NOAA Ship

Significant Spill Report

2012-01

EXECUTIVE SUMMARY

The NOAA Ship was anchored approximately 0.5 NM south of Fisher's Island, New York. During the 2330-0330 watch, the engineer on watch (EOW) transferred fuel from the holding tank to the starboard day tank. This is a routine procedure performed daily during this watch. After the fuel transfer was complete (0010 on Day 2), the EOW began the recirculation (purifying) process for the starboard day tank but erroneously opened the port day tank suction valve. This allowed the fuel in the port day tank to enter the starboard day tank.

Approximately one hour later (0123), the EOW reported fuel escaping the sounding tube for the starboard day tank in the engineering stores room, covering the deck. The EOW immediately corrected the valve configuration. At 0235, sheen was discovered on the starboard side of the main deck next to a cofferdam which was unplugged. Absorbent pads and sausage booms were placed on deck to minimize further discharge overboard. It is estimated that as much as 281 gallons of diesel fuel was discharged into the water.

Clean-up was conducted using two teams of three people, rotating in and out of the space every fifteen minutes with the Executive Officer (XO) acting as on-scene leader. Twenty-five large garbage bags were filled with the clean-up waste and were later disposed of when the ship was moored in New London, CT. At sunrise, there was no evidence of sheen on or near the ship with the exception of a small area on the starboard side of the main deck. This area was cleaned with absorbent pads.

To prevent further incidents of this nature, the fuel transfer procedures were reviewed and shall be revised to include securing cofferdams. Additionally, placards explaining the proper procedure for fuel transfer operations have been posted and a checklist is being utilized. The Ship command is also investigating methods to make the valves and piping involved easier to use and completing the installation of tank notification alarms (See Corrective Actions).

INTRODUCTION

A NOAA Ship was involved with a fuel spill incident while anchored approximately 0.5 NM south of Fisher's Island, NY. The root cause of the incident is operator error during a routine procedure. This report includes the details of the root cause of the incident along with contributing factors and possible corrective actions to prevent such incidences in the future.

TIMELINE

Day 1

2340: 3AE commences daily fuel tank transfer from holding tank to STBD Day Tank

Day 2

0010: Fuel transfer complete. 3AE erroneously opens suction valve on PORT Day Tank 4-75-1 to start the recirculating process for STBD Day Tank. 3AE should have opened suction valve on STBD day tank so fuel can cycle thru the purifier and back into same tank. With PORT suction valve open the fuel started entering the STBD Day Tank, eventually overfilling the tank.

0026: Bridge security watch round complete, all secure.

0056 (estimated): Bridge security watch leaves for security round.

0118: Crewmember reports strong diesel fuel smell to OOD who then notifies 3AE.

0123: 3AE reports fuel escaping sounding tube onto deck in ENG Stores and corrects the valve configuration. OOD notifies CO, CME and calls EU to assist.

0235: Sheen is discovered on STBD side deck next to cofferdam which is unplugged. Absorbent pads and sausages are set out to minimize further discharge in water.

0321: ENG report decks are dry and are now clearing items out of oiled boxes and throwing them away with oiled pads into trash bags. This continues for nearly 10 more hours.

0440: XO contacts NRC

0448: XO contacts USCG New Haven

0456: XO contacts CT DEP

0458: XO contacts NY DEP

0534: CT DEP calls XO for further info

Sunrise: No evidence of sheen seen in the water except for occasional splashes off the deck stbd side fwd. Absorbent pads were added to that area to stop it.

0600: 2AE types up and submits testimonial for 3AE and includes a chart with tank soundings before and after the incident

0810: XO contacts MOC-A XO to report spill

0856: NRC calls for further info

1300: Cleanup operations are complete except for need to continue organizing and re-stowing items that were removed from oiled spaces

1600: CO meets with XO and Shipboard ECO

Day 3

1300 - 1400: XO interviews 3AE and takes pictures of valves

1700: Ship arrives New London, CT

Day 4-6 - Holiday Weekend

Day 7

0600: 25 large trash bags of fuel soaked debris is picked up by United Industrial Services

1000: Ship departs New London, CT

1800 – 2000: XO interviews 2AE and 1AE and takes more pictures of valves

Day 8

1400 – 1500: CO and XO meet to review gathered information and discuss root cause and lessons learned

