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Evaluating Place of Refuge Risk in the Chesapeake Bay

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ABSTRACT 300008:

Worldwide, several tank ships have suffered structural failures at sea and shipping agents were unable to convince port stakeholders to provide the vessel a Place of Refuge. These situations resulted in catastrophic environmental damage to coastal states. They also highlighted the need for better Place of Refuge guidance to address both real and perceived risk within the port community. In coordination with the International Maritime Organization and the National Response Team, the U.S. Coast Guard established policies that encourage risk-based planning and decision-making to assist stakeholders in evaluating risks. The Coast Guard policy included a risk evaluation job aid to facilitate planning and serve as a response tool for a port faced with a Place of Refuge request from a stricken vessel. The Port Community of Hampton Roads continued this planning effort through the Area Committee. A "Steering Committee" was established and charged with drafting a Place of Refuge annex to the Virginia Area Contingency Plan. Port Community involvement was achieved through a series of workshops held by the Steering Committee. The workshop objectives were successfully met by reviewing historic local case studies, identifying critical stakeholders and working through the Places of Refuge process using the job aid. The Place of Refuge annex outlines the process used to communicate risk to stakeholders within the human health and safety, environmental and economic communities, with the goal of achieving consensus on a Place of Refuge decision. This paper will expand on the steps that led to the development of the Place of Refuge Plan and some of the key lessons learned regarding risk assessment and risk communication in the Port of Hampton Roads.

INTRODUCTION:

Going to sea is a risky venture, and when something goes wrong, help is not always available. Consequently, mariners have long ascribed to a "rescue doctrine" that dictates they help other mariners in distress as long as it does not pose serious danger to themselves or their

vessel. However, the question of rendering assistance becomes much more complicated when a stricken vessel is seeking refuge in a port. That port community must assess the risk and potential consequences to a wide array of stakeholders before granting the vessel a Place of Refuge (POR).

International Maritime Organization (IMO) guidelines define a Place of Refuge as a "place where a ship in need of assistance can take action to enable it to stabilize its' condition and reduce the hazards to navigation, and to protect human life and the environment". (International Maritime Organization Resolution A.949 (23), 2003) When a ship has suffered a casualty or other damage, the best way to prevent further damage is to offload cargo and/or lighten bunkers and repair the damage. Examples of situations that could result in a Place of Refuge request include fire, explosion, mechanical or structural failure of the vessel, impaired vessel stability or grounding. While effecting repairs is best done at a Place of Refuge, bringing a damaged vessel into port could potentially pose environmental, economic and human health and safety threats to the port.

Worldwide, several tank ships, including the motor tanker (M/T) ERIKA, the M/T CASTOR, and the M/T PRESTIGE, suffered structural failures at sea and shipping agents were unable to convince port stakeholders to provide the vessel a Place of Refuge. Due in part to coastal states being unable to come to a swift decision and their adoption of the classic attitude of "Not in My Back Yard (NIMBY)," the identification of a Place of Refuge was delayed until it was too late to prevent a major incident from occurring. Each of these incidents resulted in catastrophic environmental damage to coastal states, which may have been avoided if the coastal states could have better addressed risk and potential consequences and communicated that information to stakeholders.

Guidance, policies and resolutions for Places of Refuge decision-making have already been developed by the IMO, the National Response Team (NRT) and the U.S. Coast Guard. The IMO encouraged nations to "adopt systems to balance the needs of the vessel and the needs of the coastal state and make sound decisions to enhance maritime safety and the protection of the marine environment." (International Maritime Organization Resolution A.949 (23), 2003). The NRT provided further guidance to local Area Committees by recommending that they develop "a framework for pre-incident identification of potential places of refuge for inclusion in appropriate Area Contingency Plans." ("Guidelines for Place of Refuge Decision Making", 2007)

The U.S. Coast Guard expanded on the NRT guidance with an instruction that encouraged risk-based planning and decision-making at the port level and provided a job aid for "selecting the lowest risk Place of Refuge option for a stricken vessel." (COMDTINST 16451.9, "U.S. Coast Guard Places of Refuge Policy", 2007) The instruction charged local Captains of the Port (COTP) and Area Committees with applying these concepts to their own port, and in coordination with port partners, identifying specific locations within the port that could be considered when faced with a vessel seeking refuge.

