Arctic and Antarctic waters have some similarities, it still exists differences or specific conditions, which need to be taken into account. The Arctic is a shallow sea covered by ice and surrounded by land masses while the Antarctic is an ice covered continent which is surrounded by a deep ocean; the Arctic has native people who live there for thousand years while the Antarctic has no permanent population of people; compared to the Antarctic, the Arctic is currently less protected.<sup>12</sup>

The risk level within polar waters may differ depending on the geographical location, time of the year relevant to daylight, ice-coverage, and so on, thus, the mitigating measures required to address the specific hazards may be different in Arctic and Antarctic waters.<sup>13</sup> The Polar Code considers hazards which may lead to severe risks or consequences: ice, as it may affect hull structure, stability characteristics, machinery systems, navigation, the outdoor working environment, maintenance and emergency preparedness tasks and malfunction of safety equipment and systems; experiencing topside icing, with potential reduction of stability and equipment functionality; low temperature, as it affects working environment and human performance, maintenance and emergency preparedness tasks, material properties and equipment efficiency, survival time and performance of safety equipment and systems; extended periods of darkness or daylight as it may affect navigation and human performance; high latitude, as it affects navigation systems, communication systems and the

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<sup>6</sup> Environmental Provisions of Polar Code adopted, <http://www.arctic-council.org/index.php/en/our-work2/8-news-and-events/130-environmental-provisions-of-polar-code-adopted>, accessed 8<sup>th</sup> December 2015

<sup>7</sup> Ibid

<sup>8</sup> Ibid

<sup>9</sup> Safe Shipping and Marine Environmental Protection, <http://www.arctic-council.org/index.php/en/our-work2/8-news-and-events/287-safe-shipping-and-marine-environmental-protection>, accessed 8<sup>th</sup> December 2015

<sup>10</sup> Ibid

<sup>11</sup> Ibid

<sup>12</sup> Polar Code Hazard Identification Workshop Reports, 24 November 2011, International Maritime Organization

<sup>13</sup> International Code for Ships Operating In Polar Waters (Polar Code), Introduction 3.2, [http://www.pkulaw.cn/fulltext\\_form.aspx?Db=qikan&Gid=1510157006&keyword=polar&EncodingName=](http://www.pkulaw.cn/fulltext_form.aspx?Db=qikan&Gid=1510157006&keyword=polar&EncodingName=), accessed 31<sup>st</sup> December 2015

quality of ice imagery information; remoteness and possible lack of accurate and complete hydrographic data and information, reduced availability of navigational aids and seamarks with increased potential for groundings compounded by remoteness, limited readily deployable Search and Rescue (SAR) services, delays in emergency response and limited communications capability, with the potential to affect incident response; potential lack of ship crew experience in polar operations, with potential for human error; potential lack of suitable emergency response equipment, with the potential for limiting the effectiveness of mitigation measures; rapidly changing and severe weather conditions, with the potential for escalation of incidents; and the other environment impacts or the need for longer restoration.<sup>14</sup>

Compared to marine eco-systems in lower latitudes, polar waters surround a number of unique eco-systems, and featured by dramatic seasonal changes in physical and biological conditions, lower decomposition rates, and limited resilience to environmental changes.<sup>15</sup> These characteristics make it harder for polar water eco-systems to bear the increased human activities in these areas.<sup>16</sup> In the opinion of the sponsors to the Polar Code, just these factors and potential risks of the polar environment strongly support the development of appropriate safety and environmental standards for polar shipping and also the establishment of requirement and recommendatory provisions to fill the gaps in previous regulations.<sup>17</sup>

