Independent Evaluation of United States Coast Guard Prevention Programs—Marine Safety and Marine Environmental Protection

April 25, 2009

Prepared for

Department of Homeland Security
United States Coast Guard

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HOMELAND SECURITY INSTITUTE

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HSI delivers independent and objective analyses and advice to support policy development, decision making, alternative approaches, and new ideas on significant issues.

HSI's research is undertaken by mutual consent with DHS and is organized by Tasks in the annual HSI Research Plan. This report presents the results of research and analysis conducted under

Task 08-53
Independent Evaluation of United States Coast Guard Prevention Programs

of HSI's Fiscal Year 2008 Research Plan. The purpose of the task is to provide the USCG with an independent evaluation of two mission areas within the Prevention Program, specifically the Marine Safety and Marine Environmental Protection missions along with specific programs within Marine Safety Marine Credentialing and Boating Safety, with the aim of identifying achievements, challenges, and potential improvements. A particular focus was placed on obtaining independent feedback from industry stakeholders and Coast Guard personnel at various responsibility levels through personal interviews.

The results presented in this report do not necessarily reflect official DHS opinion or policy.

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INDEPENDENT EVALUATION OF UNITED STATES COAST GUARD PREVENTION PROGRAMS—MARINE SAFETY AND MARINE ENVIRONMENTAL PROTECTION

Final Report

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The HSI team greatly appreciates the gracious cooperation of the several hundred interviewees from private industry; the United States Coast Guard; federal, state, local, and tribal governments; non-profit organizations; and advisory and interest groups. The interviewees were universally candid and provided extensive verbal and written input that was essential to this evaluation.

The HSI team recognizes and appreciates the timely assistance of Daniel Overbey, Nancy Goodridge, Anita Epstein, and Mike Lashinsky in finalizing this evaluation.

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EXECUTIVE SUMMARY

In July 2008, the Homeland Security Institute (HSI) was tasked by the U.S. Coast Guard (USCG), Office of Performance Management and Assessment (CG-512), to independently evaluate the USCG Prevention Program. The scope of the assessment includes four elements: marine safety (including recreational boating), marine environmental protection, mariner credentialing, and engineering plan review. It also includes one contributing element: regulation development. The tasking required the Institute to address some three dozen elements of analysis, including the following tasks:

- Document the mission, purpose, and goals of the Prevention Program, and identify its stakeholders.
- Assess the degree of program alignment with various USCG and DHS strategy and guidance documents.
- Document the logical relationship between program elements and outcomes (such as fatalities, injuries, or environmental protection).
- Identify outcome drivers and trends.
- Assess program effectiveness, stakeholder satisfaction, and areas for potential improvement.

To meet this tasking, Institute personnel

- Reviewed hundreds of documents related to the Prevention Program, including strategic plans, policies, performance plans, program descriptions, regulations, and many other types of documents.
- Conducted site visits in the East Coast, Gulf Coast, West Coast, Great Lakes, Western Rivers, and Alaska regions, as well as Washington, DC. Through these visits, we obtained direct feedback from over 500 Coast Guard personnel and stakeholders (individuals from the private sector; non-governmental organizations; and state, local, tribal government, and federal partner representatives).[1]
- Independently analyzed these data to address the various required elements of analysis.

HSI's overall assessment of the USCG Prevention Program, based on the performance metrics currently used to evaluate the program for the Office of Management and Budget (OMB), suggests that the program appears to be effective. Deaths and injuries in the maritime environment are decreasing over the long term, and the number and volume of oil and chemical spills in the marine environment have decreased significantly in recent years. Recent data suggest that mariner fatalities may be increasing, although this finding depends on how the data are normalized. (A break in a downward trend in any type of casualties might be a leading indicator that Prevention Program activities are not as effective as they could be.) We note, though, that there are numerous signs that the Prevention Program is facing some challenges that might lead to reduced effectiveness in the near- to mid-term. We make numerous recommendations for

[1] See Appendix A for a summary of the interviewee list.

Program improvement in order to address those challenges quickly. In addition, we recommended several new or modified performance metrics that may provide a more useful view of Prevention Program effectiveness.

Our identification of potential areas for improvement relied heavily on stakeholder feedback. We used exploratory analysis methods, such as ethnographic interviews. These interviews used non-directive questions, allowing USCG personnel and stakeholders to uncover issues and potential improvements within the context of their day-to-day operating experience. Once stakeholders identified these issues and potential improvements, Institute staff conducted follow-on quantitative and qualitative analysis to refine the definition of an issue, identify and compare alternative courses of action, and develop specific recommendations for improving the USCG Prevention Program.

Our analysis resulted in several dozen specific and detailed recommendations, grouped in the following categories:

- Standards and Regulations Development
- Compliance Verification and Enforcement
- Workforce Issues
- Organization and Leadership
- Partner Relations
- Industry and Public Outreach (including mariner credentialing)
- Investigations and Casualty Analysis
- Non/Semi-Regulated Maritime Industries (including fishing and recreational boating)

Within these categories, some of the major findings include:

- The development of standards and regulations is a time-consuming process. For example, boating safety and Sub-chapter N (Offshore Activities) regulations have been under development for over 10 years.
- Coast Guard inspectors and marine casualty investigators have approximately one rank (4-6 years) less experience than those in similar positions a decade ago.
- The Coast Guard does not know what its Prevention workload is. As a result, it is nearly impossible to determine what the size of the Prevention workforce should be, or what the workload/workforce gap is.
- Headquarters' Prevention program management is fragmented, with six program managers and little or no coordination of overarching Prevention issues, such as critical assignments (assignment officers deal with six program managers competing for a limited pool of qualified Prevention professionals), oversight of the Prevention training program, budget and policy priorities, and Prevention workforce management.
- The Sector organization construct is problematic with respect to Marine Environmental Protection (MEP), as it is set up for Prevention to conduct inspections and investigations, and for Response to conduct spill response and clean-up. This construct is not working in

many locations, and many Sectors have improvised by having the Prevention Division and staff handle MEP response, despite the fact that their oil spill response expertise is billeted as Response staff.

- Many merchant mariners' licenses and credentials have expired due to the lengthy medical review process (in many cases 4-6 months). In one group interview, industry participants reported that over 60 of their employees/members had to be pulled out of work because their license renewals had not been processed and their mariner licenses had expired.
- Prevention regulations and policies are inconsistently enforced in different (and often adjacent) Captain of the Port (COTP) regions, and even within the same region when leadership changes.
- Coast Guard marine casualty investigations often take about two years to complete. Quicker investigation completion and subsequent dissemination of the investigation's findings to the maritime industry could result in safer operations and reduce the number of future casualties.

Although virtually all of the recommendations identified in this report already have champions within the Coast Guard, those champions are distributed throughout the new Coast Guard Headquarters organization and often do not speak with a single voice. Therefore, our final recommendation is that a single individual or staff element at Coast Guard Headquarters be responsible for overseeing and coordinating the specific and detailed recommendations identified within this evaluation. That individual or staff element should have sufficient resources, authority, and accountability to see those recommendations through to completion.

I. INTRODUCTION

This section begins with a description of the background and purpose of HSI's independent evaluation. A logic model for the Prevention Program elements within the evaluation's scope follows. We then present a brief description of the Prevention Program's major functions of Standards and Regulations Development, Compliance Verification and Enforcement, Marine Casualty Investigations, Engineering Plan Review, Mariner Credentialing, and Boating Safety. Following the program element descriptions, we describe the various Prevention Program stakeholders in the areas of marine safety, marine environmental protection, mariner credentialing, and boating safety. Finally, we discuss how the report is organized.

Background and Purpose

The Homeland Security Institute (HSI) was tasked by the Coast Guard Office of Performance Management and Assessment to perform an independent evaluation of the United States Coast Guard's (USCG) Prevention Program, specifically the Marine Safety and Marine Environmental components of this Program. The purpose of the evaluation was to identify program improvements, evaluate program effectiveness, and meet OMB Circular A-11 requirements for independent program review.

The USCG provided HSI with initial background information on the Prevention Program, such as organization charts, an overview of the Program, and key Program reference material. Further, the Coast Guard directed that HSI obtain direct input from Coast Guard personnel and stakeholders (private sector, non-governmental, and federal, state, local, and tribal governments) in order to collect information upon which an analysis of program effectiveness could be built. HSI conducted not-for-attribution ethnographic interviews with over 500 persons in 21 cities.[2] HSI used an 'exploratory research' approach to identify areas for further analysis in the evaluation. For instance, the report contains more in-depth discussion of marine inspections and casualty investigations than specific port/cargo safety issues (which often came up as part of marine facility and vessel inspections) based on the interview discussions. We then did a qualitative content analysis of interview data to sort and collate common issues, focusing on those issues in which program improvements could be made.

HSI also sought and received information and data, including guidance and policy documents, OMB reviews of the Marine Safety and Marine Environmental Protection programs, the Marine Safety Performance Plan, performance reports, and Coast Guard budget documents from interviewees and other stakeholders. Building on an analysis and evaluation of the interviews, relevant documents, and follow-up clarifications, we have produced an independent evaluation for the Coast Guard of its Prevention Program's effectiveness, strengths, and challenges, and we have provided specific recommendations for Program improvement. We also identified commonly used performance measures for the Prevention Program elements, and assessed those measures. Additionally, we provided recommendations for new performance measures.

The Coast Guard will use this independent evaluation to:

[2] See Appendix A for a summary of the interviewee list.

- Respond to OMB's independent assessment requirement, described in detail in OMB Circular A-11, and as indicated in the *Program Improvement Plans* section of the Coast Guard's 2003 Marine Environmental Protection Program Assessment Rating Tool (PART) and 2005 Marine Safety PART evaluations
- Provide the Coast Guard prevention program with stakeholder feedback
- Receive an independent evaluator's view of prevention program strengths and weaknesses
- Receive an independent evaluator's assessment of current and proposed effectiveness measures

The Coast Guard will disseminate this evaluation to the public following internal review.

The USCG Prevention Program

The Coast Guard's Prevention Program exists as a result of congressional action aimed at reducing the number of fatalities, injuries, marine casualties,[3] and damage to the environment (primarily via oil or chemical spills).

Logic Model

The logic model in Figure 1 represents a high-level hypothetical representation of the Prevention Program, and relates Program mission activities to organizational outcomes (the number of fatalities, injuries, and damage to the environment over time).[4] The figure shows the readiness resources, which are the inputs applied to the Prevention Program mission activities. The mix of readiness resources and mission activities leads to mandated mission outputs. Finally, the mission outputs are evaluated for organization outcomes, which describe the Prevention Program effectiveness.

[3] A 'marine casualty', by definition, includes grounds, collisions, allisions, loss of propulsion, loss of steering, seaworthiness issues, loss of life, injury, or occurrence causing property damage. See 46 CFR 4.05 or summary at http://www.uscg.mil/d9/msdSturgeonBay/marine_casualties.asp.

[4] This logic model is designed to parallel traditional Coast Guard logic models.

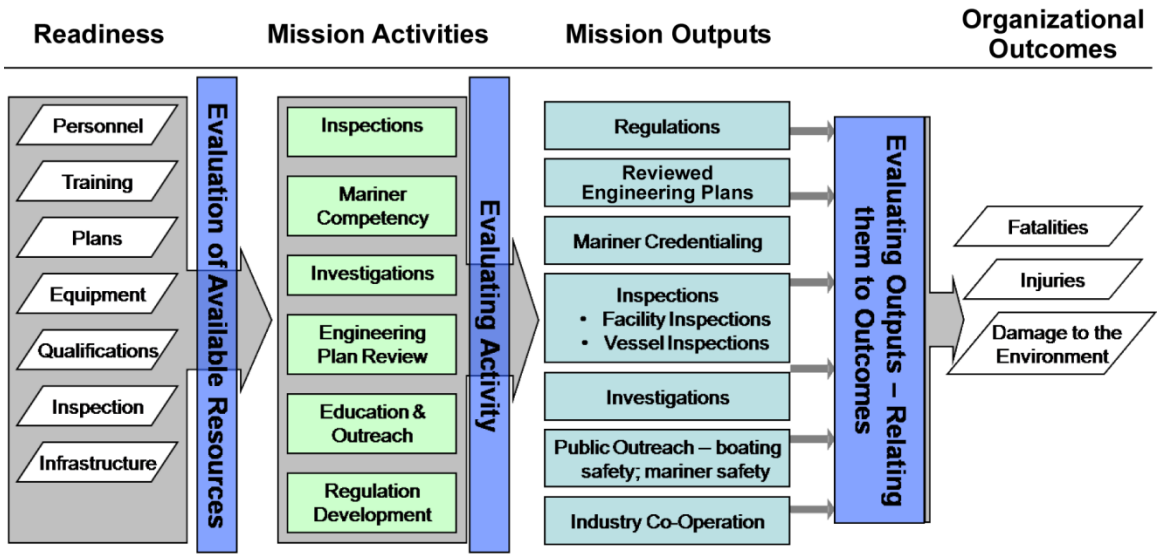

Figure 1: Prevention Program Logic Model

Program Elements

The Coast Guard identifies its Prevention Program as being comprised of three major missions—Waterways Management (WWM), Marine Safety (MS), and Marine Environmental Protection (MEP). At the direction of the Coast Guard, our evaluation focuses on the latter two, as the Waterways Management mission (including Aids to Navigation) was addressed in another recent independent evaluation. Our evaluation includes the following Prevention Program elements: regulations development, inspections, investigations, engineering plan review, mariner credentialing, and boating safety. These program elements all contribute to the success of the program missions and the overall Program; they are described below.

Regulations Development

The Coast Guard is charged with developing regulations for those impacted by its Prevention Programs, typically the maritime community—tank vessels, cruise ships, towing, offshore drilling platforms, deep draft freight vessels, waterfront facilities, recreational boats and associated equipment, and associated personnel, and industries. Regulation development is a complex process involving problem identification, causal analysis, consultation with Federal Advisory Committees (as appropriate), announcement of proposed rules, invitation of public comment, an economic cost-benefit analysis, environmental analysis (as needed), and consultation with other governmental agencies.

Inspections

Once regulations have been developed and implemented, the Coast Guard is responsible for compliance and enforcement, primarily through inspections,[5] which require both organizational

[5] Overwhelmingly, the states are the primary enforcers of recreational boating safety requirements although USCG does have jurisdiction in the navigable waters of the United States.

competencies (technical skill sets) and capacity (sufficient personnel with those skill sets). Competency is achieved by ensuring that Coast Guard personnel receive the appropriate training, education, and experience to professionally perform their missions. Capacity is attained by making sure that the workforce is adequately sized, at all levels, to ensure compliance and enforcement at all locations. For example, personnel who oversee small commercial fishing vessels in Alaska or New England do not need a skill set as wide-ranging as those who ensure the safety and security of cruise ships in Miami, which have complex engineering and operational systems. Moreover, some ports receive large numbers of chemical cargo ships (such as Houston), while others see more container or passenger ships (such as New York City or Los Angeles/Long Beach). Personnel qualifications need to match requirements for the maritime industries in each geographic location.

The Coast Guard has traditionally performed its marine safety and environmental protection missions in partnership with industry and ports, promoting information exchange, education, and training to generate voluntary acceptance and compliance with regulations while using enforcement actions as necessary when individuals or companies do not comply. Compliance verification is most often achieved through Coast Guard inspections of regulated vessels and waterfront or offshore facilities. Recreational boating safety activities are predominantly voluntary, with the notable exception of having life jackets available for all vessel occupants, and the focus is on both compliance verification and safety education and training.

Investigations

When injuries, fatalities, vessel casualties, or spills occur in federal waterways,[6] the Coast Guard investigates to determine the causal factors. The results of these investigations are disseminated within the Coast Guard and externally, and become “lessons learned” for Coast Guard inspectors and the maritime community. Ideally, this feedback mechanism prevents future incidents. In some occasions, an investigation determines a causal factor that requires changes or additions to the regulations to ensure that future similar incidents are minimized. On other occasions, investigations lead to civil penalties.

Engineering Plan Review

The Marine Safety Center (MSC) supports the Prevention Program through the verification of compliance with technical standards for the design, construction, alteration, and repair of commercial vessels. The MSC reports to the Director of Commercial Regulations & Standards (CG-52) in Coast Guard Headquarters.

Mariner Credentialing

The National Maritime Center’s (NMC) role is to serve as the Coast Guard’s centralized mariner credentialing processing facility. The NMC reports to the Director of Prevention Policy (CG-54) in Coast Guard Headquarters.

[6] Most recreational boating casualties are investigated by states.

Boating Safety

While the recreational boating community is not regulated to the same extent as other maritime industries, the Coast Guard enforces manufacturer requirements for boats (such as flotation, personnel capacity, fuel, and ventilation) and associated equipment (such as life jackets, fire extinguishers, and safety flares). The Coast Guard heavily relies on the states to conduct the bulk of recreational boating safety activities, including enforcement and accident investigations. The Coast Guard supports the states through boating safety grants.

Partners and Stakeholders

The Coast Guard has a large number and variety of partners and stakeholders within the maritime community. Typically, "partners" are those organizations that work with the Coast Guard to form regulations, ensure compliance through inspections and verification or necessary enforcement actions, and conduct marine casualty investigations. "Stakeholders" are normally those organizations that may be impacted by the Coast Guard's actions in carrying out its prevention responsibilities.

However, in the complex maritime world these distinctions often become blurred and "partners" may become "stakeholders" and vice versa. For instance, the classification societies are stakeholders under the State Port Control program because they are impacted by how the Coast Guard perceives the societies' standards and work quality for design and inspection services for foreign flag vessels. If the Coast Guard perceives a greater risk for one classification society over another, their classed ships will be inspected more frequently by the Coast Guard. However, the Coast Guard also depends on approved classification societies, such as the American Bureau of Shipping (ABS), to carry out vessel inspections and plan review activities on its behalf under the Alternate Compliance Program (ACP).[7] In this capacity, the classification society serves as a Coast Guard partner to ensure vessel safety. Maritime industries are normally considered Coast Guard stakeholders as they are impacted by the regulations and policies to ensure compliance. However, the Federal Advisory Committees that the Coast Guard must consult with prior to regulation development are largely comprised of maritime industry representatives from the private sector who serve as partners to the Coast Guard, providing valuable advice and recommendations.

A listing of some of the Coast Guard's stakeholders and partners for its various program elements are listed below.

Inspections and Investigations (Marine Safety mission)

- USCG—inspectors, investigators, commanding officers, headquarters program managers and senior leadership, Marine Safety Center, National Maritime Center (including Regional Examination Centers)
- Industries—tug and tow barge, chemical transport, tanker, cruise line, deep draft freight, fishing, offshore drilling, passenger/ferry, waterfront facilities, mariner associations and organizations

[7] Under the Alternate Compliance Program (ACP) the Coast Guard audits 10% of the inspections carried out by approved classification societies on its behalf.

- Individual mariners
- Non-governmental and not-for-profit organizations—classification societies, harbor safety committees, federal advisory (FACA) committees
- Government partners—state safety regulators, OSHA, NTSB
- International partners—International Maritime Organization (IMO), INTERTANKO, Port States
- Public—recreational boating (including recreational boating public), passengers

Inspections and Investigations (Marine Environmental Protection mission)

- USCG—inspectors, investigators, commanding officers, headquarters program managers and senior leadership, Marine Safety Center, National Maritime Center (including Regional Examination Centers)
- Industries—tug and tow barge, chemical transport, tanker, cruise line, deep draft freight, fishing, recreational boating (including recreational boating public), offshore drilling, passenger/ferry, mariner associations and organizations
- Non-governmental and not-for-profit organizations—classification societies, harbor safety committees, federal advisory (FACA) committees, environmental non-governmental organizations (some with official advisory roles)
- Government partners—state departments of environmental quality/protection, EPA, MMS, local environmental quality departments (city, county, Police Departments)
- Individual mariners
- General public

Mariner Credentialing[8]

- USCG—National Maritime Center, Regional Examination Centers (RECs),[9] senior leadership
- Individual mariners
- Industries—tug and tow barge, chemical transport, tanker, cruise line, deep draft freight, fishing, certain small vessel operators, offshore drilling, passenger/ferry, mariner associations and organizations
- Maritime Academies

[8] Mariner Credentialing is also known as Mariner Licensing and Documentation by many stakeholders.

[9] Note that the RECs now fall under the management of the National Maritime Center rather than individual Sectors.

Boating Safety

- USCG—Headquarters Program Manager, senior leadership, inspectors
- Recreational boaters and waterway users associations
- National Association of State Boating Law Administrators (NASBLA)
- Harbor safety committees
- FACA (advisory) committee (NBSAC)
- Boat and associated equipment manufacturers and retailers
- Not-for-profit and volunteer organizations
- Standards organizations
- State and local agencies and partners
- Grant recipients

Organization of the Report

The remaining sections of this report comprise the approach, assessment of performance outcomes (metrics), recommendations and improvements as well as a summary and conclusions.

Section II, 'Approach,' includes a discussion of the methodology used, including summaries of the interview, port visit, and document review processes.

Section III, 'Assessment of Performance Outcomes,' includes a review of the current performance measures or metrics used by the Coast Guard, an assessment of the prevention program's performance based on the current metrics, and a discussion of proposed performance metrics.

Section IV, 'Recommendations and Improvements,' is divided into eight areas as indicated below:

- Standards and Regulations Development – includes development of new regulations (such as towing, boating safety, and outer continental shelf activities) and outdated regulations
- Compliance Enforcement – discusses competency, capacity, and workload issues
- Workforce Issues – includes issues related to training, assignments, tour lengths, career paths, and workforce management
- Organization and Leadership – captures issues and recommendations based on the organizational structure of Coast Guard Headquarters and Sector Offices
- Partner Relations – describes issues related to maintaining the network of Prevention partners
- Industry and Public Outreach – discusses mariner credentials, consistency, and economic impacts of USCG actions

- Investigations and Casualty Analysis – includes commentary about the appeals process
- Non/Semi-Regulated Maritime Industries – provides a synopsis of commercial fishing and recreational boating issues

Section V, 'Summary and Conclusions,' summarizes the major findings and recommendations of the study with some suggestions for developing an implementation strategy. Two appendices are also provided—a summary of the interviewees, and a summary list of the recommendations.

II. APPROACH

Overview

HSI's methodology for evaluating the Coast Guard's Prevention program consisted of the following steps:

- Informational interviews with USCG Prevention program managers
- Informational interviews with USCG national stakeholders
- Port and site visits, and ethnographic interviews with USCG field staff and regional stakeholders
- Review of Prevention policy, strategy, budget, and performance documents
- Report preparation:
  - Distillation, integration, and de-confliction of interview feedback
  - Analysis and identification of recurrent themes, development of recommendations and improvement suggestions, and recognition of best practices and benchmark opportunities
  - Report drafting, including obtaining feedback from USCG and stakeholders for clarifications, amplifying information, and accuracy

The following sections provide additional details regarding the interviews we conducted as well as the documents we reviewed.

Interview Methodology

Two types of interviews were used as part of HSI's methodology: informational interviews and ethnographic interviews. The informational interviews were designed for the purpose of obtaining important facts about a program such as its mission, goals, objectives, resources, partners, and stakeholders. The ethnographic interviews, held with Coast Guard field personnel and prevention stakeholders, were designed to identify and understand the impacts (both positive and negative) of the Coast Guard prevention programs on those most impacted—the Coast Guard personnel charged with carrying out the mission, and the many prevention program stakeholders—from their individual or organization's perspective. Ethnography differs from other forms of research, such as surveys, as the researchers go into the field and conduct one-on-one and focus group interviews, as well as visit sites, to gain a more comprehensive understanding of various phenomena as perceived by participants and then represent those observations as accounts.[10]

The recommendations and improvements section of this report contains several comments by interviewees that give unadulterated views of interviewee perspectives. While HSI cannot verify the veracity of the individual comments, collectively they can reveal broadly held perceptions, which, whether accurate or not, may have organizational consequences—for example, Coast Guard personnel making decisions on perceived notions of career paths or assignments; or

[10] Bruce L. Berg, *Qualitative Research Methods for the Social Sciences*, 7th ed. (Boston: Allyn & Bacon, 2008), 191.

industry changing its behavior with regard to inspections, investigations, or the appeals process in light of what it perceives to be Coast Guard interpretations. Several of the recommendations were developed from HSI's analysis of recurrent themes based on interviewee accounts and their potential consequences for the Coast Guard.

Interviews of USCG Program Managers and National Stakeholders

HSI met with over 500 Coast Guard and stakeholder personnel in individual and focus group interviews in 17 ports and 21 cities across the nation. Stakeholders and USCG personnel raised concerns, vetted frustrations, showed appreciation, made suggestions, and recommended strategies for overcoming prevention challenges and improving program effectiveness.

USCG Program Managers: The program manager interviews were informational and were conducted to obtain an understanding of the prevention missions, goals, and objectives of the programs; the activities managed to achieve the stated goals and objectives; the resources used to carry out these activities; analysis and performance metrics used to determine program effectiveness; and the performance outputs and outcomes that result. We also discussed program challenges and opportunities for improvement as well as stakeholder feedback on their program's performance and execution. Interviews were conducted with the following:

- Chief, Office of Quality Assurance and Traveling Inspectors (CG-546)
- Chief, Office of Vessel Activities (CG-543)
- Chief, Office of Investigations and Analysis (CG-545)
- Chief, Office of Ports and Facilities Activities (CG-544)
- Director of Commercial Regulations and Standards (CG-52)
- Chief, Standards Evaluation and Development Office (CG-523)
- Deputy Director, Prevention Policy Directorate (CG-54)
- Director, Prevention Policy Directorate (CG-54)
- Assistant Commandant for Marine Safety, Security and Stewardship (CG-5)

These initial program interviews in turn led to referrals for other Coast Guard interviews including:

- Director of Governmental and Public Affairs (CG-092)
- Office of Shore Forces-Sector Program Manager (CG-7411)
- Office of Workforce Planning and Projections (CG-12A)
- Personnel Services Center (Command cadre and assignment officers)
- Marine Safety Center
- National Maritime Center

National (and International) Stakeholders: These interviews were conducted to obtain information about the effectiveness of the USCG's prevention programs, but also to understand the relationships between the Coast Guard and its prevention partners and stakeholders on a national level. Discussion items included the Coast Guard's willingness to listen to industry and partner concerns and suggestions, the Coast Guard's understanding of the impact of their programs on the maritime industry, and suggestions that stakeholders and partners may have for improving the effectiveness of the prevention program to reduce the number of maritime deaths, and maritime injuries, and marine vessel casualties, and to minimize the volume and number of oil and chemical spills into U.S. waters. National and international stakeholder interviews were held with the following groups:

- National Boating Safety Advisory Council (NBSAC)
- National Offshore Safety Advisory Committee (NOSAC)
- Navigation Safety Advisory Committee (NAVSAC)
- Chemical Transportation Advisory Committee (CTAC)
- Towing Safety Advisory Committee (TSAC) – with representatives during port visits
- Commercial Fishing Vessel Safety Advisory Council (CFVSAC) – with representatives during port visits
- American Waterways Operators
- American Pilots Association
- Cruise Lines International Association
- INTERTANKO
- Commission of Maritime Affairs of the Republic of the Marshall Islands

Port Visits and Interviews

After the majority of USCG program manager and national stakeholder informational interviews were conducted, the HSI team conducted a series of port and site visits. During these visits, the HSI team conducted individual and focus group ethnographic interviews. As with all interviews conducted by HSI, the port visit interviews were "not for attribution" to allow free-flowing and candid discussion of issues without any concerns of retribution.

The original tasking from the Coast Guard was for HSI to visit ports in the following regions: The Gulf Coast, Western Rivers, Great Lakes, Northeast, West Coast, and Alaska. HSI visited two to three ports in each region designated by the sponsor, and conducted interviews in a total of 17 ports across the country and additional cities:

Sector New Orleans	Fall River, MA	Sector Seattle
Sector Houston-Galveston	New Bedford, MA	District 13 HQ (Seattle)
Sector Upper Mississippi River	Sector Boston	Sector Los Angeles/Long Beach

Sector Ohio Valley	District 1 HQ (Boston)	Sector Anchorage
MSU Paducah	District 9 HQ (Cleveland)	MSU Valdez, AK
Sector New York	Sector Lake Michigan	
Sector Southeastern New England	MSU Chicago	

Other interviews were conducted at: LANTAREA (Norfolk, VA), National Maritime Center (Martinsburg, WV), the Marine Safety Center (Washington, DC), and with stakeholders throughout the metropolitan Washington, DC region.

HSI met with as many Coast Guard personnel and regional stakeholders during port visits as time would allow, often having five or more meetings in a day. While HSI depended heavily upon the local Coast Guard units to suggest regional stakeholders with whom HSI should meet, HSI also suggested additional stakeholders, such as the New Bedford commercial fishing fleet. HSI requested to meet with Coast Guard staff initially during port visits, and then would meet with prevention stakeholders to discuss issues.

When meeting with Coast Guard personnel, HSI typically met first with the command cadres (Sector/Deputy Commander), then with the Prevention Chief and his/her senior staff, and finally conducted separate meetings with inspectors and/or investigating officers, junior officers, command master chiefs, and the enlisted prevention workforce, as availability permitted. In those cities that had a District office, HSI met with District Prevention staff, and in one case a District Commander who was a marine safety professional.

HSI met with several stakeholder groups representing the maritime community within the specific ports or regions being visited. As stated earlier, these groups would differ depending upon the unique characteristics of the port. As a representative sample, we met with the commercial fishing industry in New Bedford, Seattle, and Alaska; representatives of the cruise line industry in Los Angeles/Long Beach, Seattle, and Alaska; the towing industry in St. Louis, Paducah, Louisville, and Houston; ferry boat operators in New York, Seattle, and Fall River; and the petroleum industry in Houston, St. Louis, Los Angeles/Long Beach, and Alaska. In every port we met with waterfront facility operators and other relevant industry representatives. In several ports we met with pilots, mariner/longshoremen unions, and yacht club and recreational boating representatives.

These interviews were instrumental in forming the recommendations and improvements suggested later in this report. Several interviewee comments from Coast Guard personnel and stakeholders are listed in the margins of the recommendations and improvements section to provide the reader an unadulterated view of interviewee perspectives.

Document Review

The USCG provided to HSI initial background information on the Prevention Program, such as organization charts, an overview of the Program, and key Program reference material. In addition, HSI collected many documents during the course of the interviews. These included documents on regulations, Coast Guard guidance and policy documents, performance measurement, trends, budgets, policies, strategic plans, operational plans, workforce management, and models, as well

as OMB and DHS performance reports. Oftentimes, the documents referenced in earlier interviews helped us frame later interviews.

III. Assessment of Performance Measures and Outcomes

In this section, we list the performance measures currently used to assess the USCG Prevention program, and provide an independent assessment of the program using these measures. We then analyze the Coast Guard's current set of measures and provide improvement suggestions. Finally, we suggest possible new measures for Coast Guard consideration.

Current Measures/Metrics[11]

The Coast Guard employs a variety of effectiveness measurement targets to communicate the success of Coast Guard Prevention Program Activities. Examples of these effectiveness measures include:

- The five-year average number of commercial mariner deaths and injuries (DHS FY 2008-2010 Annual Performance Report)
- The five-year average number of commercial passenger deaths and injuries (DHS FY 2008-2010 Annual Performance Report)
- The five-year average number of recreational boating deaths and injuries (DHS FY 2008-2010 Annual Performance Report)
- The five-year average of maritime fatalities (Marine Safety Program Assessment Rating Tool (PART) 2005)
- The five-year average of maritime injuries (Marine Safety PART 2005)
- The five-year average number of oil spills into the marine environment per 100 million short tons shipped (DHS FY 2008-2010 Annual Performance Report)
- The five-year average number of chemical discharges into the marine environment per 100 million short tons shipped (DHS FY 2008-2010 Annual Performance Report)
- Credentialing measurements, including processing time (mariner plus Coast Guard time), net processing time (Coast Guard only), credential process time for each cycle step, and the top five reasons that the National Maritime Center is awaiting for information regarding an application (National Maritime Center monthly reports)
- Engineering plan review cycle time (Marine Safety Center Strategic Plan, January 2009)

Performance Assessment Using Current Measures

The majority of the performance measures listed in the previous section are discussed in more detail below in the context of the following outcomes: marine fatalities, marine injuries, and damage to the environment. The discussion is followed by one or more graphs that show the program outcome trends using the particular measure(s). Taken as a whole, the overall

[11] In practice, measure and metric are used interchangeably. Therefore, we do not attempt to distinguish between the two. See http://samate.nist.gov/index.php/Metrics_and_Measures.html for a discussion of measure versus metric, the definitions of which are difficult to distinguish in practice.

effectiveness of the Prevention Program, based on the current Coast Guard outcome measures, has improved over time. The improvement is most dramatic in the reduction of both the number and volume of oil and chemical spills, and in the reduction of commercial fishing vessel fatalities. However, it should be noted that while the Program effectiveness appears to be improving based on these measures, significant challenges and opportunities for improvement exist. In Section IV, 'Recommendations and Improvements,' we describe those challenges and opportunities. We also note that more recent trends, apparent in the annual passenger and annual mariner casualty graphs, move in the 'wrong' direction, particularly in the past five years. These trends bear watching.

