

# Leading Systems for Oil Spill Response in Ports

Implications for Canada





## About Us

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Clear Seas Centre for Responsible Marine Shipping is an independent, not-for-profit research centre that provides impartial and fact-based information about marine shipping in Canada.

Led by a Board of Directors and advised by a Research Advisory Committee, Clear Seas' work focuses on identifying and sharing best practices for safe and sustainable marine shipping in Canada, encompassing the human, environmental and economic impacts of the shipping industry.

All Clear Seas reports are publicly released and made available at [clearseas.org](http://clearseas.org)

## About this Report

Clear Seas requested a study of governance systems and practices for oil spill response in leading ports of other countries to identify possible options for improvement of the regimes in Canadian ports. The examination of these other systems provides insights into what should be considered as Canada continues to pursue improvements to the spill response system. Although this report draws primarily on recent Pacific coast experience, the issues that it highlights are relevant to all Canadian ports, recognizing that local conditions require tailored solutions – a point which is highlighted repeatedly herein. It should be underscored that this report identifies issues that ought to be considered in an effort to improve Canada’s readiness to respond effectively to spills. It does not propose definitive solutions, but rather, it identifies possible areas for improvement and suggests potential solutions. The “implications” contained in the report offer avenues for consideration which require more detailed development and analysis in order to support policy decisions. Finally, it is recognized that several of the implications are already in the process of being implemented by the Canadian Coast Guard and other entities.

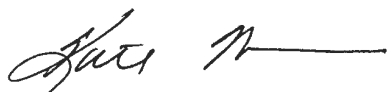
The study team was led by Dr. Trevor Heaver, Professor Emeritus at the Centre for Transportation Studies, University of British Columbia. A full list of team members and their respective contributions can be found in Appendix B and a list of those interviewed in Appendix C.

This report reflects the sum and substance of Dr. Heaver’s findings. Any changes made were for editorial and stylistic purposes only and are the sole responsibility of Clear Seas.

## Message from the Chair

The climate is undergoing rapid change due to our burning of fossil fuels and the global scientific community agrees that we must move to a carbon neutral and, perhaps even a carbon negative world soon to avoid the worst of the climate disruption impacts. Yet, we currently use fossil fuels and until that hopefully rapid transition takes place away from these energy sources, it is important to reduce the risk of accidents from ships, fuelled by oil, that carry containers and bulk cargo and those that carry liquid fuel to markets offshore. In the case of shipping, most public concerns understandably relate to the potential spill of cargo from oil tankers in the case of collision or grounding, but oil and fuel spills are not restricted to tankers – any commercial vessel fuelled by oil has the potential to pollute Canadian waters should an accident or human error occur.

This report is part of Clear Seas’ efforts to provide clear and factual information that can help to reduce the risk and negative impacts of ship-sourced fuel spills. It breaks new ground in terms of the resulting observations and implications that have not been discussed in previous studies of its kind. It adds intelligence about spill response regimes in leading ports in countries around the world, and offers insight into possibilities for us here in Canada. As such this report offers an important perspective on this complex topic and makes a significant contribution to the discourse about how best to respond to ship-sourced oil spills.



Dr. Kate Moran, Chair  
Clear Seas Centre for Responsible Marine Shipping

## Preface

The protection of the waters in and adjacent to ports from pollution from shipping is a microcosm of a global challenge: how to marshal knowledge and organize responsibilities and regulations so that shipping is conducted efficiently and in an ever more sustainable manner. Initiatives may be taken by industry, by governments and by international governmental organizations. But fundamental questions remain: Who should do what? How might governance regimes be improved and how will those changes affect spill response performance?

From a Canadian perspective, the events of the spill of oil in English Bay, B.C. from the bulk carrier *M/V Marathassa* in 2015 provided local evidence of issues associated with the response to oil spills. The events gave rise to questions: How does the governance regime associated with the response to oil spills in Vancouver compare with that in other major ports around the world? And what can be learned from the practices in other ports?

This examination of spill response elsewhere was conducted when the need for changes to the Canadian regime was known. The changes will be introduced in the future in the context of the [Oceans Protection Plan](#), announced by Prime Minister Trudeau on November 7, 2016.

The lessons learned and the implications gleaned from examining the conditions in other ports largely reinforce the directions for change recommended in two formal reviews of Canadian practices, the [Tanker Panel Report \(2013\)](#) and the [Butler Report \(2015\)](#).

However, this research into the conditions in other ports does give rise to some variations to the recommendations in those reports and changes that are not considered in those reports. It is hoped that the implications raised in this study contribute to the deliberation of the content of the Oceans Protection Plan.

Disclaimer: The Internet data and hyperlinks referenced in this report were correct at the time of publication. Over time the location of items may change as menus and webpages are reorganized but usually can be quickly found through online search engines.

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## Executive Summary

This research has examined spill response policies and practices in seven ports in five countries. They are the ports of Seattle, Los Angeles and Houston in the U.S. and Southampton, Antwerp, Rotterdam and Hamburg in Europe. These countries and ports provide a range of national policies and port conditions and practices against which to consider Canadian policies and practices.

Emergency response practices have evolved generally as a result of experience. Canada has been fortunate to have mainly learned from spills elsewhere but its focus has remained for too long on concerns for catastrophic spills.

The research outlined in this examination also builds on recent Canadian reports on spill response. They are: the [three reports conducted for British Columbia \(B.C.\) by Nuka Research & Planning Group](#); the first report of the Tanker Safety Expert Panel; and the Butler Report - [Independent Review of the M/V Marathassa Fuel Oil Spill Environmental Response Operation](#).

This report adds to matters pertinent to the development of the Oceans Protection Plan.

The implications for Canada of spill response practices in the ports and countries studied are reached with three conditions in mind. They are:

- The desired attributes of emergency response systems are well known; Canada has not followed them adequately in its spill response system.
- Studies for the Province of B.C. and the federal government have indicated the general direction of change needed and made specific recommendations. The need for area focused, risk-based response planning has been recognized since 2013.
- The development of a new Oceans Protection Plan bears witness to the need for significant changes in the [National Marine Spills Contingency Plan](#).

The fifteen implications discussed in this report, drawn from conditions in the seven ports studied, are considered in the context of the following six themes: the importance of national policy, the holistic nature and goals of oil spill prevention and response, an integrated response to spills in ports, achieving preparedness for spill response, achieving scalability in spill response and the need for continuous improvement.

The implications in this report also encompass four considerations for change not made in the other studies. They are:

1. Defining clearly the role of response organizations in training and education in addition to technical capacity, while emphasizing that they are not the lead organization responsible for the effectiveness of a spill response.
2. Considering shifting responsibility for spill response planning and management in federal ports from the Canadian Coast Guard to port authorities.
3. Mandating public availability and transparency of spill incident data and response plans of agencies and corporations under federal jurisdiction (excepting personal contact information) and encouraging the same by other levels of government.
4. Ensuring the availability and integration of local Indigenous and science-based knowledge to spill response teams.

## 1.0 Introduction

The requirements for effective emergency response mechanisms are well known. While no single statement captures all of the elements relevant in all environments, the following comes close:

**Disasters ... require responses across multiple government agencies and private sector elements, including media. These factors mandate that, for effective disaster management and because of the unpredictability of such events, response structures must be in place in advance, ready to be activated on short notice, with lines of responsibility clearly delineated and mechanisms for coordination of efforts already established. ... [comparison shows] ...careful advance planning, clear delineation of spheres of responsibility and response roles, effective mechanisms for communication at all levels, and provision for adequate communication with the public [are] key elements of effective response mechanisms.<sup>1</sup>**

The report's findings draw on a detailed desk review of international and Canadian spill response regimes and on empirical case studies involving interviews of spill response officials at seven leading ports in five countries. These interviews were conducted between June and October 2016 in the U.S. (Seattle, Los Angeles and Houston), Germany (Hamburg), Belgium (Antwerp), Netherlands (Rotterdam), and United Kingdom (Southampton).

The three ports in the U.S. were selected first. Seattle, Los Angeles, and Houston provide contrasted port environmental conditions, port traffic compositions and port communities, operating under the same national emergency response regime. Ports in Europe were selected because of their strength as international ports with comparable values to those in North America. The ports of Antwerp, Rotterdam and Hamburg were selected as major ports, in close proximity but operating under different national regimes. Southampton was selected because it is located in a highly sensitive environmental area and has both the leading U.K. oil refinery and a major container terminal in its waterway. The U.K. also has distinctive institutional arrangements, including private ownership of its ports.

Studying their policies and practices can provide insights for Canadian ports.

The on-the-water spill response process is complex and challenging in itself but it is also just one part of the larger endeavour to enable shipping to be conducted safely. Spill response affects all interests in ports and all levels of government. It has been subject to studies internationally and has benefited from advances in emergency response beyond shipping where, unfortunately, emergency events of many types have become more common.

The outcome of the experience in emergency response in general, and in oil spill response in particular, is that the guidelines for 'best practice' are well known.

<sup>1</sup> Kahn, Laura H and J. A. Barondess, 'Preparing for Disaster: Response matrices in the USA and UK', *Journal of Urban Health*, 2008, 85.6. 910-922, Abstract, Accessed on November 1, 2016 at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2587650/>

The publications of four organizations are noteworthy.

- [The International Maritime Organization \(IMO\)](#) supports an extensive programme which includes manuals, guidelines and courses on the prevention and response to oil pollution (IMO, 2015).
- [The Regional Association of Oil, Gas and Biofuels Sector Companies in Latin America and the Caribbean \(ARPEL\)](#) has developed the “Response Evaluation Tool for Oil Spills” (RETOS). RETOS provides an easy-to-use series of checklists with criteria for oil spill preparedness (ARPEL, 2014).
- [IPIECA-OPG](#) has a number of [publications](#) as a part of its Good Practice Guide Series which summarizes current views on good practice for a range of oil spill preparedness and response topics<sup>2</sup> (IPIECA-OPG).
- [The International Tanker Owners Pollution Federation \(ITOPF\)](#) has a set of 17 technical information papers related to oil pollution, including a paper on “Contingency Planning for Marine Oil Spills” (ITOPF).