This paper provides an overview of how these concepts were implemented in Hampton Roads, Virginia, a geographic area which includes the port communities and waterways of the

lower Chesapeake Bay. The authors focus on three elements of successful incident response and how they apply to Place of Refuge situations in the port of Hampton Roads. These elements include; rapid assessment and communication of risk, identification of potential consequences, and team building. Each of these elements is described in more detail below.

Risk Assessment

During the early stages of an emergency response; success largely depends on stakeholder perception in two key areas: "What are the realistic risks?" and "What are the realistic options?" Risk must first be assessed and then communicated to the public and other stakeholders. The following key points must be clearly communicated by responders and officials:

1. This is the situation
2. This is what we're doing about it
3. This is what we don't know and how we're addressing gaps in information
4. This is what you should do

The ERIKA, CASTOR, and PRESTIGE incidents all highlighted the need for coastal states to better address both real and perceived risk within the port community.

Consequences

The Coast Guard COTP is required to make tough decisions when faced with a Place of Refuge situation. He or she will weigh the potential consequences of choosing each location under consideration, and if time allows, seek input from key stakeholders and agency representatives. However, any Place of Refuge decision will result in some degree of threat to human health and safety, natural resources or the economy. All three of these competing priorities are very relevant to the Port of Hampton Roads.

The location of the Port's vessel repair facilities and terminals requires that any vessel seeking a Place of Refuge in the Port must transit through the urban areas of Newport News, Hampton, Portsmouth, and Norfolk. These areas of dense population present potential consequences to human health and safety. The safety of emergency responders and the ship's crew must also be considered and will influence the decision of where to take a vessel requesting refuge. Sometimes the safest option for the public could result in higher safety consequences for the crew and responders.

The Port of Hampton Roads is located at the mouth of the large Chesapeake Bay. The passage of a vessel seeking Place of Refuge in the Port of Hampton Roads must first pass between Cape Henlopen and Cape Charles to enter the mouth of the bay. The Capes of the Chesapeake Bay are among the highest in natural resources sensitivity in the Chesapeake Bay. Additionally, the Port of Hampton Roads and the shallow Chesapeake Bay are surrounded by high value wetland habitat. Figure 1 depicts the close proximity between anchorage or terminal locations and environmentally sensitive areas. The geography of the bay, and the shortage of protected anchorages, mean that effective containment of any potential petroleum discharge would be very difficult.