We further note that, although the Coast Guard uses the measures defined above as *outcome* measures, we have not identified causal linkages between Coast Guard Prevention Program inputs/outputs (resources and activities) and the Prevention Program outcomes. The lack of causality was expressed, too, by Coast Guard performance measurement leaders that we interviewed. The lack of causality is a concern because resources are being assigned by the Coast Guard to Prevention Program activities in order to affect the outcomes described by the metrics above, yet there is not a clearly quantifiable link between resources or activities and program outcomes.

In order to show causation instead of simply correlation between inputs/outputs and outcomes, we suggest including a control group in the analysis of each performance measure, when feasible. Such a control group could be built into the system when new regulations are promulgated, for example. When towing vessel regulations come into force, which is expected in the near future, the Coast Guard could phase in inspections by inspecting a defined percentage of vessels in the first few years, while maintaining a control group of uninspected vessels that are still subject to identical regulations. Comparison of the two groups, concurrent with a gradual and quantifiable increase in inspections over time, could prove causality between inspection resources/activities and performance outcomes. Adjustments in resources could then be made to balance costs and benefits.

Marine Fatalities

The number of marine fatalities is reliably measurable due to legal requirements to report deaths and causes. Injuries are not as reliably reported, and local practices and individual decisions to report/not report cause great variations in the reliability of data. This occurs despite a legal requirement of the injured to report maritime injuries that requires treatment beyond first aid, or prevents an individual from carrying out his normal work routine (for commercial mariners).[12] As a result, we believe that the number of marine fatalities is a better measure to use for determining performance targets and trends than is injuries, until injury statistics become more reliable. Figure 2 displays the available data for fatalities in the recreational boating sector, Figure 3 displays the recreational boating fatalities normalized for the number of registered boats, Figure 4 displays the number of mariner deaths, Figure 5 displays the number of passenger vessel deaths, and Figure 6 displays the number of commercial fishing vessel fatalities. Note that the data in the figures below are derived from: United States Coast Guard, "The Oil Spill Compendium," 1973-2004;

[12] See 46 CFR 4.05 for casualty reporting requirements, and particularly paragraphs 1(a)(5) (deaths) and 1(a)(6) (injuries).

United States Coast Guard, "Marine Safety Performance Plan: FY 2009-2014," November 2008; United States Coast Guard, "Accident Statistics,"[13] 1997-2007; and United States Coast Guard, "Recreational Boating Statistics 2007; and COMDTPUB P16754.21," June 27, 2008. Much of that data, in turn, is derived from two databases: 1992-2001 data are from the Marine Safety Information System (MSIS) database, and 2002-present data are from the Marine Information for Safety and Law Enforcement (MISLE) database.[14]

Figure 2 shows that the number of fatalities attributed to recreational boating has decreased by nearly 40 percent over the last 20 years. Figure 3, which controls for the number of registered recreational boats, demonstrates a slight downward trend in recreational boating fatalities. This downward trend may be attributable to a variety of boating safety initiatives conducted by both the Coast Guard and state and local agencies.

Figure 4 illustrates that the number of mariner deaths showed a significant downward trend into the new century. However, since then, an upward trend appears to be emerging. The Coast Guard believes that this increase in deaths could be reversed since "anticipated towing vessel regulations...were not yet implemented...[and] proposed changes to requirements for safety/survival systems and a requirement that fishing vessels have a current safety decal, are expected to favorably affect future results."[15]

Figure 5 shows that the number of passenger fatalities has increased in the past few years. High profile accidents, such as the 2003 State Island Ferry accident where 11 people died following an accident that was in part attributable to a medical issue, have led to changes in mariner credentialing requirements, including stricter medical requirements for mariners. Note that these data have not been normalized for the number of annual passenger trips or passenger trip miles, as data for all types of passenger vessels were not available. Recent observed large increases (from 2003) in ferry passenger miles would straighten a normalized curve.[16] It is also noted, though, that the small number of annual passenger vessel deaths and related incidents makes this measure an unreliable indicator of program effectiveness or outcome.

In Figure 6, the downward trend in commercial fishing vessel fatalities can be attributed to a variety of marine safety programs, as well as the emergence of a new business model within the commercial fishing sector. Derby fishing, a free-for-all approach to fishing, has been eliminated in many fisheries and an individual fishing quota has taken its place in a process entitled rationalization. Rationalization limits the number of fishing vessels permitted in a fishery, the number of days allowed in a fishery, and the size of the catch. Interview evidence suggests that there are an increasing number of boat owners and crews taking advantage of voluntary safety

[13] See http://www.uscgboating.org/statistics/accident_stats.htm.

[14] Coast Guard representatives expressed mixed sentiment regarding the MSIS versus MISLE databases. MSIS was specific to Marine Safety, and collected inspection travel time, but was also believed to be less accurate. As discussed later in the evaluation, though, MISLE has its strong critics, primarily due to non-standardized data entry procedures.

[15] Annual Review of Coast Guard Mission Performance, FY 2007, Annex A, Non-Homeland Security Missions, page 18.

[16] See http://www.bts.gov/publications/national_transportation_statistics/html/table_01_37.html for data on ferry passenger miles.

training, and requiring their deck-hands to be well-versed in safety procedures. Additionally, there is an agreement with the National Marine Fisheries Services (NMFS) (http://www.nmfs.noaa.gov) to require fishing vessel crews to have safety training before NMFS observers will board those vessels.[17] Further contributing to the downward trend are the passage of the Commercial Fishing Industry Vessel Safety Act (CFIVSA, Public Law 100-424) in 1988, and the subsequent implementation of 46 CFR Part 28 regulations on "Requirements for Commercial Fishing Industry Vessels" in 1991.

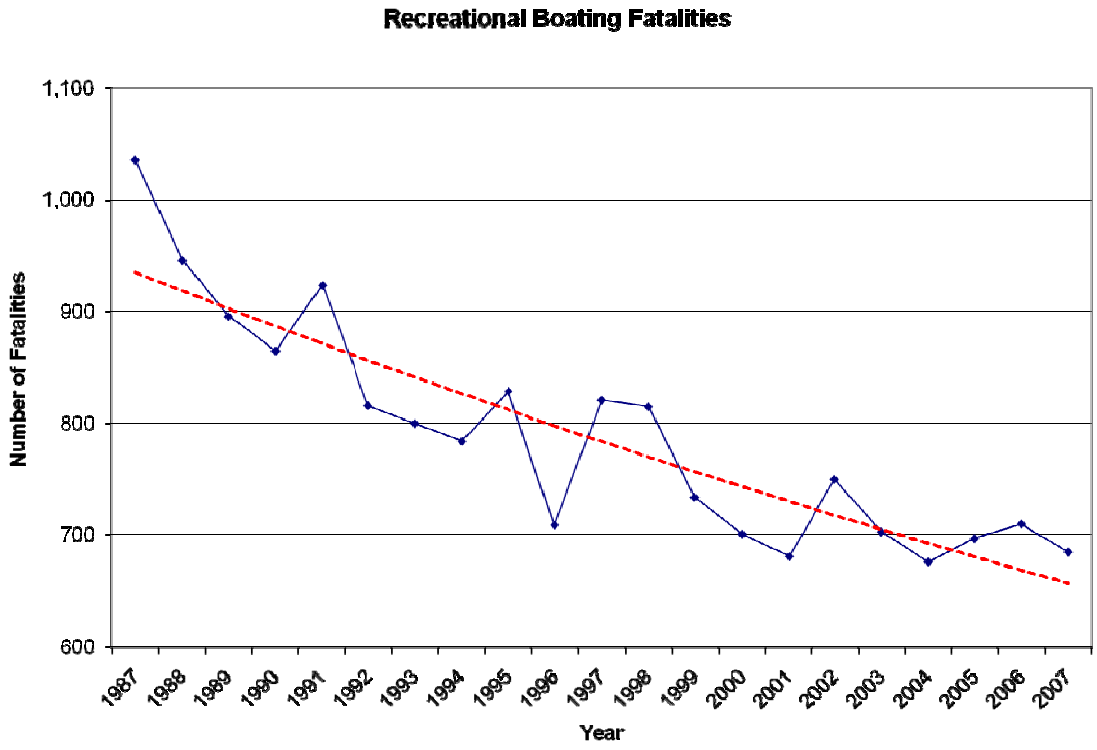

Figure 2: Recreational Boating Fatalities

[17] The agreement supports the Coast Guard's Commercial Fishing Vessel Safety Examination requirements. For text of the USCG/NMFS agreement, see: https://www.st.nmfs.noaa.gov/st4/nop/documents/MOA_Signed_Version_21December04.pdf

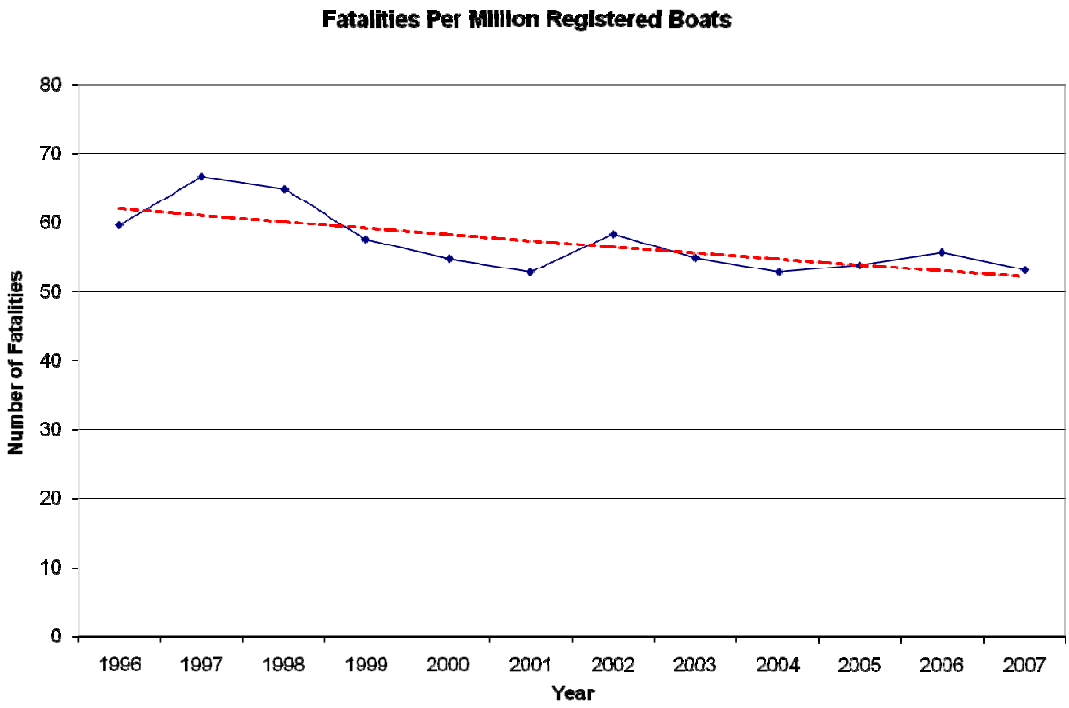

Figure 3: Recreational Boating Fatalities per Million Registered Boats[18]

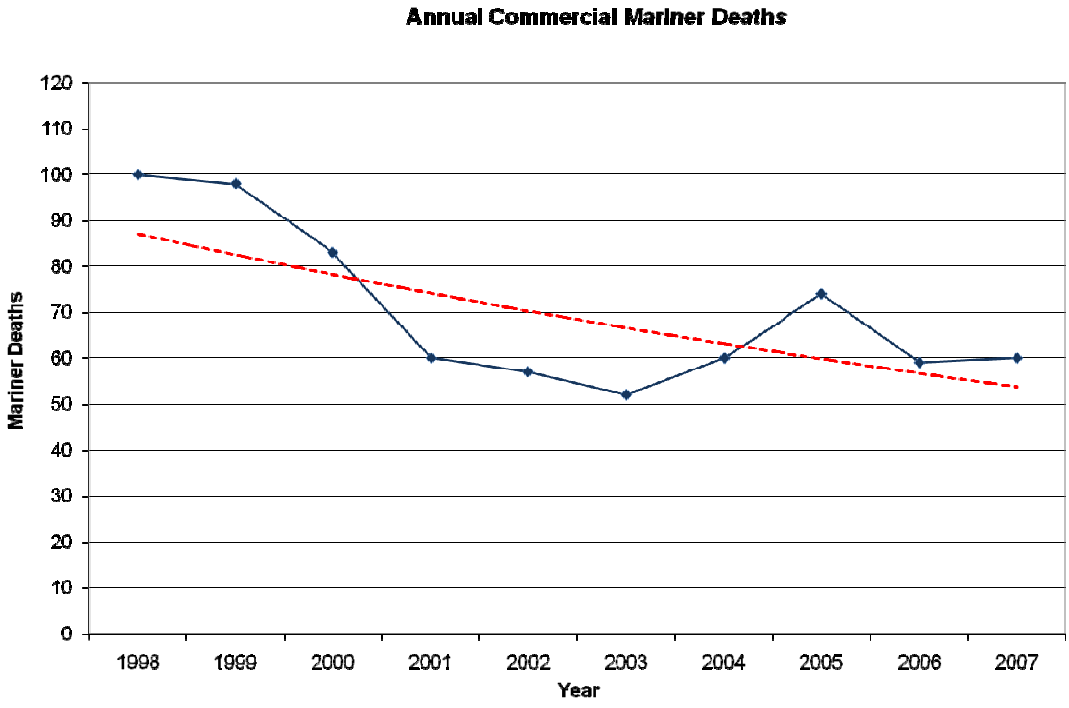

Figure 4: Annual Commercial Mariner Deaths

[18] HSI normalized results using uscgboating.com data.

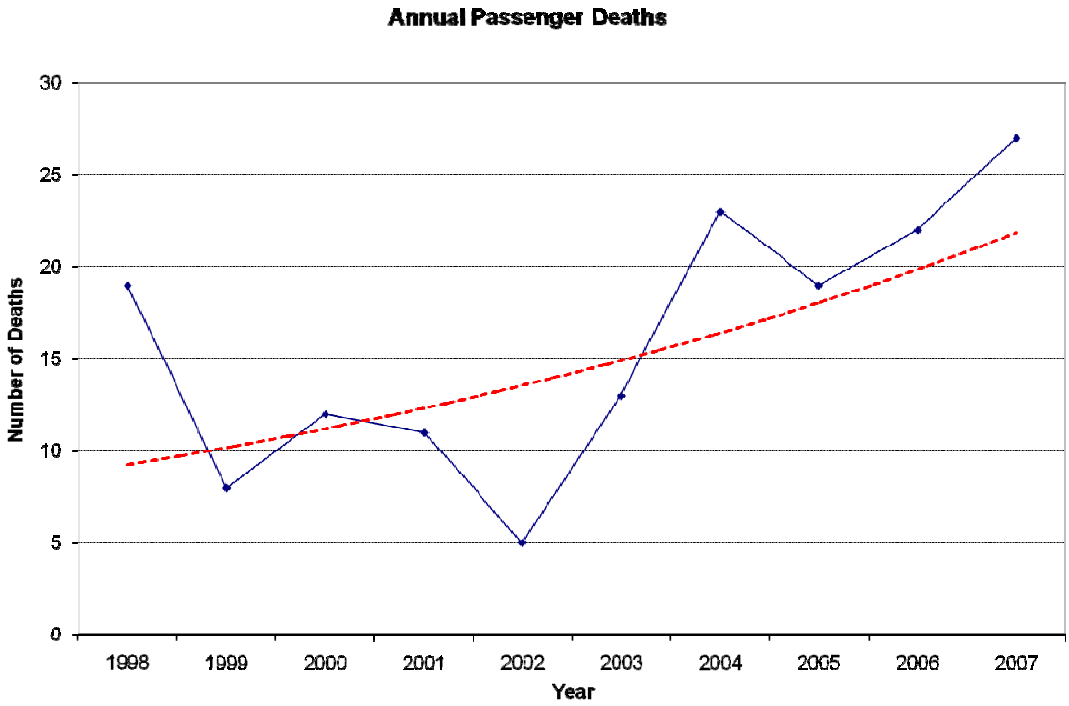

Figure 5: Annual Passenger Vessel Deaths

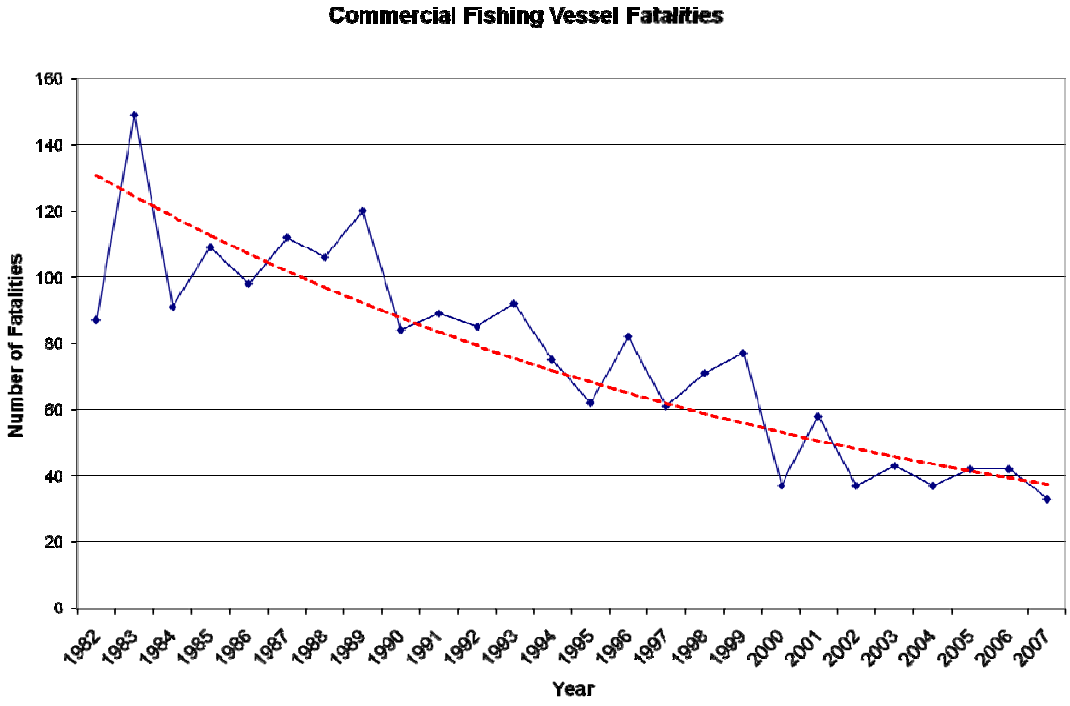

Figure 6: Commercial Fishing Vessel Fatalities

Marine Injuries

The number of recreational boating injuries has also been on the decline, as shown in Figure 7. Despite the decline, the last three years' data suggest a slight increase in injuries. This increase holds even when the number of registered boats is taken into account (that is, when the numbers are normalized). While this increase is notable, there is a need for another year or two of data to determine whether this trend is meaningful. The Coast Guard is currently working on normalizing recreational boating data for 'exposure hours,' which would be an improvement over raw injury/fatality numbers, and an improvement over normalizing for boating registrations in measuring effectiveness.

Nonetheless, Figure 8 (normalized boating injuries), like Figure 3 (normalized boating fatalities), indicates a slight downward trend over the data period. Figure 8 shows a decrease in injuries of nearly thirty percent over the last twelve years.

Figure 9 shows a small upward bias in the number of passenger injuries. Figure 10 shows a very flat curve in the number of mariner injuries. Neither set of data is normalized for the number of passengers, mariners, passenger miles, or exposure time. As noted earlier, the number of ferry boat passenger miles increased significantly after 2002. Figures 9 and 10 indicate that, although some prevention outcome casualty trend downward over the last decade, the trends are not necessarily fixed in that downward trajectory. Further analysis of actual mariner miles traveled or hours at sea might show increasing, flat, or decreasing trends.

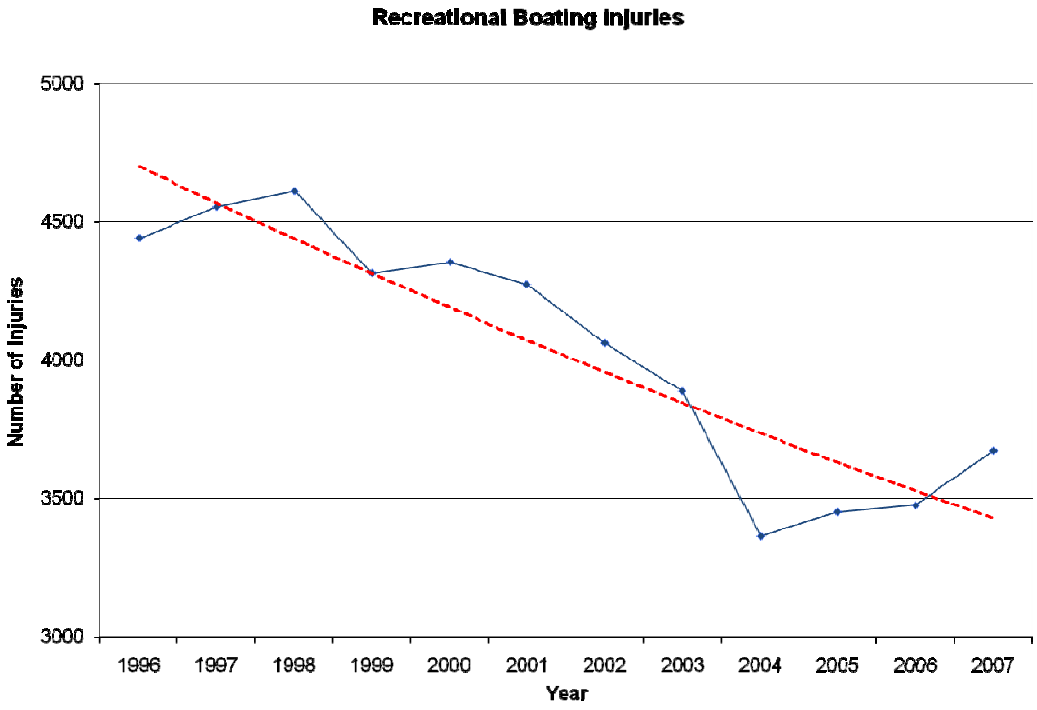

Figure 7: Recreational Boating Injuries

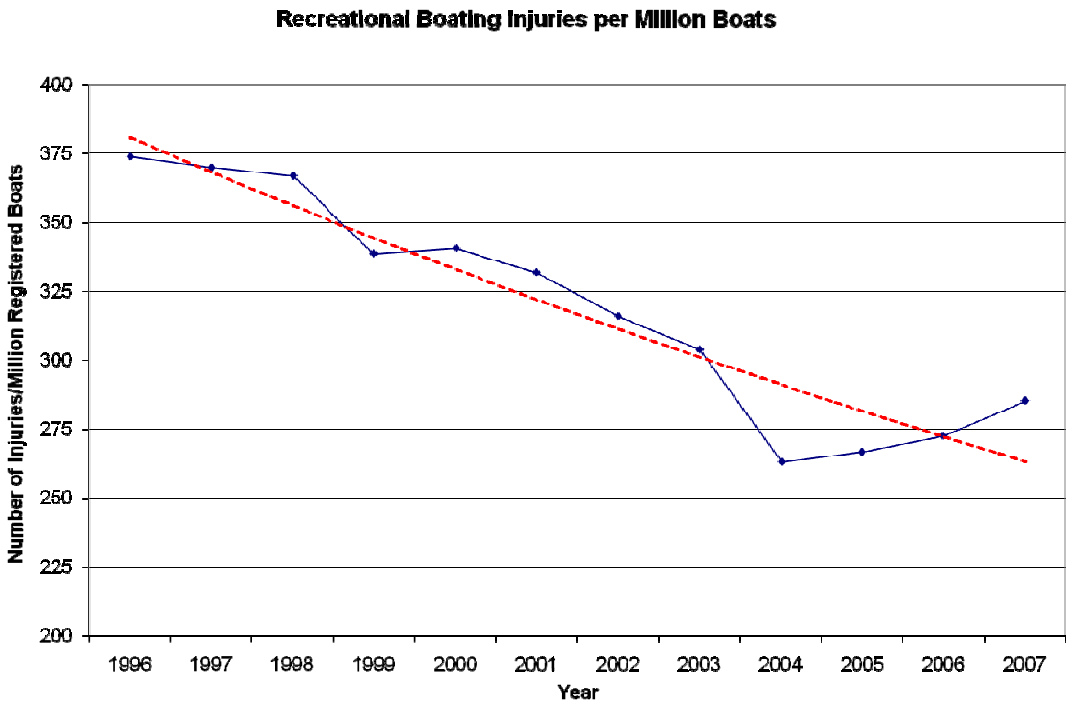

Figure 8: Injuries per Million Registered Boats

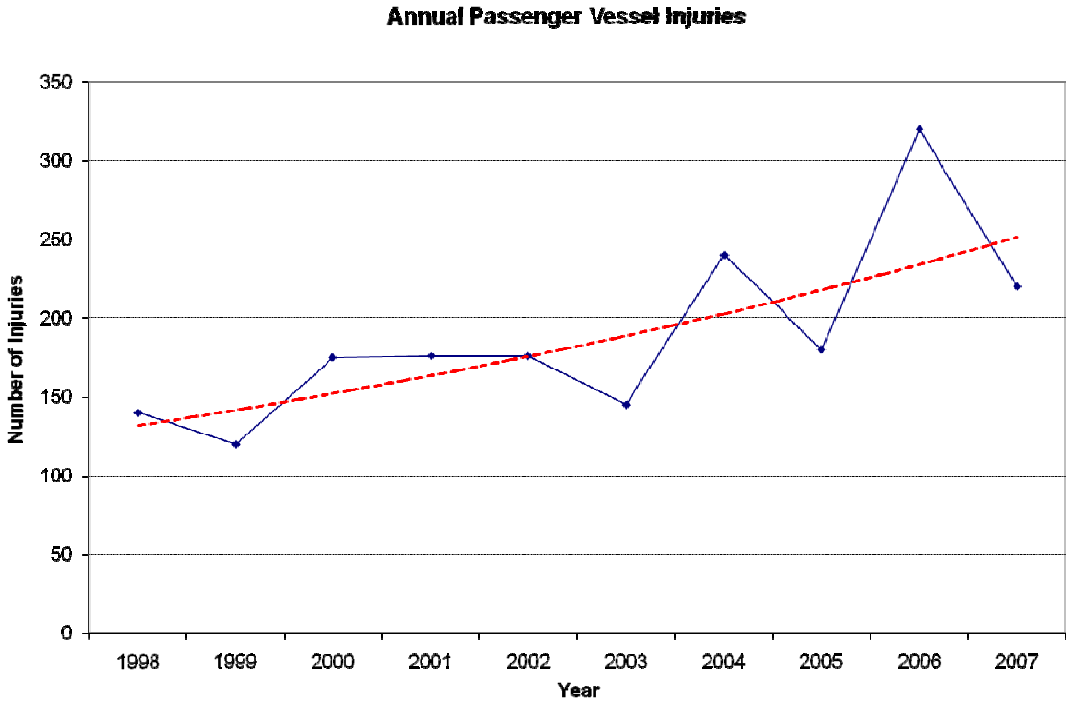

Figure 9: Annual Commercial Passenger Vessel Injuries

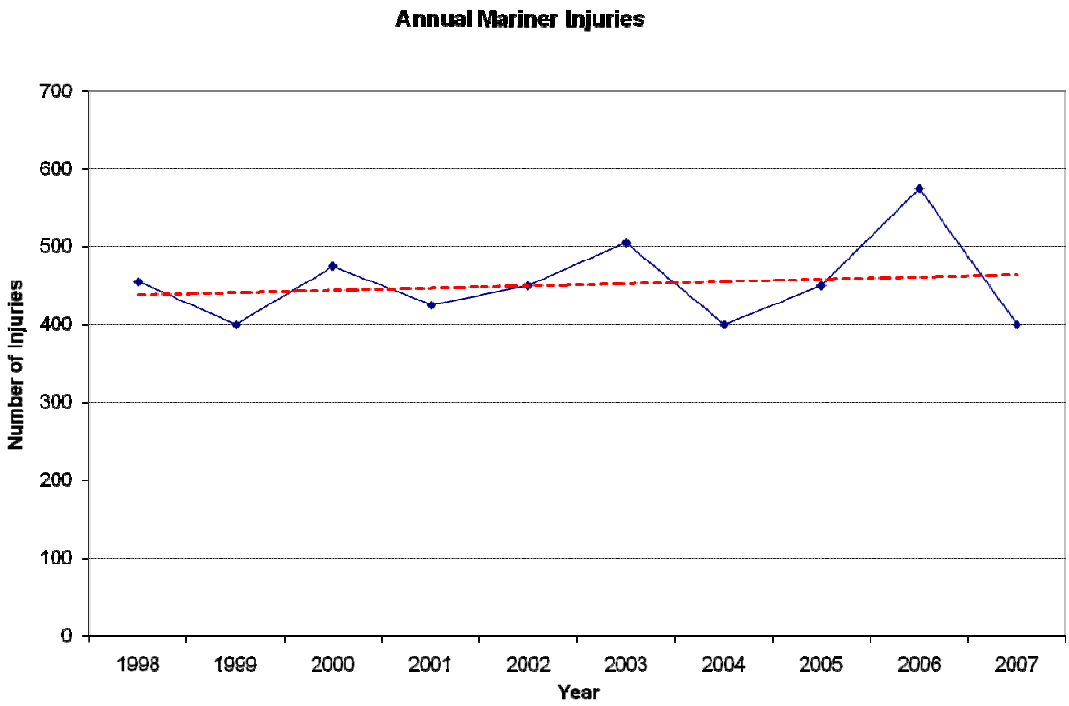

Figure 10: Annual Mariner Injuries

Damage to the Environment

The following two charts display the data from oil spills that occurred in United States waters from 1973 to 2003. Figure 11 plots the total oil spill volume on the left-hand vertical axis and the total number of spills on the right-hand vertical axis. This chart demonstrates clear downward trends in both areas, but there are some data anomalies worthy of discussion.

The reason for the divergence of the two plot lines can be traced to the passage of the Oil Pollution Act of 1990 (OPA 90). This Act legislated many changes that impacted the oil transshipment industry. The increase in the number of spills is a result of changes to the reporting requirements. OPA 90 imposed new reporting requirements for any spill producing a "visible sheen" of oil.[19] Because the new requirements came with increased civil penalties for non-reporting, mariners began reporting even the smallest of spills, as is reflected in Figure 11. The significant decrease in the total volume of spills can be traced to the mandate for double-hulled tankers, OPA 90's strict liability provisions, the potential for unlimited liability in cases of negligence, and the Certificate of Financial Responsibility (COFR) requirement.[20,21] With the proliferation of double-hulled tankers, the likelihood of any given spill reaching the level of the Exxon Valdez, which motivated OPA 90, is significantly reduced. The notable drop in spill number reporting in 2002 remains unexplained.

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[19] See 40 CFR 300 for reporting requirements.

[20] A reduction in spills can also be attributed to tug boat escorts in sensitive areas (such as the Port of Valdez) and insurance and liability concerns.

[21] See also the National Pollution Funds Center at http://uscg.mil/npfc.

