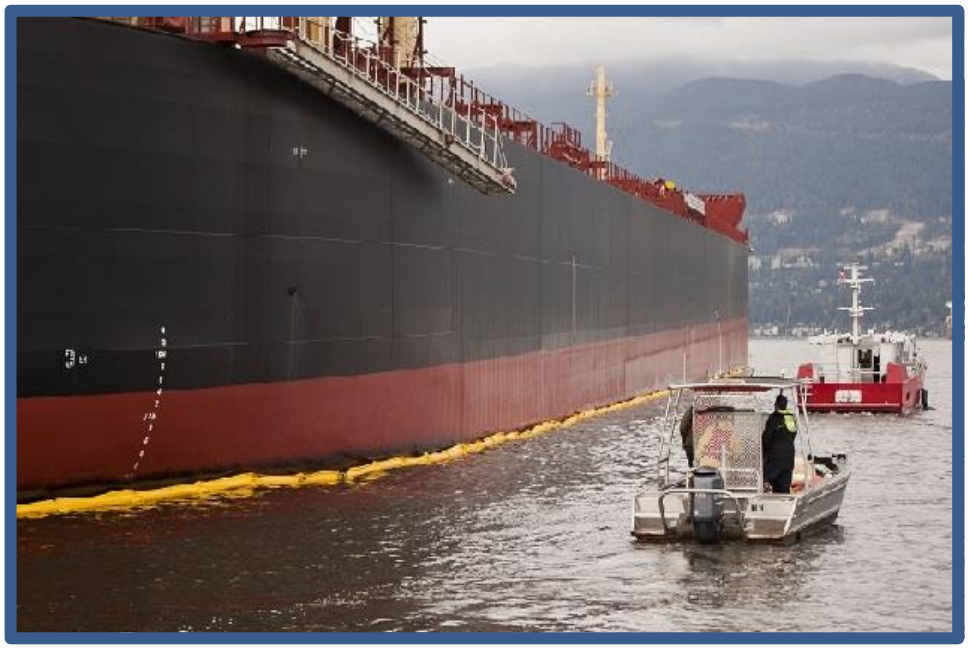
Independent Review of the *M/V Marathassa* Fuel Oil Spill Environmental Response Operation



Presented to Commissioner Jody Thomas
Canadian Coast Guard
July 19, 2015

This review was conducted with the objective of improving the overall oil spill response regime for the Canadian Coast Guard, its partners and Canadians. It is not the function of the review to assign fault.

Acknowledgements and List of Stakeholders

This report was prepared to understand the key factors of the incident. Some partners identified broader issues that, due to time constraints, could not be addressed.

The report could not have been researched, compiled and written without the dedicated assistance of the partners in Unified Command. Unified Command partners' unwavering support during response efforts throughout this incident is recognized and appreciated.

I would also like to thank the Secretariat who contributed endless hours to this review.

Our Review partners included:

- Canadian Coast Guard
- Vancouver Coastal Health
- International Tanker Owners Pollution Federation
- Stanley Park Ecology Society
- Musqueam First Nation
- North Shore Emergency Management Office
- City of North Vancouver
- District of North Vancouver
- District of West Vancouver
- Oiled Wildlife Society
- Tsleil-Waututh Nation
- Western Canada Marine Response Corporation
- City of Vancouver
- Canada Shipping Federation
- Vancouver Aquarium
- Transport Canada
- Environment Canada
- Focus Wildlife
- British Columbia Chamber of Shipping
- Port Metro Vancouver
- Province of British Columbia (Ministry of Environment and Emergency Management British Columbia)
- Local sailors

John Butler
Lead, *M/V Marathassa* Review

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Executive Summary

At 16:48PST[1] on Wednesday, April 8, 2015 the sailing vessel *Hali* observed a sheen of oil in English Bay and reported it to the Canadian Coast Guard (CCG). The CCG managed the response and clean-up operation with support from key partners, including Western Canada Marine Response Corporation (WCMRC), other federal departments, other levels of government and non-governmental organizations. Although the Captain and representatives for the *M/V Marathassa* initially denied responsibility, it was subsequently determined in the early morning of April 9, 2015 that the *M/V Marathassa* had discharged an unknown quantity of intermediate fuel oil (suspected to be IFO 380[2]) into English Bay on April 8.

This was an operational discharge of persistent fuel oil with very high consequences. Port Metro Vancouver (PMV) is a large, multi-user commercial gateway with on average 20[3] large deep-sea vessels at anchorage or terminals at any given time, representing an important economic hub for Vancouver and Western Canada. As such, it is essential that oil spills are prevented and/or cleaned up quickly and efficiently to ensure continued operation of the port. Additionally, public safety and health risks are an important consideration, as English Bay is surrounded by a large urban population who regularly use the parks and beaches of the cities. Oil spills can also have detrimental effects on the marine environment, which could impact wildlife, marine mammals and fisheries populations.

Due to the complexity of this incident, the Commissioner of the CCG initiated a review for the purpose of identifying what worked well and what could be improved. The purpose of the review is to identify the key facts that took place following the discharge of fuel oil on April 8, from the first notification to CCG to the closing of the Incident Command Post (ICP). The Terms of Reference is attached in **Annex A**. The report, however, will not examine the nature of the spill or cause of the spill, as these circumstances are the subject of an ongoing Transport Canada (TC) investigation.

CCG's Western Region, which encompasses the entire coast of British Columbia (BC), receives approximately 600 pollution reports each year, approximately 40[4] of which occur in the port, and approximately 10[5] of which require an on-water recovery. CCG and the WCMRC regularly address these spills in their daily operations. The *M/V Marathassa* on-water recovery and clean-up operation is an atypical event for the CCG or WCMRC. In this case, the response and clean-up lasted a total of 16[6] days. Skimming of the fuel oil was conducted immediately and completed on day four, the polluting vessel was boomed in the

[1] All times are reported are in Pacific Standard Time (PST).
[2] IFO 380 is referenced in the *M/V Marathassa's* Material Safety Data Sheet which can be found in Annex E.
[3] The average number of anchored vessels was provided by PMV.
[4] The number of pollution reports was provided by CCG.
[5] The number of on-water recoveries was provided by CCG.
[6] Dates and number of days for action can be found in Annex B.

early morning on April 9, and shoreline clean-up continued until day 16. There was minimal impact on the public from a health and safety perspective; however, Environment Canada (EC) estimated that approximately 20 birds were affected. Ongoing effects are being monitored by the Project Management Office (PMO), which was established following the close of the ICP. Activities of the PMO were not considered as part of the review.

Partners within Unified Command and other industry partners were invited to participate in the review to provide their perspective. Based on these discussions, the report identifies a number of areas that worked well, and highlights a number of areas that could be improved.

What worked well:

- CCG used an inclusive approach to the Unified Command structure, bringing in other levels of government and non-governmental organizations, which was seen in a positive light by most;
- As the response progressed, Unified Command, under CCG leadership, became increasingly coordinated;
- Many partners were praised for their leadership abilities within Unified Command;
- The operational fuel oil spill clean-up was successfully executed by the WCMRC under the direction of the CCG. WCMRC skimmed fuel oil off the water throughout the night of Wednesday, April 8 and surrounded the vessel with a containment boom on Thursday, April 9, to prevent further pollution damage. On Thursday morning, it was estimated that approximately 2800L[7] of intermediate fuel oil remained on the water, and by Friday afternoon 5.9L remained;
- WCMRC took a proactive posture early on in the incident, and as a result was able to respond swiftly;
- Partners were supportive of the Area Response Planning (ARP) concept moving forward, including broadened engagement in the development of plans, and the ability to provide valuable information on environmental sensitivities and risks;
- Partners welcomed the opportunity to participate in meaningful engagement on ways to improve oil spill response and are prepared to continue to build these relationships;

[7] National Aerial Surveillance Program (NASP) flight estimate was provided by Transport Canada. Satellite images are provided by Environment Canada's Integrated Satellite Tracking of Pollution (ISTOP) program. https://www.tc.gc.ca/eng/marinesafety/oep-ers-nasp-2195.htm

- Provincial and municipal partners, and WCMRC are well versed in Incident Command System (ICS) and have offered to exercise and assist the CCG in its implementation of ICS; and

- Partners highlighted that the management of oiled wildlife was conducted effectively.

What could be improved:

- CCG should improve its communication protocols with partners to ensure accuracy of communications. A combination of factors such as uncertainty of roles and responsibilities, miscommunications, and technical difficulties, resulted in a delay in the response of 1 hour and 49 minutes;

- CCG did not have the initial capacity to stand up the ICP and Unified Command as they were demobilizing Pollution Response Officers (PRO) from the *Brigadier General Zalinski* operation[8] in Grenville Channel; therefore, the CCG contracted WCMRC to initiate the on-water response and provide ICP support;

- Information sharing on a common network was not possible due to Government of Canada electronic policies and protocols, which limited the effectiveness of the ICP;

- CCG is in its third year of a five year ICS implementation and has not yet reached full operational capacity. While this was widely acknowledged, it took several days for Unified Command to achieve an operational rhythm;

- Early alerting of the municipalities, First Nations, and stakeholders of the incident was delayed due to the low classification of the incident in the provincial alerting system. Some partners were notified of the incident via informal channels due to previous working relationships or were alerted by the heightened media attention;

- Many partners noted that the current ARP timelines do not align with the immediate need to engage partners in the development of an efficient and effective plan in Vancouver Harbour. Partners would like to see ARP timelines accelerated;

- The lack of a physical presence of Environment Canada impacted the effectiveness and efficiency of the Environmental Unit. Environment Canada's on-site leadership in providing sound, independent scientific and environmental advice would have been greatly beneficial to this incident;

- Public communications from Unified Command was challenging as energy was focused on supporting government officials in media briefings, rather than ensuring key facts about the on-water operation were being shared with citizens and Unified Command partners; and

[8] The *Brigadier General Zalinski* operation is a continuing CCG-led oil recovery operation in Grenville Channel.

- In this incident, there appeared to be confusion among some partners regarding the roles and responsibilities of key partners in oil spill response.

There are 25 recommendations identified in this report for the CCG and partners' consideration. The intention is to present recommendations that improve the oil spill response regime for Canadians and have been noted by many partners. The observations, analysis and recommendations are contained in the report and summarized in the conclusion.

CHAPTER 1 – INTRODUCTION AND CONTEXT OF THE INCIDENT

1.1 BRIEF SUMMARY OF THE OPERATIONAL RESPONSE

According to the information available to the Canadian Coast Guard (CCG), the *M/V Marathassa* left the shipyard in Maizuru, Japan on March 16, 2015 to embark on its maiden voyage. The vessel then left Busan, South Korea on March 20, 2015 bound for Vancouver, with an expected date of entry of April 6, 2015.

The *M/V Marathassa* entered the Vessel Traffic Zone, a regulatory zone extending to a limit of 12 miles off the coast of Canada, on the afternoon of April 5, 2015 and projected arriving in Vancouver on the morning of April 6, 2015. The vessel was making the transit in ballast, meaning without cargo. Upon seeking authorization to enter Canadian waters, the vessel had reported no defects or deficiencies in the hull, propulsion system, steering system, radars, compasses, anchors or cables. The vessel entered Canadian waters and followed the Traffic Separation scheme through the Strait of Juan de Fuca to Port Metro Vancouver (PMV). The *M/V Marathassa* arrived in English Bay, early on the morning of April 6 and proceeded to anchorage 12.

Automatic Identification System data tracking a portion of the M/V Marathassa's journey into English Bay

Late in the afternoon on April 8, at 16:48h, the CCG's Marine Communications Traffic Services (MCTS) Centre received the first report of a mystery fuel oil spill sheen in the water, in English Bay close to an anchored deep-sea vessel, the *M/V Marathassa*. Several citizens from the Greater Vancouver Area reported similar observations in the minutes that followed, including one report indicating there were tar balls or fuel oil in the water. These reports initiated the assessment of the mystery fuel oil spill by PMV, and the subsequent regional and national response to the fuel oil spill by CCG, the Western Canada Marine Response Corporation (WCMRC) and its partners in Unified Command.

Marine oil spill response in English Bay, Vancouver involves many partners: the polluter or Responsible Party, CCG, Transport Canada (TC), Environment Canada (EC), WCMRC as the certified Response Organization, and PMV as per the *Canada Marine Act* and the associated

Port Authorities Operations Regulations[9]. These roles and responsibilities regarding oil spill response are further clarified in the *Canada Shipping Act,* 2001. While CCG has ultimate responsibility for ship-source and mystery-source spills in Canadian waters, a Letter of Understanding (LOU) between PMV and CCG provides further clarification on responsibilities in the port (referenced in **Annex F**). It indicates that the port will collect information in order to conduct an initial assessment. If a spill is determined to be recoverable, the CCG will assume command and control. Both parties have agreed to work closely through this arrangement and the model has been working successfully for numerous years.

Once the CCG received the initial pollution report, they contacted PMV at 17:04h to begin collecting information to inform the assessment. As a result of the large surface area the fuel oil spill covered, PMV: transited through the anchorages; collected information about the spill; deployed sorbent pads into the water to determine whether it was recoverable; viewed patches of dispersed sheens and recoverable fuel oil; and tried to identify the source. Assessments of the quantity of oil on the surface of the water can be challenging due to a person's limited range of view. During this period the extent of the fuel oil spill was discussed amongst the port and CCG.

Notification of several key partners such as TC, EC and the Province of British Columbia (BC) occurred at 17:10h, although the provincial alerting criteria did not initially trigger cascading communications to First Nations, affected municipalities and other partners.

Based on aerial photos received by PMV from aircraft transiting the area at 19:27h, and subsequent discussions amongst partners that the fuel oil dispersion was extensive and recoverable in some areas, the CCG activated WCMRC at 19:57h to initiate an on-water response. WCMRC responded and had crew on scene one hour 28 minutes later and immediately began skimming the fuel oil off the water. As per TC's *Response Organization Standards*[10], Response Organizations must mobilize resources within 6 hours after notification of the spill in a designated port. Additionally, the CCG has Environmental Response Levels of Service[11], requiring resources to be mobilized within 6 hours of the assessment. Due to the WCMRC's strategically located assets in the port area, their response was well within the established standards.

The CCG arrived at PMV to assume the On-Scene Commander (OSC) role, as the source of the fuel oil spill was not yet confirmed. At 21:30h, the CCG boarded the suspected polluting vessel, the *M/V Marathassa*, to discuss the spill with the Captain. The CCG issued a notice requesting the vessel's representatives' intentions of how they planned to respond to the

[9] *Canada Marine Act, 1998.* Available at: http://laws-lois.justice.gc.ca/eng/acts/c-6.7/ (Accessed: July 6, 2015)
Port Authorities Operations Regulations (SOR/2000-55), 2014. Available at: http://laws-lois.justice.gc.ca/eng/regulations/sor-2000-55/index.html (Accessed: July 6, 2015)
[10] Response Organization Standards (TP 12401), Transport Canada, 1995. Available at: http://www.tc.gc.ca/media/documents/marinesafety/tp12401e.pdf
[11] Environmental Response Levels of Service, Canadian Coast Guard, 2010. Available at: http://www.dfo-mpo.gc.ca/Library/342655.pdf

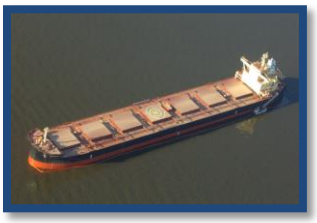
fuel oil emanating from the vessel, as per oil spill response protocols. The Captain denied the vessel was the source of the pollution.

Throughout the night, WCMRC continued to recover fuel oil from the water. Although the *M/V Marathassa* had not yet been confirmed as the polluter, WCMRC and CCG determined the need to boom the vessel at 03:25h after indications that fresh fuel oil was being discharged, which was completed by 05:25h. The first priority of any oil spill response is to control it at its source. By that time, a representative for the vessel continued to deny responsibility for the marine pollution and indicated that they would not be taking any actions.

By 07:00h, the CCG requested space at PMV to coordinate a response. Unified Command was officially established by the CCG as the lead agency, as the polluter was not willing or able to take action. Key partners, including the province of British Columbia and the City of Vancouver were already on scene.

Several aerial overflights were conducted throughout the day on April 9, including a National Aerial Surveillance Program (NASP) flight at 12:20h that estimated that there remained approximately 2800L of intermediate fuel oil on the water; however, this estimate did not include any recovered fuel oil from the previous night. By 18:06h it was estimated that the remaining fuel oil on the water had been reduced to 667L, due to recovery operations, evaporation, dispersion in the water and quantities being deposited on beaches, etc. International best practice of on-water oil spill recovery average rates in all weather conditions is 10-15%[12], but under ideal conditions the recovery rate could exceed this amount. Shoreline assessments were conducted, with reports of fuel oil at a variety of sites; however, no oiled wildlife was observed at this point.

M/V Marathassa



Type: Panamax-sized bulk grain carrier
Run by: Alassia NewShips Management Inc., based in Greece
Built: 2015
Flag: Cyprus
Deadweight tonnage: 81,000

Source*: http://www.alassia.gr/*

[12] International Tanker Owners Pollution Federation, Containment and Recovery. Available at: http://www.itopf.com/knowledge-resources/documents-guides/response-techniques/containment-recovery/ (Accessed July 6, 2015)

The nature and amount of fuel oil released from the vessel will be the subject of further investigation by TC; however, for the purposes of the response operation it was estimated to be 2800L of intermediate fuel oil IFO 380 on the water, as of the morning of April 9. While the estimated quantity was shared with Unified Command partners, the suspected type of fuel oil was not. The working estimate of the total actual fuel oil recovered by WCMRC was 1400L. This is a subjective estimate by experienced oil spill responders based on the estimates of the quantity of oil collected on the water, accumulated on boom, the vessel, sorbent pads, etc.

This lack of critical information regarding the type and quantity of fuel oil impacted the flow of public information to the responsible parties and limited their ability to advise the public on precautionary measures. This was also a subject of much speculation regarding the potential cumulative effects of the polluting fuel oil product.

The CCG, through Unified Command, continued to coordinate the overall response effort. The level of effort was significant with an average of 75 people at Unified Command and up to 100 personnel working on the water and shoreline remediation on a daily basis.

Fortunately, the impact on wildlife was mitigated to the greatest extent possible and an effective response program was put in place. Environment Canada estimates 20 birds were impacted by the fuel oil, with one fatality and three successfully captured and rehabilitated prior to being released into their environment.

The *M/V Marathassa* was released on April 24 to continue her voyage. At that time, Unified Command was demobilizing and a response team was established to address any further clean-up efforts. The Project Management Office was established to continue working with First Nations and stakeholders on outstanding tasks. On April 25, the *M/V Marathassa* departed English Bay.

1.2 FACTORS AT PLAY

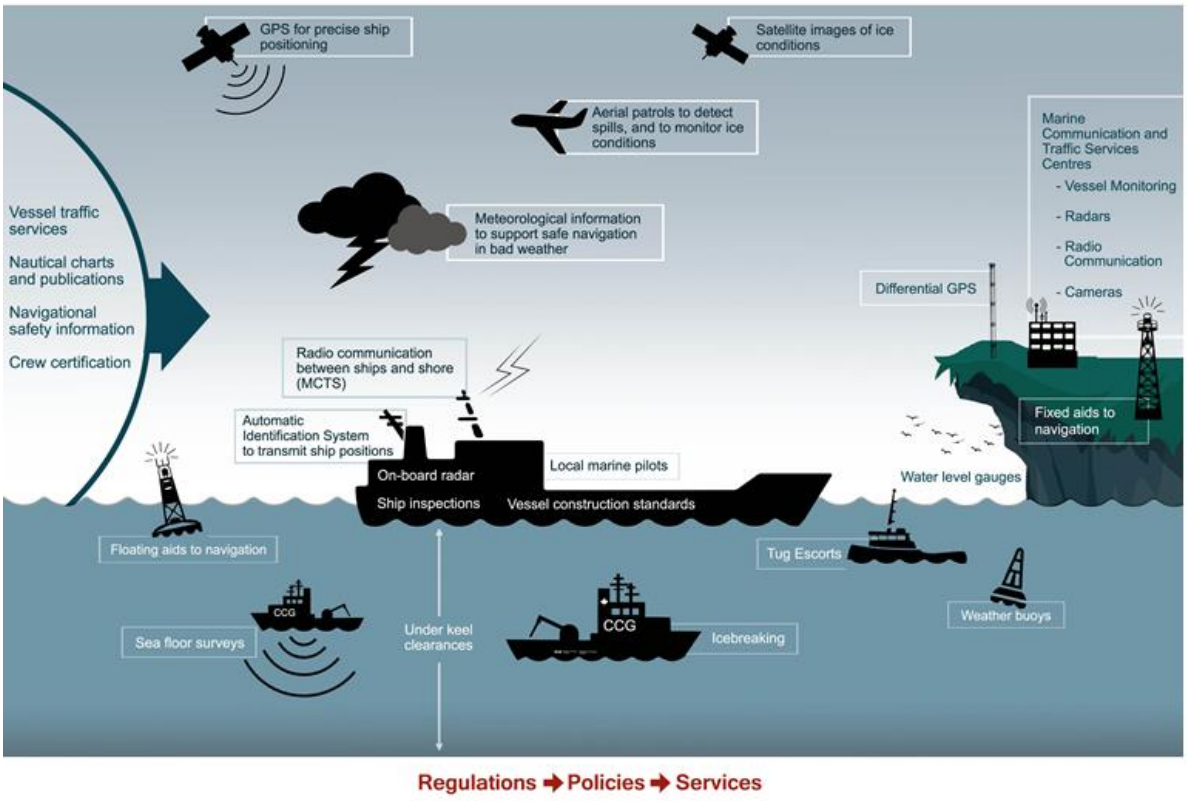
There were a multitude of factors surrounding the incident which influenced the operational response and should be acknowledged at the onset in order to have a more comprehensive understanding of the incident and how it unfolded.

