Successful Investigative and Regulatory approaches to Reducing Pollution from Commercial Vessel Machinery Space Bilges

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Abstract

Over the past decade, the United States Coast Guard Sector Southeastern New England (SENE) along with state and local partner agencies in the New Bedford, Massachusetts area have been attempting to understand commercial vessel's inability to comply with the Code of Federal Regulations (CFR) regarding oily bilge waste and proper disposal options. The regulations have been in effect since 1983 requiring oceangoing vessels of less than 400 gross tons to have the capacity to retain all oily mixtures onboard or install an approved oily water separator (OWS) equipment for processing oily mixtures from bilges.

New Bedford, MA is the homeport to over 400 commercial fishing vessels within a 2 square mile port area. The circumstances in New Bedford are considered to be representative of most ports for vessels less than 400 gross tons nationwide. Sector SENE has used various mechanisms to educate the local commercial vessel fleet owners and operators. The education includes the issuance of Marine Safety Information Bulletin 03-18 by Coast Guard Headquarters (United States Coast Guard, 2018).

In 2012, the Partner Agency - Massachusetts Department of Environmental Protection created and funded the Bilge-Pump-Out Program. This voluntary program provides commercial vessels with free oily bilge waste disposal services. Previously, there was no established "permanent" solution to the pervasive oily discharge problem and bad practice of illegally disposing of oily waste directly from commercial vessel bilges overboard into U.S. navigable waterways. In conjunction with local authorities having jurisdiction, Sector SENE began a focused pollution prevention and enforcement effort. Several pollution cases were forwarded to the Department of Justice (DOJ) and fines of over 1 million dollars have been issued for the illegal practices. The culmination of educational outreach, surge operations and coordinated interagency efforts have led to the initial levels of compliance.

Introduction

The Port of New Bedford in Massachusetts has been inundated by chronic mystery oil spills for the past several decades. The closed configuration of New Bedford harbor caused by the hurricane barrier at the entrance to the port highlights the constant illegal discharging of vessel machinery space bilges. Since 2015, United States Coast Guard Sector Southeastern New England (SENE), specifically Marine Safety Detachment (MSD) New Bedford a sub unit, has increased its investigation into pollution from vessels to decrease oil spills and sheens. Increased oil sampling and the identification of pollution sources have uncovered that it is common practice for vessels less than 400 gross tons to not comply with the pollution prevention regulations. Due to vessel design constraints, limited regulatory oversight, and industry culture, some vessels are discharging oily waste into U.S. waters as a routine business practice rather than disposing of oil in accordance with regulations. The Port of New Bedford is approximately two square miles in area and is the operational base for over 400 commercial fishing vessels. A section of the Port of New Bedford is shown in Figure 1.

Figure 1: Section of New Bedford Harbor, past pollution overflight photo

Past Practice

The local community had previously accepted oil sheens in the harbor as a normal condition and therefore a limited number of pollution reports were completed. Through educational outreach, working with local municipalities and an increased Coast Guard Enforcement presence, MSD New Bedford, encouraged increased pollution event reporting. The progress in pollution event reporting was evident in 2016 when 70 spills were reported, the most for the area in the history of the National Response Center (United States Coast Guard, 2020). This increase was seen as a positive development, since the community began to recognize the that the presence of oil sheens was an unacceptable outcome for the marine environment. Once pollution in the harbor was acknowledged as a significant issue, MSD New Bedford worked to identify potential sources of the pollution. One potential source identified was from commercial vessels pumping oily bilge water overboard, particularly commercial fishing vessels.

Applicable Regulations

The Act to Prevent Pollution from Ships, generally 33 U.S.C. 1901, *et. seq.* (APPS) required the Secretary of Transportation to prescribe regulations to implement the provisions of MARPOL 73/78. The proposed standards to be implemented included the requirement for the installation of oily water separating equipment on vessels greater than 100 gross tons. Due to industry concerns, modifications were made prior to signing the Act into law, exempting vessels less than 400 gross from installing oily water separator equipment or oil content meters. This led to the implementation of 33 CFR § 155. 330 and 33 CFR § 155.350 in 1983, which allowed vessels less than 400 gross tons to retain all oily mixtures onboard and to discharge these oily mixtures to a reception facility as detailed in Figure 2. Alternatively, vessels could install a Coast Guard approved oily water separator (OWS) that will meet the requirements by separating the

oily waste and only discharging the effluent overboard once the effluent oil content is below 15 parts per million (ppm).