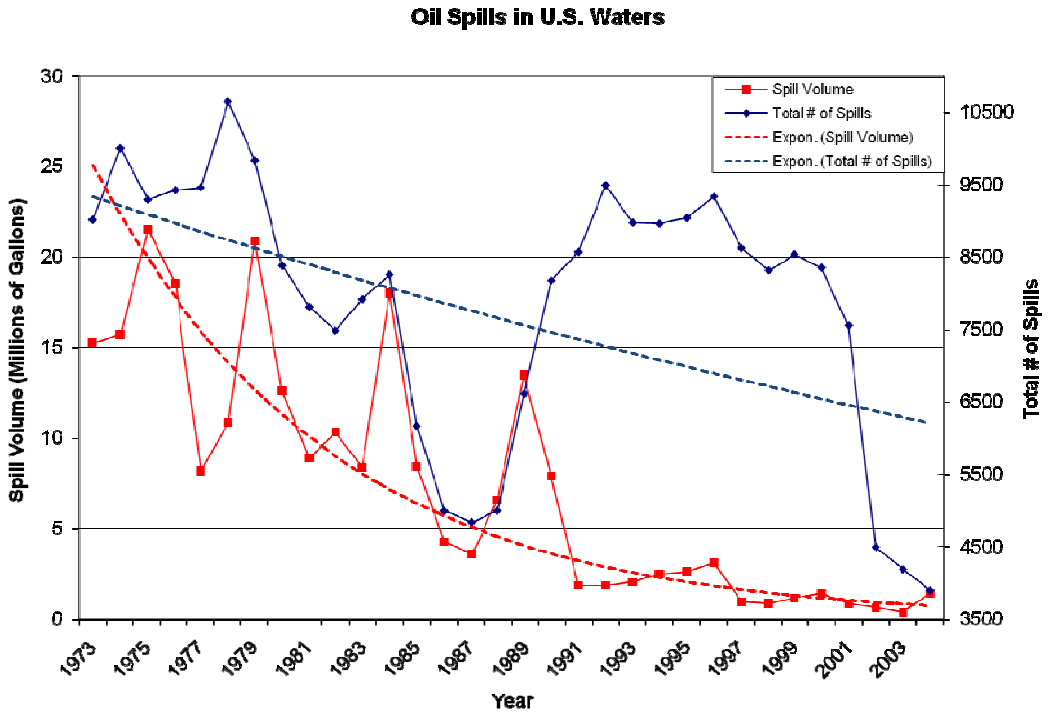

Figure 11: Oil Spills in U.S. Waters

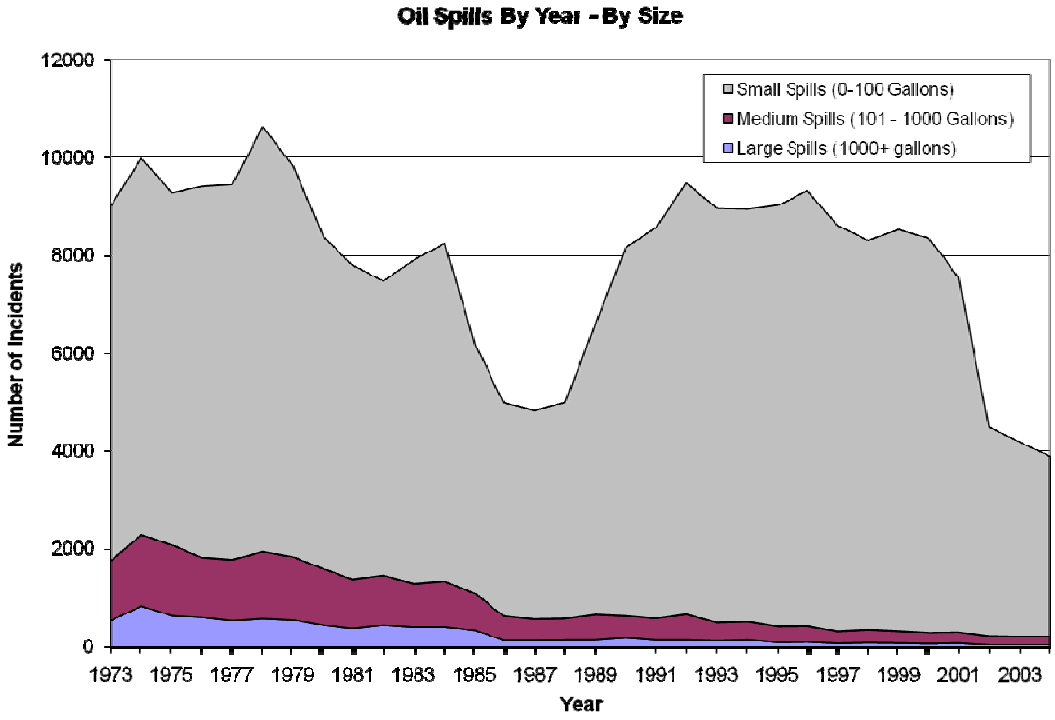

Figure 12: Oil Spills Displayed by Size of Spill

Figure 12 offers evidence that the reporting requirements of OPA 90 were successful in compelling the reporting of a large number of smaller spills. This chart also demonstrates that spills of 100+ gallons have decreased as a percentage of total reported spills.

Figure 13 includes more recent data than that found in Figure 12, drawing the data from the USCG Marine Safety Performance Plan (2009-2014) (MSPP). These data have some disparities with the data from the USCG Oil Spill Compendium, but the trends are identical. The number of spills greater than 100 gallons has been trending downward over the reporting period featured in the MSPP.

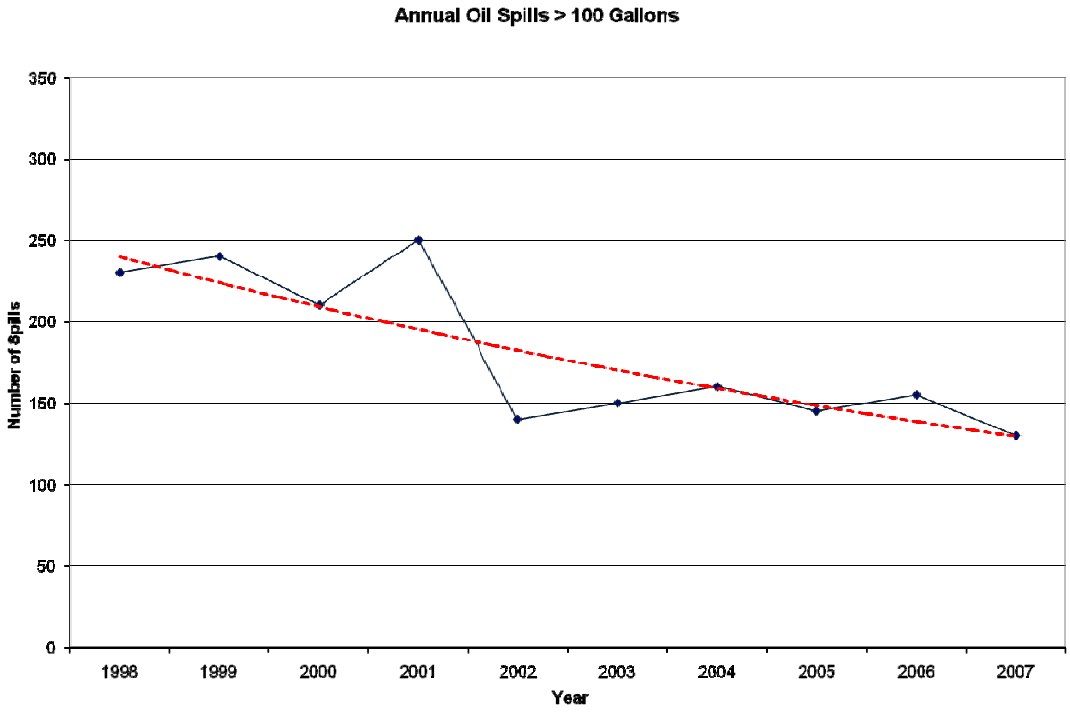

Figure 13: 1998-2007 Oil Spill Data from the Marine Safety Performance Plan

An unintended consequence of the success in the significant reduction of oil spills is that in many ports, so few spills are occurring that there are insufficient opportunities for personnel to gain experience in how expertly to respond, contain, and clean up spills when they occur. Coast Guard leaders in the Great Lakes state that so few spills occur there that they would like to send their personnel on temporary duty to Houston, or other ports with higher spill rates, where they could gain more professional experience responding to spills. Most units in this situation stated that they do not have sufficient training or travel funds to send personnel on such an assignment, which would likely be for a period of 2-4 weeks.

Recommendation (GEN-1): Coast Guard should establish a Center of Expertise (CoE) for spill response and cleanup. A centralized body of knowledge and experience would serve Coast Guard personnel nationwide as many locations do not have the expertise available locally anymore, simply due to the low number of spills in most of the country (despite a 60 percent increase in

shipping in recent years[22]). As appropriate, this CoE could develop and deploy training, maintain expertise for advising Coast Guard (and public and private partner) personnel in spill response and cleanup, provide feedback for prevention issues, and coordinate with Strike Team operations. The Gulf Coast region sees the most spills in the nation, and has the largest amount of Coast Guard and stakeholder expertise in the spill response field. It would therefore be the most logical location for such a CoE.

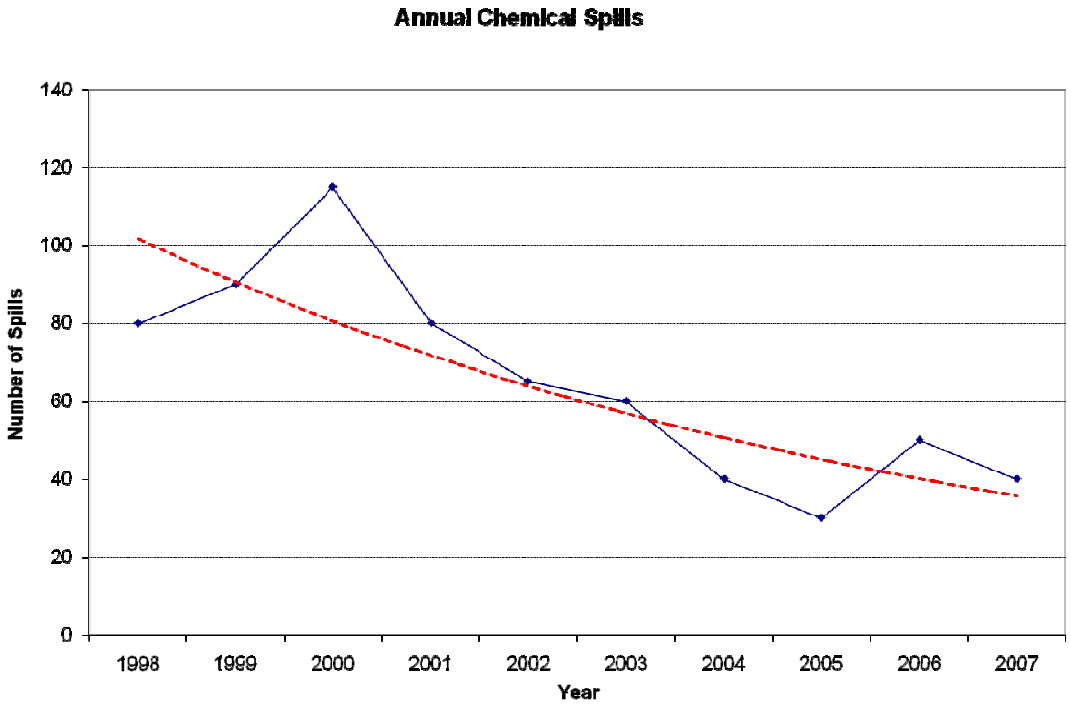

Figure 14: Annual Chemical Spills (1998-2007)
Sources: OMB/USCG MEP PART (2003), and Marine Safety Performance Plan (November 2008)

The number of chemical spills appears to be decreasing over time, although the data are not normalized for volume, trip segments, or miles traveled.

The preceding graphs and discussion showed the trends in maritime casualty and pollution outcomes that the Coast Guard tracks and uses as outcome measures in its high-level reporting documents. The next Section contains an analysis of the USCG performance measures and HSI's analysis and related suggestions

Performance Measure Analysis

We begin this sub-section with a brief discussion on normalizing current measurements. We then discuss the utility of having a consistent set of reported performance measures for the Program. We conclude this sub-section with a discussion of performance measures related to the Prevention Program elements previously introduced.

[22] Discussion with Coast Guard Flag Oficer at USCG Headquarters.

Normalizing Measurement

We note that the Coast Guard does not normalize its performance measurement data. We strongly recommend that the following data be normalized, and offer suggestions for doing so, so that true outcomes trends can be identified.

- Recreational boating data for exposure time (we recognize that this is currently being studied by the Coast Guard and partners)
- Fatalities and injuries data for number of trips, or exposure time
- The number of oil spills over 100 gallons and chemical discharges for the number of port calls or trip segments
- Credentialing and engineering plan cycle time need not be normalized, as the raw cycle time number is an output measure that provides sufficient information to inform resource allocation decisions.

Consistent Reporting of Performance Measures

The Coast Guard Prevention Program reports performance measures in numerous documents to USCG, DHS, Administration, Congressional, and public audiences. Table 1 shows the measures and the documents in which the measures are reported. All documents listed are national level documents, with the arguable exception of the *Strategic Business Plan, USCG Marine Safety Center*. Despite the fact that the documents are for identical audiences, each set of performance measures reported in individual documents is unique. (For example, commercial passenger deaths are reported in six documents, in four slightly different ways.) This is problematic for the following reasons:

- There is no consistency across reporting documents, which makes it difficult to identify and track trends
- It is difficult for readers to become comfortable without an identifiable set of effectiveness measures
- It is inefficient for the Coast Guard to collect and track variants of measures
- It is difficult to hold persons or organizational units accountable for unclear measures
- It is difficult to improve a set of measures when a consistent set is not available for analysis and discussion

Performance Measure (measure time frame, type of measure)	Marine Safety Performance Plan	DHS FY08-10 Annual Performance Report	DHS IG Annual Review of CG Mission Performance (FY07)	Annual Review of the USCG's Mission Performance (FY 2008)	Strategic Business Plan USCG Marine Safety Center	Marine Safety PART 2005 (updated 2008) and Marine Environmental Protection PART 2003	U.S Coast Guard GPRA Performance Measures (14 January 2009)
Five-year average number of commercial mariner deaths and injuries (long-term, outcome)	X	X				X	X
Five-year average number of commercial passenger deaths (long-term, outcome)		X				X	
Five-year average number of commercial passenger deaths and injuries (long-term, outcome)	X						X
Five-year average number of recreational boating deaths and injuries (long-term, outcome)	X	X				X	X
Commercial mariner deaths and injuries (annual, outcome)	X					X	X
Commercial passenger deaths and injuries (annual, outcome)	X					X	X
Recreational boating deaths and injuries (annual, outcome)	X					X	X
Marine Safety Efficiency Ratio (long-term/annual, efficiency)						X	X
Marine Safety Resource Hours (annual, input)			X	X			
Marine Environmental Protection Resource Hours (annual, input)			X	X			
Five-year average annual fatalities and injuries (long-term, outcome)			X	X			
Five-year average number of USCG-investigated oil spills greater than 100 gallons and chemical discharges into the navigable waters of the U.S. per 100 million short tons of chemical and oil products shipped in U.S. waters (long-term, output)			X	X			
Five-year average number of oil spills>100 gallons per 100 million short tons shipped (long-term, outcome)	X	X				X	X
Five-year average number of chemical discharge incidents per 100 million short tons shipped (long-term, outcome)	X	X				X	X
Oil spills greater than 100 gallons (annual, outcome)	X					X	X
Chemical discharge incidents (annual, outcome)						X	X
Marine environmental protection efficiency ratio (long-term/annual, efficiency)						X	X
MSC response time for plan review actions ("cycle time") (annual, business)					X		
Number of plans and associated plan review activities completed (monthly, business)					X		
Nonconformity rates for classification society work done on the Coast Guard's behalf (monthly, business)					X		
Resource allocation (annual, business)					X		
Percent of oil removed or otherwise mitigated as compared to the amount of oil released for reported spills of 100 gallons or more (annual, output)		X					

Table 1: Current Performance Measures Reported in Various Coast Guard and Federal Publications

Performance Measures and Prevention Program Elements

In order to assess the Prevention Program's effectiveness, HSI analyzed the Program's performance measures in relation to the two Program missions and six Prevention Program elements.[23] (Recall that the elements are: Inspections, Investigations, Engineering Plan Review, Mariner Credentialing, Regulation Development, and Boating Safety. These program elements help the Coast Guard to meet its Marine Safety and Marine Environmental Protection missions.)

The assignment of performance measures to Program elements:

- Promotes accountability by tying performance to a particular office(s) and/or Program Manager(s) that has responsibility for a particular element
- Permits identification and assignment of performance measures that can be easily traced to particular Prevention Program activities and resources
- Assists the Coast Guard in identifying a complete and consistent set of performance measures for the entire Prevention Program
- Provides Prevention leadership and stakeholders insight into the effectiveness of the entire Program

A discussion of the performance measures applicable to each Prevention mission and program element follows.

Marine Safety

The Marine Safety mission has been focused on measuring and tracking mariner casualties (deaths and injuries). The Marine Information for Safety and Law Enforcement (MISLE) System has been used to collect inspection and investigation information relevant to the Marine Safety mission. Recreational Boating Safety (RBS) utilizes the Boating Accident Reporting Database (BARD) for collecting accident data from the States. The RBS program is about to issue a contract for a National Boating Survey, which will be useful in determining exposure time for recreational boating. Exposure time is expected to be used to normalize RBS performance measure data.

Queries of the MISLE and BARD databases have traditionally been utilized to obtain performance data that is then used to provide performance targets. The Coast Guard's Marine Safety stakeholders generally use data on the number of recreational boating, mariner, and passenger fatalities and injuries to inform the variety of performance measures that the Coast Guard tracks. These measures are also reported as high-level Prevention Program performance measures in many national-level documents, such as budget requests and OMB PART evaluations. It is noted that, as seen in Table 1, there are variations in the specific performance measure definitions that are reported in various documents. Generally, one would expect a common set of clearly defined measures to be reported by the Coast Guard in all such documents.

The inspection and investigation program elements outcomes are synonymous with the Marine Safety and MEP mission outcomes. As a result, they are not treated separately here.

[23] See the Introduction section for a discussion of the program elements.

Marine Environmental Protection mission

The Coast Guard has generally focused on measuring and tracking oil and chemical pollution spills to report on its MEP mission. As with the Marine Safety mission, Coast Guard MEP stakeholders use the MISLE database to collect and query MEP information, which leads to the development of performance targets for the MEP mission. The Coast Guard generally uses the number of oil spills over 100 gallons and the number of chemical releases into waterways as the measures for performance reporting. These measures are also reported as the high-level Prevention Program performance measures in national-level documents, such as budget requests and OMB PART evaluations. Combined with the Marine Safety measures described in the previous paragraphs, the oil and chemical release measures form the most common reporting measures for the Prevention Program (with Waterways Management excepted).

Engineering Plan Review

The Marine Safety Center (MSC) supports the Prevention Program through the verification of compliance with technical standards for the design, construction, alteration, and repair of commercial vessels. Currently, the Coast Guard does not report any MSC performance measures in national-level documents. However, the MSC tracks cycle time (the amount of time it takes to review engineering plans) as a performance metric.[24] Cycle time is a reasonable and important metric relating to the commercial aspects of the MSC's work. Improved cycle time is an indicator that the economic cost to industry is being reduced, assuming that the MSC maintains consistent review standards.

A second metric that addresses the quality of the MSC's output could provide insight into the utility of the MSC's activities. Tracking the number of major defects, shortcomings, or problems identified during vessel plan reviews, normalized for the number of vessel plan reviews, could prove a valuable quality metric. 'Major' should be defined using historical defects, shortcomings, or problems that have been found to result in threshold levels of marine casualties or pollution incidents. This output measure has two benefits, but must be analyzed carefully for each benefit before conclusions are made. The benefits are (a) it helps point to changes in the quality of the MSC program element (the review process), and (b) it points to potential changes in the quality of vessels by being both a leading indicator (using historically identified issues to identify problems) and trailing indicator of vessel quality (when combined with the emergence of novel defects/shortcomings/problems).

Mariner Credential Processing

The National Maritime Center's (NMC) role is to serve as the Coast Guard's centralized mariner credentialing processing facility. The NMC utilizes a large number of metrics and performance measurements to gauge its internal effectiveness and outputs. The NMC measures credential cycle time, gross process time (mariner plus Coast Guard time), net processing time (Coast Guard only), credential process time for each cycle step, and the top five reasons that the NMC is awaiting information regarding an application. As expressed often in stakeholder interviews, the mariner is concerned with the amount of time that it takes from submission of information to receipt of credential. The metric collected by the NMC that is of most interest to the mariner is

[24] USCG Marine Safety Center *Strategic Business Plan 2009-2013*, January 2009.

gross process time, as this is the time identified by the customer (the mariner) as his/her outcome metric. This 'customer-based' processing time is the variable that most drives the implicit Prevention Program outcome of promoting maritime commerce.

The NMC also provides to the public quarterly performance updates via their website.[25] The NMC has identified issues with its mariner credentialing process time through the analysis of metrics, and identified resources to apply to and correct the performance problems in the long term.[26] In particular, the NMC, as was verified almost universally by those that HSI interviewed, had a medical evaluation processing issue tied to a lack of NMC resources. The NMC has begun addressing this problem, and a recent comparison of Coast Guard medical evaluation processing time during the January 20–March 24, 2009, time period shows a positive trend in reducing processing time. Continued tracking of this important issue will indicate whether the new resources are sufficient to address the medical processing concern. Nonetheless, we believe strongly that the NMC and the Coast Guard have in place, and utilize well, effectiveness measures.

Regulations Development

Although the Coast Guard's regulation development office, the Office of Standards Evaluation and Development (CG-523), is not contained within the Prevention Directorate (CG-54), regulations have a significant and essential contribution to the Prevention Program. Safety and pollution regulations support inspection, investigation, plan review, and boating safety activities and effectiveness outcomes. CG-523 and CG-54 work closely together in a team approach to develop and implement prevention regulations that will reduce casualties, injuries, and fatalities in the marine environment. We believe that one way this team approach could be further strengthened is in the formal sharing of relevant performance and performance measure information, including not only status reports on current regulations under development, but also systems measures such as cycle time for various office inputs/reviews, and the overall cycle time for regulation development.

Prevention stakeholders are primarily concerned that prevention regulations are not promulgated quickly enough, and that there is little transparency to the regulation development process after an initial stakeholder advisory role. The belief expressed during interviews is that the slowness in promulgating regulations is causing worse outcomes (for example, more casualties or pollution incidents). Internal Coast Guard regulation development time (referred to earlier as "cycle time") was reported in interviews as sometimes taking up to ten years or longer (for example, Boating Safety regulations, commercial fishing vessel safety amendments and revisions, and Outer Continental Shelf Activity regulations). The causes of this were expressed as a lack of regulation personnel (such as economists and lawyers) and a priority scale that was constantly shuffled, with new/ongoing security regulations almost always floating to the top, above marine safety, boating safety, and marine environmental protection regulations.

[25] See http://www.uscg.mil/nmc/whats_new.asp Performance Update section.

[26] See *Actions to Reduce Mariner Credentialing Process Time*, February 10, 2009, at http://www.uscg.mil/nmc.

Boating Safety

Boating Safety is overseen in the Coast Guard Headquarters by the Office of Auxiliary & Boating Safety (CG-542), which falls under the Director of Prevention Policy (CG-54). The national boating community is very large, and largely not subject to regulations (mandatory carrying of life jackets notwithstanding). Nonetheless, the Coast Guard, in cooperation with U.S. states, is responsible for numerous boating safety activities such as voluntary inspections. Boating accidents, though, are the single largest cause of fatalities and injuries within the U.S. maritime system. As a result of the number of casualties, the Coast Guard has an interest in identifying performance metrics that will assist in identifying trends and outcomes.

Additional Performance Metrics

Some additional performance metrics that might be beneficial for Prevention Program mission areas and elements are shown below. Virtually all would benefit from being normalized.

Marine Safety and Marine Environmental Protection

- Number of collisions and root causes[27]
- Number of allisions of consequence (damage/injury) and root causes
- Number of groundings of consequence (damage/injury) and root causes
- Number of near misses, based on non-attribution reporting similar to CG aviation MISHAP reporting. Good benchmarks for non-attribution reporting of near-misses include: Royal Caribbean Cruise Line (reportedly changed the culture from blame to safety) and the FAA system for aviation near misses (MISHAPs)
- Note: Additional benchmarks for casualty/accident reporting include: Marine Accident Information Board (MAIB) in the UK, and a similar marine accident reporting agency in New Zealand, which have very good accident reporting and extensive accident write-ups with annual summaries of marine accidents; AWO keeps a database of incidents and causal factors
- Five-year average number of recreational boating fatalities. Recreational boating is a well-defined element of the Prevention Program, as it effectively contains defined non-professional waterways users, has a defined and protected budget paid for by taxes on those same users, and has a single USCG Headquarters program manager. Therefore, a dedicated measure is appropriate for it. The effort by the Coast Guard and partners to normalize this information for 'exposure time' is laudable.
- Five-year average number of maritime accidents exceeding $100,000 in damage. (Note that this number has been arbitrarily chosen. We recommend that the Coast Guard conduct an analysis of accident data to identify an appropriate number, which is beyond the scope of this analysis.) The number of accidents is more indicative of mariner and vessel quality than the number of fatalities or injuries, or size of spills caused by such as accident. The absolute number of casualties or size of spills following a major accident is

[27] Although collisions, allisions, and groundings can result from Waterways Management issues, many are also caused by Marine Safety and Marine Environmental Protection mission issues.

often related to luck,[28] but the likelihood of an accident is correlated directly to the mariner or vessel quality.

- Inspections
  - Number and type of deficiencies discovered during construction or standard vessel inspections
  - Number of serious deficiencies that could result in fatalities, injuries, or spill if not identified and corrected
  - Number of lives at risk (but not lost/injured) due to construction, maintenance, or equipment deficiencies found
- Value of property at risk (but not lost) due to construction, maintenance, or equipment deficiencies found
- Investigations
  - The number and type of deficiencies that contributed to a marine casualty (human error, design deficiency, construction deficiency, poor/faulty maintenance, equipment failure, extreme weather)
  - The percent of cases where the root cause of the marine casualty was determined
  - Percent and types of cases where a thorough inspection may have identified the root cause prior to the casualty and avoided the incident
  - The casualty rate attributable to vessel operator related causes
- Plan Reviews: Number and type of deficiencies noted per plan reviewed
  - Number of serious deficiencies that could result in fatalities, injuries, or spills if not identified and corrected
  - Number of lives at risk (but not lost/injured), due to design deficiencies found
  - Value of property at risk (but not lost) due to design deficiencies
  - Cycle time for engineering/plan review at the Marine Safety Center; the cycle time measure directly affects the economic impact of the Coast Guard on industry or customers

Standards/Regulations

- The percentage complete of each Prevention Program regulation under development; this measure would separate Marine Safety regulations from security and other regulations, and provide a tracking mechanism that would be useful in allocating resources to Prevention regulations
- Time to develop regulations package
- Time that a regulation package is in the clearance process

[28] For example, the 2003 State Island ferry accident resulted in a number of fatalities because the ferry hit the pier at a time when people were amassing to disembark from the area of the vessel that hit the pier.

- The estimated impact/value (fatalities/injuries avoided, spills that did not occur, dollar amount saved) of regulations implemented in the past and those under development

Mariner Credentialing

- Cycle time for credential production at the National Maritime Center; the cycle time measure directly affects the economic impact of the Coast Guard on industry or customers
- Cycle time for medical review/evaluation (until medical review issue is no longer a problem)

Leading Indicators

Many of the above measures are lagging indicators. To significantly improve the effectiveness of the Prevention Program, it would be beneficial to identify leading indicators that could forecast risks before a casualty occurs so that interventions might be implemented. A very successful application of leading indicators in the marine safety field is the Port State Control program, which identified factors (the Port State and the Classification Society of a vessel) that could be used to forecast which foreign flag vessels arriving in U.S. waters were more likely to suffer marine casualties. The Coast Guard then "targeted" those vessels with Port/Flag states and Classification Societies having lower standards and greater casualty rates for inspections when the associated vessels arrived in U.S. ports. If serious deficiencies were noted, the vessels were not allowed to leave port until repairs were made or the deficiencies were otherwise corrected. As a result of the economic impact of being detained in U.S. ports, at-risk vessels with marginal maintenance, safety equipment, and training either invested in these areas and took corrective actions, or stopped visiting U.S. ports. Within a matter of just a few years, the casualty rates of foreign flag vessels in U.S. waters dropped dramatically.

A similar strategy is proposed in this report for the commercial fishing vessel fleet, which suffers one of the highest fatality rates in the maritime industry, second only to the recreational boating community. See Chapter IV, 'Recommendations, Non/Semi-Regulated Maritime Industries,' for details on a possible leading indicator that could lead to, ultimately, fewer casualties and fatalities.

If the right leading indicators can be found for foreign flag vessels and commercial fishing vessels, it may be possible to use a similar methodology to find leading indicators in other classes of vessels, and thereby reduce the related risk of marine casualties. If the Coast Guard does not, or cannot, develop an analytic capability to look at the potential for developing leading indicators of marine casualty risk, it might consider working with a third party in this area.

IV. RECOMMENDATIONS AND IMPROVEMENTS

This section summarizes HSI interviews with over 500 Coast Guard and stakeholder personnel in individual and focus group interviews in 17 ports and 21 cities across the nation. As we collected, integrated, and de-conflicted interviewee statements, and then further researched and analyzed the information we had learned, most of the recommendations that evolved fell into eight prominent categories:

- Standards and Regulations Development
- Compliance Verification and Enforcement
- Workforce Issues
- Organization and Leadership
- Partner Relations
- Industry and Public Outreach
- Investigations and Casualty Analysis
- Non/Semi-Regulated Maritime Industries

The discussion, recommendations, and improvements described below are organized within the above categories, designed to follow the process described earlier—Congress passes laws that require regulations which require compliance verification and/or enforcement by an organization having the right competencies at the right capacity. The organization investigates incidents, conducts analysis, takes corrective actions (by sharing information with the marine community and Coast Guard inspectors and making revisions and additions to safety and environmental regulations), and/or requires corrective actions (verifies compliance or ensures regulated party responds to violation) that are designed to further minimize future incidents.

Throughout the evaluation, the reader will note interview quotations contained in the margin. They are provided simply as direct feedback from prevention stakeholders, on a not-for-attribution basis.

Standards and Regulations Development

The USCG standards and regulations development process is a very lengthy and complex undertaking, involving subject matter experts, economists, environmentalists, attorneys, industry groups, other federal agencies, representatives of states, labor groups, DHS, OMB, and Congressional staff. On average, the Coast Guard reports that most rules take 3-5 years to develop under the existing process. This is due to federal requirements to inform stakeholders and get feedback from the public and interested parties; the requirement to perform a detailed economic analysis, determine any environmental impacts (and mitigation strategies, if warranted); and the assimilation of additional reviews by various government agencies (such as DHS or OMB).

During the course of our interviews, concern was expressed by industry representatives and other stakeholders about the length of time that it takes under the current process to get new regulations

implemented to reduce injuries, save lives, and reduce spills. Furthermore, stakeholders (and some Coast Guard representatives) believe that several existing regulations need to be updated. For example, interviewees cited frustration with several decades' old regulations requiring out-of-date technology to be available on vessels.[29] Identified technologies have been superseded by new technology, and processes and procedures that are now accepted industry-wide have not been formally accepted through standards or regulations by the USCG.

At least two regulations have been under development for ten or more years, one for recreational boating and the other for the offshore petroleum industry. Interviewees both within and outside of the Coast Guard noted that these delays could reflect a broken process. Recent actions have been taken by the Coast Guard to remedy this. The Office of Standards Evaluation and Development (CG-523) is the regulation process owner and works with sister divisions such as those responsible for legal, program management, or technical support, any one of which could limit the overall Coast Guard capacity for regulation development and analysis. The Commandant increased staffing and funding for CG-523 (31 full-time equivalents (FTE) and $1 million added in December 2007, $2 million for contract support added in FY08); increased capacity in the FY09 budget for other critical staffs; and mandated a Flag Officer-led review to develop recommendations for improving the regulations development process. The results from the review may give insight as to how effective the increased staffing and support has been.

In the past, the Coast Guard could only manage about 20 regulations projects per year, based on staffing capacity. A ranking criterion was used to prioritize the regulations to be developed, but unless a regulation was mandated by Congress, DHS, or the Commandant, it could not compete. Post-9/11, most of the regulations developed by the USCG were understandably maritime security-related, resulting in the continual deferral of important but not necessarily urgent regulation packages, such as boating safety and outer continental shelf activities. The USCG should find a way to balance the development of both maritime security and marine safety regulations.

Recommendation (REG-1): We recommend that the Prevention program seek agreement with the Regulations division to develop a separate priority list for Prevention program regulations. The result would be that Prevention regulations could be viewed independently of security and other regulations, and their statuses tracked more effectively. Performance measures, such as the completed percentage of an individual regulation, and cycle time, could be tracked and appropriate resources sought to more efficiently or effectively address Prevention regulations. Such an approach would reflect the important contributions of regulations development to the Prevention Program outcomes.

Both Coast Guard personnel and prevention stakeholders stated that regulation implementation would contribute to positive prevention outcomes—fewer casualties and environmental impacts. While proper economic, legal, and environmental analyses are necessary, transparency in the process is also necessary during the entire regulation development process so that stakeholders can make informed decisions in light of expected changes in the regulations.

[29] See *Outdated Regulations* section, below.

Recommendation (REG-2): USCG should institute transparency during metric development. Internally and externally, stakeholders should be able to understand and find timelines, delays, projections, and critical paths for regulation development.

New Regulations

In general, the interviewees raised concerns about developing and implementing new regulations in three areas:

- New towing regulations developed under recent authority granted to the Coast Guard.
- Boating Safety regulations. This is a collaborative effort with the National Boating Safety Advisory Council and USCG. These have been under development for 10 years, even though they are recommended and strongly endorsed by the Council.
- Sub-chapter N regulations (Outer Continental Shelf Activities) that would impact the offshore petroleum industry. These have been under development for over ten years.