Canada's Marine Oil Spill Preparedness and Response Regime

Canada's *Marine Oil Spill Preparedness and Response Regime*[13] is based on the 'polluter pay principle', which requires the polluter or the Responsible Party to take full responsibility for the cost of cleaning up any damages caused by an oil spill. This principle is supported by both industry and the federal government. Industry, through TC-certified Response Organizations, provides Canada's primary response capability.

[13] More information on Canada's *Marine Oil Spill Preparedness and Response Regime* and the existing roles and responsibilities for oil spill response in Vancouver Harbour can be found in Annex C.

Within this regime, TC provides the legislative and regulatory framework. The CCG is legislated to oversee industry's response to ship-source spills and manages the response when the polluter is unknown, unable or unwilling to respond, ensuring an appropriate response to all ship-source and mystery-source oil spills. EC provides the scientific, environmental and wildlife information and advice.



Graphical representation of marine oil spill prevention in Canada

Since its creation in 1995, the regime has been successful at preventing and reducing the occurrence of oil spills in Canadian waters, due to the regulatory, prevention and operational measures in place. As such, the occurrence of large spills in Canada is rare compared to other international regimes[14], which has limited Canada's exposure and experience in responding to large marine oil spills within Canada.

In the case of a mystery spill, the CCG is responsible for exercising leadership and managing the response in collaboration with partners and industry, as On-Scene Commander (OSC). When the polluter is identified, the CCG advises the polluter of his or her responsibilities and asks for their intentions regarding oil spill response. If the polluter is willing and able, the CCG will monitor the polluter's response, as the Federal Monitoring Role (FMO) to

[14] Since Canada has not recently had a significant oil spill, Canadian data is not available, world-wide data is used to predict the probability of spills in Canadian waters.
A Review of Canada's Ship-Source Oil Spill Preparedness and Response Regime: Setting the Course for the Future, Transport Canada 2013. Available at:
https://www.tc.gc.ca/media/documents/mosprr/transport_canada_tanker_report_accessible_eng.pdf

ensure that the response is appropriate. If the response is deemed inappropriate, the CCG will manage the response.

WCMRC, the TC-certified Response Organization for the Western Region, has a reputation for excellence and quick response. WCMRC's response capacity exceeds the 10,000 tonne planning standard currently required by the *Canada Shipping Act*, 2001[15] and TC's Response Organization Standards.[16]

As per a LOU, the port is responsible "to assess the size and nature of the spill and collect information that may assist CCG personnel with planning the appropriate response strategy" (**Annex F**). Legally, both parties are still able to respond and recover costs by accessing the vessel's protection and indemnity insurance or the Ship-Source Oil Pollution Fund (SOPF). If the source of pollution is known, PMV would normally facilitate a response between the vessel and WCMRC. If the source of pollution is unknown and PMV determines there is recoverable oil, then the response would be handed over to the CCG. In both instances, the CCG would be involved, either as FMO, or OSC, respectively.

Since the regime relies on many partners, there is a necessity for those partners to work together to ensure an efficient, effective and successful response. In practical terms, this means partners from different organizations and jurisdictions taking an active role in monitoring, assessment, notification, overall leadership in an incident, response and environmental advice. Additionally, it is important to appropriately manage the relationship with the polluter to ensure that the primary focus is protecting public safety and minimizing damage to the marine environment.

Canadian Coast Guard's Readiness, Resourcing and Exercising

The CCG's Western Region, just prior to the incident, was demobilizing from a major oil recovery operation in the Grenville Channel, the *Brigadier General Zalinski* (BGZ). The majority of the staff were not available in the Vancouver area to respond directly. The certified Response Organization, WCMRC, was available and typically responds to spills in the port and in the province for the marine industry, as they represent Canada's primary response capacity on the West Coast. Normally, the CCG's role is to monitor, ensure an appropriate response, and assume command if the polluter is unknown, unwilling, or unable to respond. The CCG may contract the Response Organization or use its own resources to respond. In a major incident, all available industry, CCG vessels and emergency response capacity are mobilized.

The CCG's Environmental Response (ER) Program in the Western Region is currently undergoing a significant staff turnover, and has lost long-term employees and expertise to attrition and other staffing opportunities. The program is currently comprised of a group of

[15] *Canada Shipping Act, 2001.* Available at: https://www.tc.gc.ca/eng/acts-regulations/acts-2001c26.htm
[16] Response Organization Standards (TP 12401), Transport Canada, 1995. Available at: http://www.tc.gc.ca/media/documents/marinesafety/tp12401e.pdf

fifteen specialists; however, resources can be cascaded from other regions during major incidents in operational, technical and administrative positions. These jobs are demanding and require a high level of technical, management and leadership skills.

As there are few environmental incidents of significance in BC, the opportunity to engage and exercise leadership with partners and practice respective roles and responsibilities in an emergency is limited. It was noted by partners that real life responses are often more challenging amongst the federal, First Nations, provincial and municipal players than when exercised.

The CCG's approach to incident management has been characterized in a positive manner by partners as being inclusive. However, in the case of the *M/V Marathassa* response effort, this inclusive approach also increased the number of participants in Unified Command, many of whom were not familiar with ICS and oil spill response. In effect, this blended the Emergency Operations Centre (EOC) and Incident Command Post (ICP) causing confusion and a lack of clarity at times for all involved.

Geography and Weather

English Bay is located in Vancouver, BC and borders on a densely populated area with numerous high rise buildings. Metro Vancouver is surrounded by 21 municipalities[17], four of which were affected by the *M/V Marathassa* spill. Any spill of persistent fuel oil, such as in the case of the *M/V Marathassa,* will be detected quickly and an immediate, coordinated approach is expected. Additionally, PMV is the third largest tonnage port in North America and the busiest one in Canada. There is also significant recreational and leisure usage of the port given the year-round boating season and the public access to its waters.

Although the probability is low, according to an independent risk assessment[18] commissioned by Transport Canada, this spill was statistically likely to occur. The risk assessment indicated there was a low probability of a significant oil spill on BC's coast, but if one were to happen, it would most likely occur around the southern tip of Vancouver Island. Therefore, the need to improve the "readiness to respond" and the overall preparedness of the regime is important.

During the first hours of the assessment, the sea state was relatively calm. Due to the calm sea state and the background lighting from the city, WCMRC was able to skim and deploy boom throughout the night. Typically, operations cannot be conducted throughout the night; therefore, this was a unique and well-executed component of the response.

[17] Metro Vancouver Services and Solutions for a Livable Region: About Us. Available at: http://www.metrovancouver.org/about/Pages/default.aspx

[18] A Review of Canada's Ship-Source Oil Spill Preparedness and Response Regime: Setting the Course for the Future, Transport Canada 2013. Available at : https://www.tc.gc.ca/media/documents/mosprr/transport_canada_tanker_report_accessible_eng.pdf

Public and Political Sensitivities

The general public's awareness of oil transportation and marine safety in Canada has been increasing, particularly given the heightened sensitivity related to proposed pipeline expansions and other oil-related projects emerging in Canada.

This translated into an increased level of interest from the public regarding all aspects of the response efforts. In particular, this increased the demands for information and prudent recommendations from the Environmental Unit (EU) based on solid science.

While it was noted by the majority of partners that the operational response to the incident was well-executed, the media attention and the lack of immediate accurate information, created additional demands for information which interfered with the management of the incident.

Way Forward

In this incident, the partners, most notably the First Nations and local governments, commented that although they have been observers in some regulatory exercises, they have rarely been active participants in oil spill exercises. The Tanker Safety Expert Panel's (TSEP) report released in December 2013 identified the need to increase federal government engagement with key partners as part of what they termed 'Area Response Planning' (ARP). The Government of Canada has adopted the ARP model, a new planning methodology that brings together more partners to develop response plans. ARP is being piloted in four areas across the country, including the southern portion of BC. This model will be beneficial in preparing for any future incidents.

CHAPTER 2 – OIL SPILL RESPONSE PHASES

2.1 NOTIFICATION

Part 3 of the *Vessel Pollution Dangerous Chemicals Regulations* requires the Master of the vessel to report pollution or threats of pollution. For vessels, these reports must be made in accordance with the *Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants*.[19]

Incidents may be reported by contacting a Canadian Coast Guard (CCG) Marine Communication Traffic Services (MCTS) Centre through a toll free pollution line or by calling the very high frequency Channel 12. When calling in a spill report, the caller will/may be asked to provide information.

Upon receipt of a spill report, the MCTS Officer is responsible for informing the necessary parties and lead agencies. This will be completed verbally and through email notification in the form of a pollution report.

Duty Officers must be aware of other incidents within their functional area of responsibility including both Environmental Response (ER) and Search and Rescue (SAR) activities. SAR incidents can be deemed as potential pollution incidents depending on the nature of the case. The transition from SAR to ER should be seamless, especially if Pollution Response Officer (PRO) powers are exercised to aid in the prevention of a pollution incident during a SAR case.

Once the assessment phase has been completed by the Duty Officer, the appropriate notification shall be made. If deemed to be a spill of "significance/importance" the Duty Officer will contact the Superintendent, Environmental Response, to provide the detailed assessment of the incident. The Superintendent will then in turn notify the Regional Director, CCG Programs, and the regional Assistant Commissioner (AC). The AC will then inform National Headquarters (NHQ) verbally, if required. Additionally, the established procedure for incident reporting will be followed. A National Incident Notification Procedure (NINP) shall accompany verbal notification if the requirements for a NINP have been met.

Duty Officers are also responsible for notifying/consulting other lead government agencies such as Environment Canada (EC), Transport Canada (TC) and provincial Ministries of Environment.

[19] Vessel Pollution Dangerous Chemicals Regulations Part3 (SOR/2012-69). Available at: http://laws-lois.justice.gc.ca/eng/regulations/SOR-2012-69/
Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants – IMO Resolution A.851(20) in Resolution MEPC.138(53). Available at: https://www.tc.gc.ca/eng/marinesafety/tp-tp9834-menu-1684.htm

The regional communications branch must be alerted of potential media enquiries relating to marine incidents. This will allow communications officers the opportunity to develop media lines and effectively manage the flow of information and ensure that accurate information is released to the public. As well, approval for media releases typically requires NHQ approval.

2.2 ASSESSMENT

Assessment is a critical phase of an oil spill; it identifies the foundation and potential future actions required at the beginning of the spill. The most important components of the assessment are the identification of the source and the action to secure the source and stop it from entering the marine environment. If the information gathering and the assessment are solid, detailed and accurate, the Duty Officer will identify the source, which will determine the role of the CCG as On-Scene Commander (OSC) or Federal Monitoring Officer (FMO). If the decision is made to respond, a rapid response is critical to effectively manage the oil spill and limit the effects to the marine environment. If the decision is to monitor the spill, the CCG will require the tools to effectively monitor the spill movement and the polluter's response.

The skill set, competence and experience of the individual or individuals to conduct an effective assessment are essential. This comes not only from a solid training regime but from years of experience in responding and monitoring marine oil spills. To do so, a Duty Officer must have a detailed understanding of section 180 of the *Canada Shipping Act*, 2001 which outlines the CCG's responsibilities in oil spill response, and section 175, which outlines the powers of the Pollution Response Officer (PRO).[20]

If the Duty Officer conducting the spill assessment is not able to conduct an effective assessment, poor decisions in the early stages of an oil spill can have adverse effects on the overall response. The individual must also understand any Memoranda of Understanding (MOU) that are in place and must maintain contact with other government agencies, to effectively communicate the information gathered during the assessment phase.

2.3 ACTIVATION

During the assessment phase, the Duty Officer, in consultation with the Superintendent ER, will determine if a response is necessary. Under the authority of the Superintendent ER, the Duty Officer will activate an operational response. An operational response can consist of simple actions to very complex response requirements.

Upon activation, the CCG will maintain the role of OSC, FMO or Resource Agency as determined by the operation. Initial response activities can be completed as per regional and area response plans. These plans are developed to provide responders with initial response priorities based on pre-planned scenarios. The plans could include examples of

[20] *Canada Shipping Act, 2001*, s 175, 180. Available at: http://laws-lois.justice.gc.ca/eng/acts/C-10.15/index.html

contextual information, including, among others, location of water intakes, aquaculture sites, local fisheries, resources at risks, sensitivities, local stakeholder lists, notification lists, and MOU's.

Activation of the ICS (formally Response Management System) is required to aid responders in an effective and efficient management of a response. If theCCG assumes the role of OSC, it becomes responsible for managing the spill and must provide resource/personnel equipment to meet the demands of the incident.

This may also require the activation of the National Response Team (NRT) to support the local response depending on the complexity, personnel needs and length of the incident. The NRT may also be used to fill regional personnel gaps if other personnel are responding to marine spills in the region. This also applies to the federal monitoring posture during a prolonged incident.

2.4 RESPONSE

The CCG is the lead government agency in relation to ship-source or mystery-source pollution incidents in the marine environment.

The response to a spill is determined based on several factors. The CCG will assume the role of OSC if the polluter is deemed to be unwilling to respond, unable to respond, or if the polluter is unknown, which is termed a mystery spill. In other situations, as FMO, the CCG will monitor the clean-up efforts of the polluter.

Commonly, once a polluter has been identified, the CCG will advise the polluter of its responsibilities. If satisfied with the polluter's intentions, the CCG will assume the role of FMO. Until such a time that the polluter has assumed responsibility, the CCG maintains the lead for managing the spill response. The CCG is at all times responsible for ensuring an appropriate response regardless of the actions of others.

The NRT is comprised of human and equipment resources related to the ER Program. The CCG has a wide selection of personnel and equipment across the country that can be called upon to assist as required during a response. The NRT is activated through the National Coordination Centre (NCC) in NHQ. The NRT will normally be activated once capabilities of local resources become overwhelmed or the complexity of an incident dictates additional resources.

If the CCG responds to a marine pollution incident, there are either the CCG or industry resources required to ensure a safe, effective and efficient response. Resources would include trained and competent response staff and response equipment maintained and ready to respond. In terms of response equipment, containment boom and a selection of skimmers to recover pollution are commonly used tools. In addition, pollution response vessels must be on standby with a certified crew trained in spill response and small craft operations.

CHAPTER 3 – OBSERVATIONS, ANALYSIS AND RECOMMENDATIONS

3.1 DISCHARGE

Key Facts

According to information available to the Canadian Coast Guard (CCG), the *M/V Marathassa* left the shipyard in Maizuru, Japan on March 16, 2015, to embark on her maiden voyage, with an expected date of entry into Port Metro Vancouver (PMV) on April 6, 2015.

It is believed that the discharge of fuel oil was released intermittently into the marine environment from the *M/V Marathassa* during the afternoon of April 8, up to the early morning of April 9, when the vessel was boomed. An aerial observation of the vessel earlier in the day at approximately 11:00h indicated that there was no pollution observed; the vessel was washing down some of its compartments and discharging water into the harbour as per normal procedures.

Transport Canada (TC) is currently leading an ongoing investigation concerning the events leading up to the discharge of fuel oil into English Bay, as per their regulatory role. As such, this review will not examine the nature or cause of the spill.

M/V Marathassa's position: anchorage 12, English Bay

3.2 NOTIFICATION

Key Facts

The discharge of fuel oil in English Bay was first detected by a sailing vessel (*Hali*) and reported to the CCG Marine Communications Traffic Services (MCTS) at 16:48h. Subsequent observations of an oil sheen by other sailing vessels and the public were reported to the Vancouver Police Department and 911, which were then provided to the CCG. These reports indicated extensive sheening and tar balls in English Bay near anchorage 12, the location of the *M/V Marathassa.*

The initial notifications were then provided to PMV and the CCG's Environmental Response (ER) Duty Officer located in Prince Rupert for further assessment and potential action. The CCG receives an estimated 600 marine related spill reports on the coast of British Columbia (BC) that require investigation and assessment each year, approximately 40 of which are in PMV.

Internal Notification

The CCG utilizes an internal notification process called the National Incident Notification Procedure (NINP), the purpose of which is to provide the CCG and Fisheries and Oceans Canada (DFO) Senior Management with an immediate initial alert to inform the organization that an event of significance has occurred or is occurring.[21]

The NINP was generated within the first hour after the CCG activated WCMRC. It was sent to the MCTS Centre for national distribution via email at 21:05h, and transmitted to the distribution list at 22:09h by email only. The recipients of the NINP included all CCG Senior Management, departmental officials nationally and the CCG's National Coordination Centre (NCC) in Ottawa.

The NCC Duty Officer is responsible to take appropriate action, as required, such as notifying senior management. During standby hours (beyond regular working hours), such as in this incident, email notifications are not required to be read until the following morning. If the event is determined to be of national significance, then a phone call is required. In the case of the *M/V Marathassa*, no verbal notification or phone call was initiated by the region.

Notification of Key Partners

Once preliminary information regarding the fuel oil spill was confirmed with the initial sailing vessel (*Hali*) who reported the spill, the MCTS Centre initiated a fan out notification process, as per standard operating procedures, and forwarded a pollution report to key partners at 17:10h. These partners included DFO, Environment Canada (EC), TC, the Joint Rescue Coordination Centre, PMV, and Emergency Management British Columbia (EMBC).

[21] National Incident Notification Procedure, Canadian Coast Guard, 2013. Accessed on July 6, 2015.

When EMBC receives a pollution report, it is sent to its 24/7 provincial Emergency Coordination Centre (ECC), who then contacts the Environmental Emergencies Response Officer (EERO). As per EMBC's protocols, an assessment by British Columbia's Ministry of Environment (MOE) is conducted in order to determine its code level and whether email or verbal notification is required. Code 1 reports, which are deemed minor, are distributed internally to the organization for information, whereas Code 2 reports require further distribution to First Nations, other provincial departments, municipal governments, and other affected partners. A Code 2 is also triggered when a request for the MOE's services is made to increase the incident classification, which was not immediately made in this case.[22]

The initial pollution report indicated that there was approximately 200 square meters of sheen and possible bunker C fuel oil extending from the stern of the *M/V Marathassa*, and that the incident was being assessed by PMV. A second pollution report was distributed at 19:40h indicating that the spill was deemed non-recoverable, approximately three hours after the initial notification. Based on this information, MOE assessed the incident to be a typical sheen, identified it as a Code 1, and noted that the PMV vessel had stood down. The Code 1 internal notification was distributed at 19:48h and no further fan out notification to other partners was distributed at the time.

The CCG received information that the spill was non-recoverable based on information inaccurately relayed from the PMV vessel to the CCG via Western Canada Marine Response Corporation (WCMRC). This alternating assessment propagated through the notification system and may have created confusion for the Duty Officers trying to evaluate the significance of the incident.

A third pollution report was then distributed by the CCG at 21:04h indicating that the spill had been reassessed following receipt of aerial surveillance photos and had been upgraded to recoverable. The report also noted that WCMRC had been contracted to respond and clean-up the fuel oil.