Figure 2: Flow Chart Display for Code of Federal Regulation Requirement's for All Commercial Vessels

As outlined in 33 CFR § 151. 05 oily bilge water means water which may be contaminated by oil resulting from things such as leakage or maintenance work in the machinery space. Any liquid entering the bilge system including bilge wells, bilge piping, tank top or bilge holding tanks is considered oily bilge water. Despite implementation of these regulations, industry compliance has not fully materialized.

MSD New Bedford takes on the Issue

In 2015, MSD New Bedford worked to determine the source of oil spills. As oil spills were reported or found, marine investigations began, focusing on where the spills originated. It was difficult to determine where a spill originated due to the large number of vessels in the small area of the harbor. It was also not always clear how recently a spill occurred. The spills or sheens were typically grey in color and weathered, which suggested the spill had been in the area for an extended amount of time. When the contents of a vessel bilge are pumped overboard the product usually looks weathered since it has been in the bilge for some time. The appearance of the sheen was not a true indicator of how recent it was discharged overboard.

As pollution incidents were investigated by MSD New Bedford, it was realized, vessels decant their bilges. This illegal activity occurs when, a vessel uses its bilge pump to draw the oily mixture from the lowest point within a machinery space compartment and discharges it overboard. The oily mixture is discharged overboard until the operator visually identifies a sheen developing in the waterway. At that point, the pump is physically placed in the off position. Operators do not realize that the oily mixture does not meet the regulations outlined in 33 CFR § 155.350/155.330 of retaining oily bilge waste onboard. Figure 3 depicts the decanting process.

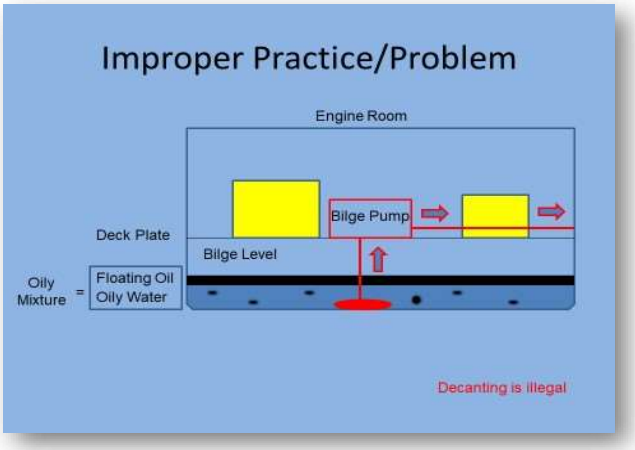


Figure 3: Illegal Decanting Process

Bilge Sampling

To identify the chemical properties of the spills, MSD New Bedford worked closely with the Coast Guard Marine Safety Lab in New London, CT to increase oil sampling. The MSD took samples of vessel bilges in the vicinity of a spill searching for potential matches even when a clear suspected source was not identified. The oil sampling analysis process takes the "fingerprint" of a spill and tries to match that "fingerprint" with potential source samples. The spill samples routinely came back as a mixture or diesel fuel, lubricating oil and other substances suggesting the spill was from a bilge where many products mix together. As a result, vessels

were traced through bilge samples to be the source of some spills. This strategy of increasing oil sampling even when a suspected source was unknown, provided a key opportunity to conduct one-on-one educational outreach with vessel operators. When an oil sample match between a vessel's bilge sample and a mystery spill were found, it provided proof that the source of some of the pollution in the harbor was from a particular vessel pumping its oily bilge waste overboard illegally. As more samples were taken, vessel employees had an opportunity to ask questions about the oil sampling process and how the results could impact them. This discussion clarified what possible civil penalties were associated with the illegal discharge and encouraged conversations regarding legal practices.