Towing Regulations

Representatives from the Towing Safety Advisory Council (TSAC), the towing industry Federal Advisory Committee Act (FACA) advisory committee, expressed great appreciation for the opportunity to work with the USCG to improve safety within the towing industry while minimizing the impact on the towing industry. During the process of public comment, input, and advice on towing regulations, over 170 people directly participated in the process, and USCG regulations writers worked closely with industry to upgrade the current regulations. An American Waterways Operators (AWO) participant represented the views of thousands of AWO members. Representatives of the towing industry expressed support of the third party inspection/audit process, similar to the Alternate Compliance Program, where the classification societies are authorized to conduct vessel inspections and the USCG audits 10% of the inspections conducted for quality control. Several members of the towing industry support the development of towing regulations, but believe that the implementation must be phased in over 1-2 years, because many of the vessels to be inspected are decades old, have never undergone a previous inspection, and would likely need some time and expense before they would be in full compliance with regulations. The concern, in particular, is that the level of standards that the USCG will apply will require significant and immediate repairs to these older vessels. A phase-in approach would lessen the economic impact to the newly-regulated industry.

The towing industry supports the Safety Management Systems (SMS), which represents an attempt to address the human element of vessel operation, for which 80% of marine casualties are linked, directly or indirectly.[30] Many of the industry's companies have initiated safety improvements, and are looking forward to the establishment of the Towing Center of Expertise in Paducah, KY, and to continued interaction with the Seaman's Church Institute (also in Paducah), where many of their workers receive training.

Recommendation (REG-3): USCG provide to stakeholders transparency into towing regulation development, allowing the towing industry to gauge its readiness for compliance with the new

[30] See http://uscg.mil/pvs/docs/ISM/SMSGuide.doc.

regulations, and to prepare for the same. This will help spread the economic impact of new regulations to the towing industry over a longer time period. It will also give partners that might be asked to help implement policies (such as classification societies) time to develop the expertise and human resources to participate in inspections.

Recommendation (REG-4): Coast Guard, in consultation with TSAC, should continue to work assertively towards implementation of new towing regulations within the next two years.

Boating Safety Regulations

The USCG has failed over the past ten years to develop and implement boating safety regulations in a timely manner even though the National Boating Safety Advisory Council (NBSAC) has provided recommendations for boating safety regulations that they believe will save lives and reduce injuries in the recreational boating community. The greatest number of deaths and injuries on the waterways is in the recreational boating sector. NBSAC members include several interest groups[31] each with decades of recreational experience on the nation's waterways. The USCG requests input from these recreational boating groups (as per FACA rules) and may include their recommendations in final regulations, yet the regulations have not been developed, adopted, or implemented. The recreational boating industry expressed appreciation of the Coast Guard's willingness to involve them in the regulation development process, but does not understand the Coast Guard's inability to develop new regulations within a reasonable timeframe.

Recommendation (REG-5): USCG should provide to stakeholders transparency into boating safety regulation development. This would permit manufacturers to prepare for changes in mandates; allow federal, state, and local governments to coordinate regulations; allow for boating stakeholders to share information on regulations; and permit the individual boater population to adapt to new or modified requirements.

Recommendation (REG-6): USCG should move assertively to implement boating safety regulations in consultation with NBSAC over the next 2-3 years.

33 CFR Sub-chapter N: Outer Continental Shelf Activities

The Coast Guard has not developed and implemented Sub-chapter N regulations (Outer Continental Shelf Activities), which have been in the Coast Guard process for ten years, even though over this time period the USCG has collaborated with the National Offshore Safety Advisory Council (NOSAC) to develop the regulations. Interviewed industry representatives view these regulations as necessary to establish a level playing field with those companies believed by some industry representatives to be operating in an unsafe manner, and to improve general safety for offshore activities. The public comment period for the regulation process has been completed for several years and industry is concerned that the Coast Guard may implement

[31] As per 46 USC 13110, NBSAC membership "shall consist of 21 members appointed by the Secretary, whom the Secretary considers to have a particular expertise, knowledge, and experience in recreational boating safety. (b)(1) The membership of the Council shall consist of (A) 7 representatives of State officials responsible for State boating safety programs; (B) 7 representatives of recreational vessel manufacturers and associated equipment manufacturers; and (C) 7 representatives of national recreational boating organizations and from the general public, at least 5 of whom shall be representatives of national recreational boating organizations."

rules based on outdated input. Advances in technology and operating procedures, vessels and platforms exploring for oil at much greater depths and distances offshore, development of larger vessels, and changing industry standards have all altered the regulatory situation in the past ten years.

For example, when the regulations were initially considered for the medical evacuation from offshore drilling platforms, helicopters could fly from shore to the rigs and transfer personnel directly to nearby hospitals. Today, drilling platforms such as the Tension Leg Platforms and Mobile Offshore Drilling Units (MODUs) operate so far offshore that a helicopter is unable to make the round trip without refueling. Regulations need to reflect new realities such as this.

Industry desires transparency of the process, an opportunity for industry to ensure that proposed regulations account for industry advances, and that regulations be developed and implemented in a timely manner by the Coast Guard.

Recommendation (REG-7): USCG should re-engage NOSAC to ensure proposed Sub-chapter N regulations are current (that is, not obsolete or overtaken by events, technology, or operational procedures of the past decade) and implement these regulations within the next 2-3 years.

Outdated Regulations

Industry members found that outdated USCG regulations may be contributing to lower levels of safety because they do not provide for advances in technology, industry standard safety measures, and procedures, or that they require obsolete equipment to be maintained. One industry member stated that "Coast Guard regulations need to be updated. [The United States] used to be a leader; now we are a follower." Examples of outdated regulations cited by interviewees include:[32]

- A 40-year-old USCG requirement designates the use of brass for firefighting nozzles, which weighs four times as much as anodized aluminum—both the American Bureau of Shipping and the U.S. Navy approve of and use anodized aluminum.[33]
- USCG requires bells on tugboats and daily radio logs for harbor, but tugboats no longer use bells.
- Since 1996, the threshold for damage requiring an investigation has been $25,000. In today's shipping marketing, $25,000 is a very low threshold. Industry believes that it should be raised to a higher figure based on current and future inflation of repair costs.[34]
- Vessel sizes have increased over the years, but the existing laws regarding tonnage limits for oil spill response vessels (OSRV) have not kept up. For example, a recent dual-use offshore supply vessel (OSV) and oil spill response vessel (OSRV) designed to operate

[32] We recognize that this list, collected from individual interviewees, is by no means exhaustive or even represents the best examples. Nonetheless, we note that one O-4 USCG inspector stated that two-thirds of equipment regulations are outdated, and many others agreed in principle with this finding.

[33] From http://www.uscg.mil/hq/cg5/cg5214/fesys.asp: 46 CFR 162.027 specifies compliance of nozzles with ASTM Standard F1546, "Standard Specification for Fire Hose Nozzles." Due to the extensive testing requirements of ASTM F1546, the Coast Guard will approve brass or bronze nozzles that meet the performance criteria of NFPA 1964.

[34] See 46 CFR 4.06, or relevant summary at http://www.uscg.mil/d13/sectportland/io_report.asp.

Industry comments:

"In the past investigating officers had a lot more experience."

"CG is putting really good people in an unfair position—no training, no culture change (especially those going directly from law enforcement to marine safety)."

"A big laundry list of safety items was identified by CG but the vessel was allowed to sail. The port state entity would have detained the vessel for four of these items."

"Wide range of experience, some are very good and experienced, some less experienced."

"We had a hydrocarbon release, two people in the hospital and hydrocarbon alarms went off. CG report said no hydrocarbon release occurred—foreign Captain took inexperienced CG inspectors down a path."

"I'm very impressed with the caliber of CG people but they aren't seasoned and experienced."

"They (CG) don't have enough experience and lack confidence. Often there is a lack of trust due to inspectors not knowing what is industry accepted practice and what may be wrong and require action."

off the coast of Alaska to assist with oil exploration and spill response was built with an ice hull to ensure that it could operate safely in Alaskan waters. Because the overall the vessel exceeded the tonnage limit cited in the law, the vessel was rejected as an OSRV by the Coast Guard. While this may be a congressional issue, it could be a candidate for a legislative change proposal. Ironically, if there is a spill, there is no doubt that this vessel would be sought and used as a response vessel.

Recommendation (REG-8): USCG, with opportunities for comments from the maritime industry and all other stakeholders, should develop a process to systematically review and update regulations. The process should include consideration of current standards used by other respected maritime organizations such as classification societies, U.S. Navy, International Maritime Organization (IMO), responsible international associations, and USCG-approved safety management systems, and should include acceptable safety measures not specifically stated in the regulations. Performance in this activity could be measured by tracking the number of regulation issues received (input measure) and adjudicated (output measure), and the cycle time (efficiency measure).

Recommendation (REG-9): USCG should evaluate the $25,000 damage threshold for initiating marine casualty investigations and consider raising it to an appropriate level based on inflation and the risk of casualty or spill if corrective action is not taken. Many of the perceived 'outdated regulations' are minor irritations to industry, yet collectively have an economic cost. The damage threshold has an ongoing cost during the vessel operation life cycle.

Compliance Verification and Enforcement

Compliance verification and enforcement requires professional personnel in sufficient numbers (capacity) and with the necessary skill sets (competencies) to work with the various maritime industries, port partners (local ports, states, and federal agencies) and international partners (International Maritime Organization, international shipping associations) to ensure compliance with USCG regulations. The Coast Guard's capacity and competencies to carry out its prevention mission are discussed below.

Coast Guard comments:

"Concur with comment that experience is one entire rank less than in the past. Pre-Sectors the Chief of Inspection was an O-5 with two O-4s, now the Chief of Inspection is an O-4 with an O-3 Branch Chief. My Branch Chiefs are all first tour prevention personnel."

"Personnel Command sent me an I.O. with no experience. She can't get to Investigating Officer school because she doesn't have the required pre-requisites."

"HQ Program Manager experience has dipped significantly; sometimes there is more experience at the field level."

"…It may take another COSCO BUSAN…Our people didn't ask the right questions and the spill was much worse than expected." (Note: One of the findings of the COSCO BUSAN investigation was that 3 CG designated Casualty Investigators were not technically qualified)

"You want to be really good at your job but you don't have as many opportunities to learn. I don't feel real competent. The attitude is almost "I hope it doesn't happen on my watch – you just want to hand it off to the next inspector. I would be a much better leader if I really knew my job well." (Junior Officer)

"The J.O. shuffle. I was assigned as an inspector but the unit put me into planning. I would like to be able to focus on learning my quals. My sole determining factor for my next billet is not standing CDO duty." (Junior Officer)

Competencies

Coast Guard inspectors and investigating officers need the professional skills in maritime safety competencies to examine waterfront facilities, tank farms, cruise ships, LNG tankers, container ships, tugs and barges, yachts, mobile offshore drilling units, and many other types of watercraft. There have been concerns that the Coast Guard's emphasis on maritime security since the 9/11 terrorist attacks has resulted in a loss of competency in the marine safety field. We found that USCG personnel ranging from Flag Officers to Sector Commanders, prevention personnel, and junior officers believe that Coast Guard marine safety experience has decreased significantly since 9/11/2001. One senior officer stated that the experience level of current prevention professionals is, on average, one entire rank less than before Sectors were formed and many of the Coast Guard interviewees agreed with that assessment.

Our interviews with industry representatives yielded a range of responses from interviewees—some stated that their high regard and appreciation for the professionalism and competency of Coast Guard prevention professionals, but the majority voiced concerns about a declining level of expertise among Coast Guard inspectors and investigating officers. Industry holds in high regard the vast majority of civilian inspectors serving the Coast Guard and would like to see more civilians in these positions.

We identified several reasons for the perceived decline in Coast Guard expertise, including the elimination of training ports in the mid-1990s; the loss of billets during CG streamlining efforts in 1995; the contraction of the U.S. Flag merchant fleet that has resulted in fewer ships to inspect (and thus fewer opportunities to gain experience); the Alternate Compliance Program (ACP), where classification societies (such as the American Bureau of Shipping (ABS), Lloyd's Register, and Det Norske Veritas (DNV)) perform inspections on behalf of the Coast Guard (with 10% of the inspections audited by USCG) resulting in fewer Coast Guard inspection opportunities; and the transition from Marine Safety Offices in each port to Sector offices ("Sectorization"), which combined group operations and marine safety functions. Ironically, as mentioned above, even the successful reduction of oil spills across the nation has

Coast Guard comments:

"No one is a master at one primary duty anymore, but now you are expected to be a jack-of-all-trades, master-of-all-trades. Because of the burden of collateral duties, it's all the J.O.s can do to get out in the field with the experienced enlisted members." (Warrant Officer)

"Two officers just arrived for two-and-a-half year tours…we need continuity…four years gives officers a chance to cement their quals…LTs no longer have marine inspector experience. Our competency level is down."

"Juniority is a real problem…but I want my junior officers to get a well-rounded background of sectors so I get them to qualify as CDOs." (Sector Commander)

"Our people have a strong commitment to professionalism and serving the maritime public; however the average knowledge base of the prevention workforce is less than we would like."

"There are a lot of new and novel designs as well as new technology and operational concepts that require excellent technical skills and knowledge of the operating environment for these new types of vessels."

"New equipment has introduced new risks."

"After the investigation of the COSCO BUSAN incident, policy came out that all Investigating Officers were to be qualified. They aren't, at many ports across the country."

contributed to eroded skill sets, as Coast Guard personnel in most parts of the country do not have as many opportunities as their predecessors for hands-on experience in investigating and responding to medium or large oil spills.

The Coast Guard greatly expanded its maritime security role after the 9/11 attacks. The creation of Sectors was designed to integrate Coast Guard operations in each port, to include the marine safety and port security operations (formerly conducted by the Marine Safety Offices) with law enforcement, aids to navigation, and search and rescue operations performed by the Group Offices. As the Sector offices stood up, they expanded staff to integrate these functions and, additionally, staff for a command center (requiring Command Duty Officers and watchstanders), a Contingency Planning Section, Logistics staff, and others. Traditionally, Group Offices and their Search and Rescue Stations had been staffed with a small number of junior officers and a majority of enlisted personnel. The Marine Safety Offices had most of the junior officers in a port, many of whom were in training or were already qualified to be marine inspectors and casualty investigating officers. As the Sector offices stood up, many of the prior junior officer positions and their incumbents were used by the Sector Commanders to fill organizational holes in the command center, contingency planning, logistics, and other roles. As a result, several officers were pulled from training or duty as marine inspectors and investigating officers to fill other critical duties. The creation of Sectors as a "resource neutral" initiative appears to have negatively impacted the Coast Guard inspection and investigation competencies due to the immense workload that was thrust upon the Sector Commanders and their staffs without additional personnel.

In the years following the 9/11 attacks, the Coast Guard was successful in obtaining additional billets, primarily for maritime security functions—Maritime Safety and Security Teams (MSST) at several ports, Deployable Operations Group (DOG), and the new Maritime Security Response Team (MSRT), as well as many liaison positions with DHS and other agencies. A large portion of these billets were at the O-3 and O-4 levels without a corresponding increase in the number of O-1/O-2 billets, which are needed to "grow" O-3/O-4s. With a few

exceptions (Direct Commissioned Officers in certain specialties), the Coast Guard cannot just "create" Lieutenants and Lieutenant Commanders with 4-12 years experience; it must grow them by promoting O-1s and O-2s through the military system. As Congress authorized additional Coast Guard personnel at the O-3 and O-4 levels, the Coast Guard filled these positions by promoting qualified O-2s to fill the newly created vacant positions in addition to the normal promotion process. An apparent unintended consequence appears to be the reduction of the "promotion point" for O-4, which had historically been nine to 11 years. Currently, the Coast Guard personnel system, which had traditionally been pyramid-shaped as the lower ranks competed for promotion (based on the "best qualified"), is now arrow-shaped, as there are fewer LTJG (O-2) positions to feed the more available LT (O-3) positions. The result is that the assignment officers do not have the number of personnel needed with the necessary competencies and are "managing scarcity."

Coast Guard leadership has recognized the declining technical expertise of their marine inspectors and casualty investigators and has taken some positive steps to attempt to improve their experience base, including establishment of feeder ports as training grounds for first tour marine inspectors and the establishment of Centers of Expertise for technical training for complex marine industries. The seven National Centers of Expertise include: Cruise Ships, Liquefied Gas Carriers, Outer Continental Shelf, Towing Vessels, Vintage Vessels, Suspension and Revocation, and Investigations. They have also been successful in acquiring over 100 civilian inspector billets, which will be used at feeder ports, centers of expertise, and additional ports for training and to provide expert marine inspection and casualty investigation services to the maritime public. Industry representatives have strongly supported the Coast Guard decision to add civilian inspectors, and also supports adding additional civilians. Discussions with USCG workforce management personnel indicate that approximately 90% of this year's first tour prevention officers due for transfer will be slated for second prevention tours to help cement their development as prevention professionals.

In addition to inspectors and investigating officers, the Coast Guard has the Marine Safety Center (MSC), whose function is to perform plan reviews of new construction and modifications to vessels and equipment to ensure that their designs will result in vessels and watercraft that are safe to operate as and where intended. MSC naval architects, marine engineers, electrical engineers, and mechanical engineers must maintain and continually update their technical skill sets to stay abreast of the new and novel designs being developed by industry such as mobile platforms to drill for oil in deeper locations in the ocean and the Arctic environment, and the latest and largest cruise ship design, which has been described as essentially a small floating city.

The interested reader is also referred to the Capacity, Sector Organization and Workforce portions of this study for related issues and recommendations. Also, see the Coast Guard Marine Safety Performance Plan, which has addressed competencies (such as training, career paths, COEs, and workload).[35]

Recommendation (CMP-1): USCG should assess and forecast the number of civilian Coast Guard prevention personnel needed in the future to provide continuity, training, skills,

[35] See http://www.uscg.mil/MarineSafetyProgram and specifically http://www.uscg.mil/announcements/alcoast/alcoast_10908.txt.

"Shipping has grown by 60% in recent years, but Prevention billets have only grown by 9%." (Flag Officer)

"Now everything has to be perfect, but 'perfect is the enemy of the good.' Nobody is looking at the personnel hours required."

"The Coast Guard takes on more and more things. We won't stop doing things and often cover for other agencies. We volunteer to do additional things."

"Everything is Priority #1. We are not allowed to not do something. We take too much on. We can't get ahead of 'firefighting.'"

"MEP is no longer MEP, its WMD, all-hazards, all-crises management response. To some extent we've sacrificed 95% of the workload preparing for the 1% rare events." (Chief)

"Since COSCO BUSAN the attitude is much more that 'We can't make a mistake.'"

"CG should consider not reinspecting recently inspected vessels or those that have an updated voluntary safety inspection decal. A friend of mine got stopped and inspected six times recently."

"CG is more risk averse as an organization."

knowledge, and local expertise for Coast Guard units. Prevention outcomes should be the primary consideration in determining the mix of civilian and uniformed Coast Guard personnel.

Capacity

There is a question of whether the USCG has enough personnel to adequately perform its prevention missions, particularly marine safety, the prevention portion of marine environmental protection, and boating safety. The Coast Guard was successful in getting over 300 additional inspectors, including over 100 civilian inspector billets in FY09 (although all have not been filled), which will help stand up the newly created feeder ports and centers of expertise. Despite this increase, the question remains, "How many marine inspectors and casualty investigators with what technical skill sets are needed?" This is a complex question, as inspectors have different combinations of a possible 17 technical qualifications based on their experience.

Furthermore, there are no "standards" or hierarchy of qualifications for a qualified inspector. Every port and Captain of the Port (COTP) zone has a different mix in both volume and types of marine industries requiring USCG oversight. The maritime industry is a dynamic world where the various shipping industries, cruise ships, tankers, tugs and barges, freighters, container ships, and mobile offshore drilling units are constantly changing—some industries are growing, others shrinking; some are moving their business to new ports; and others are drilling for oil further offshore. In general, the global shipping industry has grown significantly in recent decades, as has the recreational boating community.

The Coast Guard is attempting to get a handle on all of the personnel requirements for its Sector Offices, including Response, Prevention, and Logistics Departments, based on the workloads for each Sector. HSI conducted two interviews with the CG-741 staff, which is performing a comprehensive Sector staffing study that should be helpful in establishing the number of marine inspectors and casualty investigators that the USCG needs to perform its prevention missions.

Recommendation (CMP-2): The USCG should consider a process to periodically update the Sector staffing study to ensure that the Coast Guard has sufficient personnel to carry out its missions.

Recommendation (CMP-3): The USCG should ensure that sufficient infrastructure exists to support new assignments. In some of the ports we visited, Coast Guard facilities were completely full and new facilities would be needed to accommodate additional personnel.

Workload Issues

The Coast Guard's responsibilities and workload has grown since 9/11 with the additional emphasis on maritime security, the sharp rise in global maritime shipping, and the increased numbers of recreational boaters. Both industry and USCG leadership acknowledge the growth in workload without a corresponding increase in personnel. It is perceived by industry and Coast Guard personnel that the expanded responsibilities have taken a toll and affected the Coast Guard's ability to perform. The increased potential consequences of a significant maritime security or environmental event have led many USCG leaders to believe that there is no room for error—that they have to do everything perfectly all the time. The results and consequences of the COSCO BUSAN oil spill investigation, which resulted in Coast Guardsmen being relieved of duty (while many observers believed the Coast Guard to have responded properly, given the resources available), served to further solidify that belief. As a result, Coast Guard personnel stated that they are being stretched further and further and working longer hours in hopes of avoiding mistakes. The downside of trying so hard to avoid mistakes is that leaders become risk averse—waiting for the last piece of information that will virtually guarantee that the right decision is being made. However, consequences—such as an economic cost imposed on a vessel due to a delay in decision-making by Coast Guard personnel—often result from not making timely decisions or from being overly conservative in the decision-making process.

As the Coast Guard is challenged to perform an increasing number of tasks without sufficient personnel, at some point a decision must be made as to what tasks to eliminate. Coast Guard leadership must establish the workload priorities or priorities will be developed locally. This may have both good and bad aspects. Local commanders, who are closer to the maritime activities, know the local stakeholders, industries, and environment in which they operate. However, adjacent Sector Commanders, without structured guidance, may have very different priorities, which can be very confusing to industries that operate in multiple ports (see the Consistency Section of this study). Coordination between and among Sectors could suffer, too.

The Coast Guard uses risk-based decision-making as a guideline for many of the choices that the organization makes. Deciding what work will be done or what will be eliminated due to personnel or platform constraints should be based on the risk-based decision-making philosophy as well. For example, in the Western Rivers,[36] USCG personnel often have to travel long distances to perform inspections or investigations. A large number of investigations are being performed when a tug and tow run "aground" on a sand bar or mud flat in the river. Tow companies are required to report the "grounding" and normally have to wait for a Coast Guard investigating officer to arrive, even if there is no damage. This is arguably a waste of both Coast Guard and industry resources. As a Western Rivers Coast Guard O-4 stated, no one is considering the "Consequence" factor of the Risk Equation (where Risk = Vulnerability * Probability * Consequence). In many parts of the rivers, such as around tight bends, running the lead barge

[36] The Western Rivers includes the tributaries of the Mississippi River, and generally much of the U.S. midwest.

aground and letting the current sweep the tug downstream until the next bend is standard industry operating procedure. A very significant proportion of the "groundings" recorded in the Coast Guard MISLE database are due to Western River tug and barge groundings, which result in no damage. If the Coast Guard were to shift the resources required to respond from these "no consequence" groundings to other mission tasks, it might alleviate some of the work overload that prevention personnel are experiencing. Equal consideration has to be given to industry underreporting or underestimating severity of incidents. Nonetheless, the grounding example was a recommendation of a 1995 Quality Action Team on Investigating Officers and their workload, but was never adopted.

Recommendation (CMP-4): Review the prevention workload and prioritize based on risk. Provide guidance on which tasks may be deemed lower priority and may be performed at less than 100% of standards if workforce capacity is not sufficient to accomplish the workload within reasonable work hours. This effort should be done in conjunction with the review of Coast Guard's training and expertise needs.[37] Just as importantly, this risk assessment has to be done in the context of all 11 Coast Guard missions.

Recommendation (CMP-5): Revisit the requirement to inspect tug and barge groundings in the Western Rivers on sand bars and mud flats if the master certifies that no damage affecting operations and safety has been sustained. The master should report the incident, but the Coast Guard should consider providing relief from interrupting the vessel's journey and forcing them to wait for a Coast Guard investigating officer to inspect damage which is non-existent or negligible. (Note: A similar recommendation was made in the 1995 *Investigating Officer Quality Action Team* study.)

Recommendation (CMP-6): Coast Guard Prevention leadership should provide input into senior Coast Guard and national risk discussions and models so that the high-probability risks associated with prevention issues are recognized and incorporated into national discussions and risk models on equal footing with security and low probability/high consequence issues, such as Weapons of Mass Destruction preparedness.

Workforce Issues

Discussions with USCG members identified several personnel system issues that have had a negative impact on both the capacity and competencies of the prevention workforce. HSI interviewed a wide range of people involved in the personnel system from suppliers such as prevention program managers (CG-54 Chiefs), operations capability staff (CG-741), the workforce projection staff (CG-12A), Personnel Service Center senior officers, and the prevention assignment officers, to their customers in the field, including District and Sector Commanders, their staffs, and their enlisted and officer personnel.

The pace of organizational change with the stand-up of Sectors post-9/11, reorganization of Headquarters, the upcoming elimination of AREAs and stand-up of OPCOM and FORCECOM, along with personnel plus-ups in the budget, make it very difficult to keep up with the new and

[37] It has been noted by a former USCG officer that a similar prioritization was done post-9/11, with the result being that the Pollution Investigator qualification was neglected.

future changes and fill billets appropriately, let alone when commands want additional changes made.

The following real-life example shows the challenges occurring within the personnel system and how the challenges build on each other to create a domino effect. Sector X has three O-3 investigating officer billets. The Chief of Prevention indicated that this was a good number based on workload within the port. However, due to a lack of capacity, the assignment officers don't have three qualified Lieutenant investigating officers. Due to a lack of competencies (qualifications) there aren't even qualified O-2s available, so the assignment officers provide one qualified O-3 and two Ensigns directly out of Officer Candidate School with no experience. The Prevention Chief wants to get the new Ensigns trained and qualified to comply with Coast Guard policy that all investigating officers will be technically qualified. When applying for the Investigating Officer course at Training Center Yorktown, the Ensigns are told that they cannot attend due to training policy that requires all students to have the appropriate prerequisites before attending courses. The Ensigns cannot be used as investigating officers (because they are not qualified and cannot receive training to become qualified), and therefore the command moves them into other billets where they can be used appropriately and/or earn their inspector qualifications to eventually obtain the pre-requisites to become eligible for investigating officer training.

The following is a reasonable expansion of the above actual situation based on interviews with various USCG personnel: the command may not notify the Personnel Service Center of the changes because the Commanding Officer knows that there are not any qualified O-2/O-3 investigating officers available in the system, as assignment officers are managing scarcity in the Prevention officer corps. This scenario is further complicated if the Sector Commander wants the junior officers to get a well-rounded Sector background by attending Search & Rescue (SAR) school and qualify as Command Duty Officers. At the end of a three-year tour, the newly promoted LTJGs may or may not have their inspection qualifications, and certainly do not have their investigating officer qualifications. The Personnel Service Center's assignment officers, unaware that the LTJGs were moved out of investigations and still do not have qualifications (DIRECT ACCESS, the CG personnel database, is only 70% accurate for qualifications), are expecting to send a qualified and experienced investigating officer to a follow-on investigations billet in another port. But the two officers will not be qualified investigators and the new Sector Commander will only be able to send them to Investigations school if they have at least qualified as inspectors. Due to pushback from the Sector Commander, the assignment officers, after speaking with the six Prevention program managers who are all competing for the few available qualified prevention personnel, may assign the LTJGs to staff positions. After three years in a staff job where their inspection skills have atrophied, one officer (now an O-3) does not see a clear career path and is frustrated by his lack of a "professional home" and limited technical skills and decides to leave the service. The other O-3 does not see a career in prevention and is assigned to a Sector logistics job. Both officers leave holes in the Prevention workforce that now must be filled, possibly by incoming ensigns, and the cycle continues.

It is hardly surprising that two highly respected and recently retired marine safety professional officers stated in the strongest terms that the highest priority for the Coast Guard is to fix the personnel system in order to improve its prevention competencies and capacity. As illustrated above, the Coast Guard personnel system is a very complex system of systems, so the question is:

where to start fixing the system? A systems approach to analyzing the workforce would recognize the need for the following components:[38]

- Standards for prevention personnel in order to determine the true prevention workload—what types of work, where, and how much
- The right training at the right career points: appropriate assignments to grow prevention professionals
- The proper tour lengths to optimize professional development
- A clear and stable career path
- An organizational workforce manager responsible and accountable for influencing and coordinating all the components to produce an effective and efficient prevention workforce.

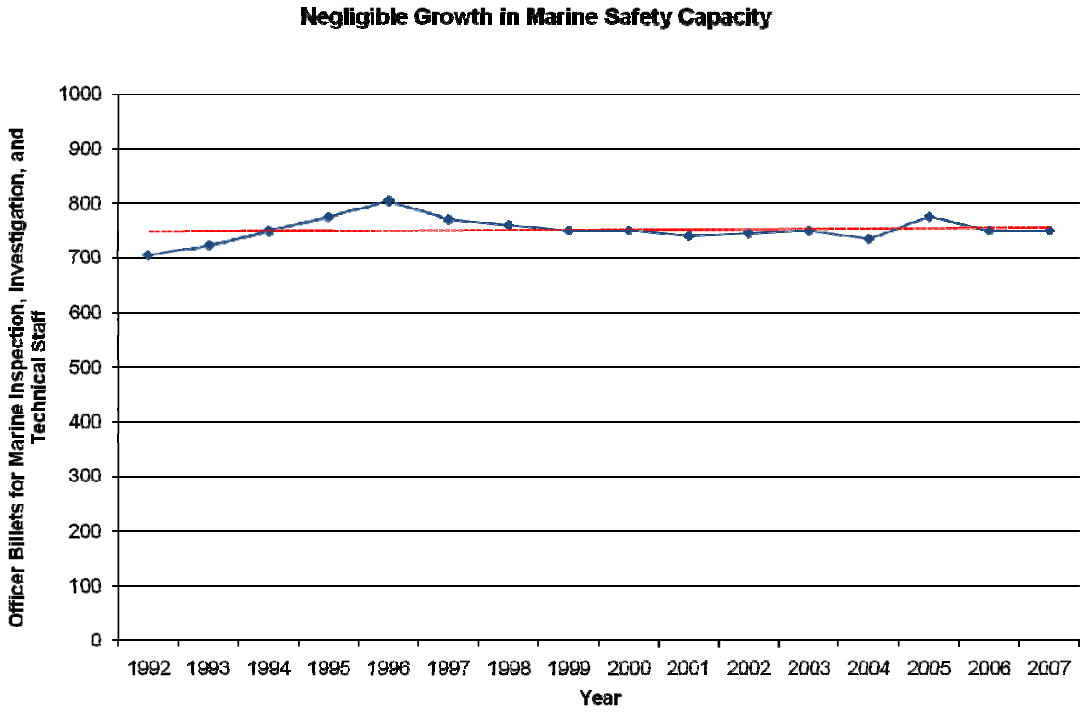

Figure 15: Growth in Marine Safety Capacity by Billets

Figure 15 points to the capacity issue in general. While the data suggest that there has been minimal growth in the number of available officer billets, interview evidence suggests that there are force management issues that limit the output and effectiveness of personnel. Firstly, many persons in a marine safety-coded billet are not dedicated 100% (and often far less) to marine safety roles or activities. Secondly, the existence of a billet does not indicate that the person filling it is sufficiently qualified to carry out duties relevant to that billet. Thirdly, the billet data show no indication of years or level of expertise. Following from these observations, the marine

[38] Part of the Coast Guard's recent attempt at a solution was to bring in experience through the hiring of civilians (possibly retired Coast Guard personnel). That has begun with 30 new billets.

safety capacity by billets also does not provide a clear indicator of prevention outputs and outcomes.

Recommendation (WRK-1): USCG should determine its marine safety and general prevention capacity by determining a standard measure of true capacity—combining quality of expertise, quantity of expertise, number of billets, billet fulfillment level, and available resources—and track this as an indicator of prevention outcomes.

Standards

Clearly specified requirements for a qualified marine inspector or investigating officer do not exist. The Prevention field has 17 sets of qualifications and officers and petty officers typically work to become qualified inspecting the types of vessels most common in their ports—for example, container vessels and cruise ships in Long Beach, tugs and barges and small passenger vessels in St. Louis, and tankers and fishing vessels in Valdez. Unlike aircraft and Coast Guard cutters with standard configuration management, every port is unique with its own set of maritime industries, geography, and operating environment. The minimum skills or combination of skills required to become a marine inspector are unclear and as a result there are no specific expectations of timeframes to become "qualified." Unless the Coast Guard member is motivated or the command motivates the member to qualify, there is no accountability either on the part of the member or the command if qualification does not occur during their tour. The system makes it more difficult for prevention staff to obtain qualifications than their MSO predecessors because current tours are now three years versus the prior four-year MSO assignments. Additionally, many Sectors require junior officers to qualify as Command Duty Officers even though they have other time-consuming collateral duties. The end result is that the unpredictable nature of actual work assignments makes it increasingly difficult for assignment officers to assume a certain level of personnel competency upon completion of prevention tours and it is more challenging to find appropriate follow-on tours for prevention members.

