

ARCTIC PILOTS FOR CANADIAN CORRIDORS

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1. Introduction

It has been acknowledged that action needs to be taken to improve the safety of navigation and the protection of the marine environment in Canada's arctic waters. The approach chosen by the Canadian government to address this need is the Northern Marine Transportation Corridors (NMTC) Initiative, which focuses on the most-transited areas within Canada's Arctic jurisdiction. Although aimed at mitigating safety and environmental risks by investing in infrastructure and aids to navigation based on a risk-based approach, the Initiative can also serve to identify areas where other risk mitigation measures could be developed. In the review of the *Canada Transportation Act*,¹ it was suggested that perhaps pilotage should be explored as a measure that could contribute to a safe Arctic marine transportation system in Canada (Transport Canada, 2016).

Safety and pollution prevention provisions applying specifically to arctic waters in Canada are currently provided by the *Arctic Waters Pollution Prevention Act*² (AWPPA) and its pursuant regulations, including the authority to make regulations that require the aid of an ice navigator and/or a pilot. Under the *Arctic Shipping Pollution Prevention Regulations*³ (ASPPR), an ice navigator is required for certain ships, in certain locations, at certain times of the year in accordance with the Zone/Date System.⁴ However, provisions for a pilot were never developed, nor was a Pilotage Authority for the Arctic region ever implemented.

The Canadian Marine Pilots' Association (CMPA) recommended in their submissions to the Canadian Transportation Act Review Panel (2014), and more recently to the Minister of Transport (2016) to consider the structure and administration of a new pilotage service when assessing its potential role in the Arctic. As such, the purpose of this paper is to explore pilotage for Canadian arctic waters in the context of the NMTC Initiative as a means of improving the safety of navigation and the protection of the marine environment. To aid the analysis, the CMPA's principles of organizing pilotage in Canada will be relied upon: to protect the public interest (i.e., safety); rigorous standards for qualifying as a pilot; recognition of regional differences in operating conditions, navigational challenges, types of marine traffic and supporting infrastructure; and the responsiveness of pilotage to changes in technology, vessels, infrastructure, and traffic patterns. The paper will begin with a brief overview of the necessity of the service, followed by a discussion of how pilotage could be offered in the Canadian Arctic, including how the service relates to the NMTC Initiative, how it could be administered, and what qualifications would be required of an Arctic pilot.

2. Necessity of the service

The Arctic is a risky and dangerous region to operate. In Canada, these inherent regional risks are exacerbated by the significant lack of infrastructure and aids to navigation (Office of the Auditor General, 2014). Furthermore, the expectation is that with declining sea ice, more foreign vessels will come, including those that are not necessarily aware of the consequences of this lacking information, or how to mitigate this issue (Transport Canada, 2016). To try to address this gap, Canada has committed to establishing low impact shipping corridors through the NMTC Initiative (Trudeau, 2017).⁵ Led by the Canadian Coast Guard (CCG) and in collaboration with Transport Canada (TC) and the Canadian Hydrographic Service (CHS), the Initiative aims to mitigate safety and environmental risks by investing in infrastructure and aids to navigation in order of priority as determined through a risk-based approach (Alvaro, 2015; Porta et al., 2017). The process began by identifying the Corridors, which are the routes through the Archipelago where the majority of traffic currently travels. A risk assessment was then conducted for the waters within the Corridors, taking into account the difficulty of navigation and/or the lack of existing navigational support. The NMTC Initiative also serves as a soft traffic management tool: the improved infrastructure and services within the Corridors will serve as an incentive to travel within the Corridors, rather than outside them.

The NMTC Initiative, although a great first step, is just that; the road to developing a transportation system equivalent to elsewhere in Canada or even the circumpolar North is long and expensive. As such, mechanisms for filling the gaps in navigational information that could be developed in a shorter time-frame and with a smaller budget should be explored. One such measure is to seek the guidance of those who know how to safely navigate the waters of the Corridors. “For many years, the companies and people who operated in the Arctic were specialized, and built up their knowledge base through experiences, some good, some not so good. But now we need to expand this expertise and use it to help improve capacity for the wider world to ensure safety if they come” (Hearn, 2016). The information necessary for safe and efficient operations does exist, but it is not formally available to prospective mariners; it is held by experienced individuals with years of practice in the region. What is necessary, then, is to find a mechanism through which this essential navigational information can be accessed; one such way is through pilotage.