For ship safety in the harsh environment of the waters around the two poles, IMO (International Maritime Organization) has adopted the Polar Code (International Code for Ship Operating in Polar Waters) to make it mandatory under the SOLAS (International Convention for the Safety of Life at Sea 1974) and MARPOL (International Convention for the Prevention of Pollution from Ship).<sup>18</sup> The Polar Code is not meant to duplicate existing standards on international safety, pollution prevention, and training, but to supplement them with more specific articles for shipping operation in polar areas.<sup>19</sup> It is obvious that the Code acknowledges the polar environments may impose additional demands on ships beyond the existing requirements of some other relevant IMO instruments. To develop regulations, policies and guidelines on environmental issues relevant to the Polar Code, Protection of the Arctic Maritime Environment (PAME) encourages IMO a lot in ballast water management, anti-fouling and black carbon emissions.<sup>20</sup>

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<sup>14</sup> International Code for Ships Operating In Polar Waters (Polar Code), Introduction 3.1

<sup>15</sup> Development of a Mandatory Code for Ships Operating in Polar Waters, [http://www.pame.is/images/05\\_Protectec\\_Area/2013/PAME\\_I\\_2013/04\\_Agenda/Agenda\\_4.2a-Annex-Proposals\\_related\\_to\\_an\\_environmental\\_chapter\\_of\\_a\\_mandatory\\_Code\\_for\\_ships\\_operating\\_in\\_polar\\_waterDenmark\\_Finland\\_Iceland.pdf](http://www.pame.is/images/05_Protectec_Area/2013/PAME_I_2013/04_Agenda/Agenda_4.2a-Annex-Proposals_related_to_an_environmental_chapter_of_a_mandatory_Code_for_ships_operating_in_polar_waterDenmark_Finland_Iceland.pdf), accessed by 11 December 2015

<sup>16</sup> Ibid

<sup>17</sup> Ibid

<sup>18</sup> <http://www.imo.org/en/MediaCentre/HotTopics/polar/Pages/default.aspx>, accessed 2nd October 2015

<sup>19</sup> An international polar navigation code for the twenty-first century, <http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=5425972&fileId=S0032247400025377>, accessed 7<sup>th</sup> December 2015

<sup>20</sup> PAME(I) 13/4.2(a)/AMSA I(B) IMO Polar Code summary paper, [http://www.pame.is/images/05\\_Protectec\\_Area/2013/PAME\\_I\\_2013/04\\_Agenda/Agenda\\_4.2a-AMSA\\_IB\\_Report\\_on\\_Status\\_of\\_the\\_Polar\\_Code\\_by\\_US-Canada-Denmark-Finland-Norway.pdf](http://www.pame.is/images/05_Protectec_Area/2013/PAME_I_2013/04_Agenda/Agenda_4.2a-AMSA_IB_Report_on_Status_of_the_Polar_Code_by_US-Canada-Denmark-Finland-Norway.pdf), accessed 11 December 2015

The complete Polar Code is expected to enter into force on 1 January 2017.<sup>21</sup> The Code will apply to passenger ships and cargo ships with a gross tonnage of more than 500, covering ship design and construction, crew training and navigation to improved coordination of search and rescue operations.<sup>22</sup> The adoption of the Polar Code will not only affect the accepting states but also influence the parties under the United Nations Convention on the Law of the Sea and the arctic coastal states to stipulate other countries' vessels within their territorial waters.<sup>23</sup>

Through the decisions in 2009 by both Maritime Safety Committee (MSC) and the Maritime Environment Protection Committee (MEPC), the development of a mandatory Polar Code includes two main parts<sup>24</sup>: maritime safety, pollution prevention.<sup>25</sup> In terms of safety measures, the Polar Code has exclusive chapters on requirement for operating in ice-covered areas and low temperatures, life-saving appliances, well-trained seafarers, communication equipment.<sup>26</sup> To distinguish the shipping capacity, vessels are defined into three categories: vessels in category A are able to operate at least in medium first year ice (first year ice means having a thickness between 0.3-3.0m), vessels in category B are required to operate in thin first year ice, vessels in category C are capable to operate in open waters where the sea ice concentration is less than 1/10.<sup>27</sup> It is obvious that specific requirements are applicable to vessels to make sure the safety navigation in cold water. In another way, vessels may navigate in polar waters until the requirements were met.