Through all these efforts, it was evident that responding to the oil spills and hoping to find an oil sample match was inefficient. It highlighted the need to increase educational outreach to prevent the spills from happening in the first place and understand why the spills were occurring. The educational effort included publishing pamphlets, email distribution of regulations through local municipalities to the maritime industry, newspaper articles, press releases, and USCG vessel boarding's.

Working with the Community

In August 2016, the MSD with the DOJ held a joint community outreach meeting to the maritime industry in the Port of New Bedford discussing regulations, necessary changes, and a warning that enforcement for noncompliance would increase. The community outreach initiative and discussions with the maritime industry made it clear that decanting of machinery space bilge waste was a common but illegal practice. The vessels that operate out of New Bedford are from along the east coast from South Carolina to Maine. It is likely that commercial fishing vessels are pumping their oily mixtures overboard while underway and in other ports beside New Bedford,

which is directly correlated to the lack of awareness of 33 CFR § 155.350.

Inspections

Over the last 5 years, the MSD has inspected hundreds of fishing vessels and identified the layout of vessel bilge spaces based on vessel configuration. These configurations are historically categorized as, Eastern Rigged, Western Rigged and Common Bilge. These categories would usually indicate the location of the engine room and where the tail shaft packing gland entered the vessels hull. Most commercial fishing vessels in New Bedford have a water lubricated tail shaft packing gland which causes water to enter the bilge in whichever space the tail shaft enters the vessel. If the tail shaft packing is worn, it was found that the amount of water introduced to the bilge was usually more than a vessel could retain given the length of a voyage of a couple of weeks. Vessel operators felt they had to discharge their bilges overboard prior to returning to port. Realizing vessels had a typical bilge configuration without having to board every vessel to inspect below decks allowed the Coast Guard to prioritize boarding's and inspections on vessels less likely to comply based on their category. Figure 4 depicts fishing vessels rig configuration and typical below deck bilge layouts.

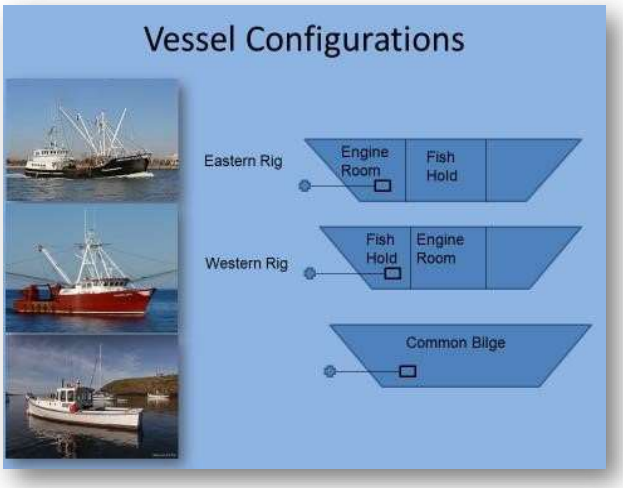


Figure 4: Fishing Vessel Configurations

Typically, a Western Rig's tail shaft enters the fish hold, and the water introduced from the tail shaft-packing gland is pumped overboard with ice melt. Since there is usually no machinery in a fish hold to allow oil to enter the bilge pumping ice melt overboard is an acceptable practice. On an Eastern Rig, the tail shaft typically entered the engine room and water from the tail shaft-packing gland would mix with the oil in the bilge creating more oily bilge waste that was illegal to discharge overboard. If a vessel owner was appropriately taking on the cost to properly disposal of oily bilge waste, they would have more incentive to reduce the amount of liquid entering the bilge to reduce costs.