At 03:07h on April 9, the CCG spoke with the EERO to request their on-scene presence, once it was determined that the spill was of higher significance. The CCG indicated that a representative would not be required until first thing in the morning. The incident was not officially upgraded to a Code 2 until 15:27h on April 9.

Most partners were notified of the incident on the morning of April 9 from a variety of sources, including the WCMRC, the City of Vancouver, MOE, and the media. MOE internal notification confirmed at 10:11h on April 9 that the First Nations, Vancouver Coastal Health, Oiled Wildlife Society and the Vancouver Aquarium had been officially notified.

[22] Verbal comments and supporting email from BC MOE's officials regarding notification protocols.

Observations & Analysis

Internal Notifications

The National Incident Notification Procedure (NINP) was established several years ago to avoid regional variability of the national alerting process and to ensure that senior management has up-to-date accurate information regarding a serious incident as it develops. The criteria for determining an incident of significance has, in the past, been an effective mechanism of managing and sharing information, particularly in the early stages of an incident. However, in this case, the NINP process did not effectively alert the CCG Senior Management, as no verbal notification or phone call was received indicating the extent of the spill and the potential impact on the Vancouver Harbour and surrounding communities, although the NINP indicated that high media attention was anticipated.

The NINP is typically drafted by regional Environmental Response staff and approved by the regional CCG Senior Management. The criteria are fairly clear in identifying when a NINP should be triggered, such as in this case where persistent fuel oil in a confined harbour and bay had the potential of reaching adjacent beaches. There is, however, a category of events in the NINP procedure that indicate when an event of significance does not require verbal notification to CCG Senior Management, which appears to be at odds with the intent of the NINP and early and accurate dissemination of information to the required senior officials. Regional officials indicate this was not a factor in this case.

Verbal notification was not initiated due to the fact that written notification was already sent and that operations were well in hand and partners were alerted. The intense public reaction was not anticipated and the net result was that the CCG Commissioner was not made aware of the significance of the spill until the morning of April 9, due to heightened media attention. Alerting the CCG Senior Management in Headquarters earlier may have provided DFO Communications the opportunity to proactively support the organization, including identifying that the CCG was the lead agency.

Recommendation #1 - The National Incident Notification Procedure criteria and the exemptions for verbal notification should be reviewed to ensure all significant incidents receive verbal notification 24/7 to the senior national leadership of the Canadian Coast Guard.

In addition, the NINP process enables other regions to develop potential support plans early should a National Response Team be necessary for an incident. This is expected in a major environmental response incident, as regional capacity is limited requiring the cascading of personnel and equipment. For example, during the *Brigadier General Zalinski* (BGZ) oil removal operation in 2014, personnel were successfully cascaded from across the country.

External Notifications

As noted, EMBC and MOE are currently responsible for determining the appropriate fan out process as part of their regional alerting process. While the notification and fan out process followed all existing standard operating procedures, it was not effective in immediately identifying the incident as significant. As per MOE's written notification protocols, an incident should be upgraded to a Code 2 once their services and presence are requested. However, given that in the early stages it was still not clear that the spill was significant, the incident was not upgraded to Code 2 until Thursday at 15:27h by the province. As such, First Nations, provincial and municipal partners were still not officially notified of the event unfolding in English Bay until the following day.

Most partners were notified of the spill early on the morning of April 9 via informal channels, primarily due to already-existing working relationships, and were not informed via the proper notification protocols. Additionally, many partners noted that email notification was insufficient, as they do not reflect the urgency or significance of an event, particularly if they are received during non-business hours. Furthermore, multiple key partners are not included as part of any formal notification process of oil spills in PMV, despite their significant professional expertise in areas such as oiled wildlife and scientific research.

The provincial government maintained the Code 1 classification following the third pollution report received at 21:04h, even though it indicated that the spill was more significant than originally thought. At present, the criteria for assessing whether an incident should be escalated to a Code 2 does not take into consideration the location and potential consequences of a spill; however, the province's risk assessment of oil spills does include these as risk factors. Had MOE re-assessed the incident to include these factors, as well as the potentially high media attention, a Code 2 may have been called, leading to a broader fan out of the incident to those who could be impacted by the spill. This notification to other levels of government and other partners would also have indicated that the CCG was taking the lead in addressing the marine pollution. However, it is clear that EMBC and MOE may not have had the most current information to make informed decisions regarding its notification classification.

This early notification may also have provided confidence that the CCG was leading the response and could have reduced negative public communications in the media.

Recommendation #2 - The Canadian Coast Guard, Emergency Management British Columbia and British Columbia Ministry of Environment should jointly review alerting and notification procedures to promote a common understanding and approach between the organizations when assessing and notifying regarding marine pollution incidents.

3.3 ASSESSMENT

Key Facts

The initial pollution report was of a 200 square meters of sheen from the starboard quarter as the sailing vessel transited the area. The sailing vessel drifted back across the area not seeing any major concentration. The second vessel to report the spill and transit the area reported a smell of asphalt and a larger slick of 250m by 0.5 km with tar balls of various sizes.

Upon receiving this information, a PMV vessel was tasked to collect information at 17:10h, as per a Letter of Understanding (LOU) between CCG and PMV. To collect information, PMV surveyed the immediate area around the anchorages to determine the extent of the spill, including speaking with the sailing vessel (*Hali*) who had originally reported the pollution to identify where there was believed to be a higher concentration of fuel oil. PMV attempted to identify the source of pollution and contacted Nav Canada Vancouver Harbour Control Tower for aerial surveillance. PMV also aimed to determine if the pollution was recoverable by deploying sorbent pads into the water.

The Captain of the vessel was denying it was the polluter, but acknowledged that there was fuel oil around his vessel. Following the collection of information, PMV determined that the fuel oil spill was recoverable and alerted CCG's MCTS Centre at 17:58h, requesting a CCG response vessel.

The MCTS Centre then notified the CCG ER Duty Officer. In direct discussion with the port, the ER Duty Officer suggested that they contact WCMRC directly and indicated that it would take 60-90 minutes for a CCG Response Specialist to arrive on scene. During that time, the CCG Superintendent, ER, received the pollution report from the Duty Officer and immediately contacted WCMRC at 18:08h to inform them that their services were likely going to be required to clean up the spill. They were not yet officially asked to activate resources, yet indicated that they were prepared to mobilize.

PMV then contacted WCMRC via their activation line at 18:25h. Five minutes later, PMV Operations discussed the fuel oil slick of recoverable pollutants in English Bay with WCMRC, who advised them that arrival time was 90 minutes. WCMRC subsequently decided to mobilize resources and was prepared to use this opportunity as an exercise.

PMV then re-surveyed the anchorages and re-checked the area of major sheen from 18:30-18:45h, attempting to locate the source of the pollution, and indicated they did not locate any other large pools of fuel oil. Although the previously deployed sorbent pads recovered fuel oil, PMV was unable to locate the original large concentration of fuel oil, nor the source.

At 19:03h PMV contacted WCMRC and discussed what they had observed. The PMV vessel was concerned about diminishing daylight and returned to the dock to obtain sampling kits. This communication was perceived by WCMRC to mean that PMV was standing down

as there was no recoverable oil. This was in error. Due to miscommunication, WCMRC demobilized and communicated this to the CCG Superintendent and Duty Officer, leading to de-escalation in the significance of the incident. As the lead agency, the CCG accepted this information without verification from the source, PMV.

Based on the information received from WCMRC, MCTS distributed another pollution report at 19:40h noting the change in assessment to non-recoverable, approximately three hours after the initial notification from the sailing vessel (*Hali*). The provincial notification process also updated its report to indicate that the PMV vessel had stood down due to unrecoverable fuel oil. No further notification of municipal and other partners was necessary. Unfortunately, this information was in error due to the miscommunications and was passed erroneously through the notification system.

While the notification fan out process was in progress, PMV received photos from a private Cessna aircraft indicating the extent of the fuel oil spill. At this time, PMV Operations and the on-duty Harbour Master discussed various actions, including boarding the *M/V Marathassa* and calling both the CCG and WCMRC. The Harbour Master called WCMRC to inform them of the aerial surveillance photos they had received. PMV informed MCTS at 19:51h that they were unable to reach the CCG Duty Officer (and were informed it was due to technology and connectivity issues), and noted that the photos received from the Cessna aircraft indicated a larger spill than originally thought.

Once the CCG had an opportunity to review the photos at 19:55h, they officially contracted WCMRC, who confirmed a few minutes later that they were mobilizing their resources.

Another pollution report was then distributed at 21:04h to indicate that the spill had been re-assessed and upgraded to recoverable due to new information from aerial photos. The report also noted that WCMRC had been contracted. At 21:31h, MOE released an updated report, noting that the spill was larger than originally thought; however, the report was not upgraded to a Code 2. As such, no further fan out of information was provided to First Nations, provincial partners and municipal governments.

Observations & Analysis

It appears that the CCG ER staff were operating under the assumption that PMV was responsible as the spill was located in the port. However, in all mystery marine spill incidents, the CCG is the lead federal agency for ensuring an appropriate response. Given that the *M/V Marathassa* had not yet been confirmed as the polluter, the CCG was, in fact, the lead agency.

This misunderstanding was likely due to two key factors. First, there has been a significant changeover in staff in the CCG's ER Program. Second, the Duty Officer was physically located in Prince Rupert and may not have been appropriately made aware of the existing roles, responsibilities, and authorities in PMV with respect to oil spill response and had not been made aware of the appropriate protocols in the event of a mystery oil spill.

Despite these two factors, CCG management is required to ensure that officers review and understand their roles and responsibilities.

PMV operates under its own letters patent, the *Canadian Marine Act* and all associated regulations with authority to address pollution incidents within its boundaries. A LOU with the CCG has clarified this authority, noting that PMV will collect the appropriate information regarding reports of pollution and hand over the command once it is determined that the spill is recoverable. Information collected includes collecting samples, deploying sorbent pads, on-water visual sightings, and requests for aerial surveillance. PMV indicated that they are currently considering newer technologies to assist in assessment such as Unmanned Aerial Vehicles (UAV) that could prove very beneficial in the future.

Concerns were raised by partners that PMV may not be the best-equipped organization to assess marine pollution incidents. In particular, participants raised concerns regarding PMV's ability to respond to oil spills and their training requirements. PMV vessel Masters are certified vessel operators, with a 60T limited masters certification with TC.[23] In addition, the port has experience with ship-source pollution in the port and working with WCMRC, enabling them to provide the best information possible to the CCG regarding potential pollution incidents. Additional exercising, however, would benefit partners ensuring all are aware of their roles.

In this instance, PMV believed that it was to collect information only, and would transfer the information over to the CCG who would make an assessment and would take over responsibility and command of the response to the mystery spill.

The lack of clarity by the CCG regarding its roles and responsibilities in the port led to both the CCG and PMV directly contacting WCMRC. WCMRC had initially been alerted by the CCG but a response had not been activated. A follow up discussion with PMV, who also did not activate the Response Organization, left uncertainty between the respective partners. In the absence of activation by either the CCG or PMV, WCMRC responded by mobilizing their response personnel as an exercise. This was a precautionary measure taken by WCMRC. Since PMV had requested a response by the CCG at 18:05h and the mobilization decision by WCMRC was only taken at 18:35h, this represented a delay of approximately 30 minutes. WCMRC was still not activated; however, they had notified the CCG that they were mobilizing as an exercise.

WCMRC mobilization continued at the Burnaby base as employees prepared to engage in a response exercise. PMV also continued its on water assessment operations in an effort to locate any further recoverable oil and locate the source of the pollution.

[23] Certificates of competency, training certificates and equivalencies directly pertaining to the *operation of a vessel* are recognized by Transport Canada as proof of competency when operating a boat fitted with a motor that is used for recreational purposes. Available at: https://www.tc.gc.ca/eng/marinesafety/debs-obs-courses-pcoc-list-marine-safety-certif-1323.htm

Communications with the CCG Duty Officer were limited at this time due to issues with his cellular phone.

At 19:03h PMV calls WCMRC for additional advice on what they are observing on the water. During this conversation it is understood by WCMRC that the port is unable to find any further recoverable oil and that they are standing down. This was a communications error between the PMV vessel and WCMRC. What had been intended to be communicated was that the PMV vessel was not observing any recoverable oil at that time and that they were returning to its base to obtain a sampling kit to collect samples of the pollutant to enable future matching with the polluter. The message that they were standing down was not the intent. This communications error between the port and the WCMRC was then communicated to the CCG. The effect of this miscommunication was that WCMRC began to demobilize from its planned exercise.

Often reported spill assessments change with further on water surveys so this reassessment by the port would not be uncommon and was accepted by the WCMRC. This miscommunication was shared with the CCG and they began de-escalating the incident and communicating this through the notification system to other federal and provincial partners. The CCG should have contacted PMV directly to verify this change in direction. In contrast to the miscommunicated message, and perception that PMV was standing down, PMV was actually continuing the on water operations. The demobilization of WCMRC at 19:03h and their subsequent activation at 19:57h represents a further delay of 54 minutes.

As part of PMV's ongoing assessment of the spill they had requested photographs of the area from transiting aircraft. This is the best method of determining the extent and nature of the pollution.

At 19:27h pictures received from a private Cessna aircraft clearly show the extent of the sheen and concentrations of recoverable oil. PMV's first call is to WCMRC to confirm that they are activated by the CCG. PMV is unaware of the demobilization that has occurred, as they were not aware of the effect of the miscommunications between the PMV vessel and WCMRC. PMV also calls the CCG with its new information at 19:45h but due to continuing connectivity difficulties has to call an alternate number. When contact is established the Duty Officer has difficulties viewing the pictures on his mobile device and has to view the new information on his personal computer. The photos are eventually shared at 19:55h.

The pictures and their assessment by the Duty Officer trigger an immediate response by the CCG. At 19:57h WCMRC is activated and is able to respond faster than the normal 60-90 minute mobilization time as the staff have just left the base and are immediately recalled. The remobilization occurs in 48 minutes and WCMRC is on scene at the *M/V Marathass*a at 21:25h, 1 hour and 28 minutes after activation.

A combination of these factors caused a delay in the response. Initially, the lack of clarity on the respective roles and responsibilities followed by a miscommunication between WCMRC and the PMV vessel and then connectivity issues. The earliest possible activation

time of PMV was at 18:08h when the CCG provided a notification to WCMRC, the actual activation occurred at 19:57h by the CCG, 1 hour and 49 minutes later.

In difficult cases, experience has shown that it is often best to assume the worst and activate the response while the assessment is continuing, particularly in areas of high consequences, such as the PMV. The precautionary principle prevents surprises in possible worst-case scenarios.

Recommendation #3 - The Canadian Coast Guard and Port Metro Vancouver should review the Letter of Understanding to clarify their respective roles and responsibilities within the port waters.

Recommendation #4 - Port Metro Vancouver should continue to collect information regarding reports of marine pollution under its area of responsibility and to request aerial surveillance to support the Canadian Coast Guard's effective assessment of marine pollution incidents.

Recommendation #5 – The Canadian Coast Guard should ensure that Port Metro Vancouver has the appropriate information, training and standards to assist their staff in performing assessments.

Recommendation #6 – The Canadian Coast Guard should ensure that all Environmental Response staff review the appropriate agreements to ensure clear communications between the Canadian Coast Guard Duty Officer and Port Metro Vancouver and to review roles and responsibilities in oil spill response within the boundaries of Port Metro Vancouver.

Recommendation #7 – The Canadian Coast Guard should review the assessment procedures with staff and ensure they are empowered and supported to take a precautionary approach when assessing reported spills, even if it means from time to time the system will overreact.

3.4 INITIAL RESPONSE

Key Facts

At 19:57h the CCG activated WCMRC to clean up the fuel oil spill, and by 20:45h, approximately 48 minutes later, resources were mobilized, arriving on scene at 21:25h to immediately begin containment and recovery.

The CCG Senior Response Officer (SRO) in Vancouver was contacted at 20:38h, transferring the lead from the Duty Officer in Prince Rupert. The SRO immediately proceeded to PMV and was briefed. He then took charge of the response and commenced routine response

activities. This included contacting WCMRC to assist in determining the appropriate response measures, contacting Environment Canada's (EC) National Environmental Emergency Centre (NEEC) to understand the risks (i.e. requesting trajectory modelling and environmental sensitivities for the PMV and surrounding areas) to facilitate response. The SRO also contacted the Vancouver Police Department to inquire whether they had received any fuel oil spill calls in the English Bay area. There were none.

The CCG SRO then boarded the vessel with a PMV representative and issued a Letter of Undertaking at 00:45h, asking the Captain to respond with the vessel's representatives' intentions for clean-up by 05:00h on April 9. The fuel oil was not yet confirmed as coming from the *M/V Marathassa* and the Captain denied that the vessel was the source of pollution. The SRO also checked with WCRMC to confirm that the clean-up operation was well underway and requested a NOTSHIP for vessels to reduce their speed while transiting English Bay to reduce the spread of fuel oil.

WCMRC continued its recovery operations throughout the night, including using a vessel equipped with a forward looking infrared camera. As the overnight operation continued, adjacent vessels were searched to identify the source of pollution; however, crews returned to the *M/V Marathassa*, as that is where the highest concentration of fuel oil was. Fuel oil was seen welling up from the stern of the vessel and a WCMRC infrared camera confirmed that the vessel was the source of the pollution. The CCG SRO then requested that WCMRC begin booming the vessel at 03:25h, which began at 04:36h and was completed by 05:53h to contain the source of fuel oil. Skimming then continued at the scene and inside the boom surrounding the vessel.

Priorities for the morning were discussed between the CCG and WCRMC, including obtaining aerial surveillance, as this is the best tool for determining the movement of oil, and focusing on sensitivity mapping, which was essential in planning response operations.

Observations & Analysis

In most ship-source pollution incidents, the Responsible Party (RP) or the polluter is readily identifiable and takes command of the response. When the polluter is unknown, unwilling or unable to respond, the CCG assumes command. In this case, the *M/V Marathassa* initially denied discharging pollutants and there was no definitive evidence of fuel oil leaking from the vessel, classifying this incident as a mystery spill. As such, the CCG took command of the incident as the lead agency and OSC. Later in the response, the polluter may assume control if it is demonstrated they are capable of managing the incident.

Once the CCG was in command, they contracted WCMRC to initiate clean-up operations. CCG does not currently have standing offers with the Response Organization, which can sometimes delay signing of the contract. While no delay occurred in this case, the CCG may want to consider entering into a standing offer contract to expedite the process when CCG is the OSC and plans to use the Response Organization as a responder. The

Response Organizations, regulated and certified by TC, represent Canada's primary response capacity for oil spill preparedness and response. As per the Response Organization Standards, Response Organizations are required to mobilize resources within six hours following notification in a designated Canadian port. As per the CCG's ER Levels of Service[24], the CCG must mobilize its resources within six hours upon completion of the assessment. Arrival time on scene will vary due to the location of the incident and resources.

In this case, WCMRC mobilized resources 48 minutes after they were activated. This response time was well within the standard of 6 hours due to WCMRC's substantial capacity in the Vancouver area.

The CCG National Spill Contingency Plan[25] identifies three key operational response priorities: safety of life, incident stabilization, and environmental protection. In this case, the CCG SRO in Vancouver effectively followed the standard operating procedures and ensured these three priorities. He ensured his own safety as the response personnel, attempted to locate and stop the source of pollution by boarding the suspected vessel, and discussed response measures with the Response Organization, understanding the environmental sensitivities. He also assumed the role of OSC in the early hours of the incident.

The CCG SRO's direction to WCMRC to boom the *M/V Marathassa* is consistent with the CCG's powers and authorities as OSC in response to a marine pollution incident. Once the priority of controlling the source was achieved and the *M/V Marathassa* was successfully and rapidly boomed, the full extent of the pollution in English Bay became the next priority due to the local environmental sensitivities. The length of time that was taken to decide to boom the vessel was noted by many. Although the *M/V Marathassa* was not confirmed as the polluter until the early hours of April 9, it was in the area of the highest concentration of fuel oil. The intermittent nature of the discharge from the vessel is consistent with the observations of the sailing vessels that transited the area. The movement of the fuel oil in the tide undoubtedly complicated and delayed the positive identification of the *M/V Marathassa* as the source.