Questions for assessing the adequacy of a contingency plan in the ITOPF document are used in a report for the province of B.C. by Nuka Research and Planning Group (Nuka). In the “[West Coast Spill Response Study](#)”, volume 3, Nuka outlines key features of what it characterizes as a ‘world-class’ marine spill prevention and response system (Nuka, 2013). In a [subsequent report](#), Nuka also identifies selected practices in a number of countries as leading and suggests how these might be considered for application in B.C. (Nuka, 2015).

Given that the desired features of oil spill response practices are known, why do some places seem to be more successful in achieving their goals than others? Whether their goals are ‘world-class’, how do the ports and cities go about achieving them? Answers to these questions can provide a foundation for answering why some aspects of the response in Vancouver were inefficient. What are the implications for Vancouver of the situations in other ports? Fortunately, some answers to these questions are already known and being acted upon. However, the full ramifications of the Canadian Coast Guard’s initiatives remain to be determined.

The six themes and fifteen implications identified in this report point to features of the response systems studied that warrant consideration as Canada develops its new Oceans Protection Plan. Most of these are consistent with and build upon the direction of changes that are being implemented currently by the Canadian Coast Guard.

## 2.0 The Conditions in Ports

The issue of spill response in Canadian ports has been flagged for study for three reasons:

- First, because of the concerns with the response to the *M/V Marathassa* spill incident in English Bay, B.C.;
- Second, because the volume of traffic and more confined navigation conditions in and adjacent to ports necessitates focused attention to prevention and response measures; and
- Third, because ports are in urban areas whereby the proximity of many people adds to environmental, economic, social and cultural concerns.

<sup>2</sup> When IPIECA was set up in 1974 the acronym stood for the International Petroleum Industry Environmental Conservation Association. Since 2002, the association is now known as IPIECA, the global oil and gas industry association for environmental and social issues. IOGP represents the upstream oil and gas industry before intentional organizations and, importantly, is active in promulgating best practices.



The very nature of ports leads to a strong focus on spill prevention. This is reflected in vessel traffic separation and control systems, and the use of pilots and tugs to ensure safe vessel movement and berthing. Activities that are seen as creating particular risks can be regulated specifically, such as the booming of vessels during bunkering (fuel loading) operations or restrictions on vessel movements during hazardous conditions. The movement of tankers through the Second Narrows in the Port of Vancouver is an example. With such precautionary measures in place, when spills happen under these conditions, they are mainly small and operational, such as those associated with bunkering.

Spills in ports can usually be managed by the polluter alone or with additional resources drawn from nearby.<sup>3</sup> In the technical terminology of spill response, they are mostly Tier 1 or possibly Tier 2 spills.<sup>4</sup> Although there may be variations on what Tier levels signify in different countries generally, the tiers relate to the size of the spill. A Tier 1 spill is smaller than a Tier 2 spill, which is smaller than a Tier 3 spill.

The following illustrates where the capabilities to mitigate the incident are sourced by Tier.

### Geographical reach of each tier capability

Capability	Geographical reach
Tier 1	Local
Tier 2	Regional or national
Tier 3	International

IPIECA-OPG puts it thusly<sup>5</sup>: Tier 1 capabilities describe the operator’s locally held resources used to mitigate spills that are typically operational in nature occurring on or near an operator’s own facility. In some situations extra resources may be required from national or regional Tier 2 providers to increase response capacity or to introduce more specialist technical expertise. Tier 3 capabilities are globally available resources that further supplement Tiers 1 and 2. The resources held at the three tiers work to complement and enhance the overall capability by enabling seamless escalation according to the requirements of the incident. An important concept is the cumulative nature of tiered response. The elements of a Tier 1 response are supplemented by higher tier capability and not superseded or replaced by it.

Port spills of any size, because of their location, can become high profile when not handled well. This was the case with the *MV Marathassa* incident. Fortunately, the physical clean up of that spill was performed better than the handling of the communications. A feature of such spills is that effective communication with all affected parties is vital including the governing authorities: Indigenous peoples, the federal government, the province, and local governments and their agencies. Coastal incidents, such as the grounding of the *Nathan E. Stewart*, a petroleum-barge tugboat, in Seaforth Channel, B.C. (October 14, 2016), raised similar issues.

These relatively small oil spills have not fit well into the Canadian spill response regime that lacks attention to local details and relationships, perhaps, because it was developed to deal with large, infrequent spills. Canada has been fortunate in having had few significantly large spills but the result is that the deficiencies in the system have remained somewhat hidden and have persisted for too long. These deficiencies are now being addressed. That said with a potential increase in tanker traffic in B.C., concerns are being raised about the possibility of responding to a major spill. Both scales of spill response have to be addressed.

3 In the area under the jurisdiction of the Antwerp Port Authority all spills are the responsibility of the Authority’s contracted response organization.  
 4 A Tier 3 spill is one of national significance and draws on national or international resources. Response at this level is considered in Section 10.  
 5 <http://www.oilspillresponseproject.org/wp-content/uploads/2016/02/GPG-Tiered-Preparedness-and-Response.pdf> page 7

### 3.0 The International Spill Response Regime

Oil spill response in ports around the world is carried out in the context of national policies that have been influenced significantly by international events and conventions. Countries have learned from spills that may have occurred elsewhere but have revealed weaknesses in their own local response regimes.

The IMO has been important in establishing approaches to spill response and to setting international conventions for a global industry. The global conventions reflect the thinking of the time and establish the context for national actions.

The first catastrophic spill from the new generation of super-tankers was in 1967 when the *Torrey Canyon* ran aground southwest of Land's End, England, spilling some 119,000 tonnes of oil. It was an international wake-up call. However, much of the ensuing attention focused on arrangements to ensure compensation for those affected by pollution and on measures to control operational discharges of oil.<sup>6</sup> Only some national and regional response plans emerged.<sup>7</sup>

Rather, it was the grounding of the *Exxon Valdez* in Prince William Sound, Alaska in 1989, spilling some 35,000 tonnes of oil that finally led to global action on spills. The requirement for double-hulled tankers was the most significant preventative measure introduced as a requirement (for future U.S. trade) by the [Oil Pollution Act of 1990 \(OPA 90\)](#) and internationally by amendments to the [International Convention for the Prevention of Pollution from Ships \(MARPOL\)](#) in 1992.

The most profound measure for spill response was the [International Convention on Oil Pollution Preparedness, Response and Co-operation \(OPRC\)](#) adopted at the IMO in 1990. It came into effect in 1995.

The focus of OPRC is on an "oil pollution incident" defined in the convention as an occurrence which results or may result in a discharge of oil and which poses or may pose a threat to the marine environment or to the coastline or related interests, and which requires emergency action or other immediate response.<sup>8</sup> Large spills were the basis for the agreement. OPRC sets out a comprehensive and global framework for dealing with marine oil spills. Its provisions are reflected in the Canadian regime. Selected Articles of OPRC are in Appendix A.

6 The International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

7 The first national contingency plan was published in the U.S. in 1968. It provided a comprehensive system of accident reporting, spill containment and cleanup. The plan also established a response headquarters, a national reaction team and regional reaction teams (EPA, 2016). Regional international agreements were reached in Europe: the Bonn Agreement, 1969 (North Sea countries), The Helsinki Convention, 1974 (Baltic Sea countries), and the Barcelona Convention 1976 (Mediterranean Sea countries) (IOSC, 1999).

8 The authority to act when an incident may result in a spill is important to ensure timely action under the obligations of the responsible party for costs.

Oil tankers of more than 150 Gross Tons and all other ships exceeding 400 Gross Tons are required to carry a [Shipboard Oil Pollution Emergency Plan \(SOPEP\)](#). Article 6 of OPRC sets out the requirements for national, port, and terminal plans in the following terms:

- Each country shall have a national system for responding promptly and effectively to oil pollution incidents including as a minimum:
  - A national authority or authorities with responsibility for oil pollution preparedness and response;
  - A national authority responsible for the receipt of pollution reports; and
  - A national authority which can request or render international assistance.
- Each country shall have a national contingency plan for preparedness and response which includes the organizational relationship with the various bodies involved in the country.
- Each country, in co-operation with the oil and shipping industries, port authorities and other relevant entities, shall establish:
  - A minimum level of pre-positioned oil spill combating equipment, commensurate with the risk involved, and programmes for its use;
  - A programme of exercises for oil pollution response organizations and training of relevant personnel;
  - Detailed plans and communication capabilities continuously available for responding to an oil pollution incident; and
  - A mechanism or arrangement to co-ordinate the response and to mobilize the necessary resources.
- Each country is required to provide the IMO with information concerning the location and communication data of its governing body that is responsible for oil spills, information on its pollution response equipment and expertise and its national contingency plan.

## 4.0 Jurisdiction and the Canadian Response Regime

Jurisdiction determines the domains over which levels of government are responsible for oil spill response.

### 4.1 Jurisdiction Related to Coastal Marine Oil Spills

In Canada, jurisdiction over the waters of the territorial sea and waters of the coastal economic zone rests with the federal government. Simply stated, coastal waters, including those of federal ports, are a federal responsibility.

The provinces are responsible for managing public lands, which means land above the low water mark.

British Columbia has a more extended jurisdiction. By a 1976 ruling of B.C.'s Court of Appeal, upheld by the Supreme Court of Canada in 1984, the Province also has jurisdiction over the seabed of the Straits of Georgia and Juan de Fuca, and Queen Charlotte Sound-Johnstone Strait, and the coastal seabed between major headlands unless responsibility has been transferred specifically to a federal jurisdiction or is in private ownership.<sup>9</sup> Resources residing in or on these foreshore and seabed areas are provincial.

<sup>9</sup> The court decisions rested on the designation of the area of the province by the British Parliament in 1866. When British Columbia entered Confederation in 1871, the province consisted of all British territories, including dry land, coastal straits, and submerged lands east of Vancouver Island and the Queen Charlotte Islands (now Haida Gwaii).

Consequently, since the federal government is responsible for shipping and for certain other marine resources, responsibility to protect and manage marine resources is a **joint effort** between provincial and federal agencies.

The pattern of jurisdiction raises a number of questions regarding the effectiveness of spill response in the provinces.<sup>10</sup> In the case of British Columbia, in particular, they include:

- What agreements are in place to address responsibilities between the high- and low-water mark given the periodic water coverage of the intertidal zone?<sup>11</sup>
- What agreements are in place between the Province and local governments for responsibility and spill response management in the various local government jurisdictions, including First Nations? Local fire and health services and local police or RCMP may be deployed. Who manages the foreshore clean-up crews?
- What are the agreements and working relationships between the Province and the CCG in response planning and management?