Without specific standards for inspectors or investigating officers it is very difficult to know how many prevention staff are needed to effectively perform the prevention missions within a particular Captain of the Port (COTP) zone (and, by extension, the Coast Guard). Questions such as "How long does a typical inspection of a certain type of vessel take?" or "Does the port location make a difference (for example, are the inspections seasonal and crowded into a few months)?" and "Is there significant travel involved getting to the vessels being inspected?" are currently not taken into consideration during personnel assignment. The Coast Guard's former MSIS data system captured reported (but not independently verified) staff hours for each task performed as well as travel and training hours. When the MISLE database replaced MSIS, the Coast Guard stopped recording individuals' personnel hours. Although MSIS data is widely viewed by Coast Guard interviewees as having been unreliable, the MISLE system does not permit the Coast Guard to measure or estimate its prevention workload. Regardless, a better approach, already addressed by the Coast Guard, but not widely implemented, is an assessment by a panel of experts to determine the "right" amount of time needed to use as a standard.[39]

[39] This concept was developed by the Coast Guard's "Enhancement Team", which brought in the panel of experts to address this problem.

"When I was stationed in Los Angeles, a marine inspector could inspect up to four ships a day, but up here in Alaska we might have to spend four days traveling to and from a vessel at a remote site to conduct a four-hour inspection."

"The Coast Guard is buying new response assets—boats, cutters and aircraft—to modernize and recapitalize its response capabilities. In order to modernize its prevention capabilities, the Coast Guard needs to invest in and recapitalize its prevention assets—the education, training, and professional development of its prevention people."

"Recency requirements mandate that members inspect vessels they are qualified to inspect within six months in order to maintain their quals. Unfortunately that doesn't work well here in Alaska because there is only a four-month maritime season here."

"At the O-2/3 levels we manage scarcity. There are not enough officers with the right skill sets to meet the needs of the field units… the first step to correct this situation is to fix the PAL (Personnel Allowance List) to accurately represent what the billet requirements are at all the Sectors. Then capacity, training, and professional development issues can be addressed."

The "Response" portion of the Coast Guard database typically uses the monthly Abstract of Operations to measure boat, cutter, and aircraft mission hours. Response personnel requirements can then be calculated using the crew and maintenance/logistics team size for each type of asset. However, the "assets" of the Prevention program are its technical experts, the people performing inspections and casualty investigations. Without knowing the average time to perform specific prevention tasks in different ports, it is nearly impossible to determine the number of personnel needed to carry out the mission.

Training, qualification, and performance standards are effective and are needed to set expectations of personnel, field commands, and the personnel system, but the system should be flexible enough to allow exceptions where appropriate. For example, there is a "recency" requirement that inspectors must have inspected recently a vessel of the type they are qualified for to keep their qualifications current. This requirement works in 95% of the country, but in Alaska the vessels only operate for four months and thus no Alaskan USCG inspector would be "current" on their qualifications if the requirement were strictly applied.

There also appears to be confusion over who would set the prevention standards if the Coast Guard decides to quantify its work force capacity. Would the prevention program managers (of five competing managers), CG-5, CG-741, or the new FORCECOM be responsible for setting standards when it stands up?

Recommendation (WRK-2): Develop realistic expected timeframes for prevention members to achieve their qualifications. Set expectations for individuals and commands and hold the system accountable to ensure that prevention personnel achieve their qualifications within a reasonable timeframe.

Recommendation (WRK-3): Develop realistic capability standards for inspectors and investigators of various maritime industry vessels and facilities. Determine how many activities they can reasonably be expected to perform annually within a given port, allowing for "overhead functions" such as all-hands events, required non-operational training, and other non-prevention activities. (Note: The Sector Staffing study has some excellent data that could be leveraged to help accomplish this recommendation.)

Recommendation (WRK-4): Build in flexibility, where appropriate, from standard practices. Take into consideration the location of the ports and the length of the maritime season.

"My biggest challenge is training- nearly all of my officers, including branch chiefs, are first-tour prevention officers. These officers don't have enough senior inspectors/casualty investigators mentors to learn from."

"We have a pretty robust training program here but going from four-year to three-year prevention billets really hurts the effectiveness of the training program."

"We need training—it frequently was taking too long to meet quotas (12-18 months). We only have three-year tours!"

"We experienced a huge backlog for Port State Control Officer training (the vast majority of our vessels are foreign flag) and developed our own two-week course to get our people trained. CG needs to develop/allow local alternatives to formal training when it is not reasonably available."

"We had a very difficult time competing for cruise ship schools—tough to get junior people into classes. Prerequisites prevent good people from getting the training they need."

"Where is the pipeline training? No standard training, not producing the right results—no overriding doctrine for prevention. As a result everybody is doing something different."

Recommendation (WRK-5): Develop and employ a Prevention-wide time tracking tool. Although we understand that selected ports use a time tracking tool called "snapshot," we have not had the opportunity to assess it; we recommend that it be considered to address this recommendation.

Identify Personnel Requirements Based on Workload

To determine the number of Prevention personnel needed to effectively perform the mission, the Coast Guard needs to proactively understand its workload and manage its workforce. Understanding the workload means knowing the type of work required (such as commercial fishing vessel casualty investigations, tanker spill investigations, boating safety accidents, or cruise ship inspections), the locations where this work is conducted, and the volume of work at each location.

The current Personnel Allowance List (PAL) does not accurately reflect the level, types, and quantities of prevention people needed across UCSG bases. In the Ninth District (Great Lakes), for example, there are no investigating officer billets in the entire district. Inaccuracies of the PAL have consequences that often result in Sector Commanders moving junior officers as needed to "plug holes" to successfully accomplish the Sector's missions. Ongoing modifications at the field unit level without making correlating changes in the Coast Guard Headquarters-based PAL database have also contributed to the inaccuracies found in the PAL.

The USCG is undertaking a Sector staffing study that will allow it to accurately determine the workload of the Sectors and determine the gap between its workload requirements and its current workforce capacity. HSI interviewed three members of the CG-741 Sector staffing study team and reviewed the comprehensive approach being used to determine the Response, Prevention, and Logistics workloads at the Sectors. HSI had two unanswered questions from the interviews:

1. How can the team anticipate workload changes when future implementation of towing regulations, growth of the international shipping community, and changes in the recreational boating population may change the workload needs?

2. Can the methodology be easily repeated in the future by different USCG personnel to monitor changes in the workload that may impact the size and makeup of the Coast Guard workforce?

This latter question is of particular interest as all three team members interviewed are due for transfer this summer.

Recommendation (WRK-6): Leverage the Sector staffing methodology and continue to monitor the USCG's workload and workforce capabilities to close workload gaps. Develop a predictive tool for "What if?" scenarios that will assist in determining in advance the workload implications of new or revised regulations, trends in maritime industry, new technologies, and changes in staffing levels.

Recommendation (WRK-7): Fix the Personal Allowance List to accurately reflect the *de facto* levels, types, quantities, and locations of Prevention people needed across the Coast Guard. Determine who "owns" positions, the Sector or Program. Identify, in a not-for-attribution manner, when the junior officers have been assigned collateral duties or given assignments to a Command Center instead of prevention positions. Individual "ideal" PALs, determined by each Sector, could be collected and compared to the Headquarters version. The comparison of these data will assist in determining the real world staffing situation.

Training

Training, education, and experience are fundamental to professional development. Prevention training is accomplished in three primary ways:

1. In the field or on the job with senior experienced inspectors and casualty investigators.

2. In Coast Guard Prevention-specific courses such as inspection and casualty investigations at Training Center Yorktown.

3. Through additional training programs such as NTSB Investigations courses, EPA HAZMAT courses, and industry training.

Three hundred additional inspectors have been added in the FY09 budgets. USCG must ensure that the training infrastructure exists to accommodate the surge of additional trainees. Training infrastructure includes qualified instructors and equipment, developed courses, classroom space, and other required facilities. Since new construction may take five years to complete, USCG may find partnering with other marine inspection and investigation specialists as a way to leverage their training, have the infrastructure available, and save construction dollars. Partnering may be a stopgap for "surge training" to accommodate 300 new trainees and help get through a backlog of training requests. A steady-state training flow sustained by the existing infrastructure could resume once the surge is over. Possible partners for training Coast Guard inspectors and investigators could include the American Bureau of Shipping (ABS) and the National Transportation Safety Board (NTSB).

"Quals process was a bit rushed—I don't feel that competent. If I get transferred to an inspection shop, I'm a little scared [that] I will be expected to be competent because I earned my qual, but I haven't had a chance to practice it. Unless you do it every day it's hard to be competent. Does the CG just want us to be exposed to everything and manage senior petty officers and warrant officers as experts, or for us to become experts/ professionals? As soon as you get qualified, you stop doing that job and get shuffled to do something else. I only got to do two inspections by myself before I was reassigned."(Junior Officer)

"I was reassigned to Waterway Div. the week after getting qualified and did not get to do any inspections by myself. We are ticket-punching but not proficient. I'm concerned that the assignment officer will assume I have inspection experience—I don't." (Junior Officer)

"Prevention has no master training list like the boat operators have. No expectation for certain quals within a certain timeframe. There is nothing in TMT that does that like they do for small boat stations."

"XO went through industry training and got no guidance from HQ. Standardization/guidance needed from HQ on where to focus efforts during industry training."

USCG field personnel confirmed that formal Coast Guard training courses at Training Center Yorktown are not available in the quantities or timeframes needed by the field. As a short-term solution to the problem, ports have developed short courses to ensure that their staff has at least the basic training needed to perform their jobs.

To maximize the organizational benefits of a training program, training must be available at the time it is needed. Members assigned to three-year prevention tours need to have inspector or investigating officer training available before the beginning of a new assignment, or have it provided within the first six months of their assignment. The Coast Guard may need to consider additional billets as training tabs (that is, dedicated training billets) if pipeline training prior to three-year assignments is chosen as an option by Coast Guard leadership. Members on four-year assignments should have the formal training they need within the first year of their tour to ensure that they can benefit from the training for at least 75% of their assignment.

Following from the COSCO BUSAN investigation, Coast Guard Headquarters implemented a policy that all investigating officers had to be formally qualified as investigating officers. The policy was implemented because three CG investigators involved in the incident were designated as investigators but were not formally qualified. To comply with the policy, the training program developed formal prerequisites for the investigating officer course. The challenge, as illustrated in the Workforce section, is that there are an insufficient number of qualified inspectors to fill all investigator billets (which are populated by well-qualified inspectors). Therefore, the training policy designed to support the Commandant's policy for qualifying investigating officers is unsustainable and does not close the gap. The training "solution" was based on the premise of a "right-sized" pyramid-shaped workforce but there are not enough O-2 billets to feed all the existing and new O-3 prevention billets, making the workforce arrowhead-shaped with fewer O-2 than O-3 billets. This is a situation where the ideal policy is the rival of what is practically needed to be successful. A phased approach, waiving full inspector requirements for members who have earned at least some qualifications, may be necessary until the personnel system catches up with the requirements and stops sending inexperienced and unqualified officers to fill investigating

officer billets. We note that a Coast Guard representative has stated that all Investigating Officer billets have recently been reprogrammed to O-3 billets.

Before Sectors were created, Marine Safety Offices had AFC30T training funds available for professional development and to train marine safety personnel. Once Sectors were created, the AFC30T funds were managed by the Sector and were used to meet Sector-wide requirements—most notably the maritime security requirements—and causing a reduction of funds available for technical training of the prevention staff. Funding should be provided and protected to ensure the professional development of the prevention workforce.

An O-4 billet was scheduled to be implemented at Headquarters in the program manager office. The purpose of this billet was for training oversight and quality assurance and included such activities as developing and approving standards for training consistency at the training ports, liaison with marine inspections, and investigating officer courses at Training Center Yorktown and through NMC correspondence courses. The O-4 billet was never implemented, and as a result inconsistencies developed across the training community. As a means to address training inconsistencies, Headquarters has scheduled twice-yearly meetings for the GS-13 feeder port trainers to compare notes and ensure some level of consistency in those now widely-available roles.

Recommendation (TRG-1): Ensure that training infrastructure is sufficient to accommodate current and anticipated prevention training requirements as well as anticipated Resource Proposals, in order to correctly size the Prevention workforce. Engage the training community to seek additional instructors and/or the civil engineering community to seek additional or renovated facilities for training use.

Recommendation (TRG-2): Explore partnering with other organizations to provide “surge training” to meet training requirements until USCG training capacity can match and sustain the demand. Potential partners include the American Bureau of Shipping (inspectors) and the National Transportation Safety Board (investigators).

Recommendation (TRG-3): Establish training and qualification standards for prevention personnel and create a training budget at headquarters and field levels to provide prevention personnel with the training that they need to be proficient and become journeymen prevention professionals. Protect funding for required prevention training to avoid using Prevention funding for other requirements at the Unit/Sector/District levels. Develop a plan to implement the training necessary to achieve the goals stated in the Marine Safety Performance Plan.

Recommendation (TRG-4): Develop a response policy or plan that permits rapid Temporary Duty assignment of Coast Guard personnel to Areas/Sectors when needed for surge or technical inspection needs. Explore whether USCG Forces Readiness Command (FORCECOM) can address this.

Recommendation (TRG-5): Establish and fill an O-5 billet, and possibly related staff positions, in FORCECOM that will be responsible and accountable for Coast Guard-wide prevention training standards, consistency, and quality control for Coast Guard training, National Maritime Center-approved correspondence courses, alternate training programs, industry training, and training consistency at the new feeder ports and centers of expertise. Use this billet to help resolve inconsistencies in the prevention training community.

Assignments:

"Prevention personnel need at least two tours back to back—at least six years. Put them in the right staff job (prevention) afterwards. They need to know enough to interpret."

Tour Lengths:

"Turnover of Coasties is a challenge. Longer tour lengths would be beneficial."

"Four years would be better than three for continuity, relationships, and competency development."

"*The consistency gained by four-year tours would be very helpful—you learn by doing it."*

"Generally speaking, longer tours of duty for those who interface with industry would be beneficial."

"Three-year assignments are not long enough. Train, learn, do. Any first tour J.O. should have a four-year assignment."

"It's exhausting to try and keep bringing these committed officers up to speed before they transfer. It's a detriment to the mission." (Warrant Officer)

Recommendation (TRG-6): Maximize technology to provide informal resources (for example, via Wiki), including immediate consultation capability with experienced personnel (for example, via Twitter or Job Help Desk). Again, initially this could be staffed by civilians to help the Coast Guard overcome its training/experience deficit. If wireless access is an issue in the field, then consideration could be made of indexing the hundreds of thousands of pictures taken of various conditions or equipment configurations. The pictures could be uploaded when computer access is available so that they are readily available during inspections and investigations.

Assignments

Interviews with Coast Guard personnel indicate the importance of solidifying professional knowledge in technical fields to ensure that expertise is retained by prevention professionals. It has been strongly recommended that back-to-back inspection and investigation tours in two different ports, with the second tour being a four-year assignment, may be the best way to effectively grow Prevention professionals. Two years ago only 33% of LTJGs assigned to Prevention billets undertook a second Prevention tour; many LTJGs were assigned to staff positions. These LTJGs were not achieving proficiency in their technical prevention skills during their first assignment (see Competencies section), and as a result their inspection and other prevention skills diminished. In 2009, assignment officers are trying to send 90% of the prevention LTJGs to a second prevention tour to solidify their technical skills in inspections and investigations.

The USCG Workforce Projection staff (CG-12A) has developed a model for workforce growth, experience, and flow to analyze options for tour lengths and assignments to provide qualified inspectors and investigators at the O-3 and O-4 levels of the organization. In the past, a CG-12A staff member served as a liaison to the Personnel Service Center to better integrate workforce projection efforts and keep up with the latest personnel policies and data. One of the model's assumptions was that only 33% of the Prevention LTJG's went to back-to-back Prevention tours (this is two-year-old data) when as mentioned above, in 2009 the back-to-back assignment rate for O-2s will be on the order of 90%, which will likely have a significant impact on the model's results.

Recommendation (WRK-7): Once the sector study is completed**,** adjust the Workforce Projection model for the workforce required to perform the Prevention mission, and conduct an analysis for workforce management and prioritization of work to be accomplished or deferred.

We note that CG-12A is undertaking a rigorous analysis of options to effectively grow the Prevention workforce. The Workforce Projection model has two cautions that should be noted: 1) the model is based on the existing PAL, which is known to be out of date, yet is currently in use across the Coast Guard; and 2) the model's assumptions should continually be validated with other key organizational offices, including the Personnel Service Center and their assignment officers, the Sector Staffing Study team (CG-741), and Prevention program managers.

"During Officer Candidate School training maybe only one day was devoted to Prevention programs, all the focus was on white hulls."

"We are seeing O-4s get out at about ten years, which is great for us because we hire them and they have more experience than CG active duty prevention personnel." (Industry representative)

"With Sectorization, junior officers run the risk of being more of a ticket-puncher than getting the right competencies. People in marine safety/Prevention are finding it difficult to compete with other CG specialties for promotion and choice assignments (Sector Commands and others). I just don't see the career path."

"I'm locked into MEP Response and now I need to get into boat forces." (Frustration; not why she joined CG or envisioned her career, wanted to be a marine safety professional).

"Capitalization for the marine safety program is its people, it's a decrepit infrastructure."

Many officers stated "If we go into fishing safety as a career, it's a dead end."

Tour Lengths

Marine inspection and casualty investigation are highly technical fields with 17 different technical qualification disciplines. It requires time to develop highly professional and competent personnel to perform these very technical functions. Historically, marine safety officers had four-year assignments and typically would have back-to-back marine safety tours to become journeymen marine inspectors and casualty investigators. Group officer assignments were normally for three years. As Sectors were stood up, the Coast Guard standardized the prevention officer tour length at Sectors at three years, while several of the prevention enlisted tours remained as four-year assignments. This may be in part due to the decrease of the O-4 promotion point and the desire to ensure that all officers being considered for promotion to Lieutenant Commander had completed three tours of duty—normally a two-year ship/shore assignment, followed by two three-year tours. The rationale behind four-year marine safety assignments was to allow junior officers the time to learn technical skills, become qualified and gain experience and confidence as professional marine inspectors and investigating officers.

As the Sector offices evolved, Prevention officers were assigned for three-year tours instead of the former four-year marine safety tours. Many Sector Commanders also required Prevention officers to attend Search and Rescue School (four weeks) and become qualified as a Command Duty Officer (CDO) to make them "more well-rounded and qualified officers." The CDO qualification process and SAR school usually takes about 4-5 months. The result is that now USCG junior officers that are expected to become proficient inspectors and investigating officers have a little more than two-and-a-half years to train, sign off on their qualifications and get the needed experience before being transferred. Two years ago, assignment officers sent 33% of transferring Sector prevention personnel to another port for a back-to-back tour to become proficient using the skills they just learned. However, instead of becoming more proficient like their predecessors in the marine

safety program, many of these officers were assigned to staff positions where their inspection and investigating skills diminished.

Industry stakeholders, port partners, and USCG members overwhelmingly support returning to the prior four-year assignments and believe that it would benefit the Coast Guard, Coast Guard members, port partners, and industry, and would result in proficient inspectors and investigating officers and improved marine safety through fewer casualties, fatalities, injuries and spills. Only two Coast Guard interviewees outside of the personnel system had concerns about four-year tours. Their concerns centered on officers being assigned for four years at ports with limited opportunities for a variety of qualifications either due to the type of port like Western Rivers or location and short season like Alaska.

Recommendation (WRK-8): Extend Prevention officer tour lengths to four years, with reasonable exceptions, to gain necessary experience, to allow time for development of journeymen inspectors and investigating officers, to understand the local risks and industry profile, and to provide 'geographic stability' and consequent work-life benefits. Arguably, the four-year tour length is the most strongly and most universally supported idea in the entire evaluation.

Career Paths

Several Coast Guard personnel raised issues about prevention career paths. In particular, junior officers are exposed to conflicting career information and question if they should become technical experts or well-rounded generalists. Enlisted personnel, primarily MSTs, in Response Divisions working on pollution response do not have opportunities to inspect facilities and vessels and therefore do not receive their qualifications and practical factors for advancement as would their MST colleagues assigned to or working in the Prevention Division. Many mid-grade marine safety (experienced) officers have been told that they are ineligible for O-5 commands under the "new rules" and others see very limited opportunities for Prevention officers to successfully compete for O-6 commands. As a result, several marine safety professionals have left the USCG to take positions with industry, which they see as a better career opportunity. These professionals told us that it is not just about the money, it is also the authority and responsibility that they can have in industry that they don't anticipate having in the reorganized Coast Guard.[40] However, we note that in the Sector Commander billets (O-6), we did not see an apparent bias in favor for a particular background. Therefore, we caution that further analysis would be required to determine whether concern for promotion is a real or perceived issue.

[40] Determining the number of personnel leaving the Coast Guard for career progression reasons is beyond the scope of this evaluation.

"Prevention has five different program managers who are all focused on providing their specific program needs, even at the expense of other prevention programs. This results in fragmented requirements. No single authority is coordinating/refereeing the workforce for the entire prevention program; they compete against each other for the limited talent available."

"Nobody is monitoring what units (primarily Sectors) are doing with the people they receive for their billets so PSC does not know what job changes the unit has made with their personnel."

"LTJG billets must be filled with entry-level personnel. We don't have the inspectors to fill these billets. If I can't find someone with the appropriate quals, I'm giving you someone who can't perform the job."

"Enlisted prevention personnel "juniority" is a major issue. It is possible for MSTs to advance from E-4 to E-7 (Chief) within one assignment. One member just made warrant officer at 9 years and 2 months (very rare)."

"Critical issues—ensure sufficient entry-level billets, develop workforce requirements and standards, shrink staffs."

The Personnel Service Center encourages units to keep members in their Personnel Allowance List billets, but in reality the Sectors put members where they need them. Many prevention personnel indicated it takes 6-8 years to mature someone on the inspection side. To have them cross-train dilutes the talent pool for inspectors. A marine environmental protection Lieutenant was in a four-year tour but was rotated every 12-18 months. The Personnel Service Center wants to keep members in the same billet for three years, but three years in enforcement or in planning results in no opportunity for inspector qualifications, and thereby hurting the member's chances for promotion or choice assignments.

In order to seriously build, sustain, and retain a professional and quality prevention workforce, the Coast Guard needs to develop clearly recognizable and valid career paths for all its prevention personnel, enlisted, officers, and civilians. While MSTs have one Master Chief MST who serves as the rating manager for all MST assignments, the prevention officer corps has six program managers.[41] This competition for personnel by program managers with different career path ideas can cause confusion in the officer corps. Developing consistent and common prevention career paths is challenging but many interviewees would welcome the challenge being addressed.

A model for identifying and clearly communicating officer career paths may be found in the Coast Guard's civil engineering (CE) community. The CE Yellow Book lists all the CE officer billets from O-2 to O-6 by location, position, and pay grade. It also includes information on the incumbents with name, year group, professional designation (Professional Engineer/Engineer-in-Training), education (BS, MSCE, MBA), and anticipated rotation date. This is useful information for personnel due to rotate. In the front of the Yellow Book is a matrix containing a listing of all the CE job types by rank in the first column and then sections listed across the top for education, professional designation, prior assignments, and professional experience. Appropriate blocks inside the matrix are checked with

[41] The five program managers within the scope of this Evaluation are the Chiefs of: Office of Auxiliary & Boating Safety (CG-542); Office of Vessel Activities (CG-543); Office of Port and Facility Activities (CG-544); Office of Investigations and Casualty Analysis (CG-545); and Office of Quality Assurance and Traveling Inspections (CG-546). The Office of Waterways Management (CG-541) is outside the scope of this Evaluation, yet competes for the same resources as all other CG-54 offices.

R (Required), HD (Highly Desirable) or D (Desirable) to give the reader an overview of what type of education, prior assignments, and experience are required or highly desirable to be competitive for specific CE jobs.

Recommendation (WRK-9): Study, develop, identify and communicate viable career paths to prevention personnel.

Recommendation (WRK-10): Investigate the value of the CE Yellow Book concept for conveying career path and assignment information to the prevention community. If the concept has merit, resource development of an initial template model updated annually by a prevention workforce manager and made available online to the prevention community.

Recommendation (WRK-11): Incorporate introductory information for prevention program career paths into Officer Candidate School (OCS) and Coast Guard Academy training curricula.

Workforce Management

Managing the Coast Guard's workforce in the best circumstances is a complex task that requires many levels of staff to assign personnel to all of the available billets. Since 9/11, the task has been further challenged and complicated by the organizational changes that the USCG has implemented. Typically, the workforce management system consists of a program workforce manager(s), the assignment officers for enlisted and officers, a workforce projection office, senior staff officers, and commanding officers from field units where personnel are assigned, as well as the personnel in the workforce themselves. The Workforce Manager and Commanding Officers/Senior Staff officers focus on their program or unit needs, while the assignment officers and workforce projection office are responsible for addressing Coast Guard-wide workforce needs. The management system has to address competency, capacity, scarcity of competent personnel, and the workload/workforce mismatch.

The Coast Guard has recently taken some proactive steps to address the workforce management challenge. These include:

- The Marine Safety Performance Plan (MSPP) published in December of 2008 developed the strategic groundwork to expand the current prevention competencies through the establishment of "feeder ports" that will serve as training grounds for first-tour prevention personnel.
- The creation of Centers of Expertise to provide training, knowledge, and subject matter experts for specialized marine safety technical areas such as cruise ships, investigations, suspension/revocation, OCS, liquefied gas carriers, towing vessels, and vintage vessels.
- The Coast Guard's Sector staffing study was designed to lay the groundwork for determining the Sector workloads across the country and present benchmarks for determining the number of personnel and competency requirements to accomplish the Coast Guard's missions. In addition, the Sector study may be used to identify personnel/workload mismatches in the field, encourage updates in the PAL, and identify workforce changes to align people, skill sets, and locations with the workload.

- The Coast Guard was successful in obtaining over 300 additional inspectors, including over 100 civilian inspectors, in the previous budget year with the intent that the newly hired (and experienced) inspectors will staff the centers of expertise and feeder ports, as well as reduce the workload in the field. Adding inspectors and establishing the MSPP and Sector staffing study are steps forward. They have, however, resulted in some unintended consequences that are discussed below.

Background: The Sector concept was implemented as a "resource neutral" initiative drawing on the Group and MSO personnel, assets, and budget resources within each port. As the concept evolved and matured during implementation, new personnel requirements emerged such as staffing a Sector command center, creating a Contingency Planning capability to coordinate actions with local, state, and industry partners, and an expanding Waterways Management capability.

As the Sectors evolved, Coast Guard Headquarters implemented a major reorganization resulting in several changes (see Headquarters Organization section). For example, in the Prevention organization, the Office of Marine Safety's Office of Personnel Resources (G-MRP) that was responsible for overall management of the marine safety workforce was dissolved during the reorganization, leaving the Prevention organization with six[42] program managers but no single coordinating prevention workforce manager to set prevention workforce priorities, provide oversight, and resolve issues.

Need for a Prevention Workforce Manager: Assignment officers take a Prevention-wide view of their organization and work with the six Prevention program managers. The Prevention program managers take a program-specific view of their workforce requirements and find that they are competing for the same insufficient pool of qualified personnel. Prevention program managers negotiate individually for billets, bringing their program the most qualified members, and avoiding the necessary Prevention program-wide view of personnel, skills, and experience. This ultimately hinders workforce effectiveness and the USCG's ability to carry out prevention missions of saving lives, reducing injuries, and minimizing spills in the marine environment.

Complicating the workforce assignment task is the lack of a single Prevention workforce manager within the workforce projection staff (CG-12A) to oversee overall Prevention workforce priorities, the collective impact of future trends and actions, and training system requirements. This results in a need for detailed and frequent discussions amongst many involved parties without established and accepted prevention workforce priorities.

Recommendation (WRK-12): Designate or create a new Prevention Workforce Management office or role within Prevention programs with responsibility and accountability for Prevention workforce management and liaison, similar to the former G-MRP function. The new office will establish workforce standards and overall Prevention workforce priorities to include conducting a workload and workforce analysis and a workload gap analysis that would lead to strategies to absorb the workforce gap in the short-term and resolve it in the long-term. Possible strategies could include workload shedding and vacancy and expertise/billet mismatch management based on risk, prioritizing training requirements, and providing oversight and quality control for prevention training. The office could provide consolidated prevention input to influence

[42] Note that the Office of Waterways Management is outside the scope of this Evaluation.

information systems development, to help make systems like DIRECT ACCESS and MISLE easier to access and data-mine. Likewise, the Prevention Workforce Management office can be responsible for coordinating the development of a Prevention workforce "Yellow Book" for career path development and serve as the primary point of contact for Prevention workforce issues with Personnel Service Center, CG-12A, CG-741 and FORCECOM.

"*Juniority.*"[43] Earlier, we pictured the Prevention officer workforce structure as being arrowhead-shaped, with more O-3 billets than O-2 billets. The influx of O-3 and O-4 Prevention billets in recent years created the top-heavy O-3 and O-4 workforce. Likewise, the MST rating has seen dramatic growth with over 225 MST petty officer billets added in 2008.[44] The addition of these billets has resulted in an accelerated promotion cycle and a reduction of experienced personnel at the various enlisted and officer ranks. Personnel are promoted as soon as there are vacancies above them in the rank structure if they have met their PQS requirement. There is no longer a requirement for MSTs to sit for the competitive service-wide examination.

Juniority is a serious issue. The promotion point for O-4 has decreased from 11 years to nine years, while the average time for promotion to E-6, senior petty officer, is now 5.7 years for MSTs. It is possible to advance from E-4 to E-7, Chief Petty Officer, in one assignment. Officers and enlisted (MSTs) personnel on average will have two fewer years of experience at the O-4 and E-6 levels than their more experienced and equivalent rank peers, which contributes to a decline in workforce competency even when all prevention billets are filled with appropriately ranked personnel.

Filling the Gaps: USCG requested 184 Prevention LTJGs in its FY10 budget request. The additional billets are critical for mentoring entry level personnel, increasing qualified Prevention professionals needed at the O-3, O-4, and O-5 levels, and creating a sustainable Prevention workforce pyramid structure for the USCG. The first Prevention assignment requires personnel to earn their marine inspection qualifications. Our interviews confirmed that, in general, the Casualty Investigation qualification has the greatest demand. Interviewees suggested that the qualifications perceived most ideal and needed to prepare for a second tour are: T-boat, Foreign Freight, and Barge, along with Marine Casualty qualifications. Interviewees also suggested that earning a hull or machinery major qualification during a first tour would be useful. It is anticipated that many of these qualifications will be achieved at the new entry-level feeder ports, but many members will not have access to the feeder ports and may need to earn these qualifications elsewhere. Training funds may be needed to send personnel on temporary assignment duty (TAD), as appropriate, to complete their qualifications.

Recommendation (WRK-13): Establish and communicate standard expectations for entry-level Prevention personnel at feeder ports regarding qualification attainment.

Recommendation (WRK-14): Eliminate O-2 investigating officer billets through reduction of some, and upgrade of others to O-3 billets, and fill the O-3 positions with qualified investigating

[43] Juniority is a term of art and can be thought of as the opposite of "Seniority."

[44] The growth of MST billets is due to the Safe Port Act and Maritime Transportation Security Act (MTSA) requirements.

officers. There are few qualified O-2 investigating officers in the Coast Guard, in contradiction of the policy requiring all investigating officers to be qualified.[45]

Recommendation (WRK-15): Significantly reduce or eliminate LTJG prevention *staff* positions. These positions do not provide the technical foundation for developing Prevention professionals. These are low-priority positions and will most likely remain vacant because there are insufficient personnel at the O-2 level. Increase the number of LTJG inspector billets in the field to include former LTJG prevention staff positions.

Recommendation (WRK-16): Do not assign first-tour prevention personnel to small ports such as Western Rivers, Great Lakes, or District 17 (Alaska). Sufficient training and qualification development opportunities are not available at these ports, and there are insufficient billets to ensure enough mentors to address technical issues that arise in these locations.

Mid-Grade Officers: The Coast Guard has seen significant growth at the O-4/O-5 levels since 9/11 due to an earlier O-4 promotion point compared to the past. O-4 positions may not require inspector or investigating officer qualifications, but in order to be competitive for O-5 Prevention Department Head positions, assignment officers are looking for officers with expertise in at least four of the following areas: Waterways Management, Contingency Planning, Inspections, Investigating Officer, Facilities, or Containers. Assignment officers assign qualified inspectors and investigating officers to some of these positions, further diluting the expertise available for Chiefs of Inspection and Investigations.