When the *M/V Marathassa* acknowledged it was the polluter on April 11, the vessel's representatives could have taken over command. The CCG made the decision to maintain command and control of the response operation due to the complexity of the incident. However, the vessel's representatives were cooperative in Unified Command.

It was noted that having a shared, comprehensive, multi-agency oil spill response plan for Vancouver Harbour that included a checklist of immediate, precautionary methods would have assisted in expediting response measure decisions. The Government of Canada

[24] Environmental Response Levels of Service, Canadian Coast Guard, 2010. Available at: http://www.dfo-mpo.gc.ca/Library/342655.pdf

[25] Canadian Coast Guard Environmental Response Marine Spills Contingency Plan National Chapter, Canadian Coast Guard, 2011 http://www.ccg-gcc.gc.ca/folios/00025/docs/national-response-plan-2011-eng.pdf

announced in May 2014 that it is implementing the Area Response Planning (ARP) concept in four pilot areas across the country, including the southern portion of BC. ARP is a new planning methodology that will bring together more partners than ever to discuss risks, planning elements, and environmental sensitivities to be included in an area response plan. This process will be co-led by TC and the CCG. While many participants were familiar with the ARP initiative, they were concerned about the timelines, as they felt a preliminary oil spill response plan should be immediately developed for the Vancouver Harbour area in order to prevent future incidents from escalating.

Recommendation #8 – The Canadian Coast Guard should continue to implement the Area Response Planning pilot project, and consider expediting elements of the planning process for the southern portion of British Columbia pilot area. This plan should be regularly exercised.

The initial reports at daylight confirmed that the pollution was widely dispersed and that the management of the incident would require many more CCG staff and the support of the WCMRC team especially during the initial stages as the CCG mobilized additional resources to the incident.

Just prior to the incident, the majority of the CCG ER personnel were in Grenville Channel demobilizing from the BGZ operation and were unable to directly respond to the English Bay spill. As such, the CCG SRO was the only onsite CCG employee addressing the spill until the morning of April 9.

Recommendation #9 - The Canadian Coast Guard should ensure it has adequate staff to respond to a major marine pollution incident in any part of its region at any given time. This may involve planning and acquiring support from a national team of trained and capable responders in spill response, emergency management, and support staff, including operational communications.

The operational response proceeded remarkably well, as the source had been located and controlled with boom and the on water clean-up and the recovery operation was proceeding as expected under near ideal weather conditions. By 18:06h on the evening of April 9, the fuel oil on the water had been reduced to an estimated 667L according to a National Aerial Surveillance Program (NASP) overflight.

3.5 INCIDENT COMMAND POST

Key Facts

Partners indicated that in the early stages of Unified Command it was not clear which agency was in command and control of the incident. In addition, some partners were more familiar with the Incident Command Post (ICP), while others have limited exposure, which meant there were varying understandings of their roles and responsibilities. Additionally there was no capacity to offer advice or coaching to participants at the time.

Observations & Analysis

It was apparent during the initial stages of the incident that many partners were not familiar with Canada's *Marine Oil Spill Preparedness and Response Regime*, leading to confusion in roles and responsibilities and misunderstanding of the polluter's liability.

During the *M/V Marathassa* incident, it was apparent that some of the key partners, such as the Province of BC and the City of Vancouver, were already very familiar with using ICS. Others, however, were unfamiliar with the concept of ICS, the organizational structure, or the roles that they should play within Unified Command, which created confusion as there were varying understandings of Unified Command.

As new participants enter the ICP, a Liaison Officer should be available to assist in orientation and determining where they would best contribute based on their area of expertise and assets that they provide. Many partners noted that this function was not available at the time, which impacted individuals who may have been less familiar with ICS and unsure where and when their contribution would be necessary.

The CCG is in the third year, of a five year ICS implementation program. Many of the front line and senior leaders are in the process of receiving formal training. Although many CCG staff members were utilizing newly learned ICS skills for the first time during this incident, it was noted that as the incident progressed, management of the ICP became clearer; Unified Command members adapted to a daily routine and relationships developed as expected.

Recommendation # 10 – The Canadian Coast Guard should continue implementing the Incident Command System and include exercising with all partners, First Nations, provincial and municipal partners, and non-governmental organizations as part of the plan.

Recommendation # 11 – The Canadian Coast Guard should develop simplified quick reference tools for Incident Command Post members who are not familiar with the roles and responsibilities of Incident Command positions.

Recommendation # 12 – The Canadian Coast Guard should ensure roles are rapidly assigned and explained to members who join the Incident Command Post.

Key Facts

Once the ICP expanded to Unified Command, the number of participants became unmanageable both in terms of span of control and the physical space.

Observations & Analysis

The CCG took an inclusive approach when admitting partners into Unified Command, which was positively viewed by most partners. It was mentioned that if this event had occurred in other jurisdictions many of the partners would not have been included in the ICP and would have been briefed external to command.

It was also noted that the Emergency Operations Centre (EOC) concept may have benefited the *M/V Marathassa* Unified Command, which would separate the non-operational personnel from the ICP. Strategic issues that may have been difficult to manage at the ICP level could have been dealt with in a different location and led by the Assistant Commissioner. The City of Vancouver and the North Shore Emergency Management Office had in fact both established their EOCs in the early days of the incident, as per the regular ICS framework; however, due to poor communications coming from Unified Command, they felt it was necessary to close their EOCs and to join the CCG's ICP. Had information been distributed more effectively, the municipalities would have been able to maintain their EOCs and to interface more appropriately with Unified Command

PMV's support during the incident was also very helpful. The ICP was set-up at the port operations centre as the CCG initially had few people on the ground while the CCG cascaded in resources.

The majority of partners noted that PMV was an ideal initial location, yet as the incident progressed, their facilities were not conducive to the growing Unified Command structure.

Recommendation # 13 – The Canadian Coast Guard should consider utilizing the Emergency Operations Centre concept at the regional level to establish a separate strategic management location from the operational Incident Command Post.

Recommendation # 14- The Canadian Coast Guard should consider pre-established Incident Command Post locations under a variety of standardized scenarios, to be included in an area response plan.

Key Facts

The CCG was mobilizing and initially lacked the coordination and control staff to effectively manage the ICP and did not have the capacity to provide a learning cell. NHQ staff was deployed later in the incident to make observations and record lessons learned.

Observations & Analysis

The deployment of a learning cell concept presents an opportunity for the CCG and its partners to learn from the incident with a view to improving in the future. Partners have agreed to provide their support in future exercises and incidents.

Although the CCG headquarters did provide support for the incident learning cell, this capacity was used internally and was not used to coach partners.

Recommendation # 15 – The Canadian Coast Guard should consider utilizing an Incident Command System coach during incidents until all staff members are fully trained.

3.6 ENVIRONMENTAL UNIT

Key Facts

EC's NEEC is responsible for providing expert advice and support in environmental emergency response and ensuring that all the appropriate and reasonable mitigation actions to protect the environment are taken in accordance with EC's acts and regulations, in collaboration with DFO and other federal and provincial jurisdictions. Specifically, NEEC provides knowledge on environmental priorities, local environmental conditions, hazardous substances, spill models, the fate and behaviour of pollutants, site specific expertise, weather forecast, migratory birds expertise and permitting, and provides assessments of oiled shorelines to prioritize their protection and clean-up using the Shoreline Clean-up Assessment Technique (SCAT). Specifically, DFO is responsible for identifying the potential repercussions with the native and non-native fishing industries, as well as providing habitat advice in relation to fish, shellfish and marine mammals.

One of the first phone calls the CCG SRO made was to the NEEC at 20:51h on April 8 to request trajectory modelling, which was received at 01:19h on April 9. Spill models were also available during the response from the MOE and from the Tsleil-Waututh First Nation. A request for environmental sensitivities to gain a better understanding of risks was also made to NEEC.

The NEEC program employs a coding system that follows set criteria for its response process and communication tools. A Level 2 incident only requires the NEEC to play a role remotely, whereas a Level 3 requires the NEEC to deploy on-site. An incident is upgraded when the lead agency requests the NEEC's presence on-site, when remotely available information does not allow the NEEC to determine and monitor if the environment is appropriately protected, or there is an opportunity for training. Typically, EC convenes a Science Table or, in the case of an ICP the Environmental Unit, during oil spills.

Once Unified Command was established, the CCG had verbally requested on-site support from the NEEC. When this support was not provided, the request was escalated by CCG Senior Management to EC Senior Management in the region. EC can self-task if the environment needs to be protected. The NEEC assessed the situation and concluded that services and advice could be provided remotely. The factors assessed included the size of the spill, the response actions underway and environmental impact. On April 18, a request for the EC NEEC official to be on site was received to render a decision on shoreline clean-

up end points. An EC representative then arrived on scene on April 19, to assist in resolving the conflict in this regard.

In the absence of EC's on-site presence, the CCG attempted to contract a local consulting firm that has experience in oil spill management, but was unsuccessful. Although EC reports that they typically do not lead the Environmental Unit (EU) during oil spills, it is Coast Guard's view that they are the best federal agency to do so. Initially, EC and BC MOE co-led the Environmental Unit; however, it became evident that this role could not be effectively fulfilled by EC remotely. Therefore, DFO and BC MOE co-led the EU on April 13, day six of the incident. EC remained a participant in the EU throughout the incident and provided services such as site-specific forecasting, estimates of mass balance, information on fate and effects of spilled products, sampling and laboratory services, and operations advice on response and clean-up.

The Environmental Unit established daily plans, the SCAT process and sampling guidelines to assist in determining end points. While the Environmental Unit was not initially formally established, the SCAT response was established by WCMRC in the afternoon of April 9, with attention to environmentally sensitive areas in English Bay. An estimated 20 birds were impacted.

Observations & Analysis

Leadership

Environmental advice was being actively sought at the beginning of the incident by the CCG SRO, an important initial step in the effective management of any oil spill. EC's environmental advice is independent and capable of addressing many environmental issues, from wildlife to the trajectory of the oil, the fate and effects of the spilled product, and the identification of the product. This is essential information that is required early in the spill to assist public health partners as well as other non-governmental organizations that have an interest in the protection of the marine environment.

While EC continued to participate in Unified Command remotely via teleconference, it was noted by most partners that working remotely was ineffective and detrimental to the overall response. While the advice provided was helpful, many partners felt that there was a lack of leadership in the EU. According to the NEEC's trigger criteria, this incident did not meet the criteria for upgrading the incident to a Level 3. A NEEC representative did arrive on site when there was disagreement between partners on shoreline clean-up endpoints on the North Shore.

In many incidents, the physical presence of the highly experienced and knowledgeable officer facilitates the discussion amongst competing scientific and environmental priorities and facilitates collaboration between multiple partners. Their experience and reasonableness enables decisions to be taken and actioned by the Operations Unit in a timely fashion.

In the absence of the EC presence, the environmental partners were left to establish a lead amongst themselves and propose actions to Unified Command. However, this is not seen as the best approach and considered ineffective as several of those involved were not familiar with oil spill response and clean-up. Once EC was on-site on April 19 for the resolution of the beach clean-up standards, they were seen as very helpful and positive, highlighting that it would have been beneficial to have had this presence and leadership throughout the incident.

In 2013, the independent Tanker Safety Expert Panel made similar comments with respect to EC's scientific leadership in an environmental response operation, particularly regarding the triggers for convening the Science Table for smaller incidents. It was noted that "in such cases, the OSC is not guaranteed immediate leadership from EC to integrate local efforts and knowledge to provide environmental and scientific expertise and advice, potentially jeopardizing the Net Environmental Benefit Analysis upon which spill response decisions are based." The Panel goes on to say that "the coordination and delivery of Environment Canada's scientific capability would be enhanced by their on-site presence when requested by the On-Scene Commander."

These comments continue to be valid. EC's on-site presence would have provided much-needed independent support and advice in the EU, would have expedited the Shoreline Clean-up and Assessment Techniques (SCAT) and environmental sensitivity decision-making, and would have added an element of public stewardship from an environmental perspective. EC recognized following the visit to Unified Command that their leadership and understanding of this complex incident was challenging over the telephone.

Recommendation #16 – Environment Canada should review its trigger criteria for on-site presence in an incident, in collaboration with the Canadian Coast Guard, particularly in complex incidents.

Recommendation #17 – Environment Canada should continue to be a leader in the Environmental Unit, providing sound and independent environmental and scientific advice during an oil spill incident.

Independence of Environmental Unit

It was noted that a private company hired by the Responsible Party and participating in the EU, was viewed as being in conflict of interest. They were seen to negatively impact discussions among some partners in the EU and appeared to be directing some decisions being put forward to Unified Command. Additionally, it was reported that their efforts appeared focused on minimizing costs to the polluter rather than trying to reach an appropriate standard of assessment and remedial actions. Some partners felt the need to obtain their own samples and hire their own experts to validate information.

Additionally, the EU was not receptive to the advice provided by the International Tanker Owners Pollution Federation (ITOPF). While ITOPF presented themselves in the role of an

independent body, many partners felt that they were representing the Responsible Party. As such, the EU was having difficulties coming to consensus on advice to Unified Command.

Response Measures

In the early days of the incident, preventative booming was extensively discussed and individuals began physically drawing on maps to identify the environmental sensitivities to ensure they would be protected. Although there was a unanimous decision within the EU, preventative booming was not supported by Unified Command and never deployed. While it is recognized that the first priority is to ensure that the source of the pollution is stopped, and to conduct the on-water response, preventative booming could have been deployed to ensure that sensitive areas and public beaches received additional protection. Many raised concerns that the "wait-and-see" approach wasted valuable time and delayed effective response operations that could have prevented further contamination. This also contributed to the public perception that the response was not effective, given that there was no visible shoreline response.

SCAT and shoreline clean-up

It was also noted that the EU lacked the proper situational awareness tools and resources. Although EC provided information, many partners felt this was lacking. Additionally, the physical absence of the EC Officer made it difficult to form effective working relationships and to discuss the complex issues at hand. As a result the EU was left to establish environmental standards as they went along. This situation was noted to have contributed to lengthier decision-making processes given competing interests.

The type of product that had been released into the marine environment was known; however, the information was not initially shared with partners in the EU, who required this information to make effective decisions. This led to information gaps. Some partners felt the need to hire their own experts to assist in addressing the question as to whether the fuel oil would sink or float. Some partners were also not satisfied with the ocean-bed search for fuel oil, believing that it was not thorough enough.

It was also noted that the spill trajectory models that were provided by EC, MOE, and Tsleil-Waututh were all in different platforms and did not correctly identify the spill trajectory.

It was noted that the SCAT process was not appropriately established and was not being conducted out of the EU. The RP's involvement in the SCAT process was also controversial as their opinion on end points was not agreed to by other partners, particularly the municipalities and the province. The municipalities felt the need to hire private contractors to draw their own samples. These competing views and priorities contributed to the view that the EU did not have clear, decisive and independent leadership. Additionally, it made sign-off of shoreline end points very contentious. Some felt that the shoreline clean-up efforts were rushed and linked to costing issues.

Recommendation #18 – Environment Canada and other levels of government should review appropriate shoreline clean-up standards that can be used for oil spill response.

Recommendation #19 - Environment Canada, in collaboration with other levels of government should ensure that the appropriate tools and resources are available for use by the Environmental Unit during an oil spill incident, such as checklists for monitoring, situation maps, sampling protocols and SCAT standards.

Information sharing and developing a common operating picture of the environment for the command and control of the response was a problem as the tools that the CCG and WCMRC were utilizing were not seen as being sufficiently thorough to enable the appropriate level of discussion and subsequent decision making. It was noted that the municipalities or the province had better tools and information to manage the incident.

Additionally, a commonly supported Geographic Information System (GIS) with all of the layers of data necessary for spill management is not readily available. Multiple partners require access to varying levels of information which often needs to be shared. A best practice, used by the CCG's Waterway Program is the integration of these databases on a common GIS tool. In essence, partners bring their best data to the table and the CCG is able to overlay it on a common GIS database. This process could be developed further to enable its use throughout the region, in cooperation with other levels of government. The ability to develop a common visual tool identifying response progress was of great benefit for all of the partners in Unified Command and for external outreach through the Public Information Officers.

Recommendation # 20 – The Canadian Coast Guard should discuss with partners the best platform for a common operating picture for sharing spill and environmental data.

Oiled Wildlife

The public does not have a good understanding of the protocols and procedures for handling oiled wildlife in Canada, including the strategies on how to clean and rehabilitate oiled wildlife. This is the responsibility of the Canadian Wildlife Service. The independent Tanker Safety Expert Panel reflected this misunderstanding and noted the absence of a framework for the management of oiled wildlife. The Panel recommended that the Government of Canada develop and implement a strategy to provide aid to wildlife, to be incorporated in the ARP process.

Partners unanimously noted that the handling of oiled wildlife was effective in the *M/V Marathassa* incident. A wildlife branch was established within the EU that established wildlife response plans, and a wildlife rehabilitation centre was identified. While there were a number of wildlife organizations participating in the branch that had competing views, and many partners in Unified Command did not have experience with oiled wildlife,

this did not significantly impact the overall result. The wildlife organizations did capture, rehabilitate and free three birds out of a total of approximately 20 birds affected.

3.7 COMMUNICATIONS

Key Facts

Partners within Unified Command were not satisfied with the collection and dissemination of information to the public and pertinent organizations regarding the spill response and its progress.

Observations & Analysis

Several of the partners mentioned the lack of timely information regarding the quantity, source and type of pollutant released into English Bay. Although information surrounding the suspected pollutant was available, there was speculation about the characteristics of the fuel oil because the information was not confirmed and communicated. Rough estimates of the quantity on the water and information on the type of pollutant were available and could have been shared to reduce tensions with public health agencies and public relation departments of partner agencies. Unified Command did not have a method of approving joint statements in this regard. Partners generally supported developing the means of joint communication from Unified Command.

Many partners noted early in the incident that the slow communications from Unified Command contributed to the public perception that the response was not progressing well.

Recommendation # 21 - The Canadian Coast Guard should ensure accurate information is released by Unified Command and/or Incident Command as soon as possible regarding the type, quantity, and fate and effects of a pollutant, including any information that is related to public health concerns.

Recommendation #22 – The Canadian Coast Guard should develop an accelerated regional approval process with respect to factual operational information during an incident, similar to the current procedures for sharing information in Search and Rescue incidents.

Key Facts

The ICS and Unified Command construct is relatively new within the CCG. The organization is in the third year, of a five year implementation program. Currently, staff members are being trained on advanced elements of ICS.

DFO departmental staff members, outside the CCG, have received very basic level ICS training. While the Communications Branch had background experience that assisted

during the response, the lack of ICS training caused considerable challenges when functioning in their dual role of corporate and Unified Command communications.

Observations & Analysis

When multiple statements regarding the incident were being circulated in the media, the Departmental Communications Branch became overburdened by the dual role of assuming support to Unified Command and maintaining corporate communications. The latter role took priority and left little support for the effective release of information from Unified Command.

Additionally, it was noted that the Public Information Officer role, which is integral to effective operation, was not fulfilled in Unified Command until three days into the incident. Departmental Communications staff was on site as early as April 10.

In the absence of Unified Command communications leadership, partners occasionally disseminated information outside of Unified Command, which created conflicting messages being transmitted to the public.

Partners were looking for integrated communications leadership and identified that this would be a priority in future incidents.

Recommendation #23 – The Canadian Coast Guard should ensure the organization has sufficiently trained human resources and tools to manage Unified Command communications.

Key Facts

The CCG lacked the critical communications infrastructure to communicate and share information with its partners in Unified Command.

Observations & Analysis

It was evident within the ICP that the Government of Canada network security protocols prevented the sharing of vital information at a critical time. The CCG and DFO staff were obligated to use personal phones, laptops and email accounts to share information with partners. The security impediments extended to the inability of partners to access printers and the CCG was compelled to purchase stand-alone printers to allow partners to print documents during the incident.

In contrast, the Province of BC had a portable system equipped with Wi-Fi ports and pre-assigned email addresses that any open computer could access to facilitate information sharing within Unified Command. The City of Vancouver had similar capacity. As part of the EMBC program, both the Province of BC and City of Vancouver had prior experience planning and exercising which enabled them to communicate effectively during the

incident. This issue had been identified in previous environmental and large scale incidents but has yet to be resolved.

Recommendation # 24 – The Canadian Coast Guard, with the Government of Canada IT, should develop a rapidly deployable communications and IT system that facilitates a more effective and timely electronic interface with partner agencies during an incident.