The Polar Code demands each relevant vessel hold a Polar Ship Certificate on board. Ships also need to carry a Polar Water Operational Manual (PWOM) to provide sufficient information on the Owner, Operator, Master, Crew and the ship's operational capabilities and limitations.<sup>28</sup> All the routes will be considered in the voyage planning, more specifically, hydrograph, extent and type of sea ice, distance to search and rescue capabilities, or some other factors like these.<sup>29</sup>

To achieve the Polar Ship Certificate would require an assessment, considering the anticipated range of operating conditions and hazards that the ship may encounter in the polar areas.<sup>30</sup> The assessment includes information on identified operational limitations, plans, procedures, additional safety

<sup>21</sup> Environmental Provisions of Polar Code adopted, <http://www.arctic-council.org/index.php/en/our-work2/8-news-and-events/130-environmental-provisions-of-polar-code-adopted>, accessed 7<sup>th</sup> December 2015

<sup>22</sup> Milestone for enhanced safety in Arctic regions, Enhancing safety of navigation in polar areas, [http://www.cnss.com.cn/html/2014/currentevents\\_0523/150995.html](http://www.cnss.com.cn/html/2014/currentevents_0523/150995.html), accessed 17<sup>th</sup> December 2015

<sup>23</sup> Tore Henriksen, *the Polar Code Ships in Cold Water-Arctic Issues Examined*, IMI\_Yearbook\_2014

<sup>24</sup> Development of a Mandatory Code for Ships Operating in Polar Waters, [http://www.pame.is/images/05\\_Protectec\\_Area/2013/PAME\\_I\\_2013/04\\_Agenda/Agenda\\_4.2a-Annex-Proposals\\_related\\_to\\_an\\_environmental\\_chapter\\_of\\_a\\_mandatory\\_Code\\_for\\_ships\\_operating\\_in\\_polar\\_waterDenmark\\_Finland\\_Iceland.pdf](http://www.pame.is/images/05_Protectec_Area/2013/PAME_I_2013/04_Agenda/Agenda_4.2a-Annex-Proposals_related_to_an_environmental_chapter_of_a_mandatory_Code_for_ships_operating_in_polar_waterDenmark_Finland_Iceland.pdf), accessed by 11 December 2015

<sup>25</sup> Polar Code, supra note 35, Introduction, Section 3

<sup>26</sup> Polar Code, supra note 35, Part I-A

<sup>27</sup> Polar Code, supra note 35, Introduction, Section 2.1-2.4

<sup>28</sup> <http://www.imo.org/en/MediaCentre/HotTopics/polar/Pages/default.aspx> accessed 26<sup>th</sup> November 2015

<sup>29</sup> CMI Yearbook2014, page 340

<sup>30</sup> Shipping in polar waters, Adoption of an international code of safety for ships operating in polar waters (Polar Code), IMO Official Website

equipment, which is necessary to mitigate incidents with potential safety or environmental consequences. For vessels operating in low ambient air temperature, systems and equipment required by the Code must function at the polar service temper, which is must be set at least 10 °C below the lowest mean daily low temperature for the intended area and season of operation in polar waters, survival systems and equipment must be fully operational at the polar service temperature for the maximum expected rescue time.<sup>31</sup>

