Discussion Paper on Marine Innovation, Research and Development

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Marine Innovation, Research and Development Forum
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1.0 Purpose of Discussion Paper

To seek input and feedback from the marine sector regarding the identification of innovation and research and development (R&D) priority areas that would enable a safer, more efficient, cleaner and more secure marine sector over the next 5, 10, 15 years and beyond. Transport Canada is also engaging academia, innovation/R&D developers and providers and other government partners to hear their views.

2.0 Expectations and Desired Outcomes

Transport Canada is seeking your ideas and suggestions on how and where we can better leverage current investment and to explore other areas of marine R&D as a means to overall strengthen the Canadian marine sector. Your input will inform Transport Canada’s Marine Innovation and Research and Development Strategy. We thank you in advance for your contribution.

3.0 Drivers of Innovation and Research and Development

- **Importance of the marine sector to the Canadian economy** – 90% of all global trade is transported by the marine sector. As an enabler of economic growth, how can the marine sector continue to leverage Canadian economic growth?

- **Rapid pace of technological change** – Keeping-up with new technologies is challenging, so how can the marine sector be better prepared to seize opportunities generated by technological changes?

- **Increased complexity and new threats on global supply chains** – What opportunities exist to strengthen the supply chain within the marine sector and with other modes?

- **Environmental considerations and growing need for social licence** – How can the marine sector continue to have access to the latest scientific research findings and better engage the public regarding their operations?
4.0 Transport Canada’s Innovation and Research and Development

Transport Canada is the department responsible for the overall safety, security, environmental stewardship and efficiency of the transportation system. As a means to support our mandate, investments are made in innovation and R&D. Transport Canada’s investment can be split into two broad categories:

1) Operational R&D – this includes research to support the current legislative regime and supporting regulations. For example, research on marine safety equipment.
2) Strategic R&D – this includes R&D activities that inform policies, address departmental and Government of Canada broader agendas (such as innovation), and aims to develop capacity in the sector.

5.0 Planning Forward – Thematic Areas

Canada’s marine sector is a major contributor to the nation’s economic growth. It is a large industry made up of both domestic and international shipping, ports, ferries, cargo, cruise, and pleasure craft. As a means to maintain and strengthen the marine sector’s contribution to Canada’s economy and create better links with other modes, strategic research investments are required to ensure the sector remains efficient, clean, safe and secure, and a strong player in the transportation system overall.

5.1 Strengthen Efficiency - Opportunities for Growth in the Marine Sector

Innovation is a key enabler of greater efficiency. While the marine sector has been quick to adopt innovative business practices and introduce new technologies, there may be other areas in which greater efficiencies could be gained, resulting in not only greater cost-savings, but in some cases also supporting environmental objectives.

**DISCUSSION QUESTIONS:**

- What are the main marine transportation issues that prevent optimized business operations?
- In what areas, if any, are you lacking in scientific information to improve business productivity?
- What points, if any, along the supply chain, are obstacles to greater efficiency?
5.2 The Environment – brings new opportunities and challenges

Marine transport in Canada represents 3.6% of transportation’s related Greenhouse Gas (GHG) emissions, and is a significant contributor of Sulphur Dioxides (SOx), Nitrous Oxide (NOx), and particulate matter (PM); black carbon is a major concern for the North. In addition to concerns on air emissions, noise pollution from vessels has also been identified recently as a challenge for the marine sector, both in terms of the vessel-port interface and in potential disruptions to marine-mammal migration and communication. More research is required to better understand this issue.

While Canada’s oil spill response regime is comprehensive, it is important that the Government and response organizations have access to up-to-date and timely information to ensure that the prevention, preparedness and response system remains ‘World Class’. Northern marine transportation also presents both great opportunity and potential risk for the environment. Transport Canada, as the lead authority, is responsible for an effective oversight and regulatory framework. A clear understanding of tools, techniques and methodologies to bolster these opportunities and mitigate risks associated with increased northern marine transportation is key (e.g., waste/garbage handling).

**DISCUSSION QUESTIONS:**
- What are the main marine transportation issues related to the environment?
- How can the marine sector contribute to solving these issues?
- Where do technologies fall short?

5.3 Enhanced Marine Safety and Security

Transport Canada, as the regulator of the transportation system, plays an important role in ensuring its regulatory framework reflects the highest levels of safety and security. A rigourous and up-to-date safety and security oversight framework requires investment in research to ensure the latest findings are considered in regulatory development and amendments. Transport Canada is committed to leveraging and/or initiating research to ensure the safe and secure navigation of Canadian vessels and those vessels operating in Canada.
Global in nature, the marine sector regulations are often the result of international negotiations, namely with the International Maritime Organization and the International Labour Organization. As a means to support Canada’s influence at these international fora, Transport Canada invests in key areas of research such as cold water operations, spill prevention and response, efficacy of ballast water systems in the Canadian climate, waste and sewage management, and the impact of noise from vessels on marine mammals.

While the Canadian fleet is diverse, the majority is composed of small vessels. This is also where there is the greatest risk of vessel accidents and/or fatalities. Despite the drop in vessel accidents, there still remains a high risk in the fishing and non-commercial marine sector. To address this, Transport Canada continues to invest in marine safety research, such as equipment and vessel construction.

Marine transport also presents significant security concerns, both in terms of the vessel and land-based operations. With increased global trade, tracking and anti-tampering have become important. Access to, and control of, critical information pertaining to the movement of vessels and cargo is of great concern. Increased threats, such as cyber-terrorism, present significant risk to the global marine transportation supply chain. Exploring and implementing new means of collecting data, such as the use of aerial and/or satellite reporting systems, could provide decision-makers with more timely information to mitigate the risk of marine security threats.

**DISCUSSION QUESTIONS:**

- What are the major marine safety and security threats moving forward?
- In what areas should Transport Canada invest as a means to update current regulations? What do you see as the benefit of this investment?
- Where do technologies fall short?

### 6.0 Summary

The objective of the Marine Innovation, Research and Development Forum is to gather information that can lead to a more strategic approach to Transport Canada’s marine innovation and R&D investments.