Recommendation #25 - The Canadian Coast Guard should consider establishing incident specific communication tools, such as a website and phone number, for significant incidents.

CHAPTER 4 – CONCLUSION AND SUMMARY OF RECOMMENDATIONS

In conclusion, this was an operational discharge of persistent fuel oil with very high consequences. While it is certainly positive that Canada has a robust oil spill response regime, the Canadian Coast Guard and its partners rarely respond to real life events due to the infrequency of persistent oil spill events in Canadian waters. The Canadian Coast Guard and its oil spill response partners need to actively engage in the development of localized area response plans. They also need to engage in exercises, both large and small, to test the system and to establish and maintain relationships. Exercising the area response plans and the Incident Command System are instrumental for a successful outcome when the real event occurs.

The *M/V Marathassa* spill allowed for many learning opportunities and the potential to identify areas for improvement in oil spill response which will benefit Canadians in the longer term. The following recommendations are therefore submitted for consideration:

1. The National Incident Notification Procedure criteria and the exemptions for verbal notification should be reviewed to ensure all significant incidents receive verbal notification 24/7 to the senior national leadership of the Canadian Coast Guard.

2. The Canadian Coast Guard, Emergency Management British Columbia and British Columbia Ministry of Environment should jointly review alerting and notification procedures to promote a common understanding and approach between the organizations when assessing and notifying regarding marine pollution incidents.

3. The Canadian Coast Guard and Port Metro Vancouver should review the Letter of Understanding to clarify their respective roles and responsibilities within the port waters.

4. Port Metro Vancouver should continue to collect information regarding reports of marine pollution under its area of responsibility and to request aerial surveillance to support the Canadian Coast Guard's effective assessment of marine pollution incidents.

5. The Canadian Coast Guard should ensure that Port Metro Vancouver has the appropriate information, training and standards to assist their staff in performing assessments.

6. The Canadian Coast Guard should ensure that all Environmental Response staff review the appropriate agreements to ensure clear communications between the Canadian Coast Guard Duty Officer and Port Metro Vancouver and to review roles and responsibilities in oil spill response within the boundaries of Port Metro Vancouver.

7. The Canadian Coast Guard should review the assessment procedures with staff and ensure they are empowered and supported to take a precautionary approach when assessing reported spills, even if it means from time to time the system will overreact.

8. The Canadian Coast Guard should continue to implement the Area Response Planning pilot project, and consider expediting elements of the planning process for the southern portion of British Columbia pilot area. This plan should be regularly exercised.

9. The Canadian Coast Guard should ensure it has adequate staff to respond to a major marine pollution incident in any part of its region at any given time. This may involve planning and acquiring support from a national team of trained and capable responders in spill response, emergency management, and support staff, including operational communications.

10. The Canadian Coast Guard should continue implementing the Incident Command System and exercising with all partners, including First Nations, provincial and municipal partners, and non-governmental organizations as part of the plan.

11. The Canadian Coast Guard should develop simplified quick reference tools for Incident Command Post members who are not familiar with the roles and responsibilities of Incident Command positions.

12. The Canadian Coast Guard should ensure roles are rapidly assigned and explained to members who join the Incident Command Post.

13. The Canadian Coast Guard should consider utilizing the Emergency Operations Centre concept at the regional level to establish a separate strategic management location from the operational Incident Command Post.

14. The Canadian Coast Guard should consider pre-established Incident Command Post locations under a variety of standardized scenarios, to be included in an area response plan.

15. The Canadian Coast Guard should consider utilizing an Incident Command System coach during incidents until all staff members are fully trained.

16. Environment Canada should review its trigger criteria for on-site presence in an incident, in collaboration with the Canadian Coast Guard, particularly in complex incidents.

17. Environment Canada should continue to be a leader in the Environmental Unit, providing sound and independent environmental and scientific advice during an oil spill incident

18. Environment Canada and other levels of government should review appropriate shoreline clean-up standards that can be used for oil spill response.

19. Environment Canada, in collaboration with other levels of government should ensure that the appropriate tools and resources are available for use by the Environmental Unit during an oil spill incident, such as checklists for monitoring, situation maps, sampling protocols and SCAT standards.

20. The Canadian Coast Guard should discuss with partners the best platform for a common operating picture for sharing spill and environmental data.

21. The Canadian Coast Guard should ensure accurate information is released by Unified Command and/or Incident Command as soon as possible regarding the type, quantity, and fate and effects of a pollutant, including any information that is related to public health concerns.

22. The Canadian Coast Guard should develop an accelerated regional approval process with respect to factual operational information during an incident, similar to the current procedures for sharing information in Search and Rescue incidents.

23. The Canadian Coast Guard should ensure the organization has sufficiently trained human resources and tools to manage Unified Command communications.

24. The Canadian Coast Guard, with the Government of Canada IT, should develop a rapidly deployable communications and IT system that facilitates a more effective and timely electronic interface with partner agencies during an incident.

25. The Canadian Coast Guard should consider establishing incident specific communication tools, such as a website and phone number, for significant incidents.

ANNEX A –Terms of Reference for the Review

INDEPENDENT ANALYSIS AND ASSESSMENT OF THE MV MARATHASSA FUEL SPILL ENVIRONMENTAL RESPONSE OPERATION IN ENGLISH BAY, BRITISH COLUMBIA

TO: John Butler, Assistant Commissioner (Ret'd)

FROM: Jody Thomas, Commissioner, Canadian Coast Guard

TERMS OF REFERENCE FOR AN INDEPENDENT ANALYSIS OF THE ENVIRONMENTAL RESPONSE OPERATION ASSOCIATED WITH THE APRIL 8, 2015, MV MARATHASSA BUNKER C FUEL SPILL EVENT

You are to provide to me an independent, unbiased analysis and assessment of the Canadian Coast Guard's (CCG) environmental response operation associated with the MV Marathassa Fuel spill event in English Bay, taking into account the provisions of the Canadian Coast Guard (CCG) Marine Spills Contingency Plan (National and Regional Chapters), Canada's Marine Oil Spill Preparedness and Response Regime, relevant legislation, and these Terms of Reference. A broader list of legislation, plans, policies, and directives to be taken into account is included in Appendix A. Also included in Appendix A is a list of key federal authorities, other levels of government, and non-government stakeholders, which you are required to engage, at a minimum, throughout your review.

Based on official government sources of information, you are to summarize the facts surrounding the outcome of the environmental response operation from the initial call until the conclusion of the CCG response, as signified by the culmination of the Unified Command.

You are to provide me with a high-level assessment of events that occurred on the MV Marathassa's maiden voyage between Japan and Vancouver, BC, including any significant events that may or may not have contributed to the pollution event.

You are also directed to review:

- all formal and informal protocols, written or otherwise, that guide the sequence of notifications to and among the various implicated authorities and stakeholders;
- the sequence of events and actions following identification of the oil spill;
- whether CCG and its partners in Incident Command were compliant with applicable/relevant plans, policies, procedures, directives, and work practices, and whether the response met industry and international response standards; and
- the effectiveness of the interactions between CCG and federal authorities, other levels of government, and non-government stakeholders in achieving the goals of the Incident Command System and Environmental Response functions.

With respect to this specific environmental response operation, and within the scope of your mandate, you are to provide recommendations, if deemed necessary, to improve the communications and operational protocols, standards, practices, actions, procedures, and directives that pertain to environmental response.

In addition, your analysis is not to express any conclusion or recommendation regarding the civil or criminal liability of any person or organization. For greater certainty, you are not to interfere with or to jeopardize any ongoing regulatory investigation, criminal investigation or criminal proceeding conducted by other public entities in relation to these events.

To support you in your assessment and in the development of your report, you will be supported by a Secretariat comprised of federal officials, who will provide a combination of subject matter expertise, analytical, research, writing, and administrative support.

You and the members of your team will be required to sign a document that will create an ethical wall to help ensure that you are able to provide an independent, unbiased review.

All CCG personnel are hereby required to assist you in this review by responding to questions and providing any requested documentation. Your primary CCG contact is Mr. Jeffery Hutchinson, Director General, National Strategies (Jeffery.Hutchinson@dfo-mpo.gc.ca), Tel: 613-993-7728.

You and your team are required to manage all information related to the review in accordance with federal law, including the Access to Information Act and the Privacy Act. Any requests that you receive to share information should be discussed with Mr. Hutchinson, who will ensure that appropriate legal and expert advice is sought regarding the release of information.

Your final report will be provided to me on or before July 19, 2015. The final report will be translated and the Minister will subsequently make this report public, no later than July 31, 2015.

APPENDIX A:
Legislation, plans, policies, and directives to be taken into account:

- *Oceans Act*
- *Canada Shipping Act, 2001*
- *Marine Liability Act*
- *Emergency Management Act*
- Canada's Marine Oil Spill Preparedness and Response Regime
- Marine Spills Contingency Plan (National Chapter)
- Marine Spills Contingency Plan (Pacific Region Chapter)
- Response Management System User's Guide, DFO/6249
- Response Management System Directive, D-3020-2002-02
- Federal Monitoring Officer Directive, D-3030-2002-01
- On-Scene Commander Directive, D-3040-2002-01
- Cost Recovery of Ship-source and Marine Pollution Response Directive, D-4010-2001-01
- Reporting of Marine Pollution Incidents Directive, D-6010-2001-01
- Canadian Coast Guard Safety and Security Manual

Key federal authorities, other levels of government, and non-government stakeholders which you are required to engage, at a minimum:

- Canadian Coast Guard
- Transport Canada, including the National Aerial Surveillance Program
- Environment Canada, including the Canadian Wildlife Service
- Western Canada Marine Response Corporation
- Port Metro Vancouver
- Emergency Management BC
- BC Ministry of Environment
- Tsleil Waututh Nation
- District of North Vancouver
- City of North Vancouver
- District of West Vancouver
- Metro Vancouver (the regional government here, formerly "Greater Vancouver Regional District")
- Shipping Federation of Canada
- Chamber of Shipping of BC
- Squamish Nation
- Musqueam Nation
- Local Wildlife Agencies (Oiled Wildlife Society of BC and Focus Wildlife)
- Vancouver Aquarium
- Pacific Pilotage Authority

ANNEX B – Chronology of Events

WEDNESDAY APRIL 8, 2015

Local Time (PST)	Events	Source	Comments
11:00	An aerial observation of the vessel earlier indicated that there was no pollution observed.	Port Metro Vancouver (PMV)	
	DISCHARGE		
16:45	Recreational boater off of 3rd beach smelled something like asphalt and observed a large slick on the water (later phones 911 at 17:05 to report)	Sailing Vessel comment	
	NOTIFICATION		
16:48	Canadian Coast Guard (CCG) received a call from Vessel High Frequency Channel 12 from vessel "*Hali*" reporting oil sheen in English Bay	CCG	
16:54	Member of the public calls CCG from Sandman on Denman Street to report a slick	CCG	
17:00	Member of the public calls PMV from Sandman Hotel on Davie Street to report a slick	PMV	
1704	CCG called PMV to notify them of the pollution report. PMV advised they had just received similar report from concerned citizen and were tasking a PMV vessel to investigate	CCG	
17:05	Recreational boater phoned 911 to report pollution. The 911 Operator took his number to pass on to CCG, via the Joint Rescue Coordination Centre (JRCC)	Sailing Vessel comment	
17:07-08	JRCC contacted the recreational boater and then passed information to CCG	Personal comment and CCG	
17:08 - 17:10	CCG Environmental Response Duty Officer (Prince Rupert) notified of possible oil slick	CCG	
17:10 – 17:16	CCG issued pollution report email to: Fisheries and Oceans Canada (DFO), Environment Canada, Transport Canada (TC), JRCC, PMV and Emergency Management BC	CCG PMV	
17:10	PMV deployed vessel to investigate	PMV	
17:12	PMV vessel departed Main Street dock	PMV	
17:14	CCG internally alerted regarding possible oil slick around anchorage 12	CCG	
17:15	PMV internally alerted	PMV	
17:18	PMV contacted agent for *M/V Marathassa*.	PMV	
17:22	Province of BC received notice from CCG regarding bunker fuel oil spill in English Bay	Province of BC	

	and internally alerted		
17:27	Dangerous Goods Incident Report (DGIR) from Province of BC: DGIR 150065-Ocean. Code 1. Possible Bunker oil approximately 200 sq metres. Harbour Master investigating possible oil near *M/V Marathassa*	Province of BC	
	ASSESSMENT		
17:30	PMV vessel arrived in the area and discussed with the sailing vessel *Hali* to identify where the concentration of oil was observed	PMV	
17:35	Captain of the *M/V Marathassa* acknowledged there was a substance around their vessel but denied it had come from their vessel	PMV	
17:40	PMV was in area deploying sorbent pads	PMV	
17:45	PMV contacted Nav Canada Vancouver Harbour Control Tower for assistance in identifying the source	PMV	
17:50	PMV estimates that substance is recoverable and unlikely to break up before reaching the beach	PMV	
17:52	Nav Canada Vancouver Harbour Control Tower reported that an incoming Helijet saw a sheen and identified the vessel in Anchorage 12 as the possible source	PMV	
17:53	Resident from West Vancouver phoned to report of oil on the water.	CCG	
17:56 – 17:58	PMV reported to CCG that there appears to be recoverable pollutant in the area and requested a recovery vessel	CCG & PMV	First Assessment of recoverable oil
17:58	CCG internally discussed the reported oil slick and that PMV could task the Western Canada Marine Response Corporation (WCMRC) to respond	CCG	There is uncertainty of responsibilities under the Letter of Understanding
18:00	PMV internally alerted and alerted WCMRC of a potential call-out from CCG	PMV	
18:04	CCG internally alerted via copy of the Pollution Report	CCG	
18:05	CCG Environmental Response officer contacts PMV. They discuss a large patch of oily pollutant approximately 10m X 100m in English Bay, estimated as recoverable by the PMV vessel. PMV requests that CCG initiate spill response. CCG suggest that it could take approximately 1 hour to 90 minutes for CCG to arrive on scene and suggested that PMV contact WCMRC	PMV & CCG	

18:08	CCG provided WCMRC a 'heads up'. WCMRC indicated they have spoken to PMV and are standing by	CCG & WCMRC	CCG expects PMV to activate WCMRC
18:20	CCG distributed Pollution Report 2015-0210 (initial Report): The Pollution Report noted that an area of 200 sq. metres of pollutant, possible Bunker C, some of it in tar balls	CCG	
18:20	PMV internally discussed CCG suggestion to for PMV to activate WCMRC	PMV	PMV expects CCG to activate WCMRC
18:25	WCMRC received message from PMV via activation line, and returned call to PMV to say the local representative will contact them. WCMRC confirmed receipt of message from CCG	WCMRC, PMV & CCG	
18:30	WCMRC and PMV discussed the large slick of recoverable fuel oil in English Bay. WCMRC advised that arrival time would be about 90 minutes	PMV	
18:35	WCMRC decided to mobilize crews as an exercise	WCMRC	
18:30 – 18:45	PMV vessel re-checks area of major sheen (Anchorage 15 to 13) to try and locate the source of the pollution, but did not locate any other large pools. The vessel returned to area where the sorbent pads were deployed, and recovered oily pads. PMV spoke with WCMRC, who confirmed that they have not been contracted; however, were mobilizing as an exercise	PMV &CCG	Visible oil is collected; there is confusion about who will contract WCMRC
18:52	PMV internally discuss obtaining advice from WCMRC on what they were observing	PMV & WCMRC	
18:58	PMV internally discussed the behaviour of the sheen, the small area affected, the large size of the sheen, and inability to locate the source and potential sources	PMV	
19:03	PMV vessel reports to WCMRC what they were observing; from this discussion, it is understood that PMV is standing down	WCMRC	Perception is that PMV is standing down
19:15	PMV Duty Harbour Master requests an update from the PMV vessel regarding discussion with WCMRC	PMV	
19:15	WCMRC updated CCG regarding discussion with PMV	CCG	CCG now believes that a response is no longer required and PMV is standing down
19:17	Private Cessna called PMV to offer photos that were taken at 18:52	PMV	
19:23	WCMRC confirmed to CCG that they have	CCG	

	been stood down by PMV		
19:27	PMV received photos from the private Cessna	PMV	
19:30	Recreational boater passing the stern of the *M/V Marathassa* observed activity on deck and that a PMV vessel was in the area	Sailing Vessel Comments	
19:30	PMV internally discussed the significance of the fuel oil spill following receipt of photos. Actions discussed: Board the *M/V Marathassa* for samples; call CCG and WCMRC. PMV returned to Main Street dock to pick up sampling kit	PMV	
19:32	CCG internally updated that WCMRC have been stood down	CCG	
19:34	PMV left a message with WCMRC advising of the significance of the spill and requested a return call. PMV then called CCG to ensure that WCMRC would be activated	PMV	
19:35	PMV internally discussed the photos taken by the Cessna that indicated a much larger fuel oil spill than originally thought. PMV vessel collected sampling kit and proceeded to English Bay to board the *M/V Marathassa*	PMV	
19:40	CCG internally updates that WCMRC was standing down.	CCG	
19:40	CCG distributed Pollution Report 2015-0210 (Update #2) – the spill has been investigated and deemed non-recoverable		CCG at this time did not have the most up-to-date information on the extent of the fuel oil spill
19:45	PMV called CCG, but could not connect by phone	PMV	There were connectivity issues in reaching CCG
19:48	DGIR 150065-update #1. Code 1. Spill investigated by Harbour Master and deemed not recoverable. Harbour Master vessel stood down	Province of BC	This is based on information from CCG at 19:40
19:50	PMV vessel departs Main St. dock with sampling kits	PMV	
19:51 – 19:52	PMV contacted CCG and is provided alternate phone number	CCG & PMV	Spill is described as substantial
19:55	PMV contacted CCG on alternate phone number to advise of the significance of the fuel oil spill, as per the photos, and to advise that CCG needed to take action. Photos were then sent to CCG	PMV	
	RESPONSE		
19:57	CCG tasked WCMRC based on subsequent reports of fuel oil on water.	CCG	
19:58	PMV contacted WCMRC to report lots of fuel oil on the water. WCMRC re-mobilized	WCMRC	

20:01	WCMRC confirmed to CCG that they were mobilizing	CCG	
20:11	PMV contacted TC	PMV	
20:26	WCMRC emailed work order to CCG	WCMRC	
20:26	CCG updated pollution report to indicate WCMRC had been contracted and was responding	CCG	
20:35	PMV vessel contacted by radio by *M/V Marathassa* to board the vessel	CCG	
20:38	CCG Vancouver contacted to take command of the response as lead agency	CCG	CCG Vancouver takes command as lead agency
20:40	CCG contacted WCMRC to exchange information and to coordinate activities	CCG	
20:45	First WCMRC vessel crewed, en route to scene.	WCMRC	
20:51	CCG contacted Environment Canada (EC) National Environmental Emergency Centre (NEEC) to request trajectory modelling and environmental sensitivities	CCG	
20:55	PMV boards the *M/V Marathassa* for investigation.	PMV	
21:00	CCG alerted TC	TC	
21:04	CCG distributed Pollution Report 2015-0210 (Update #3) – PMV has reassessed the spill from aerial photos and the spill is much larger than originally predicted. WCMRC has been contracted	CCG	
21:05	CCG sent initial National Incident Notification Protocol message (NINP) for national distribution	CCG	
21:25	WCMRC crews arrived on scene and began collecting fuel oil and skimming; source of the spill is still not identified.	WCMRC	Oil recovery commenced by the Response Organization
21:30	CCG arrived at PMV.	CCG	
21:31	Province of BC received pollution report from CCG that spill is larger than originally thought and was advised that WCMRC was contracted.	Province of BC	
21:31	DGIR 150065-update #2. Code 1. Port reassessed and spill is larger than originally thought. WCMRC dispatched.	Province of BC	
21:54	CCG contacted Vancouver Police Department (VPD) non-emergency to ask if they had any reports of oil on the beaches or smell of oil. No reports.	CCG	
22:09	CCG distributed NINP #1 message. Reported significant spill with high media attention.	CCG	
22:10	CCG on scene at Anchorage 12 with a PMV vessel.	CCG	
22:15	Second WCMRC vessel began skimming	WCMRC	