Pilotage is a service that can either be required or simply offered. The service is associated with a specific location where there are particularly high concerns surrounding either the safety of navigation, the protection of the marine environment, or both. Although pilotage may be required or recommended to all vessels, it is targeted towards those under the command of masters who are unfamiliar with the area. To be a pilot in Canada, one must meet the requirements of a master mariner or a person in charge of the deck watch, and must have gained knowledge and experience in this capacity navigating in the challenging area where pilotage is offered.⁶ To share this expertise, the pilot will board a vessel prior to entering the pilotage area, develop a safe passage plan through the area of interest, and assist the master or officer on watch throughout the transit.

Canadian law already requires an advisor of sorts on board some voyages at certain times of the year in Canada’s arctic waters: the ice navigator. By definition, though, an ice navigator could not provide the same assistance throughout a voyage as a pilot; the ice navigator is required to have experience navigating in ice, whereas a pilot is required to be knowledgeable about all navigational hazards in an area. This is not to say that those currently serving as ice navigators would not have garnered this additional knowledge and experience, but as it is not required or even recommended, it cannot be guaranteed.

3. Administering pilotage

3.1 Pilotage and the Corridors

The NMTC Initiative is focused on systematically prioritizing the development, implementation, and provision of Coast Guard services to support the safety of navigation through the Canadian Arctic, and to incentivize the distribution of traffic throughout its waters. The services of the CCG include search and rescue, aids to navigation, icebreaking, marine communications and traffic services, and environmental response. Pilotage does not fall under the mandate of the CCG, nor is it a service provided by either of their collaborators on the Initiative: TC or the CHS. As such, pilotage will not be a service included in the NMTC Initiative as it is currently defined. However, this does not mean that a pilotage service could not be developed congruently with the Corridors to achieve the common goal of protecting the public interest of safety.

The framework for defining areas that may benefit from risk reduction measures that fall under the mandate of a Pilotage Authority is provided by the Pilotage Risk Management Methodology (PRMM). The PRMM is not a rigid framework, but rather encourages tailoring of the methods to the specificities and the needs of the area being evaluated (Transport Canada, 2010). The PRMM framework is similar to the approach of the NMTC risk assessment, in that it identifies specific areas that require risk mitigation measures, and proposed means by which the risks can be prevented, reduced, or eliminated. The key difference between the two is the scale at which the assessment is applied and the level of detail in the data used. The NMTC Initiative is looking at all the waters encompassed within the Corridors, whereas the PRMM looks at a much smaller scale: specific sections of the area within the jurisdiction of a Pilotage Authority.

In the case of developing pilotage in the Corridors, though, the difference in scale and level of detail is beneficial, as the two assessments could work in concert. The NMTC assessment could be used as a first tier to identify where within the Corridors pilotage could be beneficial (e.g., where navigational information is not formally or readily available). This would indicate where to invest resources to conduct the more in-depth PRMM assessment for determining specific areas that contain exceptional hazards to navigation, that require special manoeuvring that may be challenging for certain vessel types, and/or that are particularly vulnerable to environmental impacts.

3.2 Structure of administration

3.2.1 Legislated pilotage

One approach to structuring the administration of pilotage within the Corridors is through a legislated Pilotage Authority under the *Pilotage Act*,⁷ under the Oceans Protection Plan (Office of the Prime Minister, 2016), Canada has committed to reviewing the *Pilotage Act*, and as such there is an opportunity to consider amending the *Act* to provide pilotage within Canada's arctic waters. There are currently four Pilotage Authorities in Canada: the Atlantic based in Halifax NS; Laurentian based in Montreal QC; the Great Lakes based in Cornwall ON; and the Pacific Pilotage Authority based in Vancouver BC. Each of the Authorities has the purpose of establishing, operating, maintaining, and administering pilotage in the interests of a safe and efficient service, and has the authority to establish compulsory pilotage within their given region; to define who is subject to such compulsory pilotage and who, and under what circumstances that pilotage may be waived; and to prescribe the conditions under which a ship shall have on board a licensed pilot or holder or a pilotage certificate, and how many of these individuals are required at a given time.

Pilotage does not have to be a compulsory service, though; the Atlantic Pilotage Authority, for example, provides optional pilotage in non-compulsory areas in addition to compulsory pilotage in others. To ensure the quality of the service provided in those non-compulsory areas, a set of regulations⁸ lay out provisions for certifying pilots, requesting their services, and paying them for their assistance. Such non-compulsory pilotage would be more aligned with the NMTC Initiative because it is based on the approach of incentivizing traffic rather than implementing and enforcing mandatory regulations. Oversight of the voluntary service would, however, provide shipowners with a more reliable and defined service, which reduces uncertainty and thus aids in evaluating and managing risks.