Surge Operation

In 2017, a surge operation was implemented by Sector SENE to take bilge level measurements of vessel bilges during routine boarding's. The boarding officer asked the operator a set of questions to gain more information on their process for disposal of oily bilge waste. Once measurements were recorded underway, the boarding officers contacted land side to MSD New Bedford, where a Pollution Responder attended the vessel in person and determined if the vessels bilge level was the same or different from the level recorded during the boarding, to evaluate whether the vessel had pumped oily bilge waste while underway. This operation was successful in diagnosing noncompliance. It also increased the efficiency of the Coast Guard enforcement with multiple units working together to combat the same chronic issue. Ultimately, these boarding's led to a DOJ referral for a commercial fishing vessel, culminating in heavy fines to the company and vessel master. The vessel owner was required to change their business practice to recognize that the disposal of oily bilge waste was an expense they had been illegally

avoiding. This surge operation brought to light how prevalent the lack of compliance with the pollution prevent regulations were.

Similar situations in other areas of the Country

The systemic issue of illegally discharging oily bilge waste simultaneously existed in other parts of the country. A joint effort occurred with MSD New Bedford and Coast Guard Sector Honolulu to create a Marine Safety Information Bulletin (MSIB) 003-18, titled "Oily Mixtures Management" to enhance and educate all commercial vessel entities nationwide (United States Coast Guard, 2018). While working on the MSIB, Sector Honolulu shared its approach to refer cases to the DOJ Environmental Crimes Civil branch with MSD New Bedford. Sector Honolulu and MSD New Bedford felt the Coast Guard's enforcement options were limited and unsuccessful to incentivize compliance. Historically when a responsible party for a pollution is identified by the Coast Guard, they have standardized enforcement action guidance to follow.

The levels of enforcement action choices are as follows from less stringent to worst case. Within Commandant Instruction Manual, COMDTINST M5582.1B, Notice of Violation User's Guide, the process of enforcement starts with a Letter of Warning (LOW) then proceeds to a Notice of Violation (NOV), then increases to a Class I Administrative Civil Penalty (Time, 2019). These levels were completed in Honolulu and New Bedford, and yet no change to the business practice of vessels decanting their oily bilge waste illegally was noticed by either MSD New Bedford or Sector Honolulu. This lack of change in compliance is why it was decided to refer illegal discharge cases to the DOJ Civil Branch, in hope to incentivize compliance from the commercial fishing fleets. This process had never been completed before; however, the ultimate goal was to have the operators of these vessels realize the need to change their business practices, and for the case to be completed in a timely manner. The referred cases individually reached settlements of over 400,000

dollars and required vessel owners to enter a compliance program to properly dispose of their oily bilge waste. These cases not only gained the attention of the commercial fishing vessel fleet, but also the entire vessel community within the state of Massachusetts.

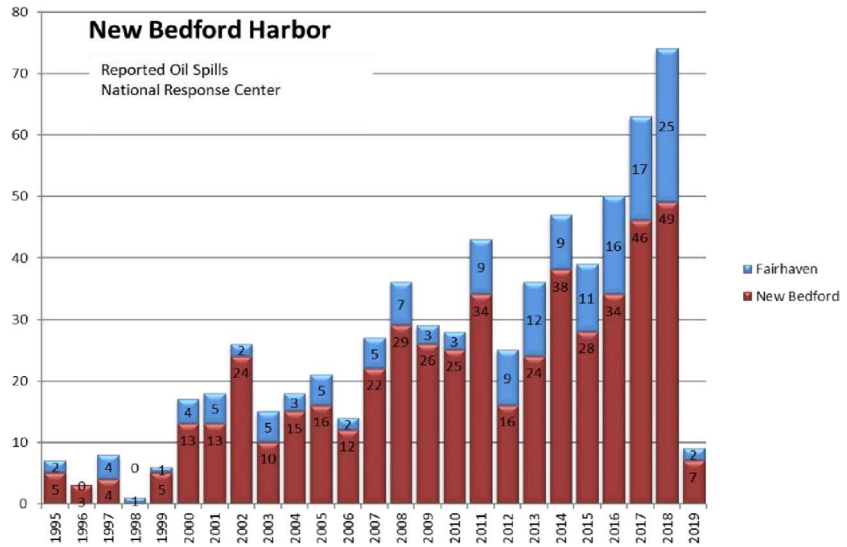
A specific case within New Bedford, MA was the United States of America v. Quinn Fisheries INC in 2018. After an investigation took place and noncompliance with pollution prevention regulations was revealed, the case was referred by the Coast Guard to the DOJ Civil Branch. A settlement agreement was reached between the DOJ and the parties in violation consisting of fines of over four hundred thousand dollars and the violators fleet of five vessels were enrolled in a compliance program. The compliance program required each vessel to undergo major re-design and retrofitting of bilge spaces, so the vessels had enough capacity to retain their oily mixtures onboard for the duration of their fishing voyages. Methods of reducing leaks from machinery equipment, using dripless tail shaft packing glands, and being conscious of petroleum products entering the bilge, were solutions that allowed the vessels to maintain the length of voyage they desired. Another option would have been to decrease the length of voyage to accommodate the limited capacity for storage of oily bilge waste.