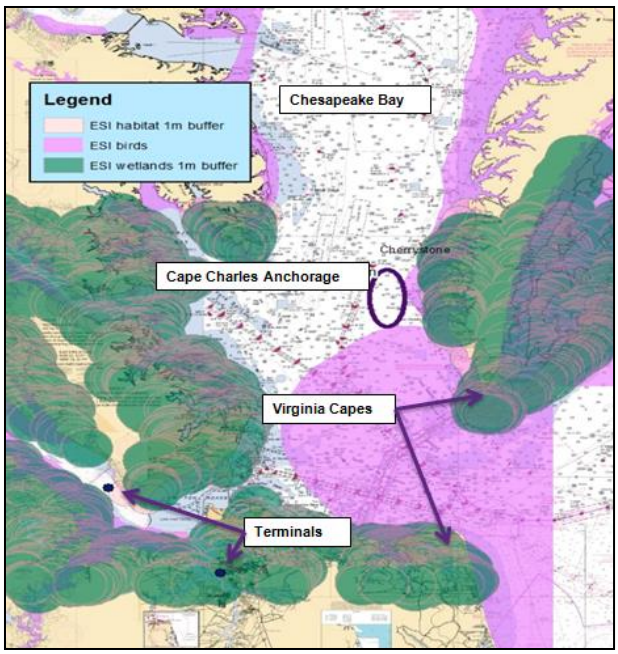

Figure 1

In terms of potential economic consequences, the port of Hampton Roads is the second largest port on the East Coast, moving more than 50 million tons of cargo annually. (Virginia Maritime Association, Port of Virginia Annual, 2013) Furthermore, the city of Virginia Beach is a national tourist destination and a critical piece of the Commonwealth's economy. Hampton Roads is also home to the largest Navy fleet on the Eastern Seaboard. All of these demands must be considered when evaluating the potential consequences of a Place of Refuge situation.

Team Building

The emergency response to a vessel in distress requires the COTP to successfully manage the operational elements of the situation as well as minimizing the threat of negative consequences to the port. However, another key aspect of a successful response is the coordinated response and "buy-in" from stakeholders, including the public. The capacity of the COTP's Incident Management Team to engage with and meet the needs of the Port Community and stakeholders is today's measure of a successful response.

METHODS:

Upon release of the Coast Guard Places of Refuge instruction in 2007, the Port of Hampton Roads adopted the Place of Refuge issue as a planning initiative through the Virginia Area Committee. A "Steering Committee", which included representatives from the local Coast Guard, Virginia Department of Environmental Quality, Virginia Port Authority, Virginia Department of Emergency Management, U.S. Fish and Wildlife Service and the U.S. Navy was established and charged with two overarching goals:

1. Socialize the Place of Refuge concepts and risk-based decision making process within the Port

2. Develop a Places of Refuge annex for incorporation into the Virginia Area Contingency Plan (ACP) to prepare the Port for an event

The Steering Committee met the first goal by holding a series of three workshops with stakeholder groups and by using Places of Refuge as the theme for the 2013 Preparedness for Response Program (PREP) Area Exercise. They met the second goal with the development of a Place of Refuge annex that outlines the processes used to assess risk, notify stakeholders, and evaluate potential consequences in a Place of Refuge situation.

Risk Assessment

The Steering Committee determined that a risk assessment process must include gathering the right data with the right people at the right time, then processing that raw data into fact-based information that could be shared with stakeholders. The Place of Refuge annex identifies the key questions that need to be answered upon receipt of a Place of Refuge request in order to expedite a decision. Risk would be initially assessed based on the information from the master or pilot onboard the vessel; while the vessel is still at sea if time allows. Risk would be further evaluated by conducting a joint agency vessel boarding to assess the situation and collect on-scene data (i.e. air samples). The vessel boarding would be conducted either offshore (seaward of the sea buoy), at anchorage or at a marine terminal. Other options, such as intentionally scuttling the vessel, grounding the vessel, or denying entry and sending the vessel to another port would only be considered after all other options had been ruled out.

Consequences

Concerned that the NIMBY attitude may negatively impact decision-making and the ability to come to a consensus in the United States, the Coast Guard developed a job aid to facilitate planning and serve as a response tool for a port faced with a Place of Refuge request. This Risk Assessment Job Aid was considered critical to help defend against the NIMBY attitude by creating a, "Repeatable, transparent process…important in building stakeholder and public confidence in the final [POR] decision, regardless of outcome." (COMDTINST 16451.9) The Job Aid became a practical application to help Area Committees realistically weigh the risks of providing a Place of Refuge versus the consequences if no action was taken and the vessel remained at sea. The anticipated outcome of the job aid process would be the production of reasonable courses of action to assist the stricken vessel and balance stakeholder concerns with those of the stricken vessel.

The Job Aid helps the users assess the possible consequences of Place of Refuge decisions to three specific stakeholder groups – human health and safety, natural resources, and economic. Economic concerns include impacts to maritime commerce, as well as both commercial and recreational fishing. Human health and safety addresses threats to the general public as well as emergency responders and the crew of the stricken vessel. Natural resource consequences include potential impacts to threatened and endangered species, habitat, cultural and historic resources and subsistence resources. The Job Aid provides a common scoring system that assigns a low score of two points (no impact) to a high score of 32 (extreme impacts). One of the goals of coordination between the COTP and stakeholders in these various communities was to help stakeholders differentiate between consequence evaluations based in fear versus consequence evaluation based on shared assumptions.