22:15	Province of BC spoke with CCG and advised they would have people on scene in the morning	CCG
22:30	DFO Communications alerted by JRCC CCG arrived at anchorage 12 on board PMV vessel to begin inspection of the scene and suspect vessel	DFO CCG
22:38	Province of BC internally alerted: Notification – Code 1. Distributed as a head's up	Province of BC
23:13	CCG Vancouver provided CCG Headquarters with map and photos of spill	CCG
23:16	CCG vessel *FRC Moorhen* tasked from Sea Island	JRCC
23:30	WCMRC "*MJ Green*" on scene. The vessel is better equipped for night time operations with forward looking infrared camera.	WCMRC
23:30	CCG and PMV board *M/V Marathassa* to inspect the holds and bilge.	CCG
23:54	CCG *FRC Moorhen* on scene.	JRCC

THURSDAY APRIL 9, 2015

Local Time	Events	Source	Comment
00:45	CCG issued notice to the Captain of the *M/V Marathassa* to request his intentions of how he planned to respond to the fuel oil coming from his vessel. A response was requested by 05:00	CCG	
01:13	CCG requested a NOTSHIP for vessels to reduce their speed while transiting English Bay to minimize the spread of pollution	CCG	
01:15	CCG received update from WCMRC regarding skimmed fuel oil volumes (approximately 800L)	CCG	
01:19	CCG received trajectory modelling from EC	CCG	
02:57	Province of BC received update from CCG, who requested further contact	Province of BC	
02:57	DGIR 150065-update #3. Code 1. CCG requests to speak with Province of BC regarding the incident	Province of BC	
03:07	Province of BC in Prince George spoke with CCG	CCG	
03:22	CCG distributed Pollution Report 2015-0210 (Update #5) – WCMRC crews continue to skim, CCG is on scene, TC overflight planned for first light. No known source, continue to investigate. Oil sightings have been limited to sparse patches and tar balls	CCG	
03:25	CCG and WCMRC determined need to boom	WCMRC	

	vessel, after indications of fresh fuel oil being discharged from the *M/V Marathassa*. Estimated 1 cubic metre of heavy oil recovered so far		
04:36	WCMRC began deployment of boom around *M/V Marathassa*	WCMRC	
~[26]05:00	A representative for the M/V Marathassa contacted CCG and denied the vessel was the source of pollution	CCG	
05:17	DGIR 150065-update #4. Code 1. CCG on scene, TC overflight planned. WCMRC conducting skimming ops. No source identified	Province of BC	
05:25	Booming of vessel complete	WCMRC	Source of fuel oil is contained approximately 12.5 hours after the initial report
06:00	WCRMC called the City of Vancouver to advise that WCMRC had been activated for a spill that now appears to be significant	WCMRC	A standard practice for WCMRC
06:27	CCG requested space from PMV to coordinate response; PMV Emergency Operations Centre (EOC) was activated. City of Vancouver contacted PMV for an update	PMV	
06:30	Vancouver Coastal Health (VCH) alerted by the City of Vancouver of the spill in English Bay	Vancouver Coastal Health	
07:00	CCG, as lead agency, established Unified Command at PMV. Fuel oil patches were throughout English Bay with pollution sheen reaching Vancouver and West Vancouver Beaches	CCG	Unified Command established with CCG lead
07:00	North Shore Emergency Management Office (NSEMO) was contacted by WCMRC	City of West Vancouver, City of North Vancouver, District of North Vancouver	
07:30	Province of BC arrived at PMV; a City of Vancouver representative was already present	Province of BC	
07:45	PMV contacted the Province of BC and asked why the City of Vancouver had not been contacted through pollution reports. PMV was informed that this is a federal concern	PMV	
08:21	The City of Vancouver contacted the Province of BC to request task # to activate in response	Province of BC	

[26] ~ is the symbol for approximately

	to spill. The Province of BC assigned TASK # 160240		
08:30	Vancouver Aquarium alerted of the spill via the media. Activated their assessment team to assess the risks to the Aquarium	Vancouver Aquarium	
09:00	Tsleil'Waututh First Nation alerted by the Province of BC	Tsleil' Waututh	
10:11	Province of BC confirmed that First Nations, VCH, Oiled Wildlife Society and Vancouver Aquarium had been notified	Province of BC	
10:15	CCG Helicopter overflight of English Bay with representatives from ER, the Province of BC and WCMRC	WCMRC	
11:00	First Media Brief held by CCG	DFO Communications	First formal media briefing
11:48	*CCGS Siyay* tasked to support response communications English Bay	JRCC	
12:20	NASP overflight estimates 2800 L oil on water. CCG flight estimates 2000 L in the main black oil slick. No shoreline impact or distressed wildlife observed	WCMRC	
12:48	CCG NINP update #1 issued: WCMRC responding to the spill; 3 WCMRC Vessels using Skimming Equipment recovering oil. Spill source remains a mystery, but suspect vessel has been boomed. TC is on board the suspect vessel today. CCG Helicopter tasked to perform overflight with ER Specialist on board; ETA on scene 1015PDT. TC 951 (NASP Aircraft) has been tasked and will be overhead at 10:45	CCG	
14:00	CCG Helicopter transports CCG personnel from Victoria to Vancouver to participate in Unified Command	CCG	
14:40	CCG Environmental Response Pollution Response Vessel III 735 away from Steveston, proceeding to English Bay	JRCC	
15:00	Media Brief with CCG	DFO Communications	
15:02	NSEMO contacted the Province of BC to request task # to activate in response to spill	Province of BC	
15:27	DGIR update #6. Incident elevated to Code 2 based on extensive media coverage and resource demands beyond local government capabilities	Province of BC	Province elevates to Code 2
18:06	NASP overflight estimates 667.7 litres of oil on water in English Bay, mostly grey sheen with occasional patches of brown/black oil	TC	

19:00	No oiled wildlife has been observed at collection sites. TC officers have inspected on board and are not yet able to confirm source. Shoreline assessments are being carried out by WCMRC and MOE, some oil reported at variety of sites.		
19:52	CCG Headquarters personnel arrive in Vancouver with the Commissioner	CCG	
20:00	Media brief with CCG	DFO Communications	
21:30	TC advised (unofficial) that *M/V Marathassa* was the likely source of pollutant		
22:48	CCG distributes NINP update #2. Updated on water activities.	CCG	
Unspecified	Stanley Park Ecological Society (SPES) informed of the spill by Aquarium staff and Parks Board. Arrived at Second Beach looking for presence of oil	SPES	

FRIDAY APRIL 10, 2015

Local Time	Events	Source	Comments
06:00	Incident Command Incident Action Plan (IAP) for the day: Continue with SCAT Continue with Shoreline clean Mobilize for Wildlife Recovery Prepare for demobilization	ICP Records	
08:30	Media briefing with CCG and TC	DFO Communications	
09:12	NASP overflight estimates 40 litres of oil on water English Bay	NASP	
10:30	DFO Communications invited into Unified Command	DFO Communications	
12:00 (est)	VCH invited to participate in the Environmental Unit after a CCG media briefing	VCH	
14:00	Media briefing with Minister Moore and CCG	DFO Communications	
14:10	NASP overflight estimates 5.9 litres of oil on water, non-recoverable	TC	
20:00	Noted in ICP Brief that a representative from the vessel owner has agreed they are the responsible party (RP)	ICP Records	
20:00	TC contracted divers to inspect the hull of *M//V Marathassa*– no conclusive report was determined at this time	TC	
21:10	CCG NINP update #3: Detailing activities on the	CCG	

	water, on the shoreline and in the ICP

SATURDAY APRIL 11, 2015

Local Time	Events	Source	Comments
00:55	TC issues detention order to *M/V Marathassa*	TC	
06:00	Incident Command IAP: Continue with SCAT Continue with shoreline clean-up Mobilize for wildlife recovery Prepare for demobilization		
07:00	CCG Pollution Response Vessel II tasked to support shoreline clean-up at Siwash Rock (Stanley Park). PRV III tasked to Vanier Park (South shore English Bay) to support shoreline clean-up	CCG	
10:00	Media briefing with CCG and other federal partners	DFO Communications	
10:36	NASP overflight noted a light sheen of oil off stern of *M/V Marathassa*, calculated at 0.3 litres	TC	
	DFO took on Public Information Officer role in Unified Command	DFO Communications	
14:28	CCG NINP update #4: ICP open, Shoreline clean-up, decontamination of vessels, and waterlines of ships, monitor wildlife rescue and rehabilitation	CCG	
14:30	Media briefing with CCG and Provincial of BC	DFO Communications	

SUNDAY APRIL 12, 2015

Local Time	Events	Source
00:55	TC issues detention order to *M/V Marathassa*	TC
06:00	Incident Command IAP: Control of Oil spill is complete Objective for the day: Continue with SCAT Continue with Shoreline clean-up Continue with wildlife recovery operations Demobilization planning Water sampling and sediment sampling	ICP Records
07:00	CCG PRV II tasked to support shoreline clean-up at Siwash Rock (Stanley Park). PRV III tasked to Vanier Park (South shore English Bay) to support shoreline clean-up	
10:00	Media briefing with CCG	DFO

		Communications
1036	NASP overflight noted a light sheen of oil off stern of *M/V Marathassa*, calculated at 0.3 litres	TC
Afternoon	DFO visited Unified Command	DFO

MONDAY APRIL 13, 2015

Local Time	Events	Source	Comments
06:00	Incident Command IAP: Continue with SCAT Continue with shoreline clean-up Vessel cleaning, including casualty (i.e. *M/V Marathassa*) Demobilization if warranted Mass Balance Update stakeholder and public communications	ICP Records	
10:00	Media briefing with CCG	DFO Communications	
18:04	CCG NINP update #5: Updates activities in the ICP	CCG	
Unspecified	Vancouver Aquarium invited to join the Environmental Unit	Vancouver Aquarium	
Unspecified	ITOPF arrived in Vancouver	ITOPF	

TUESDAY APRIL 14, 2015

Local Time	Events	Source	Comments
06:00	Incident Command IAP: Continue with SCAT Continue with shoreline clean-up Vessel cleaning including casualty Demobilization if warranted Mass Balance Establish post-ICP project team	ICP Records	
10:00	Technical panel led by CCG	DFO Communications	Last formal media briefing
18:26	CCG NINP update #6: Updates activities in the ICP	CCG	

WEDNESDAY APRIL 15, 2015

Local Time	Events	Source	Comments
06:00	Incident Command IAP: Continue with SCAT Continue with shoreline clean-up Vessel cleaning including casualty Conduct under hull cleaning of oil by divers	ICP Records	

	Mass Balance Establish post-incident project team including decision to procure third party consultant Complete testing to support decision to open fisheries and beaches (sediment and crabs) Wildlife management		
17:53	CCG NINP update #7: Updates activities in the ICP	CCG	

THURSDAY APRIL 16, 2015

Local Time	Events	Source	Comments
06:00	Incident Command IAP: Continue with SCAT Continue with shoreline clean-up Demobilization if warranted Mass Balance Establish post-incident project team, including decision to procure third party consultant Complete testing to support decisions to open fisheries and beaches (sediment and crabs)	ICP Records	
16:01	CCG NINP update #8: Updates activities in the ICP	CCG	

FRIDAY APRIL 17, 2015

Local Time	Events	Source	Comments
06:00	Incident Command IAP: Continue with SCAT Continue with shoreline clean-up and signoffs Vessel Cleaning including the casualty Demobilization Mass Balance Establish post-incident project team including decision to procure third party consultant Complete testing to support decision to open fisheries and beaches (sediment and crabs)	ICP Records	
18:01	CCG NINP update #8: Updates activities in the ICP	CCG	

SATURDAY APRIL 18, 2015

Local Time	Events	Source	Comments
0600	Incident Command IAP: Continue with SCAT Continue with shoreline clean-up and signoffs Vessel Cleaning including the casualty	ICP Records	

	Demobilization Mass Balance Complete testing to support decision to open fisheries and beaches (sediment and crabs)		
18:01	CCG NINP update #9: Updates activities in the ICP	CCG	

SUNDAY APRIL 19, 2015

Local Time	Events	Source	Comments
06:00	Incident Command IAP: Continue with SCAT Continue with shoreline clean-up and signoffs Demobilization Mass Balance Complete testing to support decision to open fisheries and beaches (sediment and crabs) Demobilization for on-water assets Long term Project Monitor Plan and Communications Release Long term Data Management Plan Wildlife centre start to demobilize.	ICP Records	
18:02	CCG NINP update #10: ICP has consolidated, and moved into the DFO Offices at 401 Burrard. As the *M/V Marathassa* incident is nearing an end, the English Bay Project Management Office is being mobilized, terms of reference being drafted.	CCG	
20:00	NEEC arrived in Vancouver	EC	

MONDAY APRIL 20, 2015

Local Time	Events	Source	Comments
06:00	Incident Command IAP: Continue with SCAT – North shore beaches (John Lawson) Continue with shoreline clean-up and signoffs Demobilization Mass Balance Complete testing to support decision to open fisheries and beaches (sediment and crabs) Demobilization for on-water assets Establish Project Monitor Plan and Communications Release Establish Data Management Plan Wildlife centre demobilize.	ICP Records	

TUESDAY APRIL 21, 2015

Local Time	Events	Source	Comments
06:00	Incident Command IAP: Escort *M/V Marathassa* from anchorage to berth with escort and response vessels Continue with SCAT – North shore areas B,C and D by CG vessel Continue with shoreline clean-up and signoff – John Lawson Demobilization Start of cleaning or on-water assets – shelter Island – Burrard Clean #7 Complete testing to support decision to open fisheries and beaches (sediment and crabs) Define requirements for Data Management Plan - Access Wildlife centre demobilize – forecasting completion Forecast transport of EC and partners to Vancouver Inner harbour	ICP Records	

WEDNESDAY APRIL 22, 2015

Local Time	Events	Source	Comments
06:00	Incident Command IAP: Continue with SCAT – Vancouver Harbour and North Shore, as required Continue with shoreline clean-up and signoff –John Lawson Demobilization Complete testing to support decision to open fisheries and beaches (sediments and crabs) Define requirements for Data Management Plan	ICP Records	

THURSDAY APRIL 23, 2015

Local Time	Events	Source	Comments
06:00	Incident Command IAP: Continue with SCAT – Vancouver Harbour and North Shore as required Continue with shoreline clean-up and signoffs –John Lawson Demobilization of ICP pending	ICP Records	

FRIDAY APRIL 24, 2015

Local Time	Events	Source	Comments
06:00	Incident Command IAP: Response Team stood-up John Lawson Beach clean-up at its end point Complete testing to support decisions to open fisheries and beaches (sediment and crabs) Demobilization of ICP and hand-over to Project Management Office commenced	ICP Records	

ANNEX C – Canada's *Marine Oil Spill Preparedness and Response Regime*

Canada's *Marine Oil Spill Preparedness and Response Regime* sets out the framework and requirements for preparing for and responding to ship-source oil spills in Canadian waters south of the 60th parallel.

The Regime was established in 1995 to address recommendations from the Public Review Panel on Tanker Safety and Marine Spills Response Capability (the Brander-Smith Panel), and to respond to increasing concerns following a number of high profile marine oil spills (the Exxon Valdez, the Rio Orinoco, and the Nestucca).

The Regime places the onus on the polluter, or the 'Responsible Party' to take full responsibility for the cost of any damages caused by an oil spill, which is called the "polluter pays principle". This can include taking actions directly to prevent, reduce or eliminate the source of pollution, or using the services of a third party.

The polluter pay principle is supported by both industry and the federal government. Industry is responsible for providing Canada's response capability and the federal government is responsible for providing the legislative and regulatory framework, and ensuring that response operations are carried out appropriately to minimize damage to the marine environment.

RESPONSE ORGANIZATIONS

Industry bears the liability and responsibility to respond in the event of an oil spill in Canadian waters and represents Canada's primary response capacity. To operate in Canada, prescribed vessels of a certain size (oil tankers of 150 gross tons and all vessels of 400 gross tons trading in Canadian waters) are required to have an arrangement with a Transport Canada (TC)-certified Response Organization, which carry out industry' s operational role to maintain Canada's response capacity. Vessels of the above-prescribed size must also have Shipboard Oil Pollution Emergency Plans (SOPEP), as required by the International Convention for the Prevention of Pollution from Ships (MARPOL).

Response Organizations are funded by shippers and oil interests, and are required to meet a uniform planning standard to maintain the on-hand capacity to respond to spills of 10,000 tonnes within prescribed time standards and operating environment[27]. Response Organizations must submit an oil spill response plan every three years to TC to demonstrate this preparedness capacity. This plan must include an exercise and training program, provide a certain amount of temporary storage, clean-up 500m of shoreline per

[27] Response Organization Standards (TP 12401 E), Transport Canada 1995
http://www.tc.gc.ca/media/documents/marinesafety/tp12401e.pdf

day, and complete on-water recovery within 10 days of deployment. Response Organizations are re-certified every three years.

South of the 60th parallel, there are four certified Response Organizations: WCMRC, Eastern Canada Response Corporation Ltd., Point Tupper Marine Services, and Atlantic Emergency Response Team.

Western Canada Marine Response Corporation

WCMRC's geographic area of responsibility extends the length of British Columbia (BC) and out to the Exclusive Economic Zone. WCMRC has eight reference and resource Area Plans that describe area sensitivities, Incident Command Post locations, staging areas, vessel launch locations, helispots, protection/treatment strategies, equipment resources, and logistical support services. These plans are provided to TC every three years for certification purposes, and are not publicly available.

FEDERAL ROLES AND RESPONSIBILITIES

The Regime relies on interdepartmental collaboration between TC, the Canadian Coast Guard (CCG), and Environment Canada (EC) to provide three primary functions:

- TC provides the legislative and regulatory framework and oversight for the Regime (e.g. inspections and enforcement, certification of Response Organizations, and ensuring the appropriate level of preparedness is available to respond to marine oil spills in Canada);

- CCG oversees the industry's response to ship-source and takes over the response when the polluter is unknown, unwilling or unable to respond; and

- EC provides and coordinates scientific, environmental and wildlife information and advice, with support from Fisheries and Oceans Canada and other experts.

In the event of an oil pollution incident, at the request of the CCG, EC will establish a Science Table comprised of experts from federal, provincial and municipal government agencies responsible for environmental protection, as well as experts from industry and non-government associations to coordinate and provide scientific and technical advice and information.

This partnership is further supported by a multi-layered system of other levels of government, including First Nations, and stakeholders who also have a role in preparing for and responding to marine oil spills in their local communities.

LEGISLATIVE AND REGULATORY FRAMEWORK

Three legal instruments form the basis of the Federal Regime:

- Part 8 of the *Canada Shipping Act*, 2001, which outlines the roles and responsibilities for the Ministers of Transport and Fisheries and Oceans regarding pollution prevention and response;

- The Response Organization and Oil Handling Facilities Regulations, which explain the procedures, equipment and resources of Response Organizations and Oil Handling Facilities for use in respect of an oil pollution incident; and

- The Environmental Response Arrangements Regulations, which outlines which vessels and oil handling facilities, are required to have an arrangement with a Response Organization for pollution response.

These domestic legal instruments are supported by international standards and conventions established by the International Maritime Organization. Two international agreements allow TC to fulfill its roles in preventing and preparing for marine pollution incidents:

The International Convention for the Prevention of Pollution from Ships (MARPOL), which is domestically enforce via the *Canada Shipping Act*, 2001, and is supported by the Vessel Pollution and Dangerous Chemicals Regulations that sets out additional standards; and

The International Convention on Oil Pollution Preparedness, Response and Cooperation, which allows Canada to provide assistance to major incidents in other member states.

THE CANADIAN COAST GUARD ENVIRONMENTAL RESPONSE PROGRAM

The CCG is the operational arm of the Government of Canada and is the lead federal agency responsible for ensuring an appropriate response to ship-source and mystery-source spills in Canadian waters. To deliver on this mandate the CCG has levels of service, legislative and administrative authorities, oil spill contingency plans, response assets, and domestic and international mutual aid agreements.

Levels of Service

The CCG Environmental Response (ER) Program aims to "minimize the environmental, economic and public safety impacts of marine pollution incidents occurring in Canadian waters".[28] Within this mandate, it is responsible for providing a preparedness capacity for response to ship-source marine pollution incidents and addressing reported cases of marine pollution.

[28] Canadian Coast Guard Environmental Response Marine Spills Contingency Plan National Chapter, Canadian Coast Guard, 2011 http://www.ccg-gcc.gc.ca/folios/00025/docs/national-response-plan-2011-eng.pdf

To ensure an appropriate preparedness capacity, the CCG maintains a National Marine Spills Contingency Plan and regional chapters for all three regions, provides competent and qualified environmental response personnel, ensuring that a Duty Officer is available 24/7.