While these questions have not been investigated in this report they are important. Recent initiatives of the Province of B.C. in preparing for land and marine spills have resulted in the possibility of regulations that could conflict with federal regulations. It is to be hoped that the current federal initiatives to bring spill response planning and management to a more local level will result in effective collaboration among all levels of government, including Indigenous peoples.

## 4.2 The Federal Response Regime

The Canadian federal government responded to the *Exxon-Valdez* spill by appointing the Brander-Smith Panel in June 1989. It submitted its final report in September 1990.<sup>12</sup> The Panel considered all pollution but the primary attention of the time was large spills. After extensive consultations, amendments were made to the [Canada Shipping Act](#) in 1993 and new regulations were in place in 1995. The Act has been revised many times over the years, and was consolidated and updated in 2001.

Consistent with the international regime, Canada follows the 'polluter pays principle'. However, following consultations with industry, Canada went further by placing primary responsibility for funding and managing the operational elements of the response regime on industry. The government is responsible for the legislative and regulatory framework, including standards, overseeing and monitoring response activities, and enforcement.

In the event of a spill, Canada places first reliance on the polluter – the responsible party – for the clean up when the polluter is known and has adequate capability to respond.

The Canadian Coast Guard (CCG) is the operational arm of the government responsible for ensuring that the response to pollution incidents meets expectations. Since 2005, the CCG has been a special operating agency under a Commissioner reporting directly to the Deputy Minister of Fisheries and Oceans Canada (DFO). Transport Canada sets guidelines and establishes the regulatory framework for preparedness and response to spills from ships and oil handling facilities. Transport Canada also certifies the private-sector response organizations. Environment and Climate Change Canada (ECCC) is the federal authority providing environmental advice following a spill.

**10** The implications of federal-provincial agreements concerning offshore oil developments for jurisdiction over oil pollution have not been investigated in this report.

**11** In the Solent in the U.K., jurisdiction lies with the port to the high-water mark and the local governments to the low-water mark! By agreement, the local governments assume responsibility above the high-water mark.

**12** The Public Review Panel on Tanker Safety and Marine Spills Response Capability, accessed at: <http://www.dfo-mpo.gc.ca/Library/117791.pdf>

The 1995 regulations prescribe that an oil handling facility must have an on-site oil pollution emergency plan consistent with local conditions but scaled according to defined volumes of oil handled and must have an arrangement with a response organization. National response standards are set for the oil handling facilities and for the response organizations. The purposes of the response organization standards are stated clearly in the 1995 document, specifically that:

**These standards provide details for response organizations in developing their response plans, ... The standards are intended to be used in the planning process in preparation for a response to an oil spill incident. Each response plan will be unique, taking into account the geographic features specific to that region. Since the response to an incident will be influenced by environmental and other factors, the standards should not be used as a yardstick against which to measure the appropriateness of the response. Rather, they seek to ensure that a suitable response infrastructure is in place and ready to be deployed in the event of any spill, regardless of size and conditions. (Transport Canada Response Organizations, Marine Safety Directorate, Ottawa, TP12401E 1995, p. 1)**

Since 2010, the federal system has undergone several reviews and has undertaken changes. The reviews include:

- Transport Canada, 2010, [Environmental Prevention and Response National Preparedness Plan, TP 13585 E](#).
- Auditor General, 2010, [Oil Spills from Ships - 2010 Report of the Commissioner of the Environment and Sustainable Development](#)
- Fisheries and Oceans Canada, 2011, [Canadian Coast Guard Environmental Response, Marine Spills Contingency Plan, National Chapter](#).
- Canadian Coast Guard, 2012, [The World-Class Tanker Safety System](#)
- Tanker Safety Panel, 2013, [A Review of Canada's Ship-source Oil Spill Preparedness and Response Regime - Setting the Course for the Future](#)
- Butler Report, 2015, [Independent Review of the M/V Marathassa Fuel Oil Spill Environmental Response Operation](#).

The Tanker Safety Panel of 2013 made 45 recommendations for change. These led to acceptance of the need for fundamental changes in spill response management practices. The Butler Report made 25 recommendations. The recommendations of the two reports are evidence of the deficiencies in the Canadian system. Responses to these recommendations are now underway but not yet with public outcomes. The implications for Canada of examining oil response systems in the leading ports of other countries must be considered in the context of these current Canadian policy developments.

Recent Canadian events are also significant. As referenced earlier, in the early hours of October 13, 2016, the tug *Nathan E. Stewart* went aground at the entrance to Seaforth Channel off Bella Bella, B.C., resulting in a spill estimated (as of November 1, 2016) to be 101,104 litres of diesel and 3,668 litres of lubricants (lube oil, hydraulic oil, gear oil, and spent lube).<sup>13</sup> This incident heightened concerns and interests in the effectiveness of spill response in Canada.

The new national Oceans Protection Plan's objective is to achieve a world-leading marine safety system to both prevent and improve response to marine pollution incidents.<sup>14</sup> Over \$1.5 billion over 5 years will be invested in new vessels, infrastructure and programmes to advance spill prevention through the enhanced safety of vessel movements. New regulations and other tools will be developed by working with stakeholders and Indigenous peoples to manage local marine traffic and response issues more

<sup>13</sup> Seaforth Channel, Incident Unified Command Information Centre, accessed at <http://spillresponsebc.ca/2016/11/01/1-pm-situation-report-nov-1/>

<sup>14</sup> The Prime Minister of Canada announces the National Oceans Protection Plan. Accessed at: <http://pm.gc.ca/eng/news/2016/11/07/prime-minister-canada-announces-national-oceans-protection-plan>

effectively. The initiative has important but, as yet, unknown implications for the existing National Marine Spills Contingency Plan.

The Prime Minister, in introducing the Oceans Protection Plan, was very frank that Canada's prevention and response regime is outdated and needs an overhaul. The full changes planned are not yet known although some are underway and others were recommended by the Tanker Panel and Butler report. The recommendations in these reports clearly identify recognized flaws of the existing system, yet to be replaced by new established practices under new legislation or regulations. These flaws include:

- i. Unclear decision-making structure and processes during spill response.
- ii. The absence of adequate risk assessment.
- iii. Insufficient recognition of local geographic conditions.
- iv. Inadequate relationships with local communities, including Indigenous peoples, in planning and operations.
- v. Lack of information transparency.
- vi. Inadequate arrangements for monitoring.
- vii. Inadequate scope of activities in response plans.
- viii. Inadequate preparedness.
- ix. Silos in government functions.
- x. Inadequate cascading arrangements.
- xi. Uncertain financing of community planning costs.
- xii. Uncertain liability conditions.<sup>15</sup>

This list is indicative of a response system needing substantial change. However, while the list is wide-ranging and with deep significance, it does not identify all shortcomings of the Canadian system when viewed from the perspective of conditions in the seven international ports studied.

The paramount lesson from examining the spill response systems in the ports of other countries is the vital importance of an **overarching national policy**. Initially, this may seem counterintuitive but there are good reasons for it. The problems of spills are universal. A national government needs to ensure that lessons learned in emergency response globally are applied locally. This overcomes the risk that the involvement of diverse national and local government authorities and of diverse corporate interests will result in inconsistent and often poor performance. Finally, central governments have responsibilities for territorial (coastal) seas. Consequently, the first theme under which the case study ports are examined is the importance of national policy.

Five additional themes, which are the general desirable features of spill response, provide the framework to identify the implications for Canadian ports of the spill response systems in the ports studied. These themes include: that the spill response approach should be holistic, integrated, well prepared, readily scalable and dynamic. Analysis of the practices in the seven ports under these themes gives rise to implications for Canadian ports that are largely in line with but extend beyond the recommendations of the Tanker Panel and the Butler Report.

<sup>15</sup> The liability issues raised by the Tanker Panel are not considered in this report.

## 5.0 THEME 1: The Importance of National Policy

National policy should ensure a high level of responsibility for spill response **at the local level**. This is achieved in various ways but in each port studied, it is the dominant outcome of the national regime. Its absence in Canada is at the root of many of the shortcomings now being addressed.

The countries and their port regimes operate under three distinct governance models. They are: the decentralized political structures of Belgium, the Netherlands and Germany; the devolved responsibility in the U.K.; and the local responsibility held by a federal agency in the U.S.

### 5.1 The Policy Framework in Belgium, the Netherlands and Germany

The Hamburg Port Authority (HPA) and the Antwerp Port Authority (APH) are wholly owned companies of the cities in which they are located.<sup>16</sup> The Port of Rotterdam Authority (PRA) is 70% owned by the city and 30% owned by the state.

In Hamburg, responsibility for spill response rests with the environment department in the city; HPA is only involved as an informed party because ship navigation or movement issues may be involved. In the cases of Antwerp and Rotterdam, the port authorities are responsible for spills in the waterways under their jurisdiction and interface with the city and provincial governments if spills extend beyond their jurisdiction. Each port authority has a close working relationship with the environment division of its city and region. In each port, a private corporation is contracted as the response organization.

### 5.2 The Policy Framework in the United Kingdom

While the political and, therefore, the policy framework in the U.K. is quite unlike that in the federal structures in Canada and the U.S., it is a highly instructive regime to examine because of the specificity and means by which it achieves local responsibility.

The escalation of civil emergencies in number and significance led to the enactment in 2004 of the Civil Contingencies Act (CCA). The CCA is significant because it introduced a single framework for civil protection in the U.K., a framework applicable to the full range of emergency events including floods, fires, infectious diseases, and spills of oil and hazardous materials on land or water. It establishes a statutory framework that entrusts local agencies with response to civil emergencies as far as possible (CCA, 2004). These local agencies achieve multi-agency cooperation through Local Resilience Forums which bring together senior representatives of the emergency services, local authorities, community organizations, and others.

The specific application to oil spills is through the National Contingency Plan for Marine Pollution from Shipping and Offshore Installations (NCP). Under the NCP, the Maritime and Coastguard Agency (MCA), an executive agency of the Department of Transport, is the U.K.'s Competent Authority for pollution response. The responsibilities of MCA with respect to oil pollution include the protection of public health, the marine and terrestrial environment and the U.K.'s economic interests. Its functions include:

- Response to spills from offshore installations and ships in the open sea under U.K. jurisdiction;
- Leadership on spills of national significance in local waters;
- *Ensuring that ports and local authorities have plans and practices consistent with NCP* (emphasis added);
- Ensuring competence to meet international cooperation obligations in spill response.