Team Building

The Places of Refuge annex is the result of several years of cooperative discussions between the Coast Guard and the Virginia Area Committee. The Steering Committee provided an opportunity to bring together the entire Port Community in a series of three structured workshops to implement risk-based and transparent decision-making. The Committee identified participants for each workshop from agencies, organizations and the community who could have a significant stake in a Place of Refuge decision (table 1). The workshop agendas included an overview of the Place of Refuge concept and then a facilitated walk-through of the Job Aid using a given scenario. The Place of Refuge annex was further socialized during the 2013 annual Preparedness for Response Exercise Program (PREP) area exercise. The objectives of the tabletop exercise included testing various aspects of the newly developed Hampton Roads Places of Refuge annex and encouraging dialogue between the various stakeholders involved.

Table 1. Represented agencies and organizations at Place of Refuge workshops.

Human Health and Safety Workshop Participants	Natural Resource Workshop Participants	Economic Workshop Participants
VA Department of Emergency Management	U.S. Fish and Wildlife Service	VA Port Authority
Norfolk Fire-Rescue	National Oceanic and Atmospheric Admin.	National Oceanic and Atmospheric Admin.
VA Department of Environmental Quality	VA Department of Environmental Quality	Virginia Beach Fire Department
VA Port Authority	VA Department of Game and Inland Fisheries	City of Norfolk
VA Maritime Incident Response Team	The Nature Conservancy	Norfolk Office of Emergency Management
Norfolk Department of Public Health	Virginia Port Authority	City of VA Beach
VA Department of Health	VA Maritime Incident Response Team	VA Beach Office of Emergency Management
VA Beach Department of Health	MD Saltwater Sport Fishermen's Association	Newport News Fire Department
Portsmouth Public Health	U.S. Coast Guard	City of Newport News
U.S. Coast Guard		Newport News Hazardous Materials Team
VA Beach Fire Department		VA Department of Emergency Management
		Maryland Department of the Environment
		VA Pilots Association
		VA Maritime Association
		MORAN Environmental
		U.S. Navy
		VA Department of Environmental Quality
		U.S. Fish and Wildlife Service
		U.S. Army Corps of Engineers
		Willcox & Savage
		Customs and Border Protection
		Anders Williams Ship Agency
		U.S. Coast Guard

DISCUSSION:

Through the course of holding the stakeholder workshops and the PREP exercise, the Steering Committee gathered important information about risk-based decision making and communication of risk to the public. These lessons were incorporated into the Places of Refuge annex which will serve as a response tool in the future. Probably more valuable to members of the Port Community was the opportunity to discuss competing priorities and reach consensus on the decision of where to send a stricken vessel requesting refuge.

Risk Assessment

The Places of Refuge annex clarifies how the port would assess risk through the use of pre-boarding questions and joint vessel boardings. The boardings are categorized by where they would be conducted; offshore, at anchorage or at a terminal. Each category of boarding requires unique responder skills, circumstances, logistical requirements and objectives:

- **Pre-boarding risk assessment:** Identify hazardous conditions of vessel, vessel stability, and potential for cargo release that could impact crew.
- **Offshore boarding:** Based on risk assessment, determine required personal protective equipment (PPE); identify necessary monitoring equipment, and identify boarding team that has appropriate training and authorities. For Hampton Roads, this team would include Coast Guard, local emergency responders (fire and/or police), VA Department of Emergency Management, a marine chemist, a vessel representative (surveyor or attorney), a paramedic, and other subject matter experts appropriate to the situation.
- **Anchorage:** If necessary, board the vessel offshore initially and then conduct a second boarding at anchorage with a more complex risk assessment team and an extensive suite of monitoring equipment and trained operators with required technical and/or organization authorities. Inclement weather or sea conditions could also necessitate a boarding at anchorage vice offshore. In Hampton Roads, the preferred anchorage for this type of boarding would be the Cape Charles anchorage, which is somewhat sheltered from weather in the lee of the Eastern Shore of Virginia.
- **Terminal:** Implement special PPE requirements, assess vessel's condition through water and/or air monitoring, develop a safety plan describing coordinated safety zones, exclusion zones and work areas, and removal of hazardous cargos. Would only necessitate a Place of Refuge decision if the vessel needed to be moved to another terminal for specialized response equipment or offloading.