To appropriately address all reported cases of marine pollution, the CCG conducts an assessment of all reported cases in order to determine further course of action, which could include using CCG pollution countermeasure equipment. If the CCG equipment and resources are required, they will be mobilised within 6 hours of completion of the assessment and arrival time on-scene will vary.[29]

In the event of an oil spill, the CCG will advise the polluter of its responsibilities and will monitor it's clean-up efforts (who may use its own resources, those of a Response Organization, or those of another third party), and will assume the role of Federal Monitoring Officer when the Coast Guard is satisfied with the polluter's intentions and plans. In cases when the polluter is unknown, unwilling or unable to response, CCG will manage the clean-up efforts as On-Scene Commander.

Legislative and Administrative Authorities

The CCG's mandate for the preparedness and response components of its ER Program in southern Canada flows from:

- The *Oceans Act* which devolves responsibilities for marine pollution response from the Minister of Fisheries and Oceans to the CCG;

- Part 8, section 180 of the *Canada Shipping Act*, 2001 provides broad powers and authorities for the CCG to take action or to direct others to take action to prevent or remedy an oil spill.

The CCG, through the Minister of Fisheries and Oceans, also has the authority to immediately enter into emergency contracts up to $10M to ensure an appropriate response to oil spills in the event of an emergency.

Preparedness

The CCG maintains Canada's National Marine Spills Contingency Plan that establishes the framework, approach and operational guidelines the CCG will use to respond to a marine pollution incident at the regional, national and international level. The CCG also maintains regional area and local response plans, including BC.

Training and exercising

The CCG has trained environmental response personnel located throughout Canada that

[29] Canadian Coast Guard Environmental Response Levels of Service http://www.ccg-gcc.gc.ca/eng/CCG/WM_Los_Page5#10

monitor, provide advice and take action in addressing pollution incidents and protecting the marine environment. The CCG College manages and delivers a suite of specialized spill management training courses for CCG employees.

The CCG's ER Program is also responsible for designing and conducting drills and exercises to practice, validate and reinforce the plans, systems and strategies as set out in the National Contingency Plan.

Response Assets

The CCG has 10 unstaffed equipment caches located in the Western Region and three staffed facilities. Response assets can also be cascaded, as required, from other regions.

Domestic and International Mutual Aid Agreements

The CCG and the United States Coast Guard have a Joint Marine Pollution Contingency Plan, which is regularly exercised, to promote a coordinated system for preparedness and response to marine pollution events in adjacent waters. The CCG also has administrative arrangements with France and Denmark that provide for mutual aid in the event that a spill exceeds the capacity for one nation to respond.

Additionally, Canada, as an Arctic state, has signed the *Agreement on Cooperation on Marine Oil Pollution Preparedness and Response* in the Arctic. This Agreement aims to strengthen cooperation, coordination and mutual assistance for oil pollution preparedness and response in the Arctic.

Canada is also a party to the *International Convention on Oil Pollution Preparedness Response and Co-operation* (OPRC) that allows CCG to call upon other nations that are party to this Convention for assistance. Signatories to the OPRC Convention agree that, subject to their capabilities and availability of relevant resources, they will co-operate and provide advisory services, technical support and equipment for the purpose of responding to an oil pollution incident.

VANCOUVER HARBOUR OIL SPILL PREPAREDNESS AND RESPONSE SUPPORT NETWORK

Canada's comprehensive, multi-layered marine safety system relies on a support network of other levels of government, including First Nations, and stakeholders who have a role in preparing for and responding to marine oil spills in their local communities.

Province of British Columbia

At the provincial level, BC's Ministry of Environment maintains a contingency plan for marine oil spills. The Ministry of Environment is responsible for provincial preparedness and response management for spills under the *Emergency Program Act* and the associated Emergency Program Management Regulation.

BC's contingency plan is aligned with the Incident Command System and outlines the organization, procedures and duties of the provincial government in response to a major oil spill in BC's coastal waters. The plan is founded on two guiding documents: the Environmental Emergency Program Policies and Procedures and the BC Emergency Response Management System.

The Ministry of Environment is also responsible for environmental monitoring, and protecting and cleaning up the inter-tidal shoreline and seabed under provincial jurisdiction.

First Nations

First Nations in the Vancouver area have a responsibility to protect their traditional territories and to ensure proper stewardship of their land and waters. Environmental protection is a key priority for First Nations - they use their traditional knowledge to ensure that environmental and cultural sensitivities are protected in the event of an oil spill.

Municipalities

Municipalities in the Vancouver area have many responsibilities in the event of a marine oil spill, including protecting its citizens from contaminated shorelines, coordinating volunteers, communicating with the public about health and environmental concerns, and providing support to the lead agency.

Port Metro Vancouver

Port Metro Vancouver (PMV) maintains a Letter of Understanding with the Canadian Coast Guard's Western Region to ensure prompt and cost-effective response to ship-source and mystery oil spills within PMV's waters, while minimizing disruption to port operations.[30]

As per the Letter of Understanding, upon notification of a spill in its waters, Vancouver Fraser Port Authority (VFPA) will assess the size and nature of the spill and collect information that may assist CCG personnel with planning the appropriate strategy.

Stakeholders

A variety of stakeholders also have a role to play in the event of a marine oil spill in the Vancouver Harbour. These organizations, including Vancouver Coastal Health, Oiled Wildlife Society, Vancouver Aquarium, Stanley Park Ecology Society, Canada Shipping Federation, British Columbia Chamber of Shipping.

[30] Letter of Understanding between Canadian Coast Guard Environmental Response Pacific Region and Port Metro Vancouver, 2009 which can be found in Annex F.

These stakeholders have numerous responsibilities, including but not limited to ensuring the safety of the public, wildlife, and marine shipping, as well as conducting scientific research on ocean pollution.

WORLD-CLASS TANKER SAFETY SYSTEM

The World-Class Tanker Safety System is a multi-year strategy announced by the federal government in 2012 in support of its plan for Responsible Resource Development. The World-Class Tanker Safety System is an approach to marine safety that falls under three pillars:

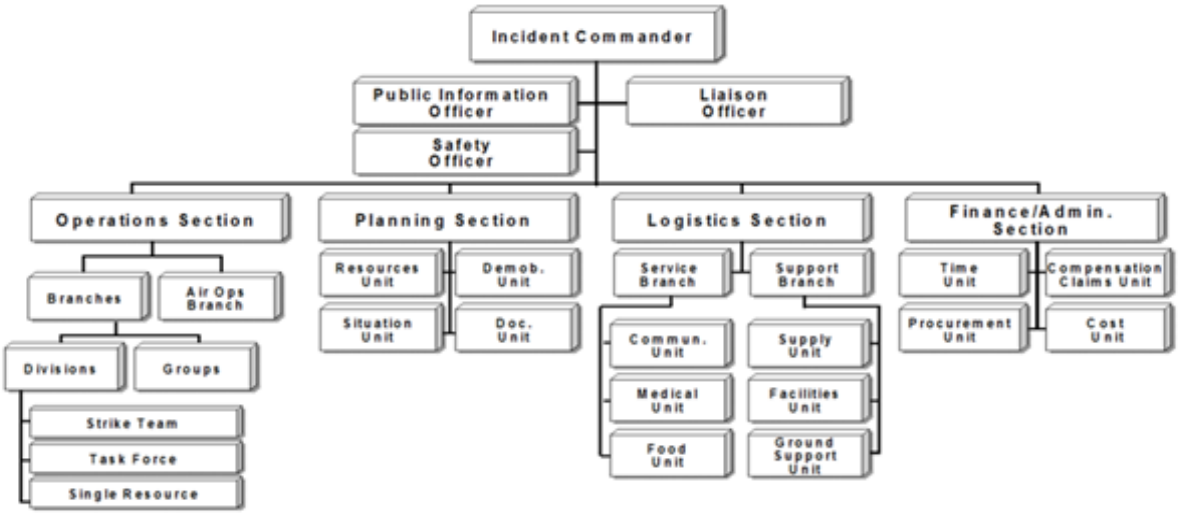
- Prevention (aiming to avoid and deter marine spills);
- Preparedness and Response (taking reasonable measures to respond to marine oil spills as quickly and effectively as possible); and
- Liability and Compensation (to ensure that polluters pay and to compensate those impacted by a marine oil spill).

Under the banner of a World-Class Tanker Safety System, the Government of Canada is implementing two key initiatives: Incident Command System and Area Response Planning.

INCIDENT COMMAND SYSTEM

Incident Command System (ICS) is an incident management methodology used to structure and organize on-scene incident response. Specifically, ICS provides a flexible and scalable command, control and coordination structure that is applicable to incidents of any type, scope and complexity, including environmental response. It allows users to adopt an integrated organizational structure to match the demands of single or multiple incidents, without being hindered by jurisdictional boundaries.

Under the ICS structure, each incident is led by an Incident Commander (IC), and the principal functions are divided into four sections: Operations, Planning, Logistics, and Finance/Administration. The generic ICS structure, below, is scalable and can expand or contract depending on the circumstances of a particular incident.



The ICS model also provides a supervisory and reporting structure. When assigned to an ICS structure, personnel will report to their ICS supervisor for the period of their assignment. Upon completion of their assignment, they will revert to their normal supervisor and reporting structure.

ICS Principles

Standardization: ICS establishes common terminology and standard processes for planning and managing resources, allowing diverse incident management and support organizations to easily work together within an ICS organization.

Command: The IC has overall responsibility for managing the incident and should have the necessary training, experience and expertise to serve in this capacity. It is possible that the IC may not be the highest ranking officer on-scene. Depending on the size and complexity of the incident, the IC may assign staff to specific functions on his/her behalf (e.g. Public Information Officer, Safety Officer, Planning Section Chief, Logistics Section Chief, etc).

An ICS organization may be expanded into a Unified Command (UC) that brings together ICs from key organizations involved in an incident in order to coordinate an effective response, while continuing to carry out their own jurisdictional responsibilities. The UC links the organizations responding to the incident and provides a forum for making consensus decisions. Should consensus not be achieved, the organization with primary jurisdictional authority has the final say.

Planning: Incident management using ICS is normally accomplished by managing objectives through the development of an Incident Action Plan (IAP). An IAP is a verbal or written plan that outlines general objectives, describes the overall strategy for managing an incident, and identifies operational resources and assignments. IAPs provide supervisory

personnel with direction and actions to be implemented during a specified operational period.

Resource Management: Comprehensive resource management within an ICS organization requires processes for categorizing, ordering, dispatching, tracking and recovering resources. This provides an up-to-date picture of Tactical Resources (i.e. personnel and major equipment available to the operational function), and Support Resources (e.g. food, communications equipment, tents, etc.)

Tactical / On-Scene Communications: A common Communications Plan is needed to ensure that responders can communicate with one another during an incident. Communications equipment, procedures and systems must be interoperable across jurisdictions. Multiple communications networks may be established, depending on the size and complexity of the incident.

ICS in Canada

ICS is currently being used by many different agencies within the broader safety and security community, across a wide range of incident response categories, at the federal, provincial and territorial level.

At the provincial level, various emergency response management systems based on the ICS methodology have been adopted, including within Emergency Management British Columbia, and British Columbia Ministry of the Environment.

The adoption of ICS is also gaining momentum across a number of federal departments, including within Public Safety Canada, Department of Foreign Affairs Trade Development Canada, the Public Health Agency of Canada, Canadian Food Inspection Agency, and Transport Canada.

ICS Implementation within THE CANADIAN COAST GUARD (CCG)

The CCG is in the process of adopting ICS as its methodology for incident management and is currently in year three of its five-year implementation plan. All five main components of ICS implementation are expected to be completed by the end of fiscal year 2017/18:

- Development of foundational ICS Documentation - (Expected completion by November 2015);

- ICS Training for CCG personnel across Canada - (Appropriate training of 2,800 Department of Fisheries and Oceans/CCG personnel expected by the end of 2017/18);

- Design and construction of a National Situation Centre to support incident management – (Expected completion by end of 2015/16);

- Acquisition of an ICS Information Management System to track and manage response actions – (Expected to be operational by the end of March 2016); and

- An Exercise Program to ensure interoperability with partners, and validate documentation and training – (ICS exercises are expected to occur as planned, in August 2016, fall 2016 and fall 2017).

AREA RESPONSE PLANNING

In 2013, the Government of Canada announced the creation of a Tanker Safety Expert Panel which was created to review Canada's current regime and propose further measures to strengthen it. The Panel's report was released in December 2013 and contained 45 recommendations. It noted that Canada requires a regime that takes into account variations across regions and adapts to vessel traffic, oil movements, as well as environmental and socio-economic sensitivities.

In response to the Panel's report, the Government of Canada began a process to pilot Area Response Planning (ARP) in four pilot areas, of which includes Southern British Columbia. Area response plans will be developed in collaboration with all relevant partners, including Response Organizations, First Nations, stakeholders and other government departments. This initiative will consider geography, local risks, environmental sensitivities, and traffic volumes, and will ensure that the appropriate spill clean-up equipment is in place and readily available. The area response plans will have a tailored set of standards and requirements for Response Organizations.

Lessons learned from these four areas will be used to refine the ARP model, and in the future, will allow the Government of Canada to consider options for implementing this spill response planning approach in other locations across Canada.

Currently, Area Response Planning (ARP) is at the communications stage and the next phase, engagement with partners, will follow. The pilot area response plans are anticipated to be completed by 2017.

ANNEX D – Lexicon

AC – Assistant Commissioner
ARP – Area Response Planning
BC – British Columbia
BDZ – Brigadier General Zalinski
CCG – Canadian Coast Guard
DFO – Department of Fisheries and Oceans
DGIR – Dangerous Goods Incident Report
DO – Duty Officer
EC – Environment Canada
ECC– Emergency Coordination Centre
EERO - Environmental Emergencies Response Officer
EMBC – Emergency Management British Columbia
EOC – Emergency Operations Centre
ER – Environmental Response
EU – Environmental Unit
FMO – Federal Monitoring Officer
GIS - Geographic Information System
ICP – Incident Command Post
ICS – Incident Command System
IFO – Intermediate Fuel Oil
IT – Information Technology
ITOPF - International Tanker Owners Pollution Federation
JRCC – Joint Rescue Coordination Centre
LOU – Letter of Understanding
MCTS - Marine Communications and Traffic Services
MOE – Ministry of Environment
MOU – Memorandum of Understanding
NASP – National Arial Surveillance Program
NCC – National Coordination Centre
NEEC - National Environmental Emergencies Centre
NHQ – National Headquarters
NINP - National Incident Notification Procedure
NOTSHIP – Notices to Shipping
OSC – On Scene Commander
PIO – Public Information Officer
PMO – Project Management Office
PMV – Port Metro Vancouver

RO – Response Organization
RMIC – Regional Marine Information Centre
RP – Responsible Party
SAR – Search and Rescue
SCAT – Shoreline Cleanup and Assessment Technique
SOPF – Ship-Sourced Oil Pollution Fund
SRO – Senior Response Officer
TSEP – Tanker Safety Expert Panel
TC – Transport Canada
UAV - Unmanned Aerial Vehicle
VFPA – Vancouver Fraser Port Authority
VTS – Vessel Traffic Services
VTZ – Vessel Traffic Zone
WCMRC – Western Canada Marine Response Corporation

ANNEX E – *M/V Marathassa's* Material Safety Data Sheet

Material Safety Data Sheet

This document is prepared under article 41 of occupational safety and health regulation

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1). Product Name : Diesel oil for ship(MFO380)

2) Advisable use and Restriction

- O Advisable use : fuel oil for ship
- O Restriction : Observe the law and regulation.

3) Manufacturer/Supplier/Distributor information

- O Manufacturer : Hyundai oilbank, 640-6, Daejuk-ri, Daesan-eup, Seosan-si, Chungcheongnam-do 356-713, Korea
- O Supplier/distributor : Same as manufacturer 82-2-2004-3877
- O Emergency response number : 82-41-660-5401,5407
- O Division : Environment & safety team

2. HAZARD IDENTIFICATION

1) Hazard classification

- Carcinogenicity Cat 1B

2) Allocation label elements

A. Symbol

B. Signal word : danger

C. Hazard statements :
May cause cancer

D. Precautionary statements

- Prevention
  Obtain special instructions before use
  Do not handle until all safety precautions have been read and understood
  Use personal protective equipment as required.
- Response
  IF exposed or concerned : Get medical advice/attention
- Storage
  Store locked up.
- Disposal
  Dispose of contents/container to (in accordance with local/regional / national/international regulations.)

chemical name		[illegible]	[illegible]	[illegible]
Bunker-C	(0~4)	1	2	0
Sulfur	(0~4)	1	1	0

3. INGREDIENT INFORMATION

Components	Common name	CAS No.	PCT (WT)(%)
Bunker-C	Bunker-C	68476-33-5	96~99
Sulfur	Sulfur	7704-34-9	1~4

4. FIRST AID MEASURES

A. Eye contact :
- Flush eyes with plenty of running tepid water for at least 15 minutes.
- Get immediate medical attention. if pain occur or persist.

B. Skin contact :
- Get immediate medical attention for burn.
- Wash affected area with soap and plenty of water. if contact with other chemicals.
- Wash with dry detergent.
- Launder and dry contaminated clothing and shoes thoroughly before reuse.

C. Inhalation :
- Remove to fresh air.
- Get immediate medical attention.
- If breathing is irregular or difficult, administer artificial respiration and give oxygen. bronchitis, or pneumonitis

D. Ingestion :
- Do not induce vomiting
- Get immediate medical attention.

E. Acute/chronic effects and symptoms : N/A

F. Advice to physician :
- If swallowed, consider gastric lavage

5. FIRE FIGHTING MEASURES

A. Extinguishing media
- O Proper extinguishing media :
- Dry chemicals , CO2, water, regulatory foam
- O Improper extinguishing media :
- N/A
- O Large fire
- Fight fire using regulatory foam or finely water fog.

- CO_2, Carbon oxides, Sulfur oxides

O Hazard for fire and explosion :

- Moderate fire hazard
- Vapor/air mixture may explode at over flash point.

C. Protective clothing and fire fighting :

- Move containers from fire area If you can Do it without risk
- Cool containers with flooding quantities of water until well after fire is out
- Do not approach both side of tank.
  If arriving and shipping place or storage facilities fire.
- Keep unauthorized personnel away.
- Water spray from safety zone.
- If firefighting is impossible, withdraw from area and let fire burn.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. consider initial evacuation for 800 meters (1/2 mile) in all directions.
- Stop spill and then fire fight.
- Water spray spilled chemicals to protect scattering.
- Do not inhale chemicals or combustion products.
- Up wind and evacuate from lower places.

6. ACCIDENTAL RELEASE MEASURES

A. Health considerations and protective equipment :

- Do not contact with heat, sparks and other sources of ignition.
- Stop spill if you can Do it without risk.
- Water spray may reduce vapor.

B Environmental considerations :

- Store away from water way and sewer.

C Spill clean-up procedures :

- Small spill
  If small spill. Absorb the spill material using sand or other noncombustible.
  Take up and put into properly labeled containers for disposal.
- Large spill
  Dike far ahead of liquid spill for later disposal.
  Eliminate all ignition sources (no smoking or flames, sparks).
  Keep unnecessary personnel away and isolate dangerous area.
  Notify the central government and local body if the material released over the limited value.

7. HANDLING AND STORAGE

A. Handling :

- Store and handle with Hazardous chemical safety management regulation.

B. Storage :

- Do grounding and ir palatric connect

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

A. Exposure limits value

Mineral oil mist

O Korea regulation : TWA : 5 mg/㎥
STEL : 10 mg/㎥

O ACGIH regulation: TWA : 5 mg/㎥
STEL : 10 mg/㎥

Hydrogen sulfide

O Korea regulation : TWA : 14 mg/㎥ (10 ppm)
STEL : 21 mg/㎥ (15 ppm)

O ACGIH regulation: TWA : 10 ppm
STEL : 15 ppm

O Biological exposure limit : N.A

B. Engineering controls :

- Provide local exhaust ventilation in a work-station location
- Equip explosion proof equipment.
- Check the suitable of exposure limits.