There are two options for encompassing the Corridors within a legislated Pilotage Authority, the first of which would be to take the same approach as TC and the Department of Fisheries and Oceans (DFO), and to combine the responsibility for the Arctic with that of a southern region in Canada. In TC, it is the Prairie & Northern Region, and in DFO, it is the Central & Arctic Region. Following this approach, responsibility for the Arctic would be given to the Pilotage Authority located in and responsible for central Canada and the Prairies. This would be the Great Lakes Pilotage Authority, which is already responsible for overseeing pilotage in (at the time of writing) the only Arctic port in Canada: the Port of Churchill, MB. Although adding the rest of the arctic waters to the mandate of the Great Lakes Pilotage Authority would be aligned with the approach taken by other federal departments, one of the reasons for developing a special pilotage service for the Corridors is that the Arctic is a unique environment with operating conditions unlike southern Canada. Therefore, in order to fully embrace the CMPA's principle of recognizing regional differences, it would seem more appropriate to establish a separate Pilotage Authority that could focus on the special characteristics and the subsequent requirements for safe navigation and protection of the marine environment in the Arctic.

Designing and implementing a new Pilotage Authority for the Corridors would be a daunting task, however it would provide the opportunity to tailor the service and the structure of the Authority to reflect the conditions and context of Arctic navigation. The question that must be asked, though, is whether the volume of traffic that would require or take advantage of the services of a pilot is sufficient to justify the investments that would be necessary to expand legislated pilotage to the Arctic. Most voyages today are under the command of masters with many years of experience in the region; these vessels are not the concern. Rather, it is the new and inexperienced operators that may venture into Canadian arctic waters with insufficient knowledge of the particular risks of navigating in Canada's Arctic specifically that cause worry (Transport Canada, 2016). There are very few of these types of voyages each year, meaning there would not be many users of a pilotage service. Consequently, the fee per use would need to be inflated in order to recover the costs of establishing and maintaining the Authority and service. The *Pilotage Act* requires that a Pilotage Authority set its tariffs "at a level that permits the Authority to operate on a self-sustaining financial basis", but also that "shall be fair and reasonable".⁹ Finding this balance simply may not be possible with the existing level and type of traffic.

3.2.2 Guidelines for pilotage

Rather than establishing a formal Authority for pilotage in the Corridors, a second option would be for individuals to offer their services as a pilot to shipping companies, whereby the hiring of the pilot would be done through a contractual agreement. To support such service provisions, though, it would be beneficial to provide companies some way to improve the reliability of the service, as is done in the non-compulsory area of the Atlantic Pilotage Authority. Given that there would not be a formal Authority, though, some other mechanism would need to be established, such as that which guides the hiring of an ice advisor in the Ice Control Zones in Eastern Canada.

The structure of the service is twofold: first, the *Joint Industry-Government Guidelines for the Control of Oil Tankers and Bulk Chemical Carriers in Ice Control Zones of Eastern Canada* (2015; JIGs) recommends that all tankers laden with oil or liquid chemicals in bulk that are transiting through an active Ice Control Zone should have on board at least one ice advisor who meets certain qualifications outlined in the JIGs. Although they are only guidelines, lack of compliance with the JIGs “may require the Canadian Coast Guard and/or Transport Canada to exercise powers as prescribed by the *Canada Shipping Act, 2001* where, in their opinion, there is undue risk to safety or the marine environment” (para. 14). The second piece of the service structure is the list of ice advisors published by the Shipping Federation of Canada each year (e.g., Shipping Federation of Canada, 2016). The list includes the availability of a number of individuals offering their services as an ice advisor in the area, their contact information, and, in some cases, a brief description of their experiences. The Shipping Federation does not, however, accept any responsibility arising from a contract between an ice advisor and a shipping company, nor does it guarantee or warrant the competency of the ice advisors it includes in its list. The list does, however, provide a prospective shipowner with a source for identifying potential ice advisors, and through the JIGs, a way of validating their qualifications for the position. The Northern Sea Route Administration takes a similar approach for providing ice pilots to ships voyaging along the Northern Sea Route: the *Rules for Navigation on the Water Area of the Northern Sea Route*¹⁰ outlines the necessary qualifications of ice pilots, and the Administration’s website lists contact information for organizations that provide the service.