Detailed data collection would take place in the initial risk-assessment phase of the incident, but this data must also be synthesized and interpreted. The initial data would likely be collected by the boarding team or other personnel in the field (i.e. shore side air monitoring). However, the interpretation of the data could be done offsite by technical experts.

To provide an example of how this would work in a Place of Refuge situation managed using the Incident Command System, the data would be collected by members of the boarding team working as a branch under the Operations Section. The boarding team would then pass that information to the Environmental Unit or Technical Specialists within the Planning Section for

analysis. The interpreted data would in turn be provided to the Unified Commander, Liaison Officer, or Agency Representative who is in a position to share that data with stakeholders or constituents.

A successful risk communicator must be a recognized expert of high status who is able to skillfully relay the information with empathy and concern. The ultimate sign of success for a Place of Refuge response, with regard to risk assessment, is that the community trusts and has confidence in their response organization.

Consequences

During the three workshops and the PREP exercise, stakeholders were presented with Place of Refuge scenarios and asked to evaluate potential consequences to human health and safety, natural resources and the economy, using the Coast Guard Job Aid. The scenarios presented to the groups were based on actual past incidents in the port of Hampton Roads. These included a barge fire, container vessel collision, hazardous material release from a vessel, and a vessel with an oiled hull requiring decontamination.

The results from the Human Health and Safety Workshop showed that stakeholders would prefer to send a vessel to a terminal for refuge rather than an anchorage. This is because potential consequences to responders and the vessel crew were significantly decreased with access to pier-side equipment. Trying to address vessel emergencies at anchorage, such as fires, or hazmat release, put the responders and crew at the mercy of sea and weather conditions and increased emergency response times, which outscored safety concerns for the general public.

The results for natural resource consequences were found to be roughly equal for different anchorages and terminals within the port. This is due to the fact that most of the potential Place of Refuge locations in the Port are in close proximity to environmentally sensitive areas, and none of the locations are more immune to pollution impact. Participants also found that they had different interpretations for some of the scoring criteria when using the Job Aid. For example, one of the criteria for measuring natural resource consequences is the potential to impact "subsistence species". The U.S. Fish and Wildlife Service uses a legal definition for subsistence that only applies to certain species, and does not apply outside of Alaska. Therefore, prior to scoring potential consequences, the stakeholders would need to agree to definitions for each of the natural resource criteria.

Potential economic consequences were found to be similar at different anchorage and terminal locations, with the exception that closing a waterway due to a Place of Refuge incident could have significant economic impact. The Job Aid was found to be useful in generating discussion but participants were concerned that "politics" was not one of the criteria considered. Again, this is an example of when stakeholders would need to agree to using the same scoring criteria or modify the job aid to fit their particular concerns.

The workshops provided the Steering Committee with valuable lessons regarding proper use of the Job Aid and potential limitations as a decision-making tool. However, the overarching message from these workshops was that shared assumptions within the teams drove their scoring. In the absence of clear, trusted data, stakeholders and the public are likely to base their decision

on fear. The Place of Refuge planning process was successful in helping the Port Community to make their assessment of consequences based on fact-based information rather than fear. Success for a Place of Refuge incident would involve stakeholders and the community having realistic and achievable expectations for the response. A "gap" between community expectations and what is achievable quickly leads to frustration and increased scrutiny of responder decisions.