Warrant Officer and Civilian Positions: In 2008, approximately 13 warrant officers retired from the USCG and were hired as new civilian inspector and investigating officers, providing excellent experience and background in the civilian positions, but adding to the USCG juniority problem. To fill the gap, the USCG promoted senior petty officers to fill the newly vacant warrant officer positions. Workforce management discussed the topic of boatswain's mates being excluded from prevention warrant officer assignments. Although the system was apparently changed to accept more personnel with engineering and technical ratings into prevention warrant officers positions, it was thought by many that there was a definite contribution made by boatswain warrants in the marine safety and marine environmental protection fields.

The maritime industry suggested hiring professional merchant mariners into civilian positions to broaden the experience base of the Coast Guard inspector corps. This action could benefit the Coast Guard's new Centers of Expertise where professional merchant mariners with 20 or more years of experience on LNG vessels, container ships, offshore petroleum industry, and tug and barge operations complement seasoned Coast Guard inspectors and investigating officers.

Recommendation (WRK-17): Explore increasing incentives to help fill civilian Prevention positions with professional marine industry members.

Workforce Accessions: According to interview feedback, the Coast Guard Academy cannot graduate the number of technically qualified officers needed in the USCG to support the Prevention program. Soliciting professional merchant mariners (including merchant maritime

[45] It is noted that a Coast Guard Headquarters representative indicated that all investigating officer billets had been reprogrammed to O-3 billets (at a minimum). Regardless, we encountered many Coast Guard personnel currently in the field that were O-2s and assigned investigating officer billets and duties.

"CG is really compartmentalized at HQ; it is tough to get answers to questions."

"HQ/Sector organizations seems to have been done for CG, not for customers. It's hard to know who to contact any more."

"The shift in CG organization has been a disaster from the industry perspective. In the past industry had "the guy" to go to. Now no one in the industry knows where to go. RADM Salerno is stretched too thin. Not customer-focused at all."

"Industry has extreme difficulty finding out who to contact in the CG to resolve issues or ask questions—what office response or prevention? Phone numbers or e-mail addresses? It's a core problem, we can't find out who to talk to."

Fragmentation of Prevention Work Force Program Managers: "Prior to HQ reorganization, the PSC dealt primarily with one overarching program manager who could provide the formal program input for assignment decisions. Now they deal with six prevention program managers who often have different goals and constraints making the assignment process much more complex."

Policy Consistency: "HQ and Districts aren't thinking things through—four different messages on Venezuelan vessels, some conflicted. We didn't have the CONOPs until the day before."

academy graduates) to consider active duty officer positions may increase the breadth of inspector and investigating experience needed in the Coast Guard. In past years, the Coast Guard successfully increased the number of maritime academy graduates coming into the service from 12-18 to 30-36 graduates in 2008. A Direct Commission Officer (DCO) program brings in an additional 4-6 Maritime Academy graduates annually into the Coast Guard at the ENS/LTJG level. The DCO program for licensed officers of the merchant marine closed several years ago, but interviewees at three maritime academies indicated that now might be a good time to revisit this program in light of the current struggling economy. The DCO program does not require a maritime academy degree, but targets licensed merchant marine officers with desirable skill sets needed in the Coast Guard. The pay may be substantially less than the merchant marine, but the pay gap might be minimized by use of a career bonus to offset the salary reduction and bring talent and skills to the Coast Guard prevention ranks.

Recommendation (WRK-18): Review and consider re-establishing the DCO program for licensed Merchant Marine officers.

Recommendation (WRK-19): Complete the Sector staffing study and determine the workload gap for each Sector. Assignment officers work with Sector Commands to fill personnel gaps through the annual transfer process to meet the *collective requirements of the Sector* through the *combined skill sets of the incoming transferees*. The goal is a USCG personnel system with more flexibility, and an optimized workforce that can meet operational requirements and international standards.

Organization and Leadership

Headquarters

Compartmentalization and Fragmentation of the Prevention Program. Under the pre-9/11 marine safety program, the Chief of Marine Safety, a two-star admiral, was recognized by the Coast Guard, industry, state and federal partners, and the international maritime community as the Coast Guard's lead in all maritime safety-related issues. The resource office (G-MR) within Office of Marine Safety provided oversight and policy guidance for marine safety resource and personnel issues.

Since 9/11, Prevention in the USCG Headquarters reorganized twice—first as the Offices of Response and Prevention, and later following the Department of Defense numbered model. Under the latest model, marine safety program was re-organized into Marine Safety, Security, and Stewardship and headed up by a two-star Admiral (CG-5). The re-organized program has a broader role and is less focused on Marine Safety/Prevention issues. Under the new system a one-star admiral is responsible for Coast Guard Prevention Policy (CG-54); six O-6 program managers report to him. The resource staff that was dedicated to broad and integrated marine safety policy, workload, and workforce analysis, and that provided overarching prevention standards and oversight, was eliminated under the re-organization. The functions performed by the resource staff were subsequently assigned to offices outside of CG-54 and, in some cases, even outside of CG-5. These external offices are not solely dedicated to the prevention mission, but serve as a resource for all Coast Guard missions.

Without the Prevention Policy Directorate (CG-54) having a coordinating office, the six Directorate Program Managers[46] (each directing an office) may individually conduct internal oversight, policy development, and resource direction for their portion of the overall prevention program. However, none is responsible for the overall program and all are inherently in competition with one another for limited personnel and budget resources. This fragmentation of prevention policy, workforce, and resource planning and execution diminishes the effectiveness and efficiency of the overall prevention program.

Recommendation (ORG-1): Establish an office solely responsible and accountable for coordinating and integrating Prevention policy, planning, workload analysis, workforce analysis, and budgeting in order to improve the overall effectiveness and efficiency of the Prevention program.

Headquarters Numbering System. Federal partners, industry, and USCG personnel do not understand the new Coast Guard re-organization and the numbering system for its offices. Stakeholders and customers have complained that the numbers are meaningless and make it very difficult to determine to make contact, ask questions, or resolve issues. Industry interviewees stated that the new numbering system appeared to be developed for internal purposes, was not customer-focused, and inhibits communication with the Coast Guard. Furthermore, the online phone book is organized only by the office numbering system, rendering it unusable as well.

Recommendation (ORG-2): Use office names, followed by office numbers, when communicating with Coast Guard partners, industry, and other stakeholders. Include publicly accessible contact information for the Coast Guard offices and officers involved in public outreach activities. The Coast Guard may consider extending this practice for internal Coast Guard correspondence as well, since their personnel are as confused by the system as their customers and stakeholders. Since the Coast Guard has an external customer focus, we recommend maintaining a clear naming system in perpetuity.

[46] There are five program managers within the scope of this evaluation. The Waterways Management office is outside the scope.

Sectors

The port security mission of the Coast Guard expanded dramatically after the attacks of 9/11 and demonstrated weaknesses in the Coast Guard structure of having both Group operations and Marine Safety Offices (MSOs) in each port where the Captain of the Port (COTP, Commanding Officer of then MSO) was responsible for port security, yet all the boats, cutters, and aircraft were "owned" by Operations and controlled by the Group offices. As a result of the lessons learned from 9/11, the Coast Guard recognized the need to consolidate its port activities under one responsible commanding officer and the Sector concept evolved to integrate Coast Guard port activities. HSI visited 17 ports in the U.S. and met with personnel at 11 Sectors[47] and four Marine Safety Units (MSUs). The Sectors were chosen so that the HSI team could access the most complete cross-section of Coast Guard Prevention personnel and Prevention stakeholders possible, within contract constraints. Interviews were conducted with command cadre, Prevention Chiefs and their staffs, junior officers, command chiefs and enlisted prevention personnel. In all of these interviews, most Sector issues discussed fell into four primary categories:

"Our pollution response is within the Prevention staff."

"The old system was much better for pollution prevention and response—you can't do one without the other—prevention people need to know the response plan."

"MSU X is organized by the HQ model with pollution investigation in Incident Management Division under Response; no formal feedback loop of investigation "root causes" of spill s back to Prevention, just ad-hoc discussions."

"Sector X decided that Response Department will not perform marine environmental response, but rather it will be performed by experienced MSTs and J.O.s in the Prevention Department. In the short term that will accomplish the mission, but in the long term it does Response officers a disservice as they will not be qualified to perform marine environmental response and will not be qualified for more advanced positions in Response as compared to their peers at other Sectors."

"Senior MST petty officers in Prevention augment OS's who do not have the experience for MEP response."

1) Marine Environmental Protection (MEP) mission execution

2) Command center staffing

3) Training/Qualifications

4) Sector Commander responsibilities and accountability

Marine Environmental Protection (MEP) – Prevention and Response. In 2003, the USCG created the Sector organizational structure to better coordinate Coast Guard activity within ports. However, the concurrent division of MEP expertise and execution into distinct Response and Prevention departments is, arguably, one organizational structural flaw that remains and significantly impacts Coast Guard personnel and operational effectiveness.

Sectors struggle with the best way to execute the MEP Prevention and Response missions at the Sector level. HSI found three different models currently being followed. Half of the Sectors we visited use the HQ model where MEP response to oil spills (including investigations and clean-up) is in the Response Department and facility/vessel

[47] There are 35 Sectors in the Coast Guard.

inspections to prevent spills are in the Prevention Department. The remaining Sectors (except for one) have the MEP response function in their Prevention Department essentially integrated with the MEP prevention function. A third model, found at one port only, had both Response and Prevention activities under an Operations Department.

"We're more diluted now, but we're much better coordinated as a result. The Sector construct facilitates better coordination but we are spread so thin."

"We should go back to Port Operations—we're losing out in cross-training opportunities and quals development. Integrated command center is good. If we can't go back we need to double the IMD petty officers (from four to eight) so people can get qualified. In a worst-case scenario we could not sustain a pollution response effort with only a Chief and four petty officers." (Chief)

"Sectors are not standardized we have three different models within our district."

The Headquarters model for Sectors, which formally separates prevention and response activities, focuses solely on function and platforms, and not expertise and experience. Sectors that use this model have encountered problems with a shortage of qualified personnel to perform the unique response and prevention activities; an inability to surge or assist colleagues, particularly in response; a lack of personnel training and professional development in a diverse set of activities; and poor communication between the Response Department and the Prevention Department.

The Coast Guard personnel system generally staffs most of the Sector Response Departments with Operations Specialist-rated petty officers that have cutter and small boat experience, and a small number of Marine Science Technicians (MSTs) that have inspection, investigation, and pollution response experience.

Nearly all enlisted personnel in the Prevention Department are MSTs. Prior to Sectors, the Marine Safety Offices had a Port Operations Department that included pollution investigators conducting facility inspections, responding to pollution incidents as investigators, and assisting with spill cleanup operations. After Sectors were developed, the Port Operations Department was dissolved and the pollution investigators were shifted to Response or Prevention billets.

A number of concerns were expressed by USCG interviewees regarding the split of prevention and response for MEP activities:

- Prevention specialists with Response roles were standing watch, and unable to take leave/vacation, or attend training.
- While in response roles, prevention staff were not conducting vessel and facility inspections and therefore unable to complete their practical factors (necessary for promotion) or earn their inspection qualifications (which influence future assignments).
- One MST petty officer assigned to Response requested an additional two years at the unit in the Prevention Department so he could complete his inspection qualifications—he never had this opportunity while working in Response.
- Many of the MST petty officers interviewed stated that they did not want to strap on weapons or be boat drivers—that is not why they joined the Coast Guard, nor how they

envisioned their careers. Instead, they joined to improve the environment, and to help prevent and cleanup oil spills.

The Headquarters Sector model breaks the connection between the roles of enlisted Coast Guard personnel in pollution investigations and preventive inspections of vessels and facilities. Under the former Port Operations construct, pollution investigators briefed the rest of the port operations staff on their findings and causes of an investigated pollution incident. Facility inspectors in Port Operations asked questions and exchanged information in order to determine causal factors that might be apparent while conducting facility inspections. Under the Headquarters Sector construct, Response and Prevention offices are stovepiped, effectively limiting information exchange between pollution investigators in the Incident Management Division and facility inspectors in Prevention. Often the two departments are in different buildings, or in one case (Southeastern New England) in different states.

Sectors that have experienced Prevention personnel (MSTs) that routinely perform the MEP Response function appear to handle the workload and share causal information that is then incorporated into inspection procedures. However, this leaves them out of compliance with the Headquarters construct for the Sector organization. One interviewee suggested that the Coast Guard classify oil and chemical spills as marine casualties that would be investigated in Prevention just like other marine casualties. This interpretation would allow the Prevention Department to legitimately perform the pollution investigation/response function and maintain alignment with the intent of the Headquarters structure. An outcome of this suggestion is that MST personnel can remain in the Prevention Department where they will get the training and experience needed for advancement.

Recommendation (ORG-3): Re-examine the Sector construct with regard to MEP response. Classify pollution incidents as a category of marine casualties and conduct pollution investigations and response out of the Sector's Prevention Department. Transfer MST/Junior officer billets from Response to Prevention, as needed, to perform this function.

Command Center Staffing. As mentioned previously, Sectors were initially stood up as a "resource neutral" initiative. As Sectors developed command centers, they typically found that there were insufficient response personnel, both enlisted and junior officers, to staff adequately the centers, forcing the officers to pull former MSO personnel into the command center watch rotations. This negatively impacted the command centers because there were fewer personnel to perform the Prevention mission, and prevention personnel (primarily MST petty officers and junior officers) found that they did not have sufficient time to receive the training and field experience needed to earn their qualifications as inspectors and investigating officers. Three ports are receiving dedicated Command Duty Officer billets to offset this problem and these billets are intended to relieve the pressure on the Prevention Departments, allow prevention personnel to stand fewer watch rotations, and allow more personnel to earn their inspector and investigating officer qualifications. The Sector staffing study is expected identify Sector personnel/workload mismatches, including appropriate command center staffing.

Recommendation (ORG-4): "Right-size" the Sector staffs with response and prevention personnel redistributed to billets that better match their skill sets and experience based on the analysis from the Sector staffing study.

Recommendation (ORG-5): Add Marine Safety to Operations Specialist training. Learning and following MS response procedures and experience will enable command center staffs to professionally handle all contingencies (as district controllers used to do). They would continue to consult specialists, as needed.

Training/Qualifications. Prevention personnel find it difficult to obtain inspector qualifications and to accomplish practical factors in order to advance professionally. There are two primary reasons: prevention staff members are pulled into additional duties as a result of the resource neutral initiative in the Sectors, and junior officer assignments were reduced from four years to three years.

Recommendation (ORG-6): Properly size the Sector staffs with personnel working in their areas of expertise, and reinstate four-year tour lengths for junior officers to resolve staffing issues at this level.

Sector commander responsibilities and accountability. The Coast Guard greatly expanded the authority and responsibility of the new Sector Commanders by combining Group Operations and Marine Safety Office functions within each port. Advancing to a Group Commander or Marine Safety Office Commanding Officer typically took 20-25 years of experience in the operations or marine safety fields due to the complexity of the mission sets, the technical skills required, the need for a thorough understanding of mission organizational relationships, as well as the number of available positions. In combining the Group and MSO functions, several issues must be addressed.

"We've made the Sector Commander's job too difficult—not setting them up for success. It's a challenge to think about all your mission sets simultaneously."

"Can my Response Chief do it all?" (Sector Commander)

"Sector Commanders are saturated."

"I received a call for advice from another Sector Commander who was not a marine safety professional on a complex prevention issue."

1. Can a Sector Commander be expected to have the breadth and depth of knowledge needed to effectively and efficiently lead the Sector organization?
2. Is there a specific personnel organizational construct necessary in a Sector for a Sector Commander with an unpredictable background (such as aviator, cutterman, comptroller, lawyer, inspector) to be successful?
3. What abilities should be inherent in a Sector Commander, or be available in his/her staff to guarantee the expertise to act as Captain of the Port, Federal On-Scene Coordinator, Officer in Charge Marine Inspection (OCMI), and relevant responsibilities?
4. What training or knowledge should be expected of a Sector Commander who is expected to hold constructive discussions with industry on, for example, requested waivers from technical marine safety regulations, and other technical prevention aspects?

The HSI team asked several Sector commanders and senior Coast Guard leaders for their candid impressions and recommendations. Like the District Commander, the Sector Commander is not

expected to be an expert in all areas, but rather to exercise excellent leadership for successful mission execution, ensure that good management practices are adhered to, and maintain and enhance relationships with the public and Coast Guard stakeholders. The Sector Commander has Chiefs of Response, Prevention, and Logistics to rely upon as well as the Deputy Sector Commander. This requires that the Personnel Service Center provide the most experienced personnel for these critical positions. See the Workforce Management and Competencies sections for a discussion of the Personnel Service Center.

From an industry and Coast Guard perspective, however, there is at least one less rank of experience at key positions now than before Sectors were established. Previously, industry had a knowledgeable and experienced O-6 marine safety professional for interpretation and resolution of regulation issues; currently, a less experienced O-5 fills the billet. Previously, an experienced O-5 was available for complex inspection and investigations issues; currently, an O-4 fills the billet. Further, the O-4s and O-5s have about two years less experience, on average, than the same ranks ten years ago.

The workforce system needs standards developed for critical positions and identified career paths that are transparent to the workforce. In the interim, while standards are developed and career paths identified, sub-optimal assignment decisions will occur. Implementing the Sector staffing study is a huge step in the optimizing direction, as it identifies the workload for each Sector and the workforce needed to effectively accomplish the workload.

Recommendation (ORG-7): Build and communicate viable career paths for developing professional Chiefs of Prevention, Response, and Logistics. Actively manage these career paths to ensure a sufficient talent pool of well-qualified and experienced personnel is available for these key positions.

Recommendation (ORG-8): Establish an informal advice network as a resource for Sector Commanders when confronted with unclear situations. Such a network could consist of a volunteer body of experienced subject matter experts willing to work with Sector command cadre and provide advice based on experience and knowledge on a not-for-attribution basis. The advice network could be peer-based and consist of senior civilian experts, or highly respected retired officers who are experts in their fields.

Recommendation (ORG-9): Identify Sector “best/proven” practices, such as Sector Jacksonville’s “Strategic Plan” and Sector Ohio Valley’s “performance measures” and establish a formal way to share this information with all Sector command cadres. Identify those practices with an identifiable and quantifiable benefit or performance gains that are worth sharing. Assign a single point of contact or staff element to coordinate sharing and implementation of these practices, whether developed by quality performance consultants or internally.

Partner Relations

Many of the Coast Guard MS and MEP activities affecting program effectiveness rely on partnerships with industry, non-government organizations, and federal, state, local, and tribal government entities. In the Prevention realm, these partnerships (1) establish networks to cover all maritime locations (geographic force multiplier) and increase the skill set available for, and

applied to, activities (skill set force multiplier), (2) share costs, (3) fill gaps in the USCG Prevention program, and (4) support advisory relationships.

Force Multiplier

The Coast Guard's Prevention mandate is limited to activities and incidents in and adjoining federal navigable waterways. However, since there are many interfaces between the Coast Guard's area of responsibility and others' areas of responsibility, there are many instances of cooperation with public, private, local, and regional entities in meeting shared prevention goals.

In those waterways that are outside the regulatory scope of the Coast Guard, federal, local, and private agencies have responsibilities or activities with the same goals and objectives as the Coast Guard has with its Prevention programs—reducing maritime casualties and damage to the environment. Concerning Marine Safety, the federal waterways are generally well defined by statute, and the Coast Guard has primary or exclusive responsibility in these waters. Where MEP is concerned, overlaps and uncertainty exist due to the mobile nature of oil and chemical spills—it is possible, for example, for a spill to migrate from non-federal to federal waterways. In those instances identified during our interviews where this cross-jurisdictional situation occurs (or where the possibility exists), we found that the longstanding cooperation, including exercises, among responders ensured that each organization with available assets and expertise would respond to a given incident.

The Coast Guard has many Prevention partners (and partners involved in related Response activities). Numerous memoranda of understanding or agreement (MOUs, or MOAs) define the geographic, functional, and legal responsibilities for Prevention activities. Formal and informal mechanisms exist that determine the exact cooperative aspects of these relationships.

The HSI team interviewed numerous Coast Guard partners. Representative examples, with the rationale or reason for prevention cooperation with Coast Guard in parentheses, are as follows:

- State and local departments of environmental quality, or equivalent:
  - California, Illinois, Wisconsin, Washington, and Alaska Department of Environmental Cooperation (MEP)—marine environmental incidents occurring in waterways leading to or adjoining federal navigable waterways, federal and state contingency plan requirements, general MEP
- State Boating Law Administrators (nasbla.org)—boating safety in state waterways, and to advise and assist Coast Guard on boating safety in federal and state waterways (coordination of laws and intent; grants)
- State and local police/harbor patrols—Los Angeles, Long Beach, Milwaukee, Valdez (Safety patrols, MEP, pollution investigations)
- EPA—MEP: deck runoff regulations, partner for non-federal waterways, and some facilities
- United States Army Corps of Engineers (USACE)—regulatory management and enforcement, and public awareness on the waterways over which they have jurisdiction
- Tennessee Valley Authority—regulatory management, and public awareness on the waterways over which they have jurisdiction

- OSHA—waterside facilities can be subject to USCG and/or OSHA oversight for safety issues (note: many industry representatives stated that they preferred working with the Coast Guard over OSHA on safety issues; no interviewee expressed the opposite)
- MMS—MMS signed an MOA with the USCG in 2004 for the former to undertake inspections on behalf of the USCG
- National Marine Fisheries Services (NMFS)[48]
- National Transportation Safety Board—NTSB signed a MOA with the USCG in December 2008 concerning responsibilities and roles in marine casualty investigations
- U.S. Customs and Border Protection—coordinated inspections/boardings, which reduce disruption to crews
- International Partners—International Maritime Organization (IMO)

Country-wide, prevention activities are undertaken by an intricate web of entities. Although they may maintain other goals, all of the partners generally share the same annual and long-term goals as the USCG Prevention Program—to prevent and reduce casualties, to prevent (and, as necessary, respond to) pollution incidents, and to ensure continued commerce in the maritime transportation system. Virtually without exception, the interviewees found their respective relationships with the Coast Guard to be worthwhile. There was minimal overlap in official responsibilities, and most cooperative prevention (or response) activities were coordinated to feed off the strengths of the respective organizations. These partnership activities contribute to meeting the Coast Guard Prevention Program goals.

Recommendation (PAR-1): USCG and its partners should coordinate performance measures development and tracking in the areas of boating safety (boater deaths, primarily; and injuries, secondarily) and marine pollution incidents in order to collectively identify trends and therefore determine the resources necessary to address common safety and environmental issues. The Marine Safety Performance Safety Plan and the Strategic Plan of the National Recreational Boating Safety Program are well-developed plans that provide extensive goals, objectives, and performance measures.[49]

Recommendation (PAR-2): USCG should identify and share best practices nationwide, and collect and share knowledge that can benefit MS/MEP outcomes. One opportunity would be to return to publishing annual casualty reviews in the Coast Guard's Proceedings Magazine, similar to the UK's Marine Accident Information Board (MAIB).

Recommendation (PAR-3): USCG should attempt to coordinate marine safety inspections and examinations with Coast Guard security boardings and other boardings (such as U.S. Customs and Border Protection). Numerous interviewees expressed concern that boardings were causing crews to lose mandatory rest, and could result in those crews operating in a less safe or unsafe

[48] See http://www.nmfs.noaa.gov/ and https://reefshark.nmfs.noaa.gov/f/pds/publicsite/documents/procedures/02-301-21.pdf.

[49] See the Strategic Plan of the National Recreational Boating Safety Program at http://www.uscgboating.org/articles/pdf/National%20RBS%20Strategic%20Plan.pdf.

manner. Although cooperative boarding and minimal interruption boardings are supposed to be the normal Coast Guard practice, interview evidence suggests that this is not always the case.

Share Costs

Industry receives benefits from inspections (safer vessels, fewer casualties, and fewer pollution incidents) that have implications for reducing litigation and insurance costs, and also promote better corporate governance (a better/safer workplace). With partnerships, the Coast Guard is able to transfer costs from the Coast Guard to the third-parties receiving prevention services and benefits. Examples of cost sharing include:

- The Alternate Compliance Program (ACP, 46 Code of Federal Regulations Part 8)[50]—not-for-profit classification societies inspect vessels according to memoranda of agreement on behalf of the Coast Guard, and collect fees for their work. Coast Guard provides oversight of the program. Note that vessel owners also utilize classification societies to inspect vessels when seeking insurance.
- Local fire, police, harbor patrol inspections of recreational and fishing boats/vessels—cost-sharing is inherent in these activities.

Recommendation (PAR-4): USCG should assess the ideal mix of Coast Guard and non-Coast Guard participation in prevention activities and determine a long-term roadmap to ensure that the ideal mix is realized.

Fill Gaps in USCG Prevention Program

Although the new tow boat regulations have not been implemented yet due to their being tied up in the Coast Guard regulation process, most interviewees with a stake in the towing industry anticipate that having 5,000-6,000 new vessels to inspect will require a Coast Guard/third-party inspection partnership simply because the Coast Guard will not have enough inspectors to undertake the additional required inspections alone. A number of working groups are currently addressing this issue, including TSAC's Towing Vessel Inspection Working Group.

Recommendation (PAR-5): We recommend that the Coast Guard provide industry with frequent updates on progress in Coast Guard/industry coordination efforts for a towing inspection regime.

Support Advisory Relationships

The Coast Guard has numerous groups that are legally mandated to provide advice to the Coast Guard on various issues in the Prevention area. Feedback from all of the advisory groups (see discussion of Federal Advisory Committee Act (FACA) committees below) regarding the Coast

[50] The Coast Guard's Alternate Compliance Program (ACP) is intended to reduce the regulatory burden on the maritime industry while maintaining existing levels of safety and providing increased flexibility in the construction and operation of U.S. flag vessels. In this voluntary program, Classification Society Rules, International Conventions, and an approved U.S. Supplement provide an alternative that is equivalent to the CFR. Compliance with this equivalent alternative standard is administered through survey and inspection conducted by authorized classification society surveyors. A Certificate of Inspection (COI) is issued by the Coast Guard to a vessel enrolled in the ACP based upon the classification society reports. See http://www.uscg.mil/hq/cg5/acp.

Guard has been very positive. Advisory group members have stated versions of the theme: "The Coast Guard has been excellent at listening in various committees and taking appropriate action."

Federal Advisory Committee Act (FACA) committees, which are open to the public, serve in a public advisory role during the public phase of regulation development. The advisory role is mandated by law. Committees are free to discuss Coast Guard proposed regulations or suggest regulations to the Coast Guard for the latter to consider developing and implementing. The committees are involved early in regulation development, but members and stakeholders are concerned with the ongoing regulation development when the regulations go into a 'quiet period' that can exceed more than 10 years (such as Boating Safety and Outer Continental Shelf Activity regulations) and therefore no information becomes available about changes to the regulations as they go through an internal Coast Guard process.

The Coast Guard FACA (Safety Advisory) committees include:[51]

- Chemical Transportation Advisory Committee (CTAC)
- Commercial Fishing Industry Vessel Safety Advisory Committee (CFIVSAC)
- Delaware River and Bay Oil Spill Advisory Committee (DRBOSAC)
- Great Lake Pilotage Committee (GLPAC)
- Houston Galveston Navigation Safety Advisory Committee (HOGANSAC)
- Lower Mississippi River Waterway Safety Advisory Committee (LMRWSAC)
- Merchant Marine Personnel Advisory Committee (MERPAC)
- National Boating Safety Advisory Council (NBSAC)
- National Offshore Safety Advisory Committee (NOSAC)
- Navigation Safety Advisory Committee (NAVSAC)
- Towing Safety Advisory Committee (TSAC)

In addition, the Coast Guard has joined with numerous industry associations to form Partnership Action Teams and in other partnership roles to improve maritime safety. Some of the organizations who have partnered with the Coast Guard include:

- American Waterways Association (AWO)
- Baltic and International Maritime Council (BIMCO)
- The International Association of Independent Tanker Owners (INTERTANKO)
- Offshore Marine Services Association (OMSA)
- Passenger Vessel Association (PVA)

[51] See http://homeport.uscg.mil/mycg/portal/ep/channelView.do?channelId=-18419&channelPage=%2Fep%2Fchannel%2Fdefault.jsp&pageTypeId=13489) for information on FACA committees.

Industry and Public Outreach

Mariner Credentials

The Coast Guard, through the National Maritime Center[52] (NMC), is responsible for mariner licensing and documentation requirements, requests, and approvals.[53] The NMC and its 'storefront' Regional Exam Centers (RECs) are an important interface between the Coast Guard and the individual mariner. Issues emanating from the NMC tend to be known or shared by most or all mariners, which makes this interface particularly sensitive in the public perception of the Coast Guard.

There is near-universal agreement that the recent slow turnaround in approving credentials by the NMC and the lack of clarity in related medical requirements[54] is believed by industry (and Coast Guard personnel) to be causing significant problems for both mariners and the companies for which they work. Reported widespread delays in receiving credentials have caused problems for individuals and companies, with many mariners reportedly being pulled from their vessels temporarily, and some losing their jobs when their licenses expire while awaiting renewal. Job losses or short-term loss of work/paycheck directly attributed to delays in credentialing approval were expressed throughout the country. In one east coast port, five pilots had to have the state legislature take action to prevent them from being fired when their licenses expired. In another major port, industry representatives in a focus group meeting indicated that 60 of their personnel had been pulled from their normally assigned duties because their licenses had expired while awaiting renewal. The result, as a number of industry representatives reported, was that less qualified mariners were given responsibilities where a more qualified mariner had been displaced. Understaffing in industry, due to a limited number of qualified mariners being available in the first place, was also expressed as an issue compounded by credentialing delays.

Recommendation (IND-1): We strongly recommend that the Coast Guard fix the credentialing crisis as one of its very top priorities:

- State clearly and provide to industry universally the timelines necessary for submission of paperwork, and the specific information necessary for submission of health-related issues (including additional paperwork, as necessary)
- The Coast Guard should recognize that:
    - Credential submission timelines must be reasonable to (a) balance credential turnaround time, allow for clarification of issues, and address concerns from industry and mariners regarding the frequency of needing to apply for new/updated credentials (industry often expressed the concern that a five-year credential be valid for five years from the date that the original credential expired, not from the date of

[52] See http://www.uscg.mil/nmc for a description of the National Maritime Center.

[53] The Mariner Credentialing Program Policy Division (CG-5434) at USCG Headquarters is responsible for policy.

[54] See http://www.uscg.mil/nmc/Whats_new_to_NMC/Medical_NVIC_Info_Bulletin_091508.pdf for the Coast Guard's recognition of the medical issue as of September 19, 2008, and the associated NVIC at http://www.uscg.mil/hq/cg5/nvic/2000s.asp#2008.

paperwork submission); and (b) take into consideration that mariners are often at sea for extended periods of time.

- Mariners are often mobile geographically (that is, they might not be able to submit and pick up their credential information/credentials in the same location).

Recommendation (IND-2): When the Coast Guard fails to meet publically issued deadlines, a predetermined risk-based analysis should inform a decision to immediately extend the expiration deadlines of current mariners' credentials so that the mariners are not unduly punished due to the Coast Guard's capacity or expertise issues.

The Coast Guard recognizes the credentialing backlog problem, and the significant contribution of medical review delays to this problem. The National Maritime Center has taken significant steps to clear the backlog by hiring Coast Guard auxiliary, U.S. military, and other medical consultants to assist in clearing the backlog. The NMC has also recognized the traditional lack of clarity in physical and medical requirements, and has begun addressing it.[55] Several interviewees across the nation suggested that the Coast Guard follow the aviation model where the FAA certifies physicians across the country to act on their behalf conducting physicals, diagnostic tests, and medical record reviews.

Recommendation (IND-3): The NMC needs to increase its medical staff and include doctors and medical personnel who can not only make timely decisions, but educate mariners. As an alternative, the Coast Guard should consider other models to provide timely, professional medical reviews, including the use of audited certified third party personnel (not unlike the Alternate Compliance Program for vessel inspections).

The NMC has developed numerous performance metrics and publishes them monthly in a publicly-available report on its website. Please see the performance measures section of this report for a full discussion of the NMC's performance measures. We believe that the Coast Guard is on the right track to address effectively the credentialing crisis. We also believe that the level of concern expressed by mariners is a lagging indicator of the credentialing issue.

[55] See http://www.uscg.mil/hq/cg5/nvic/2000s.asp#2008.