Despite ship structure and machinery installations, the Polar Code also contains fire-safety protection, life-saving appliances and arrangements, safety of navigation, communication, voyage planning, manning and training. Fire safety appliances and systems must be protected from snow and ice and must be responsible for the need for person to wear bulky and cumbersome cold weather gear, when the vessels operate at low temperature, fire safety systems and appliances must be effective under the polar service temperature. The Code also considers requirements to facilitate safe escape, evacuation, and survival in polar areas. Moreover, vessels must have methods to receive and display instant messages on ice conditions in the shipping areas, must have the ability to visually detect ice while operating in the darkness, and must have two non-magnetic methods to determine and display the vessel's heading, if there is a risk of freeze, it is necessary to prevent the accumulation of ice on antennas required for navigation and communication, the Code also includes requirements to provide effective communication for vessels and survival craft in both normal operations and emergency conditions. Planning a voyage through polar waters, the master must consider the Polar Water Operation Manual, current information on ice and icebergs in the vicinity of the intended routes to be taken when maritime mammals are encountered relating to know areas with densities of maritime mammals, including seasonal migration areas. The Code requires companies to ensure that masters, chief mates and officers in charge of a navigational watch on board ships operating in polar waters have completed appropriate training, the extent of training depends on the ice conditions and the whether the vessel is a tanker, passenger ship, or other type of vessel. Each crewmember must know very well about the provisions in the Polar Water Operation Manual relevant to their assigned duties. The discharge of oil and oily mixtures from any vessel in Arctic waters is prohibited by the Code, while this prohibition does not apply to clean or segregated ballast. The Code requires that oil fuel tanks of Category A and B vessels be separated from the outer hull, and discharge into Arctic waters of noxious liquid substances or any mixture containing such substances is also prohibited. The discharge of sewage and garbage within polar waters is prohibited unless discharged in accordance with MARPOL Annex IV and V, and specially provided in the Code.<sup>32</sup>

The Polar Code has provided a global-based standard in applying safety measures, the flag state is provided with latitude in achieving relevant requirements. It also provides proper flexibility for ensuring the ship seaworthy in all kinds of harsh environment.<sup>33</sup> It also contains specific instructions on operational discharge to reduce marine environment pollution. However, the application of the Polar Code still face challenges, to be more specific, the flag state may provide optional and equal

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<sup>31</sup> Maritime Alert: IMO Adopts Additional Provisions to Polar Code, Imposing Mandatory Environmental and Safety Requirements on Vessels Traversing Polar Waters, <http://www.kyl.com/2015/05/21/maritime-alert-imo-adopts-additional-provisions-to-polar-code-imp-osing-mandatory-environmental-and-safety-requirements-on-vessels-traversing-polar-waters/>, accessed 25<sup>th</sup> December 2015

<sup>32</sup> Polar Code: a new regulation for polar shipping, [http://www.cnss.com.cn/html/2015/updates\\_1021/190112.html](http://www.cnss.com.cn/html/2015/updates_1021/190112.html), accessed 19<sup>th</sup> December 2015

<sup>33</sup> CMI Yearbook2014, page 343

standards on safety, in another way, there is no uniform standard.<sup>34</sup> The jurisdiction of the coastal states on managing foreign-flagged vessels which sailing on their executive economic zone and territorial sea to a large extent depends on the circumstances of widely accepted and uniform rules and standards. The Polar Ship Certificate needs to record the conditions that the ship design is different from the Polar Code. To the port state, inspection procedures need to be transparency and verifiability; to the flag state, both coastal states and port states are provided with enforcement jurisdiction under the United Nations Convention on the Law of the Sea.<sup>35</sup>

The safety measures may help reduce accidents, but when it does happen, the environment, species and ecosystems will be under stress. The Polar Code also involves how to prevent the harmful influences of shipping in Arctic waters. Some common types of pollutions, like floating garbage and oil spills, lead to the banning of transport and use of heavy fuel oil.<sup>36</sup> As accidental oil spill has been considered one of the most serious environmental threats in polar areas, a ban will be required for arctic coastal states to provide 'reception facilities' in order to respect of Antarctic waters. The banning on discharges of noxious liquid substances, some stricter distance regulations on discharges sewage and garbage, will also be included. Moreover, both of the Ballast Water Management Convention and the Anti-fouling Convention are applicable to the polar waters.<sup>37</sup> Part II of the Code addresses pollution discharges from ships, for instance, oil, chemicals, sewage, and rubbish, it is expected to strengthen the existing regulations especially in the Arctic, it will compliment the Part I, which addresses safety of shipping in the polar areas and was adopted in the end of 2014.<sup>38</sup>

