

Towards a Sustainability Strategy for Shipping in the Canadian Arctic

Introduction

Indications of quite dramatic changes in climatic conditions in the Arctic, particularly with regard to global warming, and consequential changes in sea ice conditions have triggered widespread expectations of a significant expansion of Arctic shipping activity, and consequential economic, social and environmental impacts for the Region. These circumstances have given rise to uncertainty as to their exact nature and how they might best be addressed. Accepting that some of the consequences of these impacts could be serious, there has been widespread recognition that particular attention needs to be paid to the adequacy of the governance and policy regimes that currently apply to Arctic marine transportation. The Marine Affairs Program was recently asked to take a look at this situation through the conduct of a scoping study that undertook a preliminary assessment of the likely impacts of shipping in the Canadian Arctic. More particularly its aim was to bring some increased specificity to the scope and nature of future shipping impacts, and to quantify more precisely the broad policy and governance challenges that need to be addressed in order to ensure the effective oversight of Canadian Arctic shipping activities.

Broad methodology

The analytical approach adopted by the MAP study team to address these concerns comprised four basic elements, as follows:

- Drawing on existing research, identify the trends and stimuli that were expected to either facilitate access, or encourage demand, for increased Arctic shipping activity;
- Define possible scenarios/forecasts of shipping activity in the Canadian Arctic resulting from the trends and stimuli identified in (a);
- Drawing on the findings of (a) and (b) above, identify issues and impacts that might arise;
- In light of the findings in (c), identify the policy and governance challenges that would need to be addressed in order to respond effectively to these potential issues and impacts.

In addition to an in-depth literature review aimed at providing insights on impacts of shipping in the Arctic. a broad range of experts having knowledge and expertise in a variety of related fields was also consulted.



The Arctic Region

The logic behind the proposed methodology was to use the findings from the research conducted in parts (a) and (b) to establish the basis for proceeding with identification and analysis of shipping impacts. However, it soon became evident that, for a number of reasons, substantive, accurate insights into projected shipping activity sufficient to develop plausible scenarios were just not available, and therefore a methodology that based the identification of associated impacts on such scenarios was not feasible and needed to be revisited. Furthermore, those developments in the Arctic that might have been viewed as having the capacity to generate future demand for shipping activity were still in a very early and as yet undelineated state.

Trends and Stimuli

Identification of the major trends and stimuli was based very largely on the extensive research already undertaken. In particular it relied heavily on the findings of the recently completed Arctic Climate Impact Assessment (ACIA), a substantial undertaking which is widely regarded as the most recent comprehensive and reliable work on Arctic climate change. Recognizing that navigational facilitation alone did not generate shipping activity and that a demand component needed to be considered as well, the following trends and stimuli were identified:

- Recent study and research on climate change and its impact on shipping operations in the Arctic had introduced some doubt regarding the speed at which expansion in shipping activity might occur. While a scenario anticipating quite rapid expansion in shipping might appear feasible for the Northern Sea Route, or even a route across the North Pole, the situation was more complex for the Canadian Arctic and particularly the North West Passage. In these latter areas, ice reduction had been slower and reduced sea ice was expected to lead to increased ice mobility.
- These observations for the Canadian Arctic were likely to make navigation by ships significantly more challenging and risky. This was particularly a concern in 'choke points' such as straits between land masses where fast ice had normally prevailed in the past. There was also expected to be a higher prevalence of multi-year ice, icebergs or ice debris ('growlers' and 'bergy bits') adding to the navigational challenge. In short, the improvements in navigation that had been widely 'hyped', particularly through the media, were in fact seen to be very unlikely to occur in the Northwest Passage any time soon.
- With respect to resource development, forecasts of demand for dry bulk carriage were stimulated principally by mineral resource development. However, definitive forecasts of large scale marine transportation projects were limited to Mary River (Baffin Island) and High Lake (Coronation Gulf) developments.
- There were minimal forecasts of demand for liquid bulk carriage by ship arising from hydrocarbon development. This could be attributed to the present lack of any significant exploration/development activity in the high Arctic and expectations that hydrocarbon production in the Beaufort Sea, the

current principal focus of energy exploration in the Canadian Arctic, would be transported by pipeline.

- There was an important but manageable forecast for expansion in community supply/resupply demand, related principally to growing populations, and at a rate linked to that growth. Some movements of supplies and equipment in support of exploration projects were also anticipated.
- With regard to cruise shipping, there were projections of quite modest and largely unpredictable growth.
- As for demand for the possibility of container and bulk movements transiting the Canadian Arctic, there was no substantive activity foreseen in this sector in the timeframe under examination in the study.
- Finally with regard to other stimuli for non-transportation related shipping activity (e.g. fishing activity or seismic exploration), it was difficult to identify trends since the principal drivers for such activity were unrelated to demand for marine transportation per se, and were therefore largely outside the scope of the analysis.



Russian icebreaker with oil rig

Shipping Scenarios

The challenges associated with navigation through the Canadian Arctic, coupled with the modest and undefined development scenarios, led to the conclusion that no dramatic expansion in demand for shipping could be reliably predicted, , with the possible exception of the Mary River and High Lake developments,. Furthermore, the significant uncertainty in projected levels of activity made impact analysis based on forecasts of shipping activity quite problematic.

Although, as described above, the plan had been to conduct impact analyses based on specific forecasts of increased shipping activity, identification and analysis of impacts was not necessarily rendered unworkable by the conclusion that no such forecasts could be made. The principal objective in identifying and quantifying impacts was to establish the best way of managing them. The analysis therefore adopted a slightly different approach to the identification of impacts. This reoriented approach first evaluated the full range of impacts that a single 'generic' ship might cause, at least theoretically, either arising out of normal operations or as the result of an incident. Based on the assumption that these impacts could be extrapolated as shipping activity expanded, the study then addressed the policy and governance arrangements necessary to manage such impacts, as and when such expansion occurred.