There were other similar cases in Hawaii that also have followed the same process of gaining compliance. This joint effort with the Department of Justice, Coast Guard and Partner Agencies has substantially increased compliance from local fisherman. Sector SENE continues to formulate a standardized process for these referrals; however, each case is unique its own way

Partner Agencies Aid the effort

Since 2015, the MSD along with Massachusetts Department of Environmental Protection (MASS DEP) have joined forces to provide not only education to the local fisherman, but the state of Massachusetts has budgeted for a program called the “Pump-out” program. It is

noteworthy that a commercial business providing pumping of bilges had not already developed considering the large number of vessels in New Bedford. This was another indication that vessels were not willing to pay for proper disposal of oily bilge waste but choosing instead to discharge overboard illegally. The Massachusetts program focuses on providing mobile transfer trucks to any vessel that enrolls in the program and pump oily bilge waste from the vessel, free of charge. A Coast Guard Pollution Responder and a MASS DEP representative oversee the evolution of the pump off providing the fisherman with on-the-spot training of how to properly dispose of oily waste. The vessels are inspected for any suspect issues within the machinery spaces and bilge, to identify ways to reduce water or other liquids from entering the bilge and mixing with oil. This program was not intended to be a permanent solution; however, it has had a positive impact on the community, decreased the amount of oily waste discharge into the port and reduced oil spills over the past four years. Data of the number of reported spills was obtained from the National Response Center which is depicted in Graph 1.



Graph 1: National Response Data 1995 to 2019 for New Bedford Harbor, MA

Results

From 2018 alone, the overall reports from both Fairhaven and New Bedford, MA decreased from seventy-four reports to only nine in 2019, while similar standards of reporting oil spills as initiated in 2015 were upheld. This comparison revealed that the commercial vessel fleet were either utilizing the Bilge-Pump-Out program offered by the state or legally disposing of their oily bilge waste.

Figure 5: Machinery Space Bilge with oily waste

With the possible end to the state's ability to fund the program, a permanent solution needed to be created. In 2019, Sector SENE's Marine Environmental Response division implemented a way for all Coast Guard Law Enforcement resources to conduct boarding's offshore with a focus on detecting illegal discharges of oily waste as a priority. With the decision by Sector SENE, it is the beginning of a sustainable long-term program to enforce the pollution prevention laws. While Sector SENE on water assets are conducting the checks on a normal basis, the Prevention and Response Departments are simultaneously still referring cases to the DOJ with success. Mass DEP also responds as necessary based on reports received from the National Response Center, to all pollution cases in the surrounding areas of the Port of New Bedford ensuring state laws are enforced while MSD New Bedford enforces federal laws.

Another trend that occurred was a decrease in the amount of oily bilge waste generated by vessels volunteering or receiving the free discharge service from MASS DEP. Vessels enrolled in the program implanted the suggestions from the program to decrease the amount of liquid that enters a machinery space bilge. This decrease in trend is visually displayed in Figure 6, which correlates data from MASS DEP and the Bilge Pump-Out-Program, revealing that after the US vs. Quinn Fisheries Inc. case was complete, the commercial fishing community saw what could happen to them and began to change the way they disposed of oily bilge waste. As a result, they actively participated in the free state bilge pump out program as needed.