The 29<sup>th</sup> session of the IMO Assembly has been hold in the morning of 25<sup>th</sup> November 2015, IMO Headquarters, London.<sup>39</sup> Over 1000 delegates from IMO Member States, international governmental and NGO (non-governmental organizations) have joined in to hear Secretary-General Koji Sekimizu of the IMO state some major achievements of IMO during 2014 and 2015.<sup>40</sup> As the statement of Koji Sekimizu, compared with those existing IMO treaties, the Polar Code has supplemented some requirement to ships in order to address the specific challenges in the harsh conditions of the two poles, the Code should be capable to prevent or reduce accident, thus minimizing potential pollution damage.<sup>41</sup> The Polar Code covering the topics: prevention of pollution by oil, control of pollution by noxious liquid substances in bulk, prevention of pollution by sewage and garbage from ships, in order to protect vessels, seafarers and passengers in this areas.

In terms of the views on the Polar Code, people have differing perspectives. Based on the failure to eliminate the use of heavy fuel oil, though it is banished in Antarctica, Sue Libenson from Pacific

<sup>34</sup> CMI Yearbook2014, page 344

<sup>35</sup> United Nations Convention on the Law of the Sea, Article 218 and Article 220

<sup>36</sup> CMI Yearbook2014, page 342

<sup>37</sup> CMI Yearbook2014, page 343

<sup>38</sup> Media Advisory: New Polar Code Rules Will Not Protect Antarctic Waters, <http://www.asoc.org/explore/latest-news/1471-media-advisory-new-polar-code-rules-will-not-protect-antarctic-waters>, accessed 17<sup>th</sup> December 2015

<sup>39</sup> IMO Assembly opens for 29<sup>th</sup> session, [http://www.cnss.com.cn/html/2015/updates\\_1125/192970.html](http://www.cnss.com.cn/html/2015/updates_1125/192970.html), accessed 17<sup>th</sup> December 2015

<sup>40</sup> Ibid

<sup>41</sup> Environmental Provisions of Polar Code adopted, <http://www.arctic-council.org/index.php/en/our-work2/8-news-and-events/130-environmental-provisions-of-polar-code-adopted>, accessed 8<sup>th</sup> December 2015

Environment said that ‘while the Polar Code is a good step at recognizing the special risks of Arctic shipping, it still fails to directly address the highest potential risk of a heavy fuel oil spill.’<sup>42</sup> John Kaltenstein, marine policy analyst thought the Polar Code is not enough to address substantial risks in shipping, for instance, the use of noxious heavy fuel oil in the Arctic, the disturbances of wildlife, even though the code includes requirements for ships to avoid marine mammals, it fails to consider seabird colonies.<sup>43</sup>

Hannah Charles, Senior Claims Executive, UK P&I Club, said, as the numerous requirements of the Polar Code for all the shipping in Polar waters, vast amount of investment needs to be made by operators, he thought that the adoption of the Polar Code is the reflection of the shipping industry recognizing the specific of the Polar ecosystems, and the code also provides knowledge support on the higher level of care when shipping in the Polar areas.<sup>44</sup>

Campaigners Antarctic and Southern Ocean Coalition (ASOC) said the Polar Code is not enough to protect the Antarctic environment from shipping for the regulations would still allow raw sewage to be discharged over 12 nautical miles from land.<sup>45</sup>

The International Chamber of Shipping (ICS) welcomes the adoption of the Polar Code, ICS Secretary General, Peter Hinchliffe said, “The Polar Code demonstrates that IMO is the appropriate forum for developing standards for ships operating in the Arctic as it has the necessary legal and technical expertise to take full account of the interests of all maritime nations, including those with an Arctic coastline.<sup>46</sup>” ICS believe that the Polar Code will provide a more confident way in the environmental performance of polar shipping.