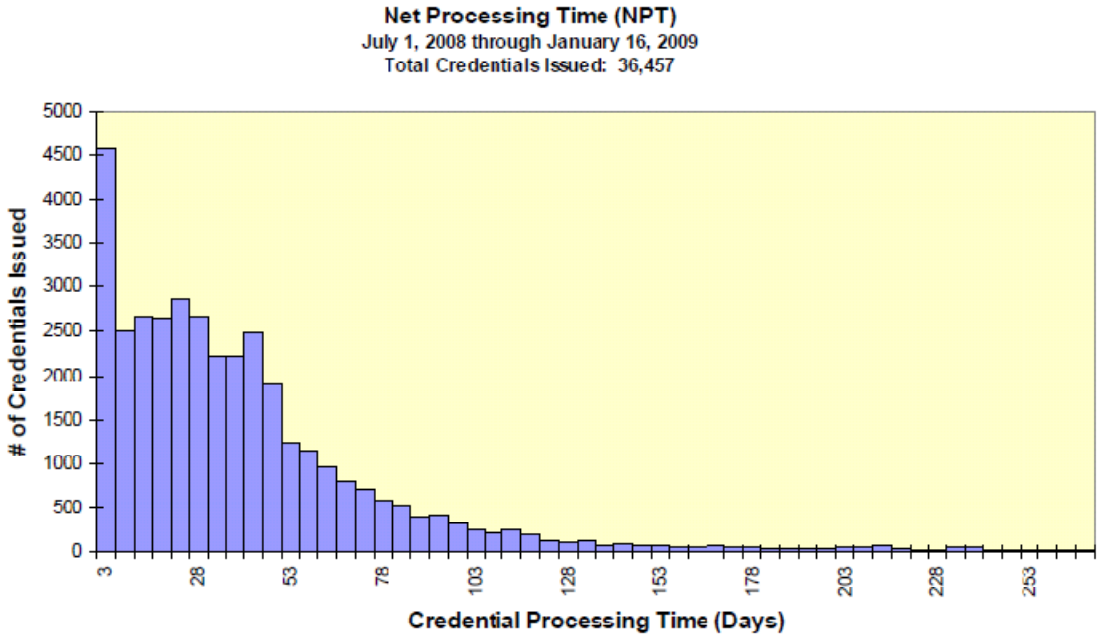

Figure 16: National Maritime Center Net Processing time (source: National Maritime Center, January 2009)

Figure 16 shows the number of credentials issued compared to the credential processing time during a recent period. This graph shows that fewer than 5% of credentials took longer than 90 days to process. However with over 60,000 mariner licenses to process annually, 5% is 3,000 mariners a year who must wait over 90 days for their licenses. We refer the reader to the NMC site,[56] which has quantified details about the components of cycle time (the length it takes for a credential to be processed), and the top information-related delays.

We note that the feedback on the centralization of credentialing activities from Regional Exam Centers to the National Maritime Center has been met with mixed reviews from mariners, industry, and Coast Guard personnel. Overall, though, the Prevention Program effectiveness appears to have benefitted from the centralization. Further analysis, which has likely occurred at the National Maritime Center, can prove empirically what we have found through interviews.

Operational, Compliance, and Enforcement Consistency

In our interviews, a number of industry representatives expressed concern that the interpretation of rules differed in both letter and intent when moving from one USCG Sector to another. Some industry representatives supported the stricter Sector's interpretation, yet were frustrated that a common view on a particular subject was not expressed uniformly across the Coast Guard.

Many industry representatives, when discussing the consistency subject, stated or recognized that it could often be argued that each vessel and situation is unique. This makes a particular solution difficult to suggest or implement.

[56] See http://www.uscg.mil/nmc/

Nonetheless, we recommend that decisions for some determined level of issue be shared across Sectors in situations where differing interpretations could cause disruptions in commerce. This issue was most prominent in vessels transiting from the Western Rivers (Eighth District) up the Illinois River into Lake Michigan in the Ninth District; and for commercial fishing vessels transiting from their operating base in Seattle (85% of the Alaskan fishing commercial fishing fleet operates out of Seattle) in the Thirteenth District to the Alaskan fishing grounds in the Seventeenth District waters. What was recognized as acceptable equipment, stability loading, or repairs in one District frequently was not in another. Industry is not so concerned about what the Coast Guard's requirement is as long as it is consistently recognized and enforced so that they can plan appropriately and do not suffer an unexpected economic impact due to different Coast Guard interpretations in different regions.

While we recognize the right of each Sector (or District) Commander to interpret regulations in their area of responsibility as they deem correct, a common source of information in these cases, such as a sharable MISLE database entry, might minimize unnecessary disruptions to commerce for vessels transiting multiple COTP zones.

Recommendation (IND-4): The Coast Guard should take appropriate steps to provide more consistent interpretations and enforcement of prevention regulations and policy.

Economic Impacts

Industry representatives expressed the following concerns regarding Coast Guard prevention activities and economic impact:

- Delays between industry reporting a prevention-related issue (such as grounding or casualty) and the time at which the Coast Guard responds with an inspection often results in a negative economic impact to the reporting company. While a portion of the incidents certainly requires Coast Guard response before resumption of activities, industry expressed a desire for the Coast Guard to understand the risk component of allowing the vessel to continue underway. An oft-cited example by the towing industry is the difference between a brief "bump and go" grounding on a western river mud flat that results in no damage or injuries versus an oil tanker hard aground in rocky New England waters.

- Interviewees commonly expressed the concern that Coast Guard inspectors (inexperienced ones, in particular) do not understand the impact of their actions in delaying vessels and ships. Some representatives stated that training on the impact to commerce of unnecessary delays could be provided to Coast Guard inspectors.

Introduce and Share New Approaches and Best Practices

Many benefits accrue when new approaches and best practices are assessed for widespread use or implementation. Suggestions and recommendations from interviews include the following.

a. Alternate Compliance Program classification societies (see discussion in previous sections)

b. Industry supports bringing back the "Prevention Through People" program of the mid-1990s.

c. Publish Top Ten lists that provide industry and other stakeholders lessons learned. Two examples include: Top Ten Reasons for Propulsion Failures and Top Ten Causes of Fishing Casualties. Many more are easily developed and could be easily shared with stakeholders.

d. Most stakeholders, particularly those in industry, stated that they were aware of and used Homeport (the Coast Guard knowledge sharing public website). Concern was expressed that Homeport was 'difficult to navigate,' particularly when controlled access parts of the web site were accessed. The latter concern was primarily apparent to those that needed to access frequently information across multiple Sectors, requiring multiple logons. For many interviewed, the challenges of Homeport navigation limited their use of this resource. We note that Homeport has effectively no information on the Marine Safety or Marine Environmental Protection programs. We also note that the *Proceedings of the Marine Safety & Security Council* (known commonly as *Proceedings* magazine) contains excellent information on current Prevention topics, yet does not appears to be available via Homeport. Although the magazine is available online or by free subscription for home/business delivery, we suspect that few are accessing this information. No one in any of our interviews mentioned Proceedings magazine as a utilized source of information.

e. Provide trend analysis or provide the data to industry to do its own trend analysis, providing information on safety issues and pollution incidents, including problem areas (river sections, obstacles, bridges) and problem issues (such as changing from heavy to light fuel enroute).

f. A maintenance and repair company suggested that it "needs third-party auditors (that is, USCG) to maintain/oversee its safety and pollution plans."

g. Implement more widely the Cooperative Boarding Program non-attribution inspections and examinations. The benefits include:

   - Improved rapport with industry personnel
   - High likelihood of cooperation during inspections and examinations
   - Lower costs to industry, as deficiencies could be corrected on a more industry-friendly schedule
   - Coast Guard expertise would more likely be sought when industry is uncertain about issues

Note that some Coast Guard partners do cooperative inspections and examinations/boardings—the Missouri Water Patrol does more of these than the USCG in the Sector Upper Mississippi River area.

Recommendation (IND-5): Increase Proceedings article availability by including Proceedings on Homeport, and by including Proceedings articles within the appropriate subject areas on Homeport. Include "Top Ten" lists for types of casualties in Proceedings articles and/or post on Homeport.

Recommendation (IND-6): Expand the Cooperative Boarding Program by implementing it either nationally, or encouraging COTPs to institute regionally, a day or week of non-attribution inspections/examinations where vessel owners/operators could have inspections made without penalty for deficiencies, if they make corrections within a reasonable time period. Ideal

timeframes would be prior to heavy seasonal activities such as commercial fishing and recreational boating seasons.

Develop Professional Relationships and Industry Outreach

There are many professional meetings and industry outreach opportunities that the Coast Guard uses to develop and nurture relationships with stakeholders. The stakeholders generally have very positive feelings about the outreach activities, with few exceptions.

While many positive relationships were identified and shared during interviews, the following are representative examples:

a. American Waterways Operators (AWO)/Coast Guard partnership. AWO members suggested that continued exposure of Coast Guard personnel to industry would be beneficial. Exchanges, in particular, were believed to benefit both sides, and build trusting professional relationships between industry and Coast Guard.

b. A Coast Guard liaison shares casualty results, and takes the Damage Control Trainer to ports before season starts for safety training.

c. RDML James Watson was quoted as saying that "[Coast Guard personnel] must reach out to industry." A number of Sector, MSO, and MSU Commanders, in particular, are actively seeking and meeting with industry personnel.

d. Virtually all that were asked stated that developing personal relationships between Coast Guard personnel and industry/stakeholder personnel turned out to be essential when an emergency or urgent situation occurs.

e. Cooperation with Industry: River Industry Action Committee (RIAC) Upper Mississippi RIAC Chair hosts conference calls to address issues or concerns for which Coast Guard is present ("relationship with CG much better than old adversarial relationship").

Some negative sentiments were shared by stakeholders, yet there was no evidence that these feelings were widespread or affected in an appreciable way the Prevention program's effectiveness. Nonetheless, examples of concerns expressed include:

a. A local Coast Guard newsletter that includes names, phone numbers, and e-mail addresses of Coast Guard Points of Contact is lacking in many regions, yet would be very helpful. This was provided historically in some areas one to two times per year.

"There is a fine line on investigations because they can turn into prosecutions—going from problem resolution to accountability. Keep safety and legal investigations separate."

"The current marine investigation process in punitive in nature, not preventative like aviation."

"Information uncovered in safety investigations should not be available for the legal case."

"Companies advise members not to say anything until the company's lawyers show up."

"Form 2692 is a joke. Nobody says more than they have to; we're not getting to the root causes."

"A conflict of interest exists for the CG. We expect the CG to point the finger away from the CG. The investigation function could be walled off, either as an independent casualty investigation agency or as a separate entity within the Coast Guard. In the UK, MAIB is independent of the Coast Guard, similarly in Canada."

"Look at the aviation model for MISHAPS."

b. Feedback on Homeport—this was generally seen as a great tool, with a lot of content, but the overwhelming majority of people interviewed stated that it is not easy to navigate, and could be used a lot more effectively. Specific wishes include (1) fewer login points, which is usually tied to too much compartmentalization of information, (2) easier navigation, and (3) presentation of key information that a stakeholder would desire (such as easily available phone numbers for CG offices).

Recommendation (IND-7): USCG should examine and implement ways to make the Homeport website more accessible and easier to use for industry and other stakeholders, including contact information for Sector, District and Headquarters prevention offices and staff.

Investigations and Casualty Analysis

Three primary issues were raised involving investigations and casualty analysis:

1) Timeliness of completion and distribution of investigation results

2) Relationship with the National Transportation Safety Board (NTSB)

3) The fine line between investigations and prosecutions

Timeliness of Investigation Results. Many industry interviewees indicated a strong desire to receive the results of Coast Guard marine casualty investigations in a timelier manner. Industry representatives stated that such promptness would help improve practices without delay. Investigations often take 18-24 months to complete and disseminate; in one recent case, it took five years. Industry would also like Coast Guard to notify involved parties when investigations are still pending or completed.

Opportunities exist for the Coast Guard to share investigation information, as appropriate. One investigation that industry representatives cited as being particularly well done was that for the Tug "VALOR," which industry uses as a training case study.

Recommendation (INV-1): The Coast Guard should implement a feedback mechanism so that lessons learned from investigations can be shared with industry in a timely manner, informally and formally, and acted upon by industry, other stakeholders, and the Coast Guard.

"Appeals aren't worth it economically."

"No fisherman has ever won an appeal—fishing prosecutors have never lost a case." (Commercial fisherman)

"Most in industry fear retribution if they appeal. One fine was appealed and the CG tried to raise the fine."

"My company appealed a spill fine and the fine was reduced."

"It appears CG is just supporting its field commanders."

"Coast Guard makes it clear upfront that if you have the nerve to appeal, it will be worse for you."

Appeals and perception of non-independence or possible bias: "This can be easily rectified—why doesn't the CG create a separate independent office to review cases?

"The situation creates a lack of trust in the system—needs an appearance of credibility."

Relationship with National Transportation Safety Board (NTSB). Both the Coast Guard and NTSB conduct marine casualty investigations. The Coast Guard handles the vast majority of investigations, while NTSB conducts some of the more major investigations, and those where there may be a conflict of interest for the Coast Guard (such as where the USCG Vessel Traffic System, aids to navigation, vessels, or personnel could have been a contributing factor). The Coast Guard and NTSB signed a Memorandum of Agreement in December 2008 outlining each agency's responsibilities and how the two organizations would interact.

Two noteworthy comments informing the USCG/NTSB relationship were made: when joint investigations are conducted there is always a better outcome than via separate investigations, and the shortfall of having NTSB investigations is that the root causes and lessons learned are not captured (by the Coast Guard) and fed back into the Coast Guard inspection process. Although imperfect, according to many interviewees, there is a continual feedback loop within Coast Guard prevention community that is fed by marine safety inspections, casualties, and investigation information and findings.

Recommendation (INV-2): The Coast Guard and NTSB develop a feedback loop to include pertinent investigation information that can contribute to prevention program effectiveness.

The Fine Line between Investigations and Prosecutions. Some industry interviewees mentioned what they considered an area of possible conflict of interest for the Coast Guard—when an investigation for safety purposes becomes the starting point for collecting evidence for potential prosecution. Suggestions included comparing the marine casualty investigation process with the Coast Guard e-Aviation Incident Reporting and Accident Tracking System (e-AVIATRS) process, which is non-punitive, or comparing the current process with marine investigation casualty processes in the U.K. and Canada.

One interviewee mentioned that the Coast Guard's *Proceedings* magazine used to conduct an annual casualty review (mid-1990s) that was very helpful to industry. He has not seen one in years but thought that it could be helpful to improve knowledge of casualty causes and therefore improve safety.

Recommendation (INV-3): Assess whether the Coast Guard's investigation activities have negative consequences (related to prosecution) that impede the gathering of information for safety and other prevention purposes. Depending on findings, determine an effective approach to overcome such a conflict while meeting both investigation and prevention goals.

Recommendation (INV-4): If not already completed, conduct and distribute an annual casualty review to industry to raise the awareness of the root causes of recent marine casualties. This could be done nationally (*Proceedings* magazine) and locally (by Sector/MSU).

Deep Draft Propulsion Casualties

When HSI met with Sector staff and stakeholders in Los Angeles/Long Beach, multiple sources mentioned a significant increase in the number of deep draft propulsion casualties that had occurred in the recent past. There were 25 deep draft propulsion failures in 2007 and 20 in 2008. In the 1990s, the average was about 15 per year. This was the only port of the 17 visited that appeared to have this issue. Upon more in-depth discussions with both industry and Coast Guard personnel, there is a belief, as yet unproven, that the casualties may be occurring due to large commercial vessels complying with the intent of California's voluntary air emission policy, which strongly encourages vessels to switch from burning heavy diesel fuel (which contributes to air pollution) to a low sulfur, lighter distillate fuel with a much lower air quality impact. Vessels switch fuel types as they approach the California ports and, according to knowledgeable industry personnel, propulsion failures appear to be occurring due to clogged fuel filters after switching fuels. All parties were careful to state that the failures had not been proven to be caused by switching fuels, but the indications pointed in this direction. All were concerned about having a major propulsion casualty that might result in fatalities, injuries, or significant environmental consequences.

Independently, this topic came up later in an HSI interview with an industry association representative who indicated this same issue occurred in the 1990s in New Orleans. Technical studies had shown that vessels operating with lighter distillate fuels had better maneuvering capabilities than those operating with heavy diesel fuel. As a result, larger vessels would switch to the lighter distillate fuels so they would have more maneuverability as they transited from the Gulf of Mexico up the Mississippi River. A significant number of propulsion casualties occurred and were found to be related to clogged fuel filters that resulted after switching to the lighter distillate fuels. HSI learned, but did not have time to confirm, that this issue may have been the subject of an article by Karen Moore in *Proceedings* magazine in the mid-1990s.

Recommendation (INV-5): USCG should team with industry representatives to determine the cause of deep draft propulsion failures off the California coast and develop and implement corrective actions before an event with serious consequences occurs. Historical information from COTP New Orleans, industries with vessels transiting the Mississippi River, and Proceedings magazine may prove helpful.

Appeal Process

Some industry representatives raised concerns about the fairness of the appeals process. There is a general feeling in industry that the odds are stacked heavily against them in an appeals case and that it is not worth the time and cost to appeal, even if they believe they are right. A few in

industry expressed fear of retribution if they were to appeal. Some process and experience issues were raised:

> "In the past, appeals would go to at least the O-6 level at Headquarters, and in some cases to the Flag Officer level. Now it is reviewed by an O-5 at the highest appeal level. The questions asked by the O-5 were not probing, and it seems like there was limited flexibility. If you don't know the issues (competencies) it is natural to take the most risk-averse position on an issue."

> "The appeal goes to Headquarters where a non-lawyer in Prevention makes a judgment and the decision is not appealable—horrendous process."

> "In many cases Coast Guard appeals reviewers are program staff that have been involved in the case earlier—this is not an independent review."

We note strongly, though, that interviewees also expressed, in the majority of cases, that companies felt that their cases (and appeals) were correctly decided by the Coast Guard. We believe that the concerns expressed above are more likely dissatisfaction with individual results than valid indictments of the appeals process.

Administrative Law Judges (ALJ)

Some voiced their opinion that the Administrative Law Judges are not sufficiently independent of the Coast Guard, as the Judges work for the Coast Guard. Some do not view the ALJ as an independent arbiter of facts for the same reason. While there are doubtlessly multiple perspectives on the ALJ and appeals processes, the perceived lack of trust and independence in the existing system should result in Coast Guard discussions about how trust and credibility can be re-established.

Non/Semi-Regulated Maritime Industries

Following is a discussion of two unregulated or partially regulated maritime industries, commercial fishing and recreational boating. The challenges and opportunities to improve the prevention effectiveness of these maritime industries, which suffer the majority of maritime deaths and injuries, are described.

Commercial Fishing

The commercial fishing industry is widely recognized as a very dangerous occupation due to the equipment involved and the weather and environment in which fishing vessels operate. HSI met with commercial fishing industry representatives in New Bedford, MA; Seattle, WA; and Alaska, and further conducted a telephone interview with a senior representative of the commercial fishing industry to gain insight into the challenges, opportunities, and best practices of the industry and the Coast Guard in reducing maritime deaths and injuries, and oil spills.

In Seattle, HSI met with about 20 members of the North Pacific Fishing Vessel Owners Association (NPFVOA). NPFVOA's Vessel Safety Program is run as a non-profit organization solely dedicated to safety education and training for fishermen and other mariners. NPFVOA's Vessel Safety Program was developed in cooperation with the USCG in 1985 and has been

regarded as the nation's model safety training program for commercial fishermen since its inception. At least 35,000 people have attended the numerous Coast Guard-approved courses sponsored by NPFVOA. NPFVOA has a membership base of approximately 200 vessels and 150 support businesses and individuals. The organization also addresses environmental issues as they relate to public safety. The Seattle-based fishing fleet operates predominantly in Alaska and accounts for 85% of the seafood catch in Alaska, which roughly equates to 55% of the nation's harvest.

In a letter following our Seattle meeting, NPFVOA stated that

> "NPFVOA has worked closely with the Coast Guard to improve fishing vessel safety for 25 years. We hold the Coast Guard in the highest regard, and rely on their search and rescue capabilities that have saved numerous lives, as well as our marine safety partnership and related initiatives. It has been noted, however, that over the past 10 years the Coast Guard's emphasis has shifted from marine safety to operations and, after 9/11, to security. We believe it is essential for the Coast Guard to have a strong marine safety presence, along with a strong partnership with industry, if improvements to fishing vessel safety are to be realized."

In addition, NPFVOA had the following recommendations to improve the Coast Guard's prevention program:

- Provide more qualified marine inspectors and investigators who are *familiar with industry practices.*
- Marine Board investigators need to be held to a high standard of expertise. Their findings can be extremely valuable in improving industry practices and in leading to needed initiatives.
- Release Marine Board investigative reports, findings, and lessons learned in a timelier manner so that industry is likely to still be focused on the casualty, and more likely to improve practices. Industry will heed the findings/recommendations if they are credible, which is why marine inspectors and investigators need to be knowledgeable about industry practices.
- Increase the number of marine inspectors.
- Require pipeline training for marine investigators prior to their being able to be the lead investigator in any marine casualty investigation.
- Ensure that Districts work cooperatively and alleviate interpretive differences so that industry can be compliant in Districts where they operate. This is especially needed where vessels sail and/or operate in more than one District.
- Provide adequate advance warning when regulatory changes are made. Bring the affected stakeholders into play early in the planning stages of the changes.
- Decrease mariner credentialing time.
- Recognize Marine Safety, and particularly Fishing Vessel Safety, as a desirable (Coast Guard) career path and promote accordingly.

"Since March 23, 2009, we've had 12 fatalities, all fishing vessels (KATMAI, OCEAN RANGER, AMBER DAWN, ARCTIC ROSE mentioned). Despite the loss of life, we only have a two-person I.O. shop." CG Officer

"CG is targeting the 'big boys' but missing those with the greatest risks. All the people who are dying now are off of WA and OR-dungeness crabbers." (Primarily smaller operations not able to afford being members of larger fishing vessel associations and investing large amounts into safety equipment or vessel maintenance.)

"Stop the 'race for fish,' slow down the vessels. CG should note the difference between fishery 'derbies' (race for fish) and 'rationalized' fishing. CG has been reluctant to engage in rationalized fishing due to political issues, despite obvious safety benefits."

"The American Fisheries Act (1998) states you can't replace your boat or you lose your fishing quota (legislation). We need to be able to replace older vessels and now build to class." (Note: this is a legislative issue.)

- Increase field presence and Coast Guard oversight, and improve industry partnerships.
- Improve internal communications between senior Coast Guard officers and field personnel, which would result in more consistent enforcement nationally. The same holds true for communications among Headquarters, District, and field units.
- Improve casualty data to determine where the *real* risks are. Apply a risk-based approach to new safety initiatives and regulations for various regions and operations.
- Eliminate the confusion between regulatory tonnage and International Tonnage Convention (ITC) tonnage. Clearly delineate which tonnage is to be used for particular rules or regulations. Also, provide guidance to operators for vessels that only have regulatory tonnage and are not required to have ITC tonnage.

Several Seattle commercial fishermen stated that the regulations affecting them were interpreted differently in the Thirteenth District (Washington and Oregon), where most of their boats are tied up, than in the Seventeenth District (Alaska) where they actually fished. What was acceptable for safety, equipment, and stability in D13 was not always acceptable in D17, and it was problematic if they had to tie up to await equipment or repairs that they did not realize they would need when they departed for Alaska.

Recommendation (FSH-1): The Coast Guard should coordinate fishing vessel safety requirements (between Districts 13 and 17) and clearly communicate those requirements to those operating in D17 waters with sufficient notice so that fishing vessels can be properly prepared in advance and operate without unnecessary interruptions.

NPFVOA further stated that:

> "The Coast Guard has been very effective at improving fishing vessel safety in Districts 13 and 17, based on several initiatives that were implemented cooperatively. Safe Crab is a good example of the Coast Guard warning the crab industry before checking for compliance with their stability letters. Vessels found to be non-compliant were not allowed to leave the dock. The result was that the casualty rate was reduced from an annual average of eight fatalities per year in the 1990s

> to zero fatalities and no Coast Guard search and rescue missions on vessels participating in rationalized crab fisheries in the last three-and-a-half years, with one exception being a man overboard fatality in January 2009."

Facilitated discussions raised some additional issues, including a statement from a senior industry representative that the number of fishing vessels that sink each year has not changed much, but the number of lives lost had decreased, primarily due to the Coast Guard and industry providing training for fishermen on how to survive longer in the water until help can arrive—including safety training on how to don cold weather immersion suits, deploy life rafts, use flares, and survive in cold weather. The value of the safety training and education was echoed by both the Pacific and New England commercial fishing focus groups with which HSI met. The New Bedford fishing community commented extensively and very favorably on the safety education and training program offered by the University of Massachusetts at Dartmouth (with variable Coast Guard funding), stating that the training unequivocally saved lives and should be expanded. NPFVOA also conducts extensive safety training courses that have resulted in a safer and more safety conscious Pacific fishing fleet.

One strategy that appears to be effective in reducing fishing vessel and personnel casualties is the implementation of "Rationalized Fishing" by the National Marine Fisheries Service (NMFS). In past years, fishing seasons/dates were declared for specific species of fish in certain geographic regions and fishing boats would race to these areas and fish as long as they could or until they filled their holds. The problem with these "fishing derbies" is that the dates were fixed and the fishing windows often short, so commercial fishermen would feel compelled to fish regardless of detrimental conditions in order to make a living. In some cases, these detrimental conditions could include the questionable operation of important navigation, communications, or safety equipment; the sudden illness or loss of a key experienced crewmember; or the approach of a major storm or deteriorating sea conditions (significant seas and wind). Rationalized fishing, implemented by NMFS in some locations for specific species, allocates a certain number of days that a vessel with an approved fishing quota can fish during the year for specific species. This provides the latitude for a fishing vessel captain to modify his fishing schedule if a serious storm is approaching, a mechanical or electrical problem occurs, or his first mate and most experienced crew member suddenly cannot get underway with the vessel. This practice was reported by interviewees as having been used rather extensively in the northeast fisheries, and implemented in some of the Alaskan fisheries. The result has been safer fishing operations.

Recommendation (FSH-2): USCG should support and encourage NMFS rationalized fishing efforts to promote safer fishing vessel operations.

The Coast Guard's measures of effectiveness for marine safety include the number of maritime deaths and injuries. These are lagging indicators that are recorded after tragic events occur. To achieve a higher level of effectiveness, it would be very beneficial to identify leading indicators of high-risk situations so that interventions could be achieved before tragic events occur.

Although leading indicators for prevention are difficult to identify, the Coast Guard's Port State Control program already has one excellent example that shows how leading indicators determining risk levels can be used to improve safety, and that can be applied to the fishing industry prevention efforts. The Port State Control program was created out of recognition that

many of the maritime casualties in U.S. ports and waterways were caused by foreign vessels with less stringent safety, personnel, and equipment requirements than the regulated U.S. domestic shipping fleet. All foreign flag vessels must have a Port State inspection (by their Flag state) and be certified by a Classification Society. Some Port States and Classification Societies are very highly respected for their high safety standards and requirements and others are not as stringent, having a poor track record of safety incidents. The Coast Guard collected and analyzed data comparing the safety records of foreign flag vessels with various Port States and Classification Societies, and targeted those vessels with less stringent requirements and poor safety records for more frequent and detailed safety inspections. As a result, many safety discrepancies were identified in advance of these vessels arriving or departing from U.S. ports, and several were detained in ports or not allowed to enter U.S. ports until equipment was repaired, stability issues corrected, or safety equipment installed. The bottom line is that after a few years of this practice, ships with poor safety records either raised their standards prior to visiting the U.S., or no longer visited U.S. ports for fear of being detained and suffering economic consequences. The Port State Control program dramatically improved the safety in U.S. ports and waterways and has been recognized as a model and adopted by many nations globally.

The question that presents itself is: what might be the leading indicators of risk for the commercial fishing industry? In discussions with commercial fishermen on both coasts, it was conveyed that the fishing companies and owners who were successful economically normally maintained their vessels well; bought good/excellent navigation, communications, and safety equipment; paid good salaries to hire experienced and better crew members and captains; and provided good training for their personnel. Operations that were economically challenged might put off routine and necessary maintenance, might not have the best navigation and communications equipment, and might hire poorly trained personnel that might be below the standards of the economically successfulgroups. Although beyond the scope of this study, it was suggested that leading indicators that might be helpful to ascertain and mitigate risk in the fishing fleet would be the economic viability of a geographic region, specific fishing industry economics (for example, lobstermen in New England are struggling, while scallopers are doing well), or companies/owners suffering economic hardships.

Recommendation (FSH-3): USCG should undertake or contract for a study to determine the relationship between economic viability of fishing operations and marine casualties, recognizing that there may be different results for different regions due to seasonal weather conditions, geography, and availability of fish stocks. If a positive correlation exists, develop appropriate leading indicators, with input from the commercial fishing industry and partners (such as NMFS and state fishing agencies), and implement effective mitigation strategies.

During interviews with the Pacific commercial fishermen, a policy issue surfaced for fishing factory vessels operating off Alaska. The Coast Guard determined that these vessels needed more buoyancy when operating in the Bering Sea. However, the fishing regulations would not allow the replacement of existing ships with newer, more buoyant ships without the loss of their existing fishing quota (fishing quotas are attached to the original vessel and cannot be transferred). This creates a situation where one literally has to keep a vessel operational until it sinks. A proposed solution of putting sponsons on 50-year-old vessels for additional buoyancy will not necessarily make them safer.

Recommendation (FSH-4): USCG and its partners should look into how the commercial fishing fleet can be recapitalized and improve its safety without economic jeopardy as indicated above.

Recreational Boating

It is reported that approximately 83 million adult Americans and millions more youths participate in recreational boating, including sailing, fishing, power boating, canoeing, kayaking and other water activities.[57] Each year, hundreds of boaters and their passengers die and thousands are injured as a result of accidents, which has made recreational boating the nation's leading maritime component for water-related deaths. The largest contributing factors are operator inexperience, lack of knowledge of safe boating operations and navigation rules, lack of wearing life jackets, and boating while under the influence of alcohol.

Unlike most maritime industries regulated by the Coast Guard, a very large portion of recreational boating activities occur in state jurisdictions—lakes, rivers, reservoirs, and streams. While the recreational boating community is not regulated to the same extent as other maritime industries, the Coast Guard enforces manufacturer requirements for boats (flotation, capacity, fuel, ventilation) and associated equipment (life jackets, fire extinguishers, safety flares). As a result, the Coast Guard heavily relies on the states to conduct the bulk of recreational boating safety activities, including enforcement and accident investigations. The Coast Guard supports the states through boating safety grants. Most recently, over $120 million in boating safety grants were provided to the states and non-profit organizations for boating safety education, training, studies, enforcement, and accident investigations by state agencies and other grantees. The Coast Guard relies heavily on their state partners in recreational boating (particularly compared to the Coast Guard's other maritime prevention activities). This is reflected in the fact that the Coast Guard conducted less than 50,000 recreational boating safety enforcement boardings last year while the states conducted approximately 1.7 million. In addition, the U.S. Power Squadrons conduct about 20,000-25,000 non-enforcement vessel safety checks annually, and the Coast Guard Auxiliary conducts approximately 100,000 non-enforcement vessel safety checks each year.[58]

The Coast Guard partners closely with the National Boating Safety Advisory Council (NBSAC), which is a federal advisory council established to advise the Coast Guard with recommendations for policy and program initiatives. NBSAC is composed of three primary sectors working with the Coast Guard to reduce injuries, property damage, and the number of lives lost as a result of boating accidents. These three sectors—the national recreational boating organizations and the general public; boating safety officials (primarily boating law administrators and marine patrol officers); and boat and associated equipment manufacturers—are represented equally on the Council, with seven members each. The Council is comprised of three primary sub-committees including Prevention Through People, Boats and Associated Equipment, and Recreational Boating Safety Strategic Planning.

NBSAC saw the need to develop a national strategic plan to achieve its primary goals of further reducing the number of accidents that were resulting in deaths and injuries on the waterways.

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[57] "National Survey on Recreation and the Environment."

[58] Discussion with Mr. Jeff Hoedt, USCG Boating Safety Division, on October 31, 2008.

NBSAC developed a strategic plan during 2005-2007 with the engagement of many boating safety community partners. Since completion, 20 boating safety partner organizations have signed and endorsed the strategic plan that laid the foundation for national boating safety areas of emphasis with strategic goals and objectives outlined for 2007 through 2011. The strategic objectives are shown below:

Sub-tier Goals 1 and 2: Reducing the five-year average number of recreational boating safety deaths and injuries:

- Objective 1: Safety Education Certificates
- Objective 2: Awareness of Safe Boating Practices
- Objective 3: Advanced Boating Education
- Objective 4: Life Jacket Wear
- Objective 5: Operator Compliance—Navigation Rules
- Objective 6: Boating Under the Influence
- Objective 7: Manufacturer Compliance
- Objective 8: Operator Compliance—USCG-required Safety Equipment
- Objective 9: Boating Accident Reporting
- Objective 10: Determine Participation Denominator (Measuring boating participation days and determining exposure hours)

Sub-tier Goal 3: Measuring Effectiveness

- Objective 1: Review Annual Reports from Grants (Review Performance Report Part II, and Review Non-Profit Grants)

NBSAC established working groups for each objective. The role of the working group members is to reach out and connect with recreational boating safety partners to implement each of the objectives and strategies and to attempt to develop performance measures.

Recommendation (RB-1): USCG should continue to give its strong support for implementation of the comprehensive Strategic Plan of the National Recreational Boating Safety Program.

Seventy percent of reported recreational boating deaths occurred on boats where the operator had not received any formal boating safety instruction.[59] During the 80th meeting of the NBSAC in 2007, Council members voted unanimously in favor of a resolution recommending that the Coast Guard continue to seek authority to require boat operators to have formal boating safety training.