1600 – 1630: XO interviews SST

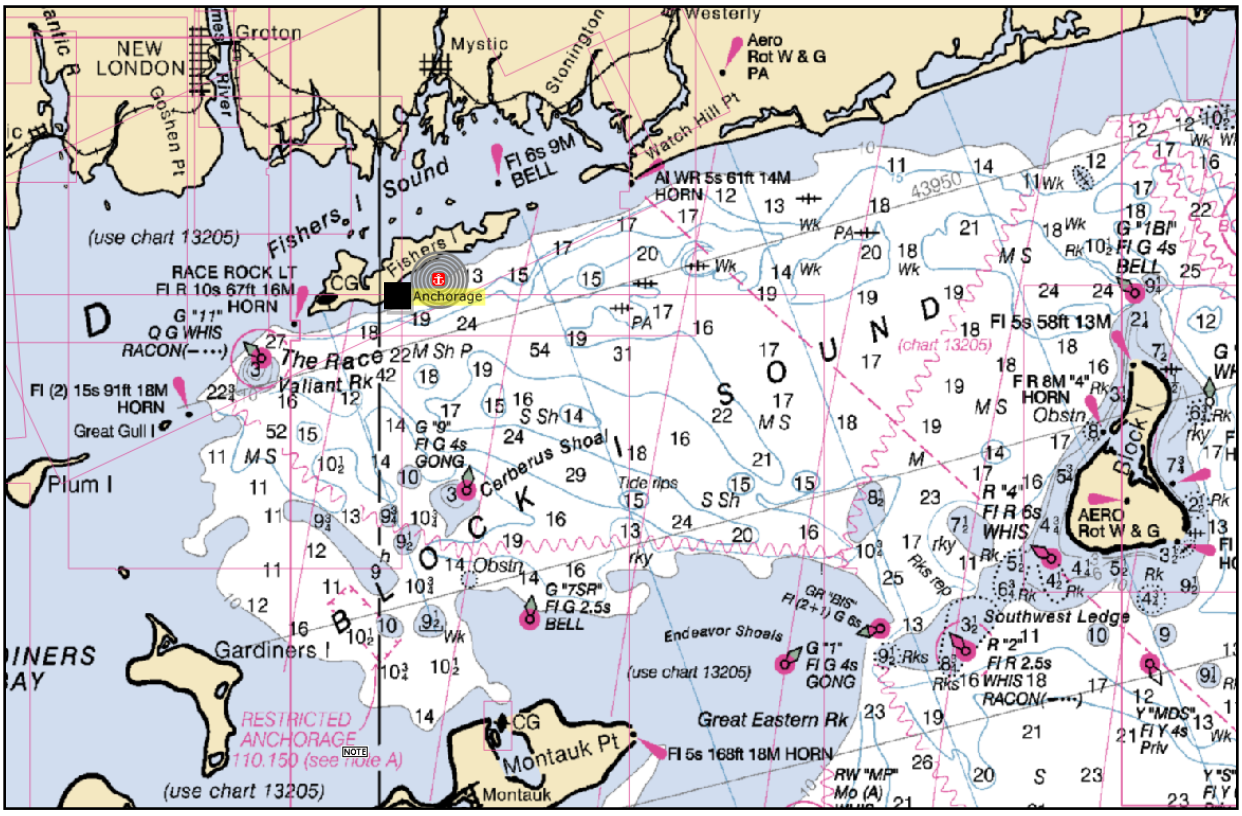
1730 – 1830: XO meets with 2AE for assistance with drafting tank diagrams.

DESCRIPTION OF EVENTS

Background Information

A NOAA Ship was anchored for the evening after working in Block Island Sound. During the 2330-0330 watch, 3AE began the process of filling the starboard day tank, as 3AE has done daily on this watch for the last several years. This process begins by transferring fuel from a holding tank to the day tank. The fuel is then "recirculated," going through a purifier and then re-entering the day tank, ready to be used by the generators or engine(s).

After transferring the fuel from a holding tank to the starboard day tank, 3AE began the purifying process, but inadvertently opened the port day tank's suction valve. This valve allowed the fuel in the port day tank to enter the starboard day tank, causing the tank to overflow.



Location of Vessel

NOAA Ship was anchored approximately 0.5 NM south of Fisher's Island, NY (see above).

Description of Spill

Fuel flowed from the port day tank to the starboard day tank for approximately one hour before the OOD was notified of a high diesel fuel smell by a crew member in 2-deck berthing (see Timeline). The OOD

contacted 3AE, who discovered fuel in the engineering store's area coming from the starboard day tank sounding tube. The valve configuration was immediately corrected, stopping the flow of diesel. The CO, XO, CME, and EU were informed of the spill to begin clean-up operations. During the clean-up operations, sheen was observed on the starboard side of the main deck, near a cofferdam which had been left open. After comparing soundings of the tanks involved, it appears that 447 gallons of fuel was lost. An estimated 30 gallons was absorbed during clean-up efforts, twenty gallons evaporated, and 116 gallons was used by the generator.

The process of sounding tanks has inherent error involved with all measurements taken. For example, a one inch difference in a day tank translates into approximately 88 gallons of fuel. The measurements taken estimate that there are 281 gallons of unaccounted fuel. However, the precise quantity of overboard discharge is unknown.

During clean up, sheen was observed in the water on the starboard side of the ship, but it was difficult to estimate how much fuel had been expelled because of the darkness. Although the wind was relatively calm on the night of the incident, the area near Fisher's Island is known for high tidal currents, around 2.0 to 3.0 knots. At sunrise, no sheen was observed near the ship from personnel onboard or from a deployed launch; however, heavy fog may have made any sheen difficult to see. It is not known if the current carried the diesel to shore, but the Ship did not receive any reports of diesel on shore near the affected area.