Deputy Director-General of the Danish Maritime Authority Francis Zachariae said, Denmark has taken an active part in placing the Polar Code on the IMO; the Code will enhance the safety of shipping in polar waters, for Denmark, the safety shipping in Greenland waters attracting more attentions, the Polar Code involves measures in addressing difficulties of shipping in icy waters, like requirements for life-saving appliances and crew training, which is also the rules on cruise ships around Greenland that the Danish Maritime Authority is working on.<sup>47</sup>

In the conclusion of the article ‘Polar Shipping, the Forthcoming Polar Code and Implications for the Polar Environments’, the author hold that the Polar Code is a critical and necessary step in the

<sup>42</sup> Environmental Groups: IMO Polar Code Too Weak, <http://www.marinelink.com/news/environmental-groups381260.aspx>, accessed 9 December 2015

<sup>43</sup> Ibid

<sup>44</sup> Polar Code Will Force Big Operator Investment, <http://www.marinelink.com/news/investment-operator-force399483.aspx>, accessed 9 December 2015

<sup>45</sup> UN Agency Sets Pollution Rules for Polar Shipping, <http://www.marinelink.com/news/pollution-shipping-agency391328.aspx>, accessed 9<sup>th</sup> December 2015

<sup>46</sup> ICS Welcomes Progress on Maritime Environment Issues at MEPC, <http://www.ics-shipping.org/news/press-releases/view-article/2015/05/18/ics-welcomes-progress-on-maritime-environment-issues-at-mepc>, accessed 18<sup>th</sup> December 2015

<sup>47</sup> Milestone for enhanced safety in Arctic regions, Enhancing safety of navigation in polar areas, [http://www.cnss.com.cn/html/2014/currentevents\\_0523/150995.html](http://www.cnss.com.cn/html/2014/currentevents_0523/150995.html), accessed 17<sup>th</sup> December 2015

evolution of Polar shipping, it is expected the provisions will require amending as its effectiveness and viability is determined after initial implementation.<sup>48</sup> The complexity of the Code's implementation will reflect on the extensiveness of its prescriptive provisions, the assessment associated liabilities and its mechanism for enforcement like port state control and any required licensing procedure.<sup>49</sup>

Overall, the International Code for Ships Operating in Polar Waters, Polar Code for short, provides international regulations on safety and environment for shipping in polar waters, it is the first legislation for vessels operating in polar areas.<sup>50</sup> The Code does not address the infrastructure deficit in the Arctic which is the greatest obstacle to safe Arctic develop, the Code still allows for non-ice strengthened ships to operate in polar waters, as many believe non-ice strengthened vessels are inadequate for Arctic transits. While the IMO has provided strict and fair environmental provisions through SOLAS and MARPOL, some rules in the Polar Code is weak and insufficient. The environmental community particularly concerned the failure to phase out the use of heavy fuel oils in the Arctic, although it is banned in Antarctica. There are no guidelines for reducing the dangers of Arctic oil spill are implemented, although it is identified as the most possible damaging environmental factor in the arctic by the Arctic Maritime Shipping Assessment. The Code does have rules on the marine mammal habits, but has no similar rules on seabirds. For signatories, the Polar Code does not leave sufficient flexibility and adaptability, as the creation of the Polar Code spanned at half a decade, and it still need time to be implemented. To the most IMO Conventions, they do not consider the specific conditions or risks inherent to the shipping in polar areas; the reason is that at the time they were accepted, shipping in polar areas was so rare.<sup>51</sup> Few countries conducted hydrographic surveys, and few legislative bodies cared about this remote region.<sup>52</sup> Nowadays, the situation has been changed, on one hand, to adapt the provisions of the existing IMO instruments to polar conditions, on the other hand, to supply the requirements, which will ensure an equivalent level of life safety and environment protection; there is a need of technical and operational provisions on ship design, specific rules on life saving appliance, crew training and pollution prevention. It can be called a risk-based code aiming to fill the gaps that were not adequately mitigated by the existing IMO instruments, for instance, MARPOL, SOLAS, without being conflict with the UN Convention on the Law of the Sea, the Antarctic Treaty System and other polar-applicable international laws.<sup>53</sup>