16 The City of Hamburg is also a federal state.

Under the NCP, the MCA has issued a Guideline for Ports (MCA, 2016). This is the blueprint for the content of and the process by which port (and local community plans) are developed. In part, it states in Paragraphs 1.20 and 1.18 (emphasis added in the text):

**The MCA undertakes the approval of harbour authority and oil handling facility plans on behalf of the Secretary of State for the Department for Transport. Plans should be compiled in consultation with adjacent ports, local authorities, oil handling facilities, the Marine Management Organization (MMO), the Environment Agency, Natural England and their equivalents under the devolved administrations. ... These organizations should be able to assist greatly with the assessment of consequences of potential pollutants. It is therefore good practice to involve them from the outset in the port plan: it is not good practice to make a first approach with a completed draft.**

*The integrity of a harbour authority plan depends upon removing any doubt over who is responsible for what.* The National Contingency Plan gives some guidance on the responsibilities that have been imposed or accepted for the clean up of pollution within the jurisdiction of a harbour authority as follows:

Location of pollution	Responsibility for clean-up
On the water	Harbour authority
Jetties/wharves/structures of harbour authorities	Harbour authority
Beach/shoreline owned by the harbour authority	Harbour authority
Foreshore owned by a private individual or group	Foreshore owner(s)
Shoreline (including land exposed by falling tide) and other structures	Local authority

The structure can be exemplified by reference to conditions in the Solent, including the River Solent and the Solent Strait, the 20-mile waterway leading to Southampton. The contingency plan of Associated British Ports Southampton, the port authority, interfaces formally with the plans of four oil handling facilities,<sup>17</sup> five Councils and one recreational boats port authority (ABP, 2016).<sup>18</sup> The development of the plans for the Solent is aided also by consultation with the Solent Environmental Group, one of 14 covering England and Wales, which also serves as an advisor during spill response.<sup>19</sup> All the plans are public documents with the exception of personal contact information. The certified response organization is the same in each of the contingency plans in Southampton but this is not the case in all British ports.

### 5.3 The Policy Framework in the U.S.

The *Oil Pollution Act 1990 (OPA 90)* is the primary legislation governing oil spills in the U.S. It was passed following the *Exxon Valdez* spill, but has been amended since.

**17** The largest is the Fawley Terminal of Esso, which is the largest refinery in the U.K. and handles some 2000 vessels per year ([https://en.wikipedia.org/wiki/Fawley\\_Refinery](https://en.wikipedia.org/wiki/Fawley_Refinery)). The Fawley contingency plan is at: [http://www.southamptonvts.co.uk/admin/content/files/PDF\\_Downloads/Oil%20Spill%20Plan/ESSO%20Fawley%20Site%20OSCP%202011.pdf](http://www.southamptonvts.co.uk/admin/content/files/PDF_Downloads/Oil%20Spill%20Plan/ESSO%20Fawley%20Site%20OSCP%202011.pdf)

**18** Marinas, not designated as port authorities, have their own spill plans and contracts or their own equipment for spill response.

**19** The Solent Environment Group Marine Pollution Contingency Plan is at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/482092/Solent\\_Standing\\_Environment\\_Group\\_plan.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/482092/Solent_Standing_Environment_Group_plan.pdf)



Under OPA 90 the federal government has jurisdiction over oil spill responses in state and federal navigable waters. The U.S. Coast Guard (USCG) is designated the lead response agency for planning and response. However, under the legislation, Area Committees (ACs) are specified as the forum through which local contingency plans will be developed (EPA, 2103). Area Committees enable agencies to develop constructive working relationships while identifying issues and problems and developing Area Contingency Plans (ACP). These committees are comprised of members from federal, state, and local governments and agencies, as well as representatives from indigenous peoples, industry, ports, environmental organizations, and others. They are responsible for developing contingency plans, evaluating their implementation, and maintaining them through a continuous improvement process. An Area Committee may recognize sub-geographic areas in a Geographic Response Plan (GRP) to provide more site-specific environmental and wildlife habitat information critical to pollution response activities under the ACP.

The U.S. regime displays a strong national consistency in structure and process (as is discussed later) while allowing focus on specific geographic areas, with varied economic and environmental conditions. It does not result in a 'one size fits all' operational plan but each plan is established through a similar process. The response organization may be contracted by the USCG or responsible parties.

## 5.4 Implications for Canada

The Canadian Coast Guard (CCG) currently has an Area Response Planning Initiative under which Area Response Plans (ARPs) are being developed for four designated areas. These areas comprise: the southern portion of British Columbia; the St. Lawrence (Montréal to Anticosti Island); Port Hawkesbury and the Strait of Canso; and Saint John and the Bay of Fundy. These projects are applying methodologies to develop risk-based ARPs.

The CCG has also been leading the development of the Greater Vancouver Integrated Response Plan to bring about a collaborative approach to planning that involves municipalities and First Nations. These initiatives appear consistent with the federal government's Oceans Protection Plan but the content of the plan is not yet released.

These developments are in line with the implications gained from our study of the foreign ports. However, in aggregate, the requirements of the Oceans Protection Plan include wider changes, notably in spill prevention. This section deals only with those implications that arise most directly from the examination of the national policies governing response practices in ports.

### IMPLICATION 1.

#### A diminished role for national standards

The practice elsewhere and now adopted in Canada is for prevention and spill response to be based on the actual conditions in particular locations.

The national policy must ensure that contingency plans reflect local conditions. **The implication is that there is a lessening place for 'national standards' and that local conditions are key determinants of response capability requirements. For instance, while the national response standard for a Tier 1 spill is for the Response Organization to be operating within six hours, local conditions commonly require much swifter response than this national standard.** There *might* be a role for national standards for activities that are unaffected by geographic specifics, such as communication standards.

## IMPLICATION 2.

### National regulations for local, risk-based spill response management

With multiple regional governments and several major ports, Canada shares with the U.K. and the U.S. the opportunity for national legislation or regulation to ensure standard administrative structures and processes to continuously guide the development of spill response plans in a **knowledge-based community structure**. The U.K. and the U.S. reach comparable ends through quite different governance structures, with the latter more relevant to Canadian conditions.

The OPA 90 establishes the USCG as the lead federal response agency and Federal On-Scene Coordinator (FOSC) for spills in coastal waters and deep-water ports. It also ensures that plans and operating decisions are made in a 'community context'. This is performed through the required scaled level of plans from the National Contingency Plan (NCP) to the Regional Contingency Plan (RCP) and the Area Contingency Plan (ACP) developed by national and regional teams and area committees respectively.<sup>20</sup> The area committee planning process is a proactive effort to deal with potential oil releases. It is open to all stakeholders including federal, state, local government agencies, Indigenous peoples, industry and environmental participants.

The Canadian Regional Advisory Councils have not functioned in an equivalent manner to the Regional Response Teams or the Area Committees. Their ineffectiveness in providing public visibility to the response program led the Tanker Panel to recommend that they be abolished. Further, Implication 3 below regarding CCG responsibility likely leads to the conclusion that they should not have been reporting to Transport Canada.

Planning and response in each of the three U.S. ports reviewed is based on detailed Geographic Response Plans (GRP). These are developed through community-wide efforts that involve input from public workshops, local oil spill and emergency response experts, federal and state agencies, as well as representatives from Indigenous peoples, industry, ports, environmental organizations, and others. The outcome is a detailed knowledge that is essential to planning resource allocation, clean-up methods and protective priorities based on net-benefit risk assessment. The resulting response plan guides the actions of first responders to a spill and avoids the initial confusion that often accompanies a spill.

### National regulations comparable to the requirements for regional and area structures and practices found in the U.S. would ensure local input for risk-based response planning.

On the basis of the interviews and written materials on the ports visited, it is not appropriate to present firm conclusions on the levels of community concerns about oil spills in their ports. However, the level of concern for spills is among the highest in Vancouver. Of course, Vancouver has recently had the *M/V Marathassa* spill demonstrating weaknesses in the Canadian system and influencing public concern. Vancouver also faces high-profile port expansion plans.

In the ports visited, three factors emerged as contributing to local acceptance of risk levels and existing processes. They are close local government involvement, the obvious importance of port industries in the communities and good records of response.

The involvement of community groups is strengthened through the ACs in the U.S.; the role of community groups (as distinct from industry groups) appears particularly strong in LA and Seattle. In Southampton, the responsibility of local governments to have their own contingency plan and be tied

<sup>20</sup> In the Pacific Northwest Region of Idaho, Oregon and Washington, the ACP is used as the RCP. In Region IX, Arizona, California and Nevada, there are three Port Area Committees for Contingency Planning: USCG Port Areas for San Francisco, Los Angeles / Long Beach, and San Diego.

into the port response systems provides a level of community confidence. It is widely accepted that in the event of a spill it is necessary to respond as quickly as possible with resources that over-protect against the impending spill.

While important in all cases, the nature and level of community involvement appears to vary among the ports and countries. A strong presence of the city government directly or through the port authority seems to be associated with confidence that the community's interests are well protected.

**IMPLICATION 3.**

**More responsibility should rest with the Canadian Coast Guard**

In the U.K. and the U.S., national approaches to emergency response have been established and the respective coast guards have been given the responsibility for their implementation in marine oil spill incidents. In Canada, some quasi-operational responsibilities, such as the certification of ROs, in addition to policy responsibilities, are under Transport Canada's jurisdiction.

The Tanker Panel report notes that division of responsibilities in Canada gives rise to a silo effect. It states:

This distribution of roles between Transport Canada and the Canadian Coast Guard has led to many activities being performed in silos, which hinders the cohesiveness of the federal management of spill preparedness and response. Our solution is for both the Canadian Coast Guard and Transport Canada to be involved in the new model at every step of the process. This approach will allow both organizations to be intimately familiar with the plans and capabilities of each Response Organization. (Tanker Panel, page 18)

The Tanker Panel did not suggest an alternative solution. Such an alternative might be to follow the model in the U.K. and U.S. by assigning greater responsibility to the CCG. This would be consistent with the new and necessary focus on local knowledge and processes. The CCG is a federal agency but it needs to operate at a local level. This alternative approach would enhance and make greater use of the expertise in the CCG. **Consideration should be given under the new Oceans Protection Plan to shifting more responsibilities to the Canadian Coast Guard.** This implies a lesser role for Transport Canada than is indicated in the Tanker Panel report. The investigation of the spill response regimes for this project does not provide insights on the matter of the Minister to whom the CCG should report.