If Canada were to take this approach, guidelines similar to the JIGs could be established that strongly recommend that an Arctic pilot be hired to assist in the voyage of a vessel through those portions of the Corridors identified as posing particularly great challenges to navigation or higher risks to the marine environment as identified from the PRMM that followed the NMTC Initiative’s risk assessment. The guidelines could also include a specific set of qualifications that such a pilot should have. This could then be taken into account when TC receives notice of the planned voyage and assesses the level of risk that it poses to the safety of the vessel and its crew or the marine environment.¹¹

Reporting in Canada’s arctic waters is to the Northern Canada Vessel Traffic Services (NORDREG), and is mandatory for vessels of 300 gross tonnes or more; for those being towed or pushed where the combined gross tonnage with the vessel providing the service is 500 gross tonnes or more; or for any vessel with cargo defined as a pollutant or a dangerous good by the AWPPA or the *International Maritime Dangerous Goods Code* (IMO, 2014), respectively. Four types of reports are required to NORDREG: a sailing plan report sent prior to entering the NORDREG zone; a position report sent immediately after entering and daily during the voyage; a final report prior to exiting the NODREG zone; and a deviation report in the event that the vessel significantly deviates from the route provided in the sailing plan report, either unexpectedly (e.g., because of ice conditions) or intentionally. In addition, special Ice Regime Routing Messages are required of any ship wishing to operate outside of the ‘open’ season prescribed in the Zone/Date System.¹² In order to operate in a zone that is ‘closed’, an ice navigator must be on board to evaluate the safety of the operation with respect to the ice conditions. Then, the Ice Regime Routing Message must be sent that includes, among other things, the outcome of the assessment by the ice navigator, and the name of the individual conducting the evaluation.

In the case of pilotage for the Corridors, reporting could be achieved through a combination of the standard reporting to NORDREG and special reporting similar to that of the Ice Regime Routing Message. Initially, the planned presence of a pilot along with his/her name could be included in the sailing plan report. Then, once the pilot was on board the vessel, an additional message could be sent to NORDREG notifying them

of the pilot's presence. This type of reporting scheme would not only be consistent with that of existing measures for navigating in Canadian arctic waters, but it is also similar to that required by Pilotage Authorities elsewhere in Canada.¹³

3.3 Qualifications of an Arctic pilot

To begin a discussion of the necessary qualification of an Arctic pilot, one must first look to the international standards. Section 7 of the *Recommendations on Training and Certification and on Operational Procedures for Maritime Pilots other than Deep-Sea Pilots*¹⁴ lists 27 items for which a pilot should have knowledge, and opens the door for “any other relevant knowledge considered necessary” to be incorporated. Furthermore, the Recommendations suggest that any pilot should have practical experience on board vessels within the pilotage area and under piloting conditions. More detailed direction pertaining specifically to pilotage for the Corridors can also be garnered from the general requirements of pilots in Canada, ice navigators, as well as from Russian ice pilots, ensuring that Canadian Arctic pilots are qualified to provide a service that is comparable to that already available in the Canadian Arctic, elsewhere in Canada, and along the Russia portion of the circumpolar route (the Northern Sea Route).

The *General Pilotage Regulations*¹⁵ do not dictate the specific qualifications of pilots across Canada, but they do outline a minimum standard, including at least five years of experience in the area for which the individual intends to serve as a pilot, and in such a capacity that he/she will have gained general knowledge of that area. Within those five years, at least 12 months must have been served as the master of a ship, or at least 24 months as the person in charge of the deck watch. To serve as an ice navigator, though, only 50 days' experience is required as the master or person in charge of the deck watch, of which 30 much have been spent in arctic waters requiring the ship to be assisted by an icebreaker or to make manoeuvres to avoid dangerous sea ice.¹⁶ Russian ice pilots are required to have an intermediate amount of experience; the prospective pilot must have served three years as master or chief mate on a ship of at least 3,000 tonnes, within which time 36 months must have been spent in the water area of the Northern Sea Route and six months within that period must have been in ice conditions.¹⁷ If the necessary qualifications of Canadian pilots, ice navigators, and Russian ice pilots are combined and the highest standard adhered to (as the CMPA's principle of rigorous standards requests), the resulting requirements of a Canadian Arctic pilot are to (a) qualify as a master or person in charge of the deck watch; (b) have five years of experience in the water area of the Corridors in a capacity that would have provided them the opportunity to garner knowledge of navigational hazards, as identified through the PRMM, and experience operating within them; and (c) have spent at least six months in ice conditions that required icebreaking assistance or special manoeuvres to avoid concentrations of ice that might have endangered the ship.