C. Personal protection :

O Respiratory protection :

- Respiratory protection should be qualified of "Safety" mark by KOSHA (Korea occupational safety and health agency).
- Respiratory protections were required in case of highly frequency in use or highly exposure.

Respiratory protection classified from high concentration to low concentration and consider property before use

mask(for organic gas)
mask(organic gas respirator cartridge and full face piece)
Air filter mask(organic gas respirator cartridge and full face piece)

If unknown concentration or emergency, following respirator needs

Air-line mask (combination air-line mask)
Air-mask(SCBA) (full face-piece)

O Eye protection :

- Further eye protection such as chemical splash goggles and or face shield must be worn when the possibility exists for eye contact due to splashing or spraying liquid.
- An eye wash unit and safety shower station should be available nearby working place.

O Skin protection :

- Wear proper chemical resistant gloves.

O Body protection :

- Wear proper chemical resistant clothing.
- Immediately take off contamninated cloth with chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

9. Physical and Chemical Properties

9.1 Appearance: brown black viscous liquid or solid
9.2 Odor : odorless
9.3 PH: No data
9.4 Boiling point or boiling point range : No data
9.5 Melting point or melting point range : No data
9.6 Flash Point: 66℃
9.7 Velocity of Vaporization: No data
9.8 Ignition: Not determined
9.9 Ignition or Explosion range : 1.0 ~ 5.0%
9.10 Vapor Pressure: 0.2 mmHg(@20℃)
9.11 Solubility(water) : insoluble
9.12 Vapor density : Not determined
9.13 Specific Gravity: 0.9~1.1
9.14 Spontaneous Combustion Temperature: 407℃
9.15 Decomposition Temperature : No data
9.16 Viscosity(@50℃, ㎟/S) : 900~9000 SUS(@38℃)
9.17 Molecular weight :No data

10. Stability and Reactivity

10.1 Chemical stability
Stable at room temperature and pressure

10.2 Prohibited Conditions
Avoid heat, sparks, open flames and other ignition sources if containers are exposed to heat, container damage or explosion may occur. Keep away from water supply facilities and sewage. Toxic gases may be accumulated in the closed room.

10.3 Prohibited Materials
Halogen, combustible materials, and oxidizing agents

10.4 Toxicant during decomposition
Toxic carbon oxides, sulfur compounds and hydrocarbons may generate during thermal decomposition.

11. Toxicological Information

11.1 Exposure Channels : No data
11.2 Acute toxicological Information
- Oral toxicity : 5,100mg/kg mouth - rat LD50
- Skin toxicity: 2,100mg/kg mouth - rat LD50
- Inhalation toxicity: No data
- Skin irritation: classification 1
- Serious Eye damage: classification 2A
- Respiratory hypersensitiveness: No data
- Skin hypersensitiveness: Not determined
- Carcinogenicity effect: No determined
- Hazardours for Inhalation : Category 2

12. Ecological Information

12.1 Aquatic life and ecology toxicity: No data
12.2 Persistence and decomposition: No data
12.3 Bioaccumulation possibility: No data
12.4 Soil mobility: No data
12.5 Other harmful effect: No data

13. Disposal Considerations

13.1 Disposal method: Dispose according to the related regulations.
13.2 Disposal cautions: No data

14. Transport Information

14.1 ID No.(UN) : -
14.2 Proper name of shipment (UN): Combustible liquid (Fuel Oil No.6)
14.3 Hazard class:-
14.4 Packaging class: 3
14.5 Ocean Contamination: No data
14.6 Specific countermeasures for safety: No data

15. Regulatory Information

15.1 Korea
- Industrial safety and health act: legislated exposure limits
- Toxic chemicals control act: No data
- Managing dangerous object act: Classification 4 (Combustible Liquid), Classification 3 (Petrochemical, water-insoluble liquid), 2,000Ltr

15.2 Other foreign acts:
- U.S. :
CERCLA 103 (40CFR302.4): Hydrogen Sulfide: 100LBS RQ
SARA 302 (40CFR355.30): Hydrogen Sulfide: 500LBS TPQ
SARA304 (40CFR355.40): Hydrogen Sulfide: 100LBS RQ
SARA toxicity, SARA 311/312(40CFR370.21) Acute toxicity: No, Chronic toxicity: Yes, Fire risk: Yes, Reaction risk: No, Rapid spouting risk: No
SARA 313 (40 CFR 372.65): Hydrogen Sulfide
OSHA (29 CFR 1910.119): Hydrogen Sulfide: 1500LBS TQ

- California Proposition 65:
Soot, tars, mineral oils(untreated and mildly treated oils and used engine oils) and cancer May be generated.(02 27, 1987)

- EC
EC classification: Carcinogenic material (Group 2)
EC hazards and safety sign: R45 It may cause cancer
S45 Immediately ask doctor's recommendation if accident occur or it feels that health condition is not good (if possible provide warning sign and MSDS)
S53 Avoid exposure – see MSDS before use

- Current Status of national list in the inventory
U.S.TSCA: listed in the inventory
TSCA 12(b): not determined"

14.3 Hazard class: -
14.4 Packaging class: 3
14.5 Ocean Contamination: No data
14.6 Specific countermeasures for safety: No data

16. Other Information

16.1 Reference: KOSHA MSDS, Ministry of Labor notification 2008-1, 2007-25
16.2 Initial Writing Date: 1 July 1996
16.3 Update Information: 2nd, 15 May 2008
16.4 Other Information: No data

1)Appearance : liquid, brown or red brown

2)Odor : petroleum odor like asphalt

3)Threshold of odor : N/A

4)pH : N/A

5)M.P/B.P : N/A

6)Initial boiling point or range : N/A

7)Flash point : ≥70 ℃ (C.C.)

8)Evaporation rate : N/A

9)Flammability (solids, gas) : N/A

10)Upper/lower flammability/explosive limit : N/A

11)Vapor pressure : N/A

12)Solubility : Insoluble

13)Vapor density : N/A

14)Specific gravity : ≤ 0.991

15)n-octanol/water partition coefficient: : N/A

16)Auto ignition temperature : N/A

17)Viscosity : ≤ 380 ㎟/s, 50℃

10. STABILITY AND REACTIVITY

A. Stability :

- Stable under normal conditions

B. Hazardous reactivity :

- Do not occur polymerization

C. Conditions to avoid :

- Avoid heat, sparks, open flames, or other sources of ignition.
- Container may rupture or explosive by heat
- Store away from water way and sewer.
- May accumulated dangerous gas in closed space.

E. Hazardous decomposition products :

- Carbon oxides, Sulfur oxides

11. TOXICOLOGICAL INFORMATION

1) Exposure route information

- O Inhalation: irritation,inebriant symtoms.
- O Oral: disturbance gastrointestinal
- O Skin: mild irritation, liver disturbance
- O Eye : mild irritation

2) Acute and chronic effects by short term or long term exposure

1) Bunker-C

- O Acute toxicity
  - Oral : N/A
  - Dermal : N/A
  - Inhalation : N/A
- O Skin corrosion/irritation N/A
- O Serious eye damage/ eye irritation N/A
- O Respiratory sensitization : N/A
- O Skin sensitization : N/A
- O Carcinogenicity: Cat 1B (EU classification)
- O Germ cell mutagenicity : N/A
- O Reproductive toxicity : Not applicable
- O Specific target organ toxicity single exposure : N/A
- O Specific target organ toxicity repeated exposure: N/A
- O Aspiration hazard N/A

2) Sulfur

- O Acute toxicity
  - Oral : LD50 >5000 mg/kg (rat)
  - Dermal : LD50 >2000 mg/kg (rat)
  - Inhalation(mist) :Cat 4/ LC50 1.66 mg/L (mammalia)
- O Skin corrosion/irritation : N/A
- O Serious eye damage/ eye irritation : N/A
- O Respiratory sensitization : N/A
- O Skin sensitization :N/A
- O Carcinogenicity: : N/A
- O Germ cell mutagenicity : N/A
- O Reproductive toxicity : N/A
- O Specific target organ toxicity single exposure : N/A
- O Specific target organ toxicity repeated exposure : N/A
- O Aspiration hazard : N/A

3) Standard of numeric value of toxicity : N/A

12. ECOLOGICAL INFORMATION

- If spilled to lake or river without proper treatment, may cause effect to aquatic organism by blocking of oxygen.
- Fish :LC50=866 mg/L (96h-Brachidanio rerio) (Sulfur)
- Crustacea : EC50>5,000mg/l (48h-daphnia magna) (Sulfur)
- Algae : N/A

2) Persistence and biodegradation :
- Persistence : N/A
- Biodegradation : N/A

3) Bioaccumulation :
- Biodegradation : 11% 28 days(Residue)
- Bioaccumulation : BCF=3.162 (sulfur)

4) Mobility in soil : N/A

5) Other hazardous information : N/A

13. DISPOSAL CONSIDERATIONS

1) Disposal :
- A mop, sand and earth containing oil more than 5% are specified waste; these should be disposed under article 12 of waste management regulation and regulations relative to the application 6, addendum 4 of a waste management law
- If oil was entered to water, separate and purifying in waste water plant.

2) Precaution :
- Should be dispose with authorized waste disposal company.
- Do not dispose or incinerate without warning.
- Check the direction, if this material was involved in waste management regulation.

14. TRANSPORT INFORMATION

1) UN No : UN1202

2) Proper shipping name : Fuel Oil

3) Class or division : 3

4) Packing group : III

5) Marine pollutant : N/A

6) Special safety response for transportation or transportation measure
- O Fire schedule EmS No : Not applicable
- O Spillage schedule EmS No : Not applicable

15. REGULATORY INFORMATION

O Bunker-C : Not listed
O Sulfur: Not listed

2) Hazardous chemical management regulation in Korea :
O Bunker-C : Not listed
O Sulfur: Not listed

3) Hazardous chemical safety management regulation in Korea : Class 4 3rd petroleum
O Bunker-C : Class 4 3rd petroleum
O Sulfur: Class 2nd sulfur

4) Waste management regulation in Korea
O Bunker-C : Handle under article 12, regulations relative to the application 6. addendum 4 of a waste management law
O Sulfur: Handle under article 12, regulations relative to the application 6. addendum 4 of a waste management law

5) Other in KOREA and except KOREA regulation :

O Persistent organic. pollutants management regulation : Not listed
O EU classification
- Classification : Carcinogenicity (Cat 2)

- Risk phrases : May cause cancer

- Safety phrases :
In case of accident or if you feel unwell seek medical advice immediately (show the label where possible)
Avoid exposure - obtain special instructions before use.

O U.S.A. management information
- OSHA regulation(29CFR1910.119)
Hydrogen Sulfide : 1500 LBS TQ
- CERCLA 103 regulation (40CFR302.4)
Hydrogen Sulfide : 100 LBS RQ
- SARA 302 regulation (40CFR355.30)
Hydrogen Sulfide : 500 LBS TPQ
- SARA 304 regulation (40CFR355.40) : Not listed
Hydrogen Sulfide: 100 LBS RQ
- SARA 311/312 regulation (40CFR370.21) :
Acute : Yes
Chronic : No
Fire : Yes
Reactivity : No
Sudden release of pressure : No
O States regulation
California Prop. 65: Soots, tars, mineral oils
Carcinogen (02.27.1987)

Toxic Substance Control Act(TSCA) : listed.
TSCA 12(b) export notification : Not listed.

- O Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade :Not listed
- O Stockholm Convention on Persistent Organic Pollutants (POPs) : Not listed
- O Mont- real Protocol on Substances that Delete the Ozone Layer : Not listed

16. OTHER INFORMATION

1) REFERENCES :

- KOSHA CODE W-05-2007 [Guideline for MSDS preparation, 2007. 11]
- Globally harmonized system of classification and labeling of chemicals. [The joint committee with government of GHS : registration No. 11-1410119-000032-01]
- Revised notification of classification, labeling and MSDS of chemicals. [The ministry of labor notification No.2008-1]
- MSDS offered by KOSHA KISCO-NET
- Other: chemical analysis database

2) Prepare date : 2009.06.24

3) Revised date :

4) Other

- This MSDS should be delivered to all users after reading the direction thoroughly.
- This information was prepared for safety handling of user, buyer or another person.
- Do not understand as only limiting warranty for specific property and suitability or quality of product.

1000 MT.

B-C

Material Safety Data Sheet

S-OIL Corporation

1. Chemical Product and Company Information

1.1 Product : Bunker-C
1.2 Application : Fuel.
1.3 Manufacture/Supplier Information
- Manufacturer
Company: S-OIL Corporation
Address : 360 Sanam-Li, Onsan-Eup, Ulju-Gu, Ulsan-Si, Kyungnam, Korea
Information service call : 82-52-231-2454
Department in charge : Refining Process Engineering Department
- Supplier
Company:
Address :
Information service call :
Department in charge

- Preparation Department : Refining Process Engineering Department

2. Hazards Identification

2.1 Hazards Classification

-Skin corrosion/ Irritation	Category 1
-Serious Eye Damage/ Eye irritation	Category 2A
-Respiratory or Skin Sensitization	Category 2
-Hazardous to the Aquatic Environment	Category 2

2.2 Symbol

-Exclamation mark
-Signal Word : Warning
-Hazard Statement : Causes severe burn on skin, harmful if swallowed, causes eye irritation, harmful for aquatic organism
-Precautionary Statements
•Prevention
Avoid breathing fume/mist/vapors/spray
Wash hands thoroughly after handling
Wear protective gloves/clothing/goggle
•Response
Seek medical attention immediately
Wash and dry contaminated clothes and shoes before reuse
If inhaled, remove to fresh air and keep at rest in apposition comfortable for breathing
If swallowed, wash mouths but not try to vomit
Wash contaminated skin / take shower
If in eyes, rinse cautiously with water for several minutes/ remove contact lens if possible
Don't make to vomit, gather vomiting and excreta
•Storage
Store in sealed and labeled containers
•Disposal
Dispose of in a manner consistent with applicable regulation

3. Composition and Information on Ingredients

Chemical/Common Name	CAS No.	Amount
Bunker-C	68553-00-4	More than 99wt%

4. First Aid Measures

4.1 Eye Contact: Wash eyes thoroughly with plenty of water for at least 15 minutes.
4.2 Skin Contact : Wash contaminated area perfectly with soap and water for at least 15 minutes during removing contaminated clothes and shoes.
If necessary, seek medical attention immediately.
Wash and dry contaminated clothes and shoes perfectly before reuse.
4.3 Inhalation : If there is side effect, remove person to fresh air from the exposure area.
If person is not breathing, provide artificial respiration.
Seek medical attention immediately.
4.4 Ingestion : In case of ingestion, consider gastrointestinal irritation
4.5 Information on medical doctors : No specified antidote

5. Fire Fighting Measures

5.1. Extinguishing Media : Dry chemicals, CO2, water spray, fire fighting foam.
5.2 Toxicant from Combustions : Carbon oxides
5.3 Extinguishment
If it is not dangerous, remove containers from fire areas.
Even if the fire is suppressed, continuously spray water to the heated containers.
Avoid accessing to the both ends of the tank.
For fire in the storage area, spray water using unmanned hose supports or monitor nozzles to the heated containers to cool them. If it is not possible, escape from the fire area.
Immediately escape from the fire area if there is noise from the safe exhaust system and color change of the tank caused by fire.
Keep away at least half mile from the fire area if tanks, tank trucks, train are burning.
Escape radius for tank, train, tank truck: 0.8km(0.5mile)
Do firefighting after stopping leakage.
The efficiency of water may be low.
Spray high-pressure water to spilled materials to prevent evaporation.
Spray water at safe region.
Avoid inhalation of materials or combustion products.
Stand against the wind and avoid lower region.

6. Accidental Release Measures

6.1 Necessary actions to protect human health: prepare for personal protection
6.2 Necessary actions to protect the environment:
6.3 Purification and removal methods:

7. Handling and Storage

7.1 Safety handling

7.2 Storage
U.S. OSHA 29 CFR 1910.106
Ground is necessary.
Keep away from prohibited materials for mixing.

8. Exposure Control and Personal Protection

8.1 Exposure Limits
-Fuel Oil No.6

-Mineral Oil Mist :

Organizations	TWA	STEL	Ceiling
KOSHA	5mg/m3	10mg/m3	
OSHA	5mg/m3		
ACGIH	5mg/m3	10mg/m3	
NIOSH	5mg/m3	10mg/m3	

-Coal Tar Pitch Volatiles:

Organizations	TWA
KOSHA	0.2mg/m3
ACGIH	0.2mg/m3
NIOSH	0.1mg/m3

-Hydrogen Sulfide:

Organizations	TWA	STEL	Ceiling
KOSHA	10ppm, 14mg/m3	15ppm, 21mg/m3	
OSHA	10ppm (14mg/m3)	15ppm, (21mg/m3)	20ppm
ACGIH	10ppm	15ppm	
NIOSH			10ppm (15mg/m3)

8.2 Engineering Management
No data

8.3 Protection
-Respirator Protection
Use respiratory protection equipment attached the "S" mark of KOSHA, Korea.
Direct connection type small anti-poison mask (organic gas cartridge)
Direct connection type small anti-poison mask (organic gas cartridge and full face piece)
Air filtration type respirator (organic gas cartridge and full face piece)
Unknown concentration or emergency
Air respirator (full face piece)
Supplied-air respirator (complex airline mask)

-Eye Protection
Safety face shield with safety glasses or goggles are recommended for the eyes protection from dusts or mists. A business proprietor should install eyes washing facilities near working areas to protect worker's eyes for emergency.

-Hands Protection
Use proper chemical resistant gloves.

-Human Body Protection
Use proper chemical resistant clothes. Immediately take off the contaminated clothes with chemicals.

ANNEX F – Port Metro Vancouver and the Canadian Coast Guard's Letter of Understanding

Letter of Understanding

Between

Canadian Coast Guard, (CCG.)
Environmental Response, Pacific Region

And

Vancouver Fraser Port Authority, (VFPA)

Background

1) Under the *Canada Shipping Act 2001*, (CSA 2001), and the *Oceans Act*, CCG is the lead agency with responsibility for ensuring that oil spills from ships and mystery oil spills in Canadian waters, are responded to appropriately.
2) Under the Canada Marine Act, VFPA has control over vessel movements within VFPA waters.
3) CCG and VFPA wish to achieve an understanding which facilitates prompt and cost-effective responses to ship-source and mystery oil spills within VFPA waters, while at the same time minimizing disruption to port operations.
4) This Letter of Understanding is based on the principles found in earlier MOUs of July 4, 1990, (between CCG and Canada Ports Corporation) and of March 29, 2001, (between CCG and the Vancouver Port Authority).

Terminology

1) "VFPA waters" refers to all the waters under the navigational control of the VFPA as defined in Schedule A of VFPA's Letters Patent.
2) "Spill" refers to any discharge of a pollutant from a ship or believed to have come from a ship, into or impacting VFPA waters.
3) "Minor spill" refers to a spill that has the following characteristics:
   a) requires no response action or in the view of VFPA's is being addressed appropriately;
   b) has minimal or no impact on the Port's operations; and/or
   c) generates no media interest.

Communication Protocol and First Response

1) All spills will be reported to Marine Communications and Traffic Services, ("MTCS"), for dissemination to affected agencies, including VFPA and CCG.

2) Upon receiving notice from MCTS of a spill, VFPA will assess the size and nature of the spill and collect information that may assist CCG personnel with planning the appropriate response strategy.

3) If VFPA determines that a spill is not a minor spill, VFPA will hand the response over to CCG by contacting the CCG Duty Officer, (DO), through MCTS and providing the DO with all available, relevant information.

4) Upon receiving notification of the hand-off, CCG will take over the response. The VFPA representative will represent the interests of the CCG at the spill site until relieved by the CCG.

5) CCG may provide VFPA with resources on a stand-by basis, to supplement VFPA spill response equipment as needed.

6) VFPA and CCG will each provide assistance to one another in their efforts to assist with recovery of the costs incurred by the parties as a result of the spill.

7) This LOU may be amended upon the written agreement of both parties and may be revoked by either party giving the other 60 days notice.

8) This LOU is not intended to constitute an agreement which will be legally binding on the parties and is not intended to be relied upon by the parties as creating any legal rights or obligations.

The above has been agreed to by:

D. Rondale

[Insert Name]
Canadian Coast Guard, Pacific Region
Department of Fisheries and Oceans

T. Leclerc

[Insert Name]
Vancouver Fraser Port Authority

December 1st, 2009