**IMPLICATION 4.**

**Response organizations have technical and educational roles**

In the absence of published spill contingency plans and in light of the initiative of the Province of B.C. to advance the role of response organizations (also referred to as preparedness and response organizations, PROs) in the preparation of such plans, it is appropriate to examine their role elsewhere and to consider the implications for Canada.<sup>21</sup>

In the ports studied, the spill response organization (RO) is a company contracted to execute the response for all spills in Antwerp and when the responsible party's resources are insufficient in the other ports. In Hamburg, the city is required to put the response contract out to bid every five years. In Antwerp, a new RO was contracted in 2015. In Rotterdam, in addition to the contracted RO, the oil companies maintain a significant supply of supplementary booms. In Southampton, the RO is increasing the inventory of equipment on the waterfront. In U.S. ports, contractors are used but seemingly without the same multi-year commitment to a single company as found in Europe. In most cases, more than one spill response firm exists in the port.

**21** The provincial plan covers land as well as marine spills.

In all the ports, ROs have the technical expertise and the human and physical resources to offer advice during planning and to execute response plans. They are not responsible for decisions that involve value judgements in contingency planning or spill response. For example, they do not rank the priority with which different areas should be protected in the event that full protection cannot be afforded to all areas.<sup>22</sup> This is done through a process with considerable scientific and community input.

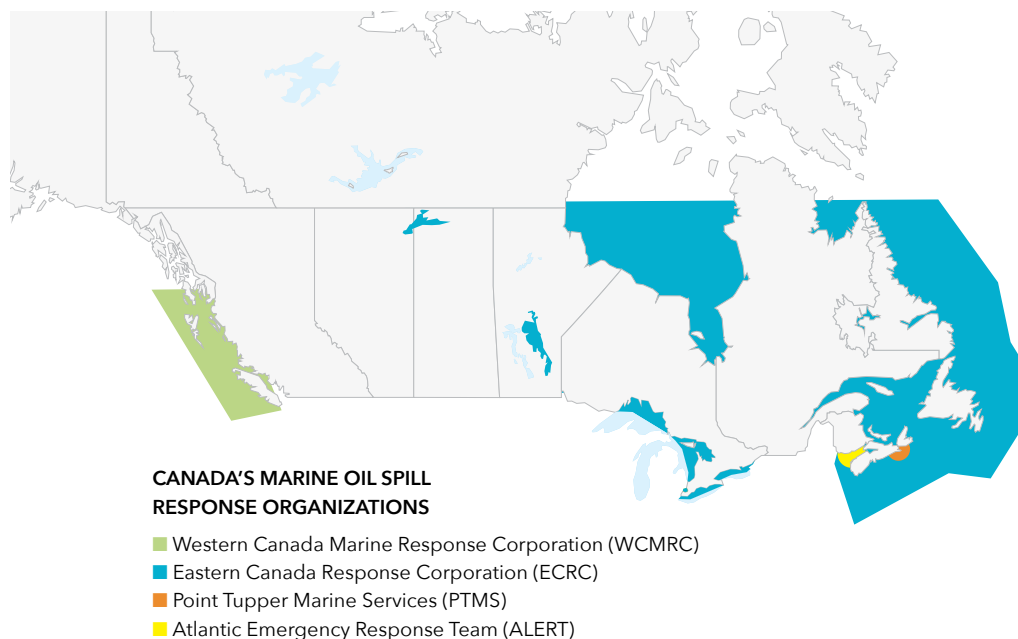
In no port, including in Canada, is the RO the organization with the ultimate responsibility for monitoring that a response is undertaken appropriately. Nor is the RO the organization that escalates a response from a Tier 2 to a Tier 3 level or initiates international response plans. In Canada and the U.S., this is the responsibility of the Coast Guard. In each port studied, the response activities are the responsibility of the lead party ultimately responsible for the effectiveness of the spill response.

In the U.K., port contingency plans are the responsibility of private corporations, the port authorities, as is pilotage. However, the plans are made and executed under processes that require considerable scientific and community input. They are also monitored by the MCA (the Coastguard).

A question that may be helpful in deciding the role of the RO in spill response planning and execution is, who 'owns' the plan? When a response organization is called out it is because oil has been released or is in danger of being released in a place that has adverse consequences for the community. Society seeks to ensure through its institutions that plans exist so that such events are unlikely and, if they occur, are managed effectively. In this sense, no matter how plans are developed, they are 'society's plans'.

To whom does a society look to have a plan and to see that it is executed properly? In no port studied is that the RO. In Canada, it is the CCG in fact, and in the public's mind (judging by post-event analyses), that is held responsible.

In Canada, there are four certified response organizations. The map below indicates the areas for which each of these agencies is responsible:<sup>23</sup>



<sup>22</sup> The Southampton Port Authority contingency plan places priority locations in six categories on a net benefit criterion with salt marshes and tidal flats of international and national importance ranked highest and public beaches ranked last.

<sup>23</sup> <https://www.tc.gc.ca/eng/marinesafety/oep-ers-regime-ros-771.htm>

Does it make a positive or negative difference that the oil industry finances the Response Organizations in Canada? The answer is positive as industry involvement obviates part of the standby cost of oil spill emergency protection falling on the public. However, pursuit of polluter pays should not go the step further of making the RO decide on the appropriate content of the plan. The RO needs inventory and deployment plans that have to mesh with the CCG or Area/Local contingency plan. The RO can also play a vital role in training terminal company personnel and public volunteers. As Canada moves to a regime more reliant on local input to response planning, this training and engagement will be an important role.

**Response organizations are important in the development of spill response plans, in the training of people for roles in spill response and in the execution of spill response exercises and actual responses but they are not the lead organization responsible for the effectiveness of the spill response.**

**IMPLICATION 5.**

**The need for transparency**

The Tanker Panel report draws attention to the importance of keeping the public informed about contingency planning and the record of oil spills through better communication and community engagement. However, **experience elsewhere suggests that transparency is also beneficial for oil spill data, spill investigations, the processes by which contingency plans are made and the contingency plans.**

Given that the contingency plans deal with oil spills affecting public space it is appropriate for the plans of private as well as public bodies to be made public, with the exception of personal contact information that they may contain. Since September 30, 2016, pipelines and oil handling facilities have been required to make their contingency plans public.

There will never be unanimous agreement by all stakeholders that contingency plans have the right level of capability and priorities. Nonetheless, transparency facilitates the processes by which broad community buy-in is achieved. Transparency does not mean that spills do not get bad press. After all, any spill is bad news. However, open public knowledge provides the appropriate base by which public perceptions are shaped. In an improved spill response regime, this may reduce community fears and it might also lessen the chance of damaging, unmeasured and inaccurate political outbursts from elected officials.

## **6.0** **THEME 2: The Holistic Nature and Goals of Oil Spill Response**

The response to oil spills is only a part of a large endeavour that is captured by the Oceans Protection Plan. The first objective of such a plan is to prevent spills from happening in the first place. In this, Canada has a good record. However, changes in shipping activities and technologies often create new needs and opportunities to do better. The recent announcement of a \$1.5 billion commitment to oceans protection is largely to advance prevention through support vessels and improved navigation management.

To that end pilotage is one well-established way to enhance ship safety.

#### **IMPLICATION 6.**

### **Effective public communication is an objective of spill response**

Spill response understandably focuses on prevention, response, recovery and restoration.

However, this can lead to a focus on technical performance – to the detriment of viewing spill response as a very public process for which satisfying the community interests in the processes and outcomes is important. Too often, cases have occurred in which the contingency plan did not give sufficient attention to the need to provide the public with accurate, appropriate and timely information. The importance of a professional public communications capability as a part of spill response has sometimes been learned the hard way by public relations failures. Apparently such was the case in the U.K. in the matter of the *Sea Empress* grounding in Milford Haven in 1993.

It is important that planning for – or responding to – spills is not driven or impeded by media concerns. However, effective media and public reporting (increasingly through social media) is necessary to meet the public's need for information while enabling response to proceed efficiently and uninterrupted.

**Effective media and public relations is an explicit objective of the response task.**

## **7.0 THEME 3: An Integrated Response to Spills in Ports**

The reality of spills is that they move with tides, currents and winds so that effective liaison needs to be achieved across geographical areas. What is one area's spill now may become another area's problem soon. In the case of the European ports, this requires effective communication between separate lead organizations. In the U.S. and in Canada, the Coast Guard is the lead party within and beyond the port so that managing the cross-boundary relationship is not an issue. Rather, the major concern is to maintain effective liaison with stakeholders and Indigenous peoples within the port community.

The role of national policy in ensuring an integrated approach to spill response planning has already been noted. It can also play a role in ensuring an effective and balanced expertise is integrated into operational spill response decision-making.

The model to consider for Canada is the approach adopted in the U.S. under the National Incident Management System (NIMS) of the Federal Emergency Management Agency (FEMA, 2015). One aspect of integration is the inclusion of scientific and technical expertise. This is considered in the section on preparedness.

Under NIMS, the Incident Command System (ICS) is the standardized U.S. approach to managing crisis response, including oil spills. It might be better called an incident management system as it is designed for effective and efficient incident management by integrating facilities, equipment, personnel, procedures, and communications in a standard organizational structure. ICS is normally structured in five major functional areas: command, operations, planning, logistics, and finance and administration.

NIMS calls for the use of Unified Command (UC) as an expansion of ICS. Under UC, the various jurisdictions and/or agencies and non-government responders come together to create an integrated response team and become responsible for the overall management of the incident. In the event of an inability to reach a consensus on needed action in an appropriate time frame, the decision rests with the Federal On Scene Coordinator. For the system to work well requires effective advanced planning,

including development and implementation of overall objectives and strategies, as discussed under Implication 2, and effective exercising and training as discussed under Implications 9 and 10.

**IMPLICATION 7.**

**Adopt Unified Command as a part of response policy**

While Canada has committed to adopting the ICS approach, it remains to be seen how far it has been adopted. The response structure for the October 2016 Seaforth Channel / Bella Bella tug spill, however, seemed consistent with Unified Command.