An undeniable challenge, though, will be finding individuals who meet the above requirements of an Arctic pilot in the Canadian Corridors. The low levels of traffic to date mean that there are not many opportunities for individuals to gain the necessary experience to qualify as an Arctic pilot (Hodgson, Russell & Megannety, 2013; Østreng et al., 2013). Given the minimal traffic that would require pilotage at present, though, this may not be a major issue as the demand for pilots would also be low. However, if as anticipated, traffic of this kind increases, then so too must the number of pilots; to offer a service that you cannot provide would be ineffective in achieving the objectives of establishing the service. As such, in order to provide an effective and efficient pilotage service in the future, Canada will need to address the challenge of recruiting and training an adequate number of Arctic pilots to meet the demands of future traffic levels in the Corridors. How, exactly, Canada will do this is another discussion entirely.

Conclusion

It is well known that significant gaps exist in the infrastructure and services available to mariners voyaging in Canadian arctic waters. Through the Northern Marine Transportation Corridors Initiative, the Canadian Coast Guard, in collaboration with Transport Canada and the Canadian Hydrographic Service, is working to prioritize their efforts to improve the safety of navigation in defined Corridors through Canada's Arctic Archipelago. Although Canada is making progress, the process will take time. To help fill the gap, pilotage could be developed to make available the valuable knowledge and experience held by those who have been operating in the Canadian Arctic for years. As a first step, a voluntary set of guidelines could be established to indicate where a pilot could be particularly helpful, and to provide a list of the experiences and knowledge that such a pilot should have. Furthermore, a list of individuals that meet such qualifications could be established to further assist companies in securing the support necessary to improve the safety of voyages. Through standard NORDREG reporting and the special Ice Regime Routing Message, Transport Canada could be made aware of the assistance being provided, which they could then take into consideration when evaluating the risk the voyage poses to the vessel, the crew on board, and the marine environment it plans to navigate through. In the future, if and when the volume of traffic that would benefit from pilotage increases to such a level that demanded further assistance or enforcement, the voluntary guidelines could be transitioned into a set of regulations implemented by a legislated Arctic Pilotage Authority, thus establishing a mechanism to allow the service to be responsive to the changes in demand over time.

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¹ *Canada Transportation Act* SC 1996 c 10.

² *Arctic Waters Pollution Prevention Act* RSC 1985 c A-12.

³ *Arctic Shipping Pollution Prevention Regulations* CRC c 353 [ASPPR].

⁴ The Zone/Date System was introduced in 1972 by ASPPR Schedule VIII. It prescribes opening and closing dates for each zone based on the ice class of the ship and historical ice conditions for the zone. The ice navigator requirement has been maintained in the draft *Arctic Shipping Safety and Pollution Prevention Regulations* as of 27 January 2017.

⁵ At the time of writing, this announcement was a U.S.-Canada Joint Statement.

⁶ *General Pilotage Regulations* SOR/2000-132 [General Pilotage Regs].

⁷ *Pilotage Act* RSC 1985 c P-14 [Pilotage Act].

⁸ *Atlantic Pilotage Authority Non-compulsory Area Regulations* SOR/86-1004.

⁹ *Pilotage Act* supra note 6 at ss 26(3).

¹⁰ *Rules for Navigation on the Water Area of the Northern Sea Route*, Order of the Ministry of Transport of Russia No 7 (17 January 2013) [NSR Rules].

¹¹ Transport Canada maintains the authority to prohibit a vessel from entering any of the Shipping Safety Control Zones in the Canadian Arctic if it is deemed unsafe due to any reason outlined in a regulation pursuant to the AWPPA according to subsection 12(1)(c).

¹² See note 4.

¹³ *Atlantic Pilotage Regulations* CRC c 1264 at s 6 and s 8; *Great Lakes Pilotage Regulations* CRC c 1266 at s 8; *Laurentian Pilotage Regulations* CRC c 1268 at s 6-12; *Pacific Pilotage Regulations* CRC c 1270 at s 12-13.

¹⁴ *Recommendations on Training and Certification and on Operational Procedures for Maritime Pilots other than Deep-Sea Pilots*, Res A.960(23), (5 December 2003) IMO Doc A 23/Res.960.

¹⁵ *General Pilotage Regs* supra note 6.

¹⁶ ASPPR supra note 3 at s 26. To account for new international maritime law, the draft *Arctic Shipping Safety and Pollution Prevention Regulations* also indicate a requirement for ice navigators to be qualified and certified in accordance with recent amendments to the *International Convention of Training, Certification and Watchkeeping for Seafarers, 1978* and the *Seafarers' Training Certification and Watchkeeping (STCW) Code*.

¹⁷ NSR Rules supra note 7 at para 33.