Description of Containment and Response

Containment and clean-up of the internal spill, estimated at 30-50 gallons, was conducted by two teams of three members. These teams used shipboard absorbent pads and booms to soak up the diesel fuel. Absorbed fuel was put back into the day tanks as possible. The area was ventilated by opening doors and hatches, and blowers were set up to help move air out of the space. Response team members were swapped out every fifteen minutes to get fresh air and rest. Response was restricted to a select group to reduce exposure and ensure sufficient working space in engine stores. Responders were required to don gloves and boots. No respiratory PPE was used. If boots were not available, responders were required to wrap their shoes with absorbent diapers. One individual was non compliant with PPE; all others were fully compliant.

Upon discovery of the fuel on the main deck, the area was cleaned with absorbent material, and the starboard side gunwales were blocked to prevent further discharge into the water.

NOTIFICATIONS

XO contacted the National Response Center at 0440 on Day 2 followed by contacting Coast Guard Sector Long Island Sound (New Haven, CT) and the Connecticut and New York Departments of Environmental Protection. At 0810, XO contacted the Executive Officer of MOC-A to report the spill. On Day 3, XO and Environmental Compliance Officer (ECO) discussed the details of the spill with MOC-ECO. An internal "pre-brief" was held with SECD and MOC ECO on Day 10 at 1400 EST. A full briefing with SECD, STEM, SECO, MOC-A, and MOC ECO was completed on Day 11 at 1300 EST.

CAUSES OF DISCHARGE: PROXIMATE AND ROOT CAUSES

The root cause of this incident was human error involving the unintentional opening of the incorrect suction valve, allowing fuel to flow from the port day tank to the starboard day tank, causing the day tank to overflow.

The proximate causes leading to the significance of the spill and lack of containment aboard the vessel are failure to follow standard operating procedures and inadequate equipment setup. All cofferdams should be plugged during such transfers; however, this requirement does not appear in the procedure.

Additionally, valve configurations do not make it apparent which valves are opened and which are closed (see figures below). Installing more accessible valve handles that clearly indicate the open/close status could prevent such an incident from occurring again. The Ship had tank level indicators (TLIs) installed six years ago, which were never fully commissioned. The Ship's installed tank level indicators, notifying the EOW of changes in the amount of fuel in each tank, were not utilized because there is no available read-out in the control station.

This transfer was (and historically has been) completed at night. With fewer people on the deck, it is possible that the spill continued longer than it would have during the day time and crew's ability to respond to oil on the water is limited.

Tank level indicators (TLIs) were installed on all tanks approximately six years ago, but a read-out was not installed in the engineering control station, presumably because of funding issues. This renders the indicators useless. Completing the installation will aid in preventing such spill occurrences in the future.

Shown above is an example of a suction valve on this Ship. It is not apparent whether the valve is open or closed because of the nut fitting.

CORRECTIVE ACTIONS

Immediately following the incident, the fuel transfer procedures were reviewed. Opportunities for improvement were indentified, including securing coffer dams during internal tank transfers, performing such transfers during working hours, staggering bridge watchstander and engineering rounds, and

installing a read-out for the tank level indicators. The department has also implemented the use of a checklist to assist in configuring valves correctly for transfers. The command will assist in making both the procedure and checklist easier to use and understand.

Placards will be set up to assist the EOW in determining the status of the tanks (standby or online) and the correct corresponding valve configuration.

The Ship command intends to hold meetings with CME and the Port Engineer, to investigate ways to make it more readily apparent whether valves on fuel tanks are opened or closed.

A safety stand down was held with the CO, XO, and ECO the afternoon after the incident. The discussion during the stand down has resulted in planned changes to be made to the Ship's SOPEP. Another stand down will be held with the ship's crew to discuss SOPEP changes, locations of response equipment, and proper response procedure.

A bridge checklist will be made to assist the OOD/CO /XO in making appropriate response decisions.

The SOP for recirculating tanks will be updated to reflect that engineers should, at a minimum, sound tanks involved with the transfer once after the first five minutes of the process to ensure no fuel is lost.

LESSONS LEARNED

The following lessons learned were discussed in the aforementioned safety stand down:

- Ensure shipboard procedures are being followed. This can be done by ensuring the procedures are readily available and easy to use/understand.
- Change SOPEP to include positions/titles of response team members, not names and to require a boundary walk following discovery of any discharge
- Ensure response team members keep current 24-Hour HAZWOPER certifications.
- Get more PPE to fit team members.
- Need an assistant ECO to ensure there is always someone with appropriate training aboard in case of an emergency.
- Need to clarify ship specific SOP on how to notify crew of spills.
- MOC ECO should be contacted as soon as MOC-A is notified.