**Unified Command needs to be adopted as a part of the broader initiative to achieve local government and community involvement in spill response management.**

**IMPLICATION 8.**

**The role of Port Authorities**

The responsibilities of the port authorities for spill response in the ports studied vary greatly.

In four of the ports, the port authority (PA) has very limited responsibility. In Hamburg, the city's PA ensures that facility operators have a capability to manage operational spills but spill monitoring and response rest with the city's Environment Emergency Response Unit, available 24/7. In the U.S., port authorities are landlords responsible for port lands, as are their Canadian counterparts, but are without any responsibility for the water body except for small basin areas such as marinas.<sup>24</sup> The USCG is responsible for port and associated waters. This makes U.S. ports very different from federal ports in Canada.

In Antwerp, Rotterdam and Southampton, the port authorities are responsible for spill response. They operate under very different institutional and geographic conditions but, in each, the responsibilities for the safe management of shipping, including spill response, and for the development of trade are combined successfully. They always have vessels on the water with crews able to detect and assess oil in the water; they have to have their own contingency plans to protect port and community interests; and they have ongoing diverse relationships with the communities of which they are a part. They have strong interests to do their best in meeting community expectations while keeping the port open for businesses. Effective spill response capability serves those interests.

Federal ports in Canada are responsible for federal lands and waters. In the case of Vancouver, the Vancouver Fraser Port Authority (VFPA) is responsible for the stewardship of federal waters and lands that include Roberts Bank, the Fraser River to Maple Ridge and Burrard Inlet. The port authority manages over 16,000 hectares of water, more than 1,000 hectares of land and approximately 350 kilometres of shoreline. Its mandate is to facilitate Canada's trade objectives, ensuring goods are moved safely, while protecting the environment and while considering the interests of local communities. It has close relationships with its communities on many economic and environmental matters. Although spill response is not an official part of their mandate, it is often a VFPA spokesperson who speaks out about the safety of shipping in response to concerns about spills from tankers and other ships.

By a Letter of Understanding (not a legally binding agreement) signed in December 2009 and published as an Annex in the Butler Report, VFPA and the CCG agreed that following notice of oil on the water to VFPA and CCG (assumed to be from Marine Communications and Traffic Services), a VFPA vessel would

**24** Because U.S. port authorities are not responsible for the water bodies, they do not have harbour masters. As a result, the International Harbour Masters Conference held in Vancouver in 2016 had no U.S. port representatives.

be sent to assess the situation. If the VFPA determines that the spill is *not* minor, then arrangements for handover to the duty officer of CCG would take place for subsequent spill response management.

At the time of the *M/V Marathassa* spill, VFPA did not have a contract with Western Canada Marine Response Corporation (WCMRC), the response organization for the west coast, although its services could have been requested. The VFPA was placing heavy reliance on the actions of CCG. What priorities may have existed or exist in contingency plans for the protection of specific facilities is not known as the plans are confidential.

**The similarity of conditions in Canadian ports with those in Europe and the difference with those in the U.S. raises the question of whether port authorities, rather than the CCG, should be responsible for spills in the waters over which the port authorities have jurisdiction.**

A change in responsibility would not need any change in the role of the Response Organizations under all plans but it would result in changed relationships in the planning and operational leadership. In port waters, VFPA would be the lead organization, ensuring a local perspective. Its immediate planning partners would be the province, the local communities, First Nations, and terminal operators, with WCMRC in an advisory role.

The VFPA already has diverse relationships with local governments and community groups on many matters, including environmental issues. The port plan would have to interface with plans for the waters beyond the port's jurisdiction so a trade-off exists. Is it better to make an 'outside agency' responsible for the port plan and its operation or is it better to expect a port plan to interface with a larger area plan developed and managed by the CCG? The principle of Unified Command can apply in any case. Only the players would differ.

A change in responsibility for spill response in Canada's ports would be a break with the past. It is also in conflict with the notion of following the U.S. pattern of responsibility resting with the Coast Guard. However, experience elsewhere reveals alternative models, with evidence (implications) that Canada may follow alternative allocations of responsibility for spill response.

## **8.0** THEME 4: Achieving Preparedness for Spill Response

Quick action is vital to effective containment of, and response to, an oil spill. The first hour is critical. This is obvious but achieving it is difficult. Consistently across the ports, given the location of equipment and personnel aligned with prior risk assessment, the most important contributor to preparedness is effective communication and frequent exercises. Exercises ensure a knowledge of responsibilities, relationships and decision processes, all aided by individuals that have come to know each other. Exercises make sure that cool heads prevail when urgent action is required during high-stress, real-world situations.

### **IMPLICATION 9.**

#### **Improved spill exercise policy is essential**

Exercises vary in nature and frequency, from the simplest and most frequent - a notification exercise every few months to make sure that the communication lists are correct, to annual exercises requiring deployment of equipment. The latter are costly but accepted as necessary. Tabletop simulations,



where no equipment is deployed but where teams are mobilized and respond according to exercise inputs delivered by an exercise control team, are recognized as cost effective and typically delivering substantial benefits.

It is important that main exercises be selected and designed carefully to test potential weak elements in a response system and be monitored and followed by written reviews by external as well as internal experts to identify flaws and areas of possible improvement.

In the U.K., the MCA plays an important role in ensuring that local authorities as well as ports carry out exercises. In the U.S., under OPA 90, shipping companies and facilities are required to hold training exercises annually, with an OPA audited exercise once every three years. Also, the USCG carries out government unannounced exercise events at terminals using 'average most probable' discharges. The USCG holds them four times a year but any one company is not tested more than once in three years.

While exercises are a part of Canadian practice, the Tanker Panel report notes that they have too often been carried out in silos and that a "more robust exercise program is needed" (Tanker Panel, page 24). The *M/V Marathassa* incident is evidence that the right types of exercises had not been carried out often enough.

### **Improvements in the location, structure and frequency of exercises are essential.**

Improvements are already taking place in exercise design but no information has been gathered about them.

#### **IMPLICATION 10.**

#### **Updated training is essential**

The need for trained individuals goes beyond the response organization. It starts with the first observers advising on the details of the spill and contributing to the strategy of the response. Getting it wrong is very costly. This implies that, with current practices, harbour vessels in Vancouver have crew members trained well in oil spill reporting which requires a knowledge of oil types and the effects of weather and sea conditions.

Response organizations are expected to have well-established training programs. The most common challenge identified in the ports visited was the need to train members of the public who would act as volunteers for shore clean up in case of a spill. The consistent experience is that when a spill comes ashore volunteers rush to the scene. They need to be kept clear, a familiar role of crowd control by the police.

One way to utilize citizens' interests is to form organizations for volunteers so they can meet occasionally and have a framework for training and maintaining their interest.

### **The need for response training is already recognized for coastal communities with the practices in Alaska of coastal community involvement providing an example.**

Two examples of the roles of public organizations may be cited. Ecological organizations are commonly the base for expertise in the treatment of affected wildlife and the natural environment. Other services,

such as the provision of food to response personnel, may be provided by a community organization, such as the Red Cross, available to assist in any emergency.

**IMPLICATION 11.**

**Accessibility to knowledge is essential**

Assessing the threat posed by an oil spill requires specialized knowledge: of the type of oil; how it may behave in particular water conditions; how it may affect particular plants and animals; how it may move under particular tide, current and weather conditions; how successful clean up methods may be; and how treatment techniques may affect the environment. Ensuring the availability of such knowledge requires foresight and planning.

The common practice is to have access to computer models remotely to obtain estimates of oil movements.<sup>25</sup> However, it has been pointed out that when oil is close to shore and wind conditions are affected by microclimatology, the truly local conditions may not be modelled adequately. The knowledge of locals familiar with the spill area can be invaluable.

For science-based knowledge, the clear need is for immediate access to knowledgeable individuals. As in B.C., in which the Provincial Ministry of Environment has someone assigned to the Unified Command (UC), the U.S. has a state person assigned to the UC. The UC roles are not operational but instead are the steering force for managing all aspects of the response. In the U.S., the USCG may activate National Oceanic & Atmospheric Administration (NOAA) as their scientific support coordinator (SSC).

In the U.K., all spills have available to them immediately the expertise of a Standing Environmental Group (SEG). The small area of England and Wales is divided into 14 regions, each with its own SEG.

A case in point is the contingency plan of the Solent Environment Group:<sup>26</sup>

The purpose of the SEG is:

- To provide public health and environmental advice and guidance to all response units involved in response to an oil and or chemical marine pollution incident and subsequent clean up operations.
- To advise response units so as to minimize the impact of the incident on the environment in the widest sense, taking account of risks to public health and the natural environmental, and potential impacts arising from any response operations, whether salvage or clean up operations, at sea and on the shoreline.
- To monitor, assess and document the public health and environmental (including wildlife) impact of a maritime pollution incident with respect to oil and/or chemicals and the impact of all measures implemented in response to the incident.
- To facilitate welfare, rehabilitation or humane disposal of wildlife casualties by recognized animal welfare organizations.

**In a country the size of Canada, with ports, cities and marine traffic of international scale, there must be local and science-based knowledge readily available to spill response teams.**

The Tanker Panel and the Butler Report underscored the importance of scientific advice from Environment and Climate Change Canada to those managing an incident. The Butler report noted the

<sup>25</sup> In Canada, we understand that the models reside with the National Environmental Emergency Centre, centralized as a national function in Montreal.

<sup>26</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/482092/Solent\\_Standing\\_Environment\\_Group\\_plan.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/482092/Solent_Standing_Environment_Group_plan.pdf)

value of the presence of a person from the National Environmental Emergency Centre (NEEC) who arrived in Vancouver 11 days after the *M/V Marathassa* spill occurred. However, the notion of reliance on individuals travelling from Montreal is not adequate, even if they are dispatched more readily than in the past.

It is necessary to ensure effective access to scientific and local knowledge, which may be inside or outside NEEC and provincial Ministries of Environment. Indigenous communities are an invaluable source of local environmental knowledge. They can also provide a community-based framework for contributing people and resources to response activities.