Team Building

The PREP Area Exercise was conducted in a tabletop format focused on helping the participants understand the Place of Refuge process and participate in using the Places of Refuge Job Aid. This was the first time that representatives from all three port communities (human health and safety, natural resource and economic) were brought together with vessel representatives and the COTP to discuss a Place of Refuge scenario.

The scenario was based on the release of a non-toxic chemical from a container ship that created an odor plume that could be detected but was not hazardous. Although the exercise scenario involved little actual risk to public health, natural resources, and to the economy, there was strong engagement of the PREP participants. Participants were very skilled at explaining what they would need in terms of information and support, when they would need it, and how long it would take to inform the public and other stakeholders if they were placed in this position. Key lessons learned from this exercise highlighted the importance of:

- On-site assessment teams to quickly collect data
- Prompt and skilled analysis of this data
- Quickly providing this risk assessment data to stakeholders in order to inform their constituency and the public

Organizations with the legal responsibilities to protect and inform their constituencies know that there is no correlation between what people understand is actual risk and the perception of that risk. Things that are invisible (radiation), or not understood (chemicals with funny names), are scary. The Port Partners with these responsibilities understand this point and are most willing to explain the complications they face in dealing with their constituency. For example, if this scenario were encountered in Hampton Roads, local 911 dispatch centers would likely be overwhelmed with calls from concerned citizens.

Another key lesson learned from the exercise was the assumption made by many of the participants that the Government would take the lead in the process of risk assessment. This was in conflict with the shipping representatives who had their own opinion regarding their assessment roles, responsibilities and capabilities. A review of past case studies of vessels in distress in the Port of Hampton Roads shows that the stricken vessel's owners and agents invariably accepted their roles as the vessel's sponsor and problem solver. In all of these cases, effective coordination with the vessels owners, agents and the Port's emergency response community resulted in quick resolution of the problem.

CONCLUSION:

One of the goals of the Place of Refuge Steering Committee was to socialize the decision-making process outlined in the Coast Guard instruction and Job Aid to the Hampton

Roads Port Community. Through the course of holding the stakeholder workshops, the Steering Committee achieved this goal but also gathered valuable lessons about communicating risk to stakeholders. Community engagement fundamentals, such as identifying appropriate stakeholders in the community, and developing a process to help them begin to "score" risks and consequences, have been started.

Through this process, the Port Community has recognized the unique geography and relationships of the Port Partners of the Port of Hampton Roads. Port Community participation in the identification and evaluation of potential consequences improves the chances of making shared assumptions based on fact-based information as opposed to assumptions based in fear or misunderstanding. It is believed that these interactions will result in realistic and achievable response expectations in the event of a Place of Refuge situation as well as buy-in from the Port Community on decisions made by officials regarding options for a stricken vessel in their port.

Engaging with the Port Community – two-way communication – when making risk-based decisions concerning a vessel in distress and seeking a Place of Refuge requires pre-planning. The Places of Refuge annex now contains a transparent process for the collection of facts and the evaluation of risks. The Places of Refuge annex documents planning for assessments in the Port of Hampton Roads based on location of the vessel – offshore, at anchor, or at a terminal.

The PREP exercise, and development of the Place of Refuge annex, also highlighted that communicating fact-based risks to the public is not a trivial responsibility. In the event of a Place of Refuge request, the participation of the entire emergency response community would be needed to ensure that real data is collected on-scene by responders with the appropriate skills and authorities. Just as important, the on-scene data analysis must be effectively disseminated to the Port Community so that they can begin their own outreach to their constituencies. The Places of Refuge process outlined in the Coast Guard instruction and the Place of Refuge annex developed for the Virginia Area Contingency Plan provide a sound foundation for productive engagement between the Hampton Roads COTP and the Port Community.

REFERENCES:

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NRT Guidelines for Places of Refuge Decision Making, July 26, 2007

U.S. Coast Guard Places of Refuge Policy, COMDTINST 16451.9, 17 July, 2007

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