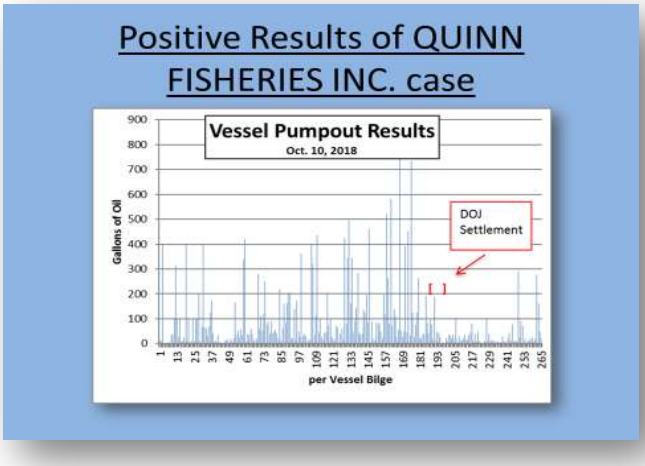


Figure 6: MASS DEP data after first DOJ civil case

Since this initial success of a large-scale DOJ Civil case, there have been two other cases within MSD New Bedford's area of responsibility. The same process of referral has taken place and a consistent enforcement nudge has been applied to continue to implement the regulatory requirements and prevent pollution.

It is important to highlight the cost and effectiveness of the "free" Bilge Pump-Out Program in comparison to the DOJ enforcement process. The program operated by MASS DEP is free to the commercial vessel operator and is funded by the state of Massachusetts. With that

said, the funding for this state driven initiative will come to an end and operators will be forced to pay local mobile truck oil waste disposal service providers or dispose of the oily waste to a land side facility. If the commercial vessel operator refuses to use the commercial options or be a part of the free program, they could be subject to fines from the United States Coast Guard and possible case referral to the DOJ.

Conclusion

From 2019 to 2020, there have been positive environmental outcomes as a result of the determined hard work to reduce oil pollution from commercial vessel bilges. The Quinn Fisheries fleet has increased their fleet from five vessels to a total of eleven, which now are all operating in compliance and working safely on the water. MASS DEP is still working with other port partners, the United States Coast Guard, and the city of New Bedford to install a permanent reception facility within one or if not all major port facilities in the area. Permanent reception facilities will allow the commercial fishing fleets to dispose of their respective oily waste in accordance with the laws and regulations at convenient facilities but at a cost to the vessel owners and operators. The Bilge-Pump Out Program is still active and is continuing to yield positive results as long as it is in service. In the last MASS DEP data call, it was identified that several commercial fishing vessels are utilizing the program repeatedly and choosing to legally dispose of their oily bilge waster.

The MASS DEP Bilge-Pump Out Program was not intended to be a permanent solution but provides data regarding the level of need for a permanent commercial disposal facility. MASS DEP and the Coast Guard worked together to simultaneously provide the free pump out program and increase enforcement to highlight to the commercial fishing industry the need to dispose of their oily bilge waste legally. That is why the Coast Guard started the DOJ case referral process.

This form of enforcement was used to work in conjunction with MASS DEP to increase awareness of the laws and regulations. This team effort was implemented for one common goal, to shift the way commercial fishing vessels dispose of their oily waste and create significant change with respect to a systemic pollution issue that has been present for over fifty years in Sector SENE. Lastly, the area has seen an overall decrease in illegal discharges and industry relationships have been enhanced. This has created a communication path for future working relationships to support compliant commerce and productivity.

In all, the Coast Guard has identified the major environmental issue across the entire United States with the goal in mind to find a permanent and enduring solution. Despite limited Coast Guard direct enforcement options to hold vessels accountable for oily waste, Sector SENE with the help of Sector Honolulu has found creative ways to increase compliance, protect the environment and improve industry relations. This universal problem when fully solved through similar efforts elsewhere, will create a better marine environment, increase fishing vessel efficiency, and decrease the pollution footprint within every harbor it which is applied, including the Port of New Bedford where progress is already apparent form the statistics regarding spills.

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