**IMPLICATION 12.**

**The need for 'pre-clearance'**

**The urgency of action in spill response means that pre-clearance should be a part of basic preparation so that if specialized or international resources and people are required their availability will not be delayed by regulatory matters.**

Three examples are offered. The first is the desirability of having established limits in place for clean-up technologies. A case in point is the use of chemical dispersants where the range of applications has been established in Europe by environmental authorities. This may be more appropriate than to leave the decision to the Coast Guard. The second example is to make sure that there are no restrictions on the immediate movement and employment of foreign resources and people in spill response. The third example is the desirability of ensuring clarity over responsibility, authority and liability issues associated with wreck removal. It is not clear whether signing the Nairobi Convention on dealing with shipwrecks would be beneficial to Canada.<sup>27</sup>

**IMPLICATION 13.**

**The breadth of spill response plans**

Two matters that should be a part of spill response planning are sometimes not given sufficient attention.

The first is disposing of or treating contaminated material. The availability of holding capacity sufficient to match cleaning rates is included in the assessment of the RO's response. However, the disposal of oil and contaminated material seems not to be included in response plans. It is simply left to the ROs, who usually do have arrangements in place for the disposal of contaminants as a part of their 'normal' business. However, the treatment or other disposal of contaminated materials on the scale of a significant spill is an unresolved issue in some ports. It does not seem to be an issue in Antwerp or Rotterdam, perhaps because of the scale of their chemical and oil processing industries.

**Plans for treatment or other disposal of contaminated materials on the scale of a significant spill need to be resolved.**

The second matter is a plan by which places of refuge are provided to ships in distress and likely to pollute. Most countries are grappling with their obligations under IMO international guidelines of how and where to provide refuge to ships in distress and likely to pollute (IMO, 2016). Canada has regional plans in place by which Transport Canada and CCG can coordinate and lead decision making (Transport

<sup>27</sup> The Nairobi International Convention on the Removal of Wrecks, which came into force April 2015, provides the legal basis for States to remove, or have removed, shipwrecks that may have adverse effects on the safety of lives, goods and property at sea, as well as the marine environment. It fills a gap in the prior international framework.

Canada, 2016a). However, no pre-designation of places of refuge are identified in the Pacific region because of the great variability of conditions among incidents (Transport Canada, 2016b).

**Decisions on a Place of Refuge for a ship in distress will have to be made if and when such an emergency arises.**

## 9.0 THEME 5: Achieving Scalability in Spill Response

It is not possible to have physical and human resources in all places at a level to meet the worst imaginable spill. The location of resources is planned on the basis of risk assessment to ensure adequate immediate protection, including such scenarios as two incidents at the same time. However, it is necessary to have arrangements in place by which the resources and the organization structure can be expanded. They need to be scalable (or allow for cascading as in the Tanker Panel report).<sup>28</sup>

### IMPLICATION 14.

#### Scalable management and resources

As noted previously, the concept of a tiered response is widely used to differentiate the scale of resources needed for spill response (IPIECA-OGP, 2015). Customarily, the tiers have been linked to tonnages of oil spilled as a criterion for the scale of resources needed in response. (Tier 1 handle by a single agency, Tier 2 requiring local or regional resources, Tier 3 requiring national or international resources.)

It is now recognized that many variables affect the level and nature of resources, expertise and authority that need to be available to deal with a spill. The view expressed by managers in the port and city of Southampton, the RO and MCA, is that the location and conditions associated with an actual or potential spill are the critical determinants to whether an escalation to national resources and to the national authority is warranted. At the national level, a committee in the so-called Cabinet Room in Whitehall in London advises an individual who has sole responsibility for decision making, which can provide effective access to resources quickly.

There is no simple criterion that determines which tier of response is required. The potential scale and consequences of a spill and, therefore, the resources needed for an effective response call for experience and knowledge. The effectiveness of any tiered response system is that the different levels of capability work together effectively.

<sup>28</sup> The ultimate in scalability is present in the resources of the largely petroleum industry funded Oil Spill Response Limited with its head office in Southampton but facilities around the world including a dedicated Boeing 737 aircraft.

Canada uses four Tiers defined by tons spilled and identified with service times in relation to the standards set for ROs by Transport Canada in 1995 (Transport Canada, 1995).

Tier	Maximum Quantity of Oil Spilled	Response Time Requirements
Tier 1 response capability	150 tonnes	6 hours
Tier 2 response capability	1,000 tonnes	12 hours
Tier 3 response capability	2,500 tonnes	18 hours
Tier 4 response capability	10,000 tonnes	72 hours

Access to national and international resources is recognized as necessary in the Tanker Panel report. This carries implications for the structure of the authority in the CCG.

**The processes and implications of escalation nationally and internationally need elaboration.**

The details of the Canada – U.S. Joint Contingency Plan have not been examined but the well established and highly flexible plans in the English Channel and North Sea may be useful benchmarks.

## 10.0 THEME 6: The Need for Continuous Improvement

Training and exercises are necessary to ensure individuals and organizations are prepared and able to work effectively together. They should also be undertaken with the goal of finding ways to improve performance even without material change in conditions. However, in reality, the conditions of shipping are dynamic. The volume and composition of trade varies over time, leading to changes in the number, size and technology of ships. The technologies used in communications for vessel traffic management and for spill response management continue to improve. Spill clean-up methods also continually improve. As a consequence, an important goal of a spill response system is to ensure the pursuit of continuous improvement.

### IMPLICATION 15.

#### Approaches to continuous improvement

Continuous improvement in spill response requires ongoing research into the sciences related to oils in the ocean environment and into the effectiveness of alternate technologies.<sup>29</sup> It also requires processes that ensure that response plans are based on current information on local environmental conditions. Finally, plans need to be updated to ensure that they are in keeping with new knowledge and the changing conditions in shipping.

To this end, **leading spill response systems include not only mandated schedules for exercises but also the mandated revision and review of contingency plans on a three- or five-year basis.**

<sup>29</sup> The announcement of the new Oceans Protection Plan includes a commitment to provide increased support for research.

## 11.0 Conclusions

The implications for Canada of this study of spill response practices in seven leading ports in five countries are reached with three conditions in mind. They are:

- The desired attributes of emergency response systems are well known; Canada has not followed them adequately in its spill response system.
- Studies for the Province of B.C. and the federal government have indicated the general direction of change needed and made specific recommendations. The need for area focused, risk-based response planning has been recognized since 2013.
- The development of a new Oceans Protection Plan bears witness to the need for significant changes in the National Marine Spills Contingency Plan.

The fifteen specific implications presented previously and listed in a summary on p. 29, encompass four considerations for change not made in the prior studies. They are:

1. Defining clearly the role of response organizations in training and education in addition to technical capacity, while emphasizing that they are not the lead organization responsible for the effectiveness of a spill response.
2. Considering shifting responsibility for spill response planning and management in federal ports from the Canadian Coast Guard to port authorities.
3. Mandating public availability and transparency of spill incident data and response plans of agencies and corporations under federal jurisdiction (excepting personal contact information) and encouraging the same by other levels of government.
4. Ensuring the availability and integration of local Indigenous and science-based knowledge to spill response teams.

The remaining implications are in line with the recommendations of previous reports or are consistent with the standard requirements of excellence in emergency response systems.

## Summary of Implications by Theme

### THEME 1:

## The Importance of National Policy

#### IMPLICATION 1.

**A diminished role for national standards:** The implication is that there is a lessening place for 'national standards' and that local conditions are key determinants of response capability requirements.

#### IMPLICATION 2.

**National regulations for local, risk-based spill response management:** National regulations comparable to the requirements for regional and area structures and practices found in the U.S. would ensure local input for risk-based response planning.

#### IMPLICATION 3.

**More responsibility should rest with the Canadian Coast Guard:** Consideration should be given under the new Oceans Protection Plan to shifting more responsibilities to the Canadian Coast Guard.

#### IMPLICATION 4.

**Response organizations have technical and educational roles:** Response organizations are important in the development of spill response plans, in the training of people for roles in spill response and in the execution of spill response exercises and actual responses but they are not the lead organization responsible for the effectiveness of the spill response.

#### IMPLICATION 5.

**The need for transparency:** Experience elsewhere suggests that public transparency is beneficial for oil spill data, spill investigations, the processes by which contingency plans are made and the contingency plans.

### THEME 2:

## The Holistic Nature and Goals of Oil Spill Prevention and Oil Spill Response

#### IMPLICATION 6.

**Effective public communication is an objective of spill response:** Effective media and public relations is an explicit objective of the response task.

### THEME 3:

## An Integrated Response to Spills in Ports

#### IMPLICATION 7.

**Adopt Unified Command (UC) as a part of response policy:** UC needs to be adopted as a part of the broader initiative to achieve local government and community involvement in spill response management.

#### IMPLICATION 8.

**The role of Port Authorities:** The similarity of conditions in Canadian ports with those in Europe and the difference with those in the U.S. raises the question of whether port authorities rather than the Canadian Coast Guard should be responsible for response to spills in the waters over which the port authorities have jurisdiction.

#### THEME 4:

### Achieving Preparedness for Spill Response

#### IMPLICATION 9.

**Improved exercise policy is essential:** Improvements in the location, structure and frequency of spill response exercises are essential.

#### IMPLICATION 10.

**Updated training is essential:** The need for response training is already recognized for coastal communities with the practices in Alaska of coastal community involvement providing an example.

#### IMPLICATION 11.

**Accessibility to knowledge is essential:** In a country the size of Canada, with ports, cities and marine traffic of international scale, there must be local and science-based knowledge readily available to spill response teams.

#### IMPLICATION 12.

**The need for 'pre-clearance':** The urgency of action in spill response means that pre-clearance should be a part of basic preparation so that if specialized or international resources and people are required their availability will not be delayed by regulatory matters.

#### IMPLICATION 13.

**The breadth of spill response plans:** The treatment or disposal of contaminated materials on the scale of a significant spill needs to be resolved.

Decisions on a Place of Refuge for a ship in distress will have to be made if and when such an emergency arises.

#### THEME 5:

### Achieving Scalability in Spill Response

#### IMPLICATION 14.

**Scalable management and resources:** The processes and implications of escalation nationally and internationally need elaboration.

#### THEME 6:

### The Need for Continuous Improvement

#### IMPLICATION 15.

**Approaches to continuous improvement:** Leading spill response systems include not only mandated schedules for exercises but also the mandated revision and review of contingency plans on a three- or five-year basis.