The Northwest Passage

Forecast Impacts

The adjusted methodology therefore led to an examination of the characteristics of potential impacts in three broad categories:

- Non-persistent impacts - those which occur at the time that a ship that is being operated normally and in accordance with all applicable regulations and obligations, is present but which abate once the ship had departed. Such impacts include noise, either from ice-breaking activity, the ship's machinery or its propeller. It also includes the physical action of the propeller (particularly relevant in relation to whales) and ship's wash.
- Persistent impacts – those that arise from a ship being operated normally and in accordance with regulatory and other obligations, and that endure for varying periods after the ship has departed. Such impacts include engine exhaust emissions and

channels formed by icebreaking action that may take a significant period of time to refreeze.

- Incorrect/improper/illegal ship operations – those impacts that result from accidents, incorrect operation or from procedures that are at variance with regulatory and other obligations, and may arise from either unintentional or intentional behaviour. Examples of such impacts that could arise include those in relation to ballast water discharges, oily bilge water, sewage, garbage or grey water discharges, use of illegal anti-fouling paint, or spills of oil, hazardous and noxious substances (HNS), or other polluting substances.

The study concluded that, despite commonly held concerns regarding ballast water, air emissions and other discharges, the risk of any such incidents occurring would likely diminish over time as various recently agreed conventions came into effect.. However there were still seen to be potential impacts of very significant concern which therefore merited particularly close examination. These included:

- Incidents or accidents, involving the break-up or loss of a ship, and resulting in a high risk of pollution or loss of life. The principal area of concern was an accident involving a serious discharge of a polluting cargo such as crude oil. The analysis concluded that this possibility more than any other merited close consideration with respect to the impact of shipping on the Arctic.
- The impact of ships on Arctic community interests and, particularly, in the context of this study, between ships making passage through ice, the ecosystems that such movements impacted, and the consequences for the communities that accessed these ecosystems for their livelihood.
- Regardless of growth expectations, the unpredictability and enhanced level of associated risk of cruise ship activity. This is a concern not only in terms of the numbers and timing of such ships, but also the locations that they may choose to visit and the activities in which they might engage in at those locations. Such activities may directly or indirectly impact wildlife or cause potential damage to aboriginal sacred lands or other cultural practices.

Governance and Policy Considerations

It was recognized that the responsible operation of shipping in the Arctic required both effective regulatory oversight (to monitor and manage ship activities) and an appropriate capacity to provide the necessary level of

assistance and support. The study therefore addressed some of the challenges associated with the management of shipping in the Canadian Arctic, and identified some of the essential features that this governance regime would need to accommodate.

With respect to consideration and consequences for governmental oversight, the analysis identified three broad categories of priorities that merited attention and further study. These were identified as follows:

- Policy and governance considerations and consequences, including:
 - the need for an Arctic marine transportation sustainability strategy;
 - the need to examine the merits of possible bilateral or multilateral approaches either to replace or to augment Canada's current unilateral approach;
 - the merit of adopting a more proactive approach to deciding what should constitute appropriate levels of shipping activity, rather than taking a reactive "wait and see" approach;
 - application of the precautionary approach;
 - financial management considerations including the issue of cost recovery;
 - Canadian shipping policy (including cabotage policy) and its impact on the North;
 - the role and contribution to the management of shipping impacts offered by the environmental impact assessment process, and
 - the need for a 'tailored' policy and governance regime for the Mackenzie River.
- Regulatory oversight considerations and consequences, including: the need for:
 - updating of the Arctic safety regulatory framework;
 - imposition of obligatory reporting requirements;
 - monitoring and enforcement capabilities; and
 - examination of the merit of establishing additional or alternative protective regimes such as 'special areas, particularly sensitive sea areas, sulphur emission control areas, etc.
- Service support considerations and consequences, included the following:
 - Enhanced prevention services, including:
 - strengthened navigational support, and
 - icebreaker assistance;

- Enhanced response services including:
 - the provision of ports and places of refuge,
 - adequate but appropriate search and rescue capabilities, and
 - adequate response capacity to an oil spill or other pollution incident.

Conclusion

It should be stressed that the principal goal of this study was directed less at answering all the questions associated with Arctic shipping activity, and more at posing them! It was also directed at developing a broad methodology that could be utilized in undertaking a more comprehensive examination of appropriate responses to the questions posed by the study.

Ultimately, the study concluded that, while shipping activity would undoubtedly have important implications for, and impacts on, the Canadian Arctic, these implications and impacts were likely to be less extensive, and would occur later, than current public expectations (largely driven by media hype) were suggesting. More particularly, the study broadly concluded that, so long as emerging technology continued to be developed and applied to ships operating in the Arctic, and correct practices and procedures, as reflected in recent international conventions, were responsibly followed, the activities of most ships were not expected to present serious risks to the environmental or social sustainability of the Arctic. That said there were significant issues associated with certain ship activities, none more serious than the carriage of crude oil or heavy fuel oil in the Canadian Arctic.

In this respect there were a number of important policy and governance issues that needed to be addressed sooner rather than later, if the future sustainability of the Canadian Arctic was to be assured.



Satellite image showing the Northwest Passage in red

This publication is based on research conducted for Transport Canada titled "Arctic Shipping Impact Study" by J. R.F. Hodgson, J. Calvesbert and M. Winterbottom. For a full copy of the research report, contact marine.affairs@dal.ca. To enhance readability, references used to prepare the document were not included but are available upon request.