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<sup>48</sup> Anderson, H. Edwin III, Polar Shipping, the Forthcoming Polar Code and Implications for the Polar Environments, *Journal of Maritime Law & Commerce*, Vol.43, No.1, January 2012, [http://heinonline.org/HOL/Page?handle=hein.journals/jmlc43&div=21&g\\_sent=1&collection=journals#](http://heinonline.org/HOL/Page?handle=hein.journals/jmlc43&div=21&g_sent=1&collection=journals#), accessed 29<sup>th</sup> December 2015

<sup>49</sup> Ibid

<sup>50</sup> Governing Maritime Transportation in the Arctic, [http://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/9590/Ghosh\\_MP.pdf?sequence=1](http://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/9590/Ghosh_MP.pdf?sequence=1), accessed 29<sup>th</sup> December 2015

<sup>51</sup> Anne Bouyssou, The Introduction of Alien Aquatic Species by Ships in the Arctic: the Role of the Polar Code and Other International Legal Instruments, [http://commons.wmu.se/cgi/viewcontent.cgi?article=1299&context=all\\_dissertations](http://commons.wmu.se/cgi/viewcontent.cgi?article=1299&context=all_dissertations), accessed 30<sup>th</sup> December 2015

<sup>52</sup> Ibid

<sup>53</sup> Progress Towards the Mandatory Code for Polar Shipping, <http://www.tandfonline.com/doi/pdf/10.1080/18366503.2014.888135>, accessed 30<sup>th</sup> December 2015

This paper holds the views in a positive way: the work on the Polar Code shows the efforts that people desire to develop a new standard of seaworthiness appropriate for the polar areas, and the orientation on common legislation and interest standards when shipping in Arctic and Antarctic.

The world needs clear-eyed discussion on numerous controversial issues in the polar area, considering the impacts of climate change, the benefits of native people, the side effects of economic development.<sup>54</sup> The polar areas need protection from environmental damage, the international organization must get serious about this global issue, and shipping in the region must do so in the most possible environmental way.<sup>55</sup> It needs to be realized that strict requirements on the installations in ships are the foundation for sustainable future developments; the Polar Code needs to take on the responsibility of ensuring safe engineer standards and reducing the risks to human lives and the region's sensitive environmental condition. The disputes in the polar areas need a peaceful settlement mechanism, most extended offshore sovereignty zone definitions are under the provision of the United Nations Convention on the Law of the Sea, while there do remain a small number of disputed regions. To address these problems need the cooperation of relevant nations and the consensus from each government on the relevant rules, and the shaping and development of the Polar Code needs the support of other conventions on the polar areas and the efforts of relevant county and international organization.

In the development of the Polar Code, the Arctic Council has played a very important role, and will still continue its efforts. It is obvious that the Arctic Council brings together the circumpolar states and the indigenous people to address the common challenges.<sup>56</sup> The Council has taken acts to address the emerging challenges in the Arctic and has set a pattern of making decisions based on the established principles of the international law and also respects the benefits of the relevant nations. At the IMO's recent Workshop in Safe Ship Operations in the Arctic Ocean, February 28, 2014, Professor Oran Young mentioned that the Arctic Council, as an institutional body, has the capacity of enforcing the Polar Code, for the Council has a great deal of experience with the agreements on Arctic marine pollution, and the cooperation between the IMO and the Arctic Council on the Polar Code can be mutually beneficial.

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