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## Appendix A

### International Convention on Oil Pollution Preparedness, Response and Co-operation: Selected Sections of Articles: 2, 3, 5 and 6

#### **ARTICLE 2: Definitions (in part)**

- (2) "Oil pollution incident" means an occurrence or series of occurrences having the same origin, which results or may result in a discharge of oil and which poses or may pose a threat to the marine environment, or to the coastline or related interests of one or more States, and which requires emergency action or other immediate response.

#### **ARTICLE 3: Oil pollution emergency plans**

- (1) (a) Each Party shall require that ships entitled to fly its flag have on board a shipboard oil pollution emergency plan as required by and in accordance with the provisions adopted by the Organization for this purpose.
- (b) A ship required to have on board an oil pollution emergency plan in accordance with subparagraph (a) is subject, while in a port or at an offshore terminal under the jurisdiction of a Party, to inspection by officers duly authorized by that Party, in accordance with the practices provided for in existing international agreements or its national legislation.
- (2) Each Party shall require that operators of offshore units under its jurisdiction have oil pollution emergency plans, which are co-ordinated with the national system established in accordance with article 6 and approved in accordance with procedures established by the competent national authority.
- (3) Each Party shall require that authorities or operators in charge of such sea ports and oil handling facilities under its jurisdiction as it deems appropriate have oil pollution emergency plans or similar arrangements which are co-ordinated with the national system established in accordance with article 6 and approved in accordance with procedures established by the competent national authority,

#### **ARTICLE 4: Oil pollution reporting procedures**

- (1) Each Party shall:
- (a) require masters or other persons having charge of ships flying its flag and persons having charge of offshore units under its jurisdiction to report without delay any event on their ship or offshore unit involving a discharge or probable discharge of oil:
- (i) in the case of a ship, to the nearest coastal State;
  - (ii) in the case of an offshore unit, to the coastal State to whose jurisdiction the unit is subject;
- (b) require masters or other persons having charge of ships flying its flag and persons having charge of offshore units under its jurisdiction to report without delay any observed event at sea involving a discharge of oil or the presence of oil:
- (i) in the case of a ship, to the nearest coastal State;
  - (ii) in the case of an offshore unit, to the coastal State to whose jurisdiction the unit is subject;

- (c) require persons having charge of sea ports and oil handling facilities under its jurisdiction to report without delay any event involving a discharge or probable discharge of oil or the presence of oil to the competent national authority;
  - (d) instruct its maritime inspection vessels or aircraft and other appropriate services or officials to report without delay any observed event at sea or at a sea port or oil handling facility involving a discharge of oil or the presence of oil to the competent national authority or, as the case may be, to the nearest coastal State;
  - (e) request the pilots of civil aircraft to report without delay any observed event at sea involving a discharge of oil or the presence of oil to the nearest coastal State.
- (2) Reports under paragraph (l)(a)(i) shall be made in accordance with the requirements developed by the Organization and based on the guidelines and general principles adopted by the Organization. Reports under paragraph (l)(a)(ii), (b), (c) and (d) shall be made in accordance with the guidelines and general principles adopted by the Organization to the extent applicable.

#### **ARTICLE 5: Action on receiving an oil pollution report**

- (1) Whenever a Party receives a report referred to in article 4 or pollution information provided by other sources, it shall:
- (a) assess the event to determine whether it is an oil pollution incident;
  - (b) assess the nature, extent and possible consequences of the oil pollution incident; and
  - (c) then, without delay, inform all States whose interests are affected or likely to be affected by such oil pollution incident, together with
    - (i) details of its assessments and any action it has taken, or intends to take, to deal with the incident, and
    - (ii) further information as appropriate, until the action taken to respond to the incident has been concluded or until joint action has been decided by such States.
- (2) When the severity of such oil pollution incident so justifies, the Party should provide the Organization directly or, as appropriate, through the relevant regional organization or arrangements with the information referred to in paragraph (l)(b) and (c).
- (3) When the severity of such oil pollution incident so justifies, other States affected by it are urged to inform the Organization directly or, as appropriate, through the relevant regional organizations or arrangements of their assessment of the extent of the threat to their interests and any action taken or intended.

## ARTICLE 6: National and regional systems for preparedness and response

- (1) Each Party shall establish a national system for responding promptly and effectively to oil pollution incidents. This system shall include as a minimum;
  - (a) the designation of:
    - (i) the competent national authority or authorities with responsibility for oil pollution preparedness and response;
    - (ii) the national operational contact point or points, which shall be responsible for the receipt and transmission of oil pollution reports as referred to in article 4; and
    - (iii) an authority which is entitled to act on behalf of the State to request assistance or to decide to render the assistance requested;
  - (b) a national contingency plan for preparedness and response which includes the organizational relationship of the various bodies involved, whether public or private, taking into account guidelines developed by the Organization.
- (2) In addition, each Party, within its capabilities either individually or through bilateral or multilateral co-operation and, as appropriate, in co-operation with the oil and shipping industries, port authorities and other relevant entities, shall establish:
  - (a) a minimum level of pre-positioned oil spilt combating equipment, commensurate with the risk involved, and programmes for its use;
  - (b) a programme of exercises for oil pollution response organizations and training of relevant personnel;
  - (c) detailed plans and communication capabilities for responding to an oil pollution incident. Such capabilities should be continuously available; and
  - (d) a mechanism or arrangement to co-ordinate the response to an oil pollution incident with, if appropriate, the capabilities to mobilize the necessary resources.

## Appendix B

### The Study Team

The study team was led by Dr. Trevor Heaver, Professor Emeritus at the Centre for Transportation Studies, University of British Columbia. The project would have been impractical without the participation of many people. The early and subsequent advice of Dr. Elliott Taylor of Polaris Applied Sciences was vital to the research direction and the work with the three U.S. ports.

The research in the U.S. ports has been conducted largely by Jocelyn Fraser, Liu Scholar & UBC Public Scholar, PhD Candidate in Mining Engineering, who has previous consulting experience in spill response. That experience has been beneficial generally. The research in Antwerp and Rotterdam was the responsibility of Valentin Carlan, PhD Researcher, under the direction of prof. Dr. Christa Sys and prof. Dr. Thierry Vanelander, all of the Faculty of Applied Economics, Department of Transport and

Regional Economics. Finally, Dr. Jane Lister, Associate Director, CTS, has consistently provided advice on the research and project management support.

All members of the research team have offered advice on the final report, as have Meghan Mathieson and Miles Jolliffe of Clear Seas. The advice has contributed greatly to the accuracy and clarity of the text.

## Appendix C

### List of Persons Interviewed

Research with the geographic scope of the study has been facilitated by the ready availability of the general literature and specific studies on the Internet. However, the opportunity to conduct personal interviews with a range of knowledgeable managers in each port has been indispensable to gaining accurate insights into the conditions of each port. The important assistance provided by these managers is acknowledged with thanks.

#### **Vancouver:**

Canadian Coast Guard: Tim McCann, Lead, Environmental Response – Western Region Area Response Planning (ARP), – Canadian Coast Guard Task Force

Kinder Morgan: Kelly Malinoski, Manager, Emergency Management.

Staynor Response Services Ltd.: John Staynor.

Trans Mountain Expansion Project: Bikramjit Kanjilal, Lead, Marine Development.

Vancouver Fraser Port Authority: Jeff Pelton, Marine Operations Specialist.

Western Canada Marine Response Corp: Michael Lowry, Manager Communications.

#### **Houston:**

Greater Houston Port Bureau, Captain Bill Dieht, President.

U.S. Coast Guard: LCR Brent Yezefski, LTJG Keriann Mason, and Chief Tim Rice.

Port of Houston Authority: Captain William Buck, Chief, Port of Houston Fire Department

Dr. Joan Mileski: Professor, Texas A&M University at Galveston.

#### **Los Angeles:**

U.S. Coast Guard: CDR Rom Mathews; CDR Lushan Hannah; and LCDR Dan Ippilioto.

State of California: Jon Victoria, Natural Resources Agency, Dept. Fish & Wildlife, Office Spill Prevention & Response; Sonya Towers, Environmental Specialist

Los Angeles County Fire Department: Oliver O’Connel, Rescue Boat Captain

Port of Los Angeles: Dong Lee, Tactical Planning / Haz-Mat Investigations, Los Angeles Port Police

**Seattle:**

U.S. Coast Guard: CDR Brian Meier, Response Chief, and LCDR Jason Hagen.

Port of Seattle: Mike DeSota, Environment Compliance Program Manager.

City of Seattle, Seattle Fire Department: Willie C Barrington II, Captain, Emergency Preparedness/Homeland Security.

**Antwerp:**

Antwerp Port Authority: Joris Vanderhallen and Kris De Craene.

Harbour Master: Marc Bosseler, Peter De Pauw, and Robert Hendrikx.

IBZ (Federal Emergency Planning and Management): Christel Haex and Anne Martens.

Federal Waterway Police: Peter Van Eeckhoven.

Civil Protection: Rene D'Hooghe

Brabo Cleaning Company: Koen De Groof.

Group de Cloedt (dredging): Jef De Brabandere.

Antwerp Municipality: Bart Bruelemans.

Ship Owners' Association: Wilfred Lemmens.

**Hamburg:**

Ministry of Environment and Energy, Environmental Emergency Response Unit: Dr. Gudrun Winkler.

Hamburg Port Authority: Sven Maudrich, Head, Support Program Protection

**Rotterdam:**

Port of Rotterdam Authority: Marco Wensveen.

Ministry of Public Works: Sjon Huisman.

AON (Risk Management): Erwin Van Geyte.

Rotterdam Oilboompool: Oemesh Soekar.

HEBO Maritime Services: Mark Van de Meer.

**U.K., Southampton**

Maritime and Coastguard Agency: Will Crocker and Andrew Healy, Counter Pollution and Salvage.

Associated British Ports Southampton: Ray Blair, Deputy Harbour Master.

Southampton City Council: Ian Collins, Emergency Planning and Business Continuity Manager and Stephanie Layzell, Emergency Planning Officer.

Adler and Allan Limited: Beth Esau, Marine Contracts Manager and David Bray, Assistant Contract Manager.

Oil Spill Response Limited: Andrew Nicoll, Advocacy Manager.

**U.K., London:**

ITOPF Ltd.: Dr. Mark Whittington, Technical team Manager and Nicky Cariglia, Technical Advisor,

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