Recommendation (RB-2): The Coast Guard should continue to seek Statutory Authority to require that boat operators, on waters subject to the jurisdiction of the United States, possess a certificate showing completion of an education course or its equivalent (as proof of successful

[59] Coast Guard's 48th annual report, Boating Statistics 2006.

completion of a recreational boating safety course or test that conforms to National Boating Education Standards as recognized by the U.S. Coast Guard).

HSI attended the National Boating Safety Advisory Council (NBSAC) meeting on November 1-3, 2008, in Arlington, VA, observed many of the sessions, and conducted personal interviews with several of the Council members, including representatives of recreational boating manufacturers, state boating agencies (state boating law administrators), and national boating organizations. In addition, HSI met with representatives of the recreational boating community at some of the ports visited around the country. Relevant observations, comments, and suggestions are shared below.

NBSAC members gave the Coast Guard high marks for being a "vital partner," listening to the former's suggestions and concerns and then taking follow-up actions. NBSAC members also indicated that the Coast Guard's Boating Safety Division was very professional (although perhaps understaffed), and that Coast Guard Flag Officers appeared to be getting more engaged in boating safety than in the past; NBSAC members greatly appreciated their participation and engagement.

Members identified their highest priorities as being: (1) the wearing of life jackets, (2) education, and (3) alcohol. While they were confident that their recreational boating fatality data was accurate for boating accidents, and reasonably comfortable with serious injuries, NBSAC was not confident that their non-serious injury data was accurate.

When asked in what ways (if any) the Coast Guard delays or inhibits the NBSAC from achieving its goals, multiple members commented that the Regulatory process is "so long and painful." Members are hopeful that the Coast Guard will focus efforts on completing pending boating safety regulations implemented, as they feel that implementation of regulations would save lives. (Note: See prior recommendations for Boating Safety regulations under Standards and Regulations Development.)

Members were hopeful that the 17-character Hull Identification Number (HIN) program would be implemented, as it would tie together three different boat identification databases.

Members further thought that the Coast Guard should review the effectiveness of the Coast Guard's grants to non-profit organizations ($6.3 million annually), asking whether the grants are for initiatives that support the National Boating Safety Strategic Plan, Goals and Objectives; what has been the performance of grantees; and whether some grantees received funds simply because they had a history of receiving them.

Recommendation (RB-3): Resources permitting, Coast Guard should consider reviewing/comparing the effectiveness of its entire boating safety grant programs where it has the flexibility to redirect grants to more effective programs.

Recreational boaters in the ports had largely complimentary comments about the Coast Guard, but raised a few issues of more than local significance. It was mentioned that casual boaters do not generally know where to get Notice to Mariner (NTM) information, or know that they might wish to seek it out in the first place. Two hazard areas were raised for recreational boaters also: dredges (the barges are lit, but the long pipes, which are up to 1000 feet long, are not), and the fact that while large container ships are "lit," recreational boaters near the water's surface cannot see the lights, which can be as high as 60 feet above the water for tugs and lightly loaded barges.

Recommendation (RB-4): USCG should review navigational lighting configurations (such as dredge piping and tall vessels) from the perspective of a recreational boat operating near the water surface at night for safety concerns, and take appropriate action as necessary.

V. SUMMARY AND CONCLUSIONS

The Coast Guard's Prevention program (marine safety, prevention portion of marine environmental protection, and boating safety) is largely effective. This is generally reflected in long-term downward trends in the number of deaths and injuries in the maritime environment, and the steady and significant downward trend in the number and volume of oil and chemical spills. Some doubt exists in the very recent marine safety trends in commercial passenger and commercial mariner deaths, which are showing signs of an upward trend.

The Coast Guard has developed, over many years, a very successful Prevention program. The successes include:

- Significant respect from all stakeholders regarding Coast Guard professionalism
- Widespread corporate knowledge and expertise in the prevention field
- Excellent and active relationships with an enormous variety of prevention partners
- Personnel with the insights into Prevention Program challenges, and the abilities to address the challenges (such as mariner credentialing, workforce projections, engineering plan review)
- A dedicated workforce with a passion for their jobs and public service

It is clear that there are many opportunities to improve further the effectiveness of the Prevention programs. Issues include:

- The need for timely development and implementation of standards and regulations in the areas of towing vessels, boating safety, and offshore activities
- The experience and competency levels of the Coast Guard's inspectors, marine casualty investigators, and other Prevention professionals, which have declined in recent years
- Unreliable workload measurements, which result in the Coast Guard not knowing the level of workforce needed to meet the workload
- The existing Coast Guard Personnel Allowance List, which does not accurately reflect the number, levels, and types of personnel needed to successfully execute the Prevention mission
- The self-perceived inability of industry representatives to access USCG Prevention decision makers, as evidenced by delays in Coast Guard processing of mariner credentials, inspection of transiting vessels, and/or arrival of investigators on scene
- Performance measures that do not fully reflect the entire Prevention Program, are not normalized, and do not clearly link Coast Guard Prevention activities to program outcomes

The Coast Guard has recognized many of these issues and taken proactive steps and corrective actions. These actions include development of a Marine Safety Performance Plan, with input

from industry; the addition of over 300 inspectors (including over 100 civilian inspectors); the establishment of "feeder ports" to act as training bases for entry level Prevention personnel; and the creation of Centers of Expertise for subject matter expertise and training in specialized maritime industries. Additional actions are being taken not only to grow the competencies needed by Prevention personnel, but also the capacity of the Prevention program through the Sector staffing study, which seeks to determine the actual number of Prevention personnel needed to effectively perform the mission, and the Workforce Projection Model, which seeks to determine how best to grow the workforce to produce the number of journeymen inspectors, investigating officers, and other prevention personnel needed to execute this critical mission.

Based on discussions with over 500 Coast Guard personnel and stakeholders from around the country, and significant documentation and performance data review and analysis, this report provides additional suggestions for further improving the Coast Guard's effectiveness and efficiency in this mission area. Over 75 specific recommendations are summarized in Appendix B.

An asterisk indicates those recommendations that HSI believes the Coast Guard should consider among its higher prevention priorities. Some recommendations are annotated with (x), which indicates that these recommendations may be relatively straightforward to implement without high cost or a great deal of policy complexity.

Recommendation (GEN-2): Our final recommendation is that a single individual or staff element at Coast Guard Headquarters be responsible for overseeing and coordinating the specific and detailed recommendations identified within this evaluation. That individual or staff element should have sufficient resources, authority, and accountability to see those recommendations through to completion.

HSI is grateful to the hundreds of Coast Guard and stakeholder personnel who candidly contributed their concerns, suggestions, and strategies for improving the Coast Guard's prevention program. Without their invaluable input this report would not have been possible.

APPENDIX A: SUMMARY INTERVIEWEE LIST

HSI conducted interviews between November 2008 and March 2009 (inclusive). The interviews were conducted in person across the United States, with representation from as many prevention stakeholders as was practicable.

The interviews were done on a not-for-attribution basis. The list below provides sufficient information to regarding breadth of interviewees, but does not violate the not-for-attribution nature of the interviews. The number of interviewees at each meeting is listed in parentheses following the meeting/interview description.

- Attended NBSAC Meeting and met with NBSCA committee members (Arlington, VA) (6)
- Met with CDR Carter, NOSAC Designated Federal Officer (New Orleans, LA) (1)
- Attended NOSAC Meeting (New Orleans, LA) (4)
- Met with Sector New Orleans Command and Prevention Staff (New Orleans, LA) (4)
- Met with Sector Houston Command and Prevention Staff (4), Gulf Intracoastal Association (GICA) (1), American Bureau of Shipping (ABS) (4) (Houston, TX)
- Super tanker vetting inspector (Houston, TX) (1)
- Attended CTAC Meeting (Houston, TX) (6)
- Attended USCG Innovation Expo (met several USCG members and discussed this evaluation – RDML Neffinger, LCDR Paul Mucha (D1 Organizational Performance Consultant), CAPT Hung Nguyen (Sector Ohio Valley Commander), Travis Taylor (Sr. Marine Inspector-RTC Yorktown, CWO Rick Boyko (Sr Marine Inspector, Marine Inspection & Investigations School – Yorktown) (Norfolk, VA) (5)
- Met with LANTAREA Prevention (CDR Emeric), Inspections & Investigations and CDR Emile Benard, Chief Waterways (Norfolk, VA) (2)
- Attended Navigation Safety Advisory Council (NAVSAC) Meeting (Washington, DC) (3)
- CAPT Gordon Loebl, Chief, Office of Quality Assurance & Traveling Inspectors (CG-546) (1)
- CAPT Eric Christensen (Chief) and Bob Gauvin (Technical Advisor), Office of Vessel Activities (CG-543) (2)
- Mr. Jeff Lantz (SES), Director of Commercial Regulations and Standards (CG-52) (4)
- Visited National Maritime Center (NMC) (4)
- CAPT Mike Rand (Chief) and Doug Rabe (Technical Advisor), Office of Investigations and Analysis (CG-545) (2)
- RDML Brian Salerno Asst. Commandant for Marine Safety, Security and Stewardship (CG-5) and RDML Jim Watson, Director of Prevention Policy (CG-54) (2)

- Western Rivers Visits:
  - St. Louis, MO, and Harford, IL: Sector Upper Mississippi River Commander (CAPT Steve Judson), CDR Cunningham (Deputy) and LCDR Tim Whalen (Prevention Chief) (3); Towing Industry representatives on Miss. River waterfront (8); National Maintenance and Repair Shipyard, met Scott Detring, Safety Director, and staff (6); Conoco-Phillips refinery, met James Ditterline (Logistics Coordinator), Shawn Miller (HSEQ Coordinator) and Larry Forehand (Chief of Security) (3); Passenger Vessel operators, Tom Dunn, Director of Operations for Gateway Arch Riverboats and his Marine Operations Manager, Gary Desnoyer (2)
  - Paducah, KY: Marine Safety Unit (MSU) Paducah Commanding Officer (CDR Chris Myskowski), XO, Chief of Prevention and senior staff (6); Visited Seaman's Church Institute (SCI) (Training facility for tug and barge industry personnel), met towing and related industry representatives including Mario Munoz, Chairman of the Towing Safety Advisory Committee (TSAC), and Les Grimm, Ingram Barge, AWO representative who works closely with SCI (26)
  - Louisville: Sector Ohio Valley Commander (CAPT Hung Nguyen) and staff, XO, Prevention Chief (LCDR Phil Ison), 2 LTJGs, OS Sr Chief, Chief of Logistics (9); Three stakeholder groups including shipyards/facilities, towing/barge lines, casino, tank farms, bulk terminals (12)
- Interviewed Jim Adams of American Commercial Lines (ACL) and an AWO representative by phone (1)
- CAPT Mark O'Malley, Chief, Office of Ports and Facilities Activities (CG-544) (1)
- CDR Byron Black, Office of Shore Forces-Sector Program Manager (CG-7411) (1)
- Great Lakes Visits:
  - Cleveland: USCG Ninth District Sr. Prevention staff: Chief (CAPT Lorne Thomas), Deputy (CDR Tim Cummins), LCDR Dean Firing and Bob Allen (Env. Specialist) (4); Commanding Officer of Marine Safety Unit Cleveland (CDR Linda Sturgis) (1); Lake Carriers Association representatives Jim Weekly (President) and Glen Nekvasil (VP Corporate Communications) representing 16 companies that own 63 laker vessels (400-1000 ft vessels) that transport bulk commodities on the Great Lakes (2); Ninth District Commander (RDML Peter Neffenger) and his Chief of Staff (CAPT Dave Callahan) (2); Great Lake Towing Company: Mr. Ron Rasmus, President and CEO, and Gregg Thauvette, VP Operations (2)
  - Milwaukee: Sector Milwaukee Commander (CAPT Bruce Jones), Chief of Prevention (CDR Charlie Tenney) and Prevention staff (8); Port partners (U.S. Army Corps of Engineers, Milwaukee Marine Patrol, WI Dept. of Natural Resources, Milwaukee Harbormaster (5); Vessel and facility operators (Car ferry, Tank farms, bulk terminals, salvors, yacht club (7)
  - Chicago: Marine Safety Unit (MSU) Commanding Officer (CDR Paul Mehler) and his senior staff (6); CBP Assistant Port Director, Tactical Operations (Mary McCarthy) (1); Vessel and Facility operators (Wendella tour boats – Michael Borgstrom, President, is a past chairman of the Passenger Vessel Association (PVA)), Chicago Yacht Club, British Petroleum, Ports of Indiana, bulk terminals) (8); MSU junior officers (4), enlisted members (8), and Chief (1)

- Northeast Port Visits: New York, Boston, Providence, Fall River MA, New Bedford, MA:
  - New York: Senior Sector New York Prevention staff (CDRs Paul Flaherty and Brian Gisel) (2); Towing/AWO representatives (K-Sea and McAllister Towing) (4); Working lunch with senior Prevention staff for Inspections and Investigations (6); Sector New York Inspectors and Investigating Officers (15); Sector Commander, CAPT Bob O'Brien (1); Sector New York TWIC Coordinator, Mr. Frank Fiumano, and Lockheed Martin TWIC Program Coordinator, Mr. Patrick Coscette (2); Mr. Brian Fisher and John C. (Prevention staff) escorted us to various harbor facilities to meet stakeholders (2), Staten Island Ferry staff (3), New Jersey Sandy Hook Pilots Association (3), Towing Industry representatives (Moran & McAllister) (2), Bethann Rooney, Manager, Port Security, Port Authority of NY&NJ (1)
  - Boston: First District Chief of Prevention and his staff (4) Sector Boston Prevention staff (CDR Claudia Gelzer, Chief, LCDR Chris Gagnon-Inspections & Investigations, LCDR Pamela Garcia-Waterways) (3)
  - Providence: Sector Southeastern New England staff including Sector Commander (CAPT Ray Perry), Executive Officer (CDR John Kondratowicz) and Prevention Chief (CDR Pat McElligatt) (15)
  - Fall River, MA: Regional stakeholders (Moran shipping, Steamship Authority, ferry, shipping agents and Mass. Maritime Academy) (20)
  - New Bedford, MA: Commercial Fishing Industry representatives (scallopers and lobstermen, New Bedford Port Director, USCG Auxiliary rep) (7)
- RDML Mary Landry, Director Governmental and Public Affairs (CG-092) (1)
- Mr. Howard Hime, Chief, Mr. Jaideep Sirkar, Administrative Program Manager, and staff, Standards Evaluation and Development Office (CG-523) (3)
- INTERTANKO, Mr. Joe Angelo (1)
- West Coast and Alaska Visits: LA/Long Beach, Seattle, Anchorage, Valdez:
  - Los Angeles: Sector Los Angeles/Long Beach: Chief of Prevention (CDR Dan Kane) and Chief of Response (CDR Collins) (2); Sector LA/LB Marine Inspectors and Investigating Officers (28); Facility Security/Safety Officers (7); Sector Commander (CAPT Paul Wiedenhoeft); Deep Draft Industry (Cruise ships, container vessels, tanker pilots (8); Small passenger vessels, ferries and tour boats (3); Long Beach and Los Angeles Port Authorities (5); USCG Regional Exam Center Supervisor (1); USCG Pollution Investigators (7); Partner Agencies & Organizations (Fed/State/Local & OSROs) (7); Shipping Agents (4); Command Senior Chief & Reserve Senior Chief (2); Towing, Offshore Supply Vessels, Bulk (4); Recreational Boating Interests (2)
  - Seattle: USCG District Thirteen and Sector Seattle Prevention Staffs (5); Sector Seattle Prevention Junior Officers (6); Ports and Waterfront Facilities (3); Harbor Services representatives (agents, life raft facilities, shipyards, salvors) (15); Passenger Vessel Industry (small passenger vessels, tour vessels; Washington State ferries, Masters, Mates & Pilots Unions, cruise ships) (8); Commercial Fishing Industry (North Pacific Fishing Vessel Owners Associations and Alaska Crab

Coalition representatives) (22); Deep Draft, Pilots and Towing Vessel representatives (11)

  - Anchorage: Sector Anchorage Commander (CAPT Mark Hamilton) and Chief of Prevention (CDR Dreiyer) (2); Sector Junior Officers (3); Port, Waterfront Facilities, and Harbor Services representatives (21); Passenger Vessel Industry (6); Commercial Fishing Industry (1) (Note: Cod season had just opened up and many were actively engaged in fishing); Deep Draft, Pilots and Towing Vessel representatives (6)
  - Valdez: Tour of marine facilities including end of Alaskan Oil Pipeline facility – LT Jesse Garrett, Chief of Inspections, Marine Safety Unit (MSU) Valdez (1); MSU Valdez staff (9); Observed quarterly Area Maritime Security Committee (AMSC) meeting with local government partners and key industry representatives; Facility and Shipping representatives (tankers, facilities, Valdez Port Director, shipping agent, SERVS, SPV fleet, fisherman and pilots) (12); City and State Officials (Alaska Dept of Conservation, National Guard, City Manager, Police Chief, Fire Chief, Harbormaster and CBP) (9); Regional Citizens Advisory Council (5)

- Marine Safety Center, Washington, DC, met with CAPT Pat Little, Commanding Officer, and senior staff (5)
- CAPT Frank Sturm, Deputy Director, Prevention Policy Directorate (CG-54) (1)
- CAPT Ted Thompson, Sr. VP, Technical & Regulatory Affairs, Cruise Lines International Association, Inc. (CLIA) (1)
- Mr. Paul Kirchner, Executive Director-General Counsel, and Mr. Clay Diamond, Deputy Director, American Pilots' Association (APA) (2)
- Mr. Dave McLeish and staff, Workforce Planning and Projections (3)
- Visit to Massachusetts Maritime Academy (Buzzards Bay, MA) to meet with MA, ME and NY Maritime Academy personnel and Maritime Administration (MARAD) representatives (15)
- CAPT Dave Throop, CG Personnel Command, Officer Personnel Management (5)
- Prevention Detailers, CG Personnel Command (5)
- MARAD, Mr. Paul Gilmour and staff, MARAD HQ (DC) (4)

U.S. Coast Guard Personnel Engaged: 224

Port Partners Engaged: 56

Industry and other Stakeholder Personnel Engaged: 231

Total: 511

Ports Visited (17): Anchorage, Boston, Chicago, Cleveland, Fall River, Houston-Galveston, Los Angeles/Long Beach, Louisville, Milwaukee, New Bedford, New Orleans, New York, Paducah, Providence/Southeastern New England, St. Louis, Seattle, Valdez

Additional cities: Norfolk, VA, Martinsburg, WV, Washington, DC, Buzzards Bay, MA

APPENDIX B: RECOMMENDATION SUMMARY

(Recommendations in bold print indicate those that HSI suggests the Coast Guard should consider as priority issues. Recommendations cited as (x) indicate recommendations that may be relatively straightforward to implement, with no obvious significant resource or policy issues.)

Legend for Recommendations:

GEN—General

REG—Standards and Regulations

CMP—Compliance

WRK—Workforce

ORG—Organization and Leadership

PAR—Partner Relations

IND—Industry and Public Outreach

INV—Investigations and Casualty Analysis

FSH—Commercial Fishing

RB—Recreational Boating

Report Section	Recommendation Summary
Performance Assessment	(GEN-1) Establish a Center of Expertise for spill response and cleanup.
Standards and Regulations Development	(REG-1) Develop a separate priority list for Prevention program regulations.
Standards and Regulations Development	(REG-2) Institute transparency during regulations metric development.
Standards and Regulations Development (Towing Regulations)	**(REG-3) Provide stakeholders with transparency into towing regulation development so that the towing industry can gauge its readiness to comply with new regulations.**
Standards and Regulations Development (Towing Regulations)	**(REG-4) Work assertively in consultation with TSAC toward implementation of new towing regulations within the next two years.**
Standards and Regulations Development (Boating Safety Regulations)	**(REG-5) Provide stakeholders transparency into boating safety regulation development.**
Standards and Regulations Development (Boating Safety Regulations)	**(REG-6) Move assertively to implement boating safety regulations in consultation with NBSAC over the next 2-3 years.**
Standards and Regulations Development (Outer Continental Shelf)	**(REG-7) Re-engage NOSAC to ensure proposed Sub-chapter N regulations (Outer Continental Shelf Activities) are current and implement these regulations within the next 2-3 years.**
Standards and Regulations	(REG-8) Develop a process to systematically review and update

Development (Outdated Regulations)	regulations with opportunities for input and feedback from the maritime industry.
Standards and Regulations Development (Outdated Regulations)	(REG-9) Evaluate the $25,000 damage threshold for initiating marine casualty investigations and consider raising it to a more appropriate level.
Compliance Verification and Enforcement (Competencies)	(CMP-1) Assess and forecast the number of civilian prevention personnel needed in the future to provide continuity, training, sills, knowledge, and local expertise for CG units.
Compliance Verification and Enforcement (Capacity)	(CMP-2) Develop a process to periodically update the Sector Staffing Study to ensure that the CG has sufficient personnel to carry out its missions.
Compliance Verification and Enforcement (Capacity)	**(CMP-3) Ensure that sufficient infrastructure exists to support new staff assignments.**
Compliance Verification and Enforcement (Workload Issues)	(CMP-4) Review the Prevention workload and prioritize based on risk.
Compliance Verification and Enforcement (Workload Issues)	(CMP-5) Revisit requirement to inspect all tug and barge groundings in Western Rivers.
Compliance Verification and Enforcement (Workload Issues)	(CMP-6) Include Prevention issues on equal footing for consideration in national discussions and risk models with security low probability/high consequence issues such as WMD.
Workforce Issues	(WRK-1) Determine marine safety and general prevention capacity by determining a standard measure of true capacity and track as an indicator of prevention outcomes.
Workforce (Standards)	**(WRK-2) Develop realistic expected timeframes for members to achieve their qualifications.**
Workforce (Standards)	(WRK-3) Develop realistic capability standards for inspectors and investigators – determine how many activities (and how well) they can be expected to perform annually within a given port.
Workforce (Standards)	**(WRK-4) Build in flexibility, where appropriate, from standard practices Take into consideration the location of ports, the industries there, and the length of the maritime season (for example, "recency" requirement for Alaska). (x)**
Workforce (Standards)	(WRK-5) Develop and employ a prevention program personnel time tracking tool to capture the time spent on prevention activities.
Workforce (Identify personnel requirements based on workload)	(WRK-6) Monitor the prevention workload and workforce capabilities to identify and close workload gaps. Develop a predictive "What if?" tool to determine in advance the workload implications of new or revised regulations, trends in industry, new technologies, and changes in staffing levels.
Workforce (Identify personnel requirements based on workload)	**(WRK-7) Fix the Personnel Allowance List to accurately reflect the *de facto* levels, types, quantities, and locations of prevention people needed across the Coast Guard.**
Workforce (Training)	**(TRG-1) Ensure that training infrastructure is sufficient to accommodate current and anticipated prevention training requirements.**
Workforce (Training)	(TRG-2) Explore partnering with other organizations to provide surge training to meet training requirements.

Workforce (Training)	**(TRG-3) Establish training and qualification standards for prevention personnel and create a sufficient prevention training budget.**
Workforce (Training)	(TRG-4) Develop a response policy or plan that permits temporary duty assignment of personnel to Districts/Sectors when needed for surge or technical inspection needs.
Workforce (Training)	**(TRG-5) Establish and fill an O-5 billet and possibly related staff positions in a FORCECOM that will be responsible and accountable for CG-wide prevention training standards, consistency and quality control.**
Workforce (Training)	(TRG-6) Maximize technology to provide informal job resources, including immediate consultation capability with experienced personnel (such as Twitter or Job Help Desk).
Workforce (Assignments)	**(WRK-7) Update and validate the Workforce Projection model using a *de facto* PAL.**
Workforce (Tour Lengths)	**(WRK-8) Extend Prevention officer tour lengths to four years, with reasonable exceptions.**
Workforce (Career Paths)	**(WRK-9) Study, develop, identify, and communicate viable career paths to prevention personnel.**
Workforce (Career Paths)	(WRK-10) Investigate the value of the Civil Engineering Yellow Book concept for conveying career path and assignment information to the prevention community.
Workforce (Career Paths)	(WRK-11) Incorporate introductory information for prevention career paths into OCS and CG Academy training curricula.
Workforce (Workforce Management)	**(WRK-12) Designate or create a new Prevention Workforce Management office or role within Prevention programs with responsibility and accountability for Prevention workforce management and liaison, similar to the former G-MRP function.**
Workforce (Workforce Management)	**(WRK-13) Establish and communicate standard expectations for entry-level Prevention personnel at feeder ports regarding qualification attainment.**
Workforce (Workforce Management)	**(WRK-14) Eliminate O-2 investigating officer billets, and fill O-3 positions with qualified investigating officers.**
Workforce (Workforce Management)	(WRK-15) Significantly reduce or eliminate LTJG prevention *staff* positions, which do not provide the technical foundation for developing Prevention professionals.
Workforce (Workforce Management)	**(WRK-16) Do not assign first-tour Prevention personnel to small ports.**
Workforce (Workforce Management)	(WRK-17) Explore increasing incentives to help fill civilian Prevention positions with professional marine industry members.
Workforce (Workforce Management)	(WRK-18) Review and consider re-establishing the DCO program for licensed Merchant Marine officers.
Workforce (Workforce Management)	**(WRK-19) Complete the Sector staffing study and determine the workload gap for each Sector. Assignment officers work with Sector Commands to fill personnel gaps through the annual transfer process to meet the *collective requirements of the Sector* through the *combined skill sets of the incoming transferees*.**
Organization and Leadership (Headquarters)	**(ORG-1) Establish an office solely responsible and accountable for coordinating and integrating Prevention policy, planning, workload analysis, workforce analysis, and budgeting in order to improve the**

	overall effectiveness and efficiency of the Prevention program.
Organization and Leadership (Headquarters)	(ORG-2) Use office names, followed by office numbers, when communicating with Coast Guard partners, industry, and other stakeholders. Include publicly accessible contact information for the Coast Guard offices involved in public outreach activities. (x)
Organization and Leadership (Sectors)	**(ORG-3) Re-examine the Sector construct with regard to MEP response.**
Organization and Leadership (Sectors)	**(ORG-4) "Right-size" the Sector staffs with response and prevention personnel redistributed to billets that better match their skill sets and experience based on the analysis from the Sector staffing study.**
Organization and Leadership (Sectors)	(ORG-5) Add Marine Safety to Operations Specialist training.
Organization and Leadership (Sectors)	**(ORG-6) Properly size the Sector staffs with personnel working in their areas of expertise, and reinstate four-year tour lengths for junior officers to resolve staffing issues at this level.**
Organization and Leadership (Sectors)	(ORG-7) Build and communicate viable career paths for developing professional Chiefs of Prevention, Response, and Logistics.
Organization and Leadership (Sectors)	(ORG-8) Establish an informal advice network as a resource for Sector Commanders when confronted with unclear situations. (x)
Organization and Leadership (Sectors)	(ORG-9) Identify Sector "best/proven" practices, and establish a formal way to share this information with all Sector command cadres. Assign a single point of contact or staff element to coordinate sharing and implementation of these practices. (x)
Partner Relations (Establish Networks)	(PAR-1) Coordinate (with partners) performance measures development and tracking in the areas of boating safety (boater deaths, primarily; and injuries, secondarily) and marine pollution incidents, in order to collectively identify trends and therefore determine the resources necessary to address common safety and pollution issues.
Partner Relations (Establish Networks)	**(PAR-2) Identify and share best practices nationwide, and collect and share knowledge that can benefit MS/MEP outcomes.**
Partner Relations (Establish Networks)	(PAR-3) Attempt to coordinate marine safety inspections and examinations with Coast Guard security boardings and other boardings (such as CBP).
Partner Relations (Share Costs)	(PAR-4) Assess the ideal mix of Coast Guard and non-Coast Guard participation in prevention activities and determine a long-term roadmap to ensure that the ideal mix is realized.
Partner Relations (Fill Gaps in USCG Prevention Program)	**(PAR-5) Provide industry with frequent updates on progress in Coast Guard/industry coordination efforts for a towing inspection regime.**
Industry and Public Outreach (Mariner Credentials)	**(IND-1) We strongly recommend that the Coast Guard fix the credentialing crisis as one of its very top priorities. State clearly and provide to industry universally the timelines necessary for submission of paperwork and the specific information necessary for submission of health-related issues (including additional paperwork, as necessary).**
Industry and Public Outreach (Mariner Credentials)	**(IND-2) When the Coast Guard fails to meet publically issued deadlines, a predetermined risk-based analysis should inform a decision to immediately extend the expiration deadlines of current mariners' credentials so that mariners are not unduly punished due to the Coast Guard's capacity or expertise issues.**

Industry and Public Outreach (Mariner Credentials)	**(IND-3) NMC should increase its medical staff and include doctors and medical personnel who can not only make timely decisions, but also educate mariners.**
Industry and Public Outreach (Operational, Compliance, and Enforcement Consistency)	**(IND-4) The Coast Guard should take appropriate steps to provide more consistent interpretations and enforcement of prevention regulations and policy.**
Industry and Public Outreach	(IND-5) Increase *Proceedings* article availability by including Proceedings on Homeport, and by including *Proceedings* articles within the appropriate subject areas on Homeport. Include "Top Ten" lists for types of casualties in Proceedings articles and/or post on Homeport. (x)
Industry and Public Outreach (Best Practices)	(IND-6) Expand the Cooperative Boarding Program by either implementing nationally, or encouraging COTPs to institute regionally, a day or week of non-attribution inspections/examinations where vessel owners/operators could have inspections made without penalty for deficiencies, if they make corrections within a reasonable time period.
Industry and Public Outreach	(IND-7) Examine and implement ways to make the Homeport website more accessible and easier to use for industry and other stakeholders.
Investigations and Casualty Analysis	**(INV-1): Implement a feedback mechanism so that lessons learned from investigations can be shared with industry in a timely manner, informally and formally, and acted upon by industry, other stakeholders, and the Coast Guard. (x)**
Investigations and Casualty Analysis	(INV-2): CG and NTSB should develop a feedback loop to include pertinent investigation information that can contribute to prevention program effectiveness.
Investigations and Casualty Analysis	(INV-3): Assess whether the Coast Guard's investigation activities have negative consequences (related to prosecution) that impede the gathering of information for safety and other prevention purposes. Depending on findings, determine an effective approach to overcome such a conflict while meeting both investigation and prevention goals.
Investigations and Casualty Analysis	(INV-4) If not currently done, conduct and distribute an annual casualty review to industry to raise the awareness of the root causes of recent marine casualties. (x)
Investigations and Casualty Analysis	**(INV-5) Determine the cause of deep draft propulsion failures off the California coast and develop and implement corrective actions.**
Non/Semi-Regulated Maritime Industries (Commercial Fishing)	**(FSH-1) Coordinate fishing vessel safety requirements (between Districts 13 and 17) and clearly communicate those requirements to those operating in D17 waters with sufficient notice so that fishing vessels can be properly prepared in advance and operate without unnecessary interruptions.**
Non/Semi-Regulated Maritime Industries (Commercial Fishing)	**(FSH-2) Support and encourage NMFS rationalized fishing efforts to promote safer fishing vessel operations.**
Non/Semi-Regulated Maritime Industries (Commercial Fishing)	(FSH-3) Undertake or contract for a study to determine the relationship between economic viability of fishing operations and marine casualties. If a positive correlation exists, develop appropriate leading indicators with input from the commercial fishing industry and partners (such as NMFS and state fishing agencies) and implement effective mitigation strategies.
Non/Semi-Regulated Maritime Industries	(FSH-4) Investigate (with partners) ways in which the commercial fishing fleet could be recapitalized and improve its safety without economic

(Commercial Fishing)	jeopardy.
Non/Semi-Regulated Maritime Industries (Recreational Boating)	**(RB-1) Continue to give its strong support for implementation of the comprehensive Strategic Plan of the National Recreational Boating Safety Program.**
Non/Semi-Regulated Maritime Industries (Recreational Boating)	**(RB-2) Continue to seek Statutory Authority to require that boat operators, on waters subject to the jurisdiction of the United States, possess a certificate showing completion of an education course or its equivalent (as proof of successful completion of a recreational boating safety course or test that conforms to National Boating Education Standards and as recognized by USCG).**
Non/Semi-Regulated Maritime Industries (Recreational Boating)	(RB-3) Resources permitting, consider reviewing/comparing the effectiveness of its entire boating safety grant programs where it has the flexibility to redirect grants to more effective programs.
Non/Semi-Regulated Maritime Industries (Recreational Boating)	**(RB-4) Coast Guard should review navigational lighting configurations (such as dredge piping and tall vessels) from the perspective of a recreational boat operating near the water surface at night for safety concerns, and take appropriate action as necessary.**
Conclusions (Coordinating Implementation of Recommendations)	**(GEN-2) A single individual or staff element at Coast Guard Headquarters be responsible for overseeing and coordinating the specific and detailed recommendations identified within this evaluation. That individual or staff element should have sufficient resources, authority, and accountability to see those recommendations through to completion.**

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