September 2007
Publication #07-08-009

WASHINGTON STATE DEPARTMENT OF ECOLOGY

PREVENTION BULLETIN 07-01

The SEA SYNERGY

This bulletin was prepared to share lessons learned with industry and the interested public, and to make recommendations to prevent similar occurrences. The company operating the M/V SEA SYNERGY has provided comment.

OVERVIEW

On Tuesday, December 6, 2005 at about 2035 (local time), while delivering intermediate fuel oil (IFO) to the ship SEA SYNERGY, personnel aboard the tank barge INVESTIGATOR heard oil splashing down on the deck of the barge from the side of the ship and shut down the transfer. The SEA SYNERGY was at the Upper Vancouver Anchorage of the Columbia River near Vancouver, Washington. The INVESTIGATOR was moored to its starboard side. After shutting down the barge's pumps, the tank barge personnel contained the two to three gallons of oil on the deck of the barge. About 264 gallons of IFO was spilled on the deck of the SEA SYNERGY. Less than one gallon (reported as a few drops) of IFO was estimated to have spilled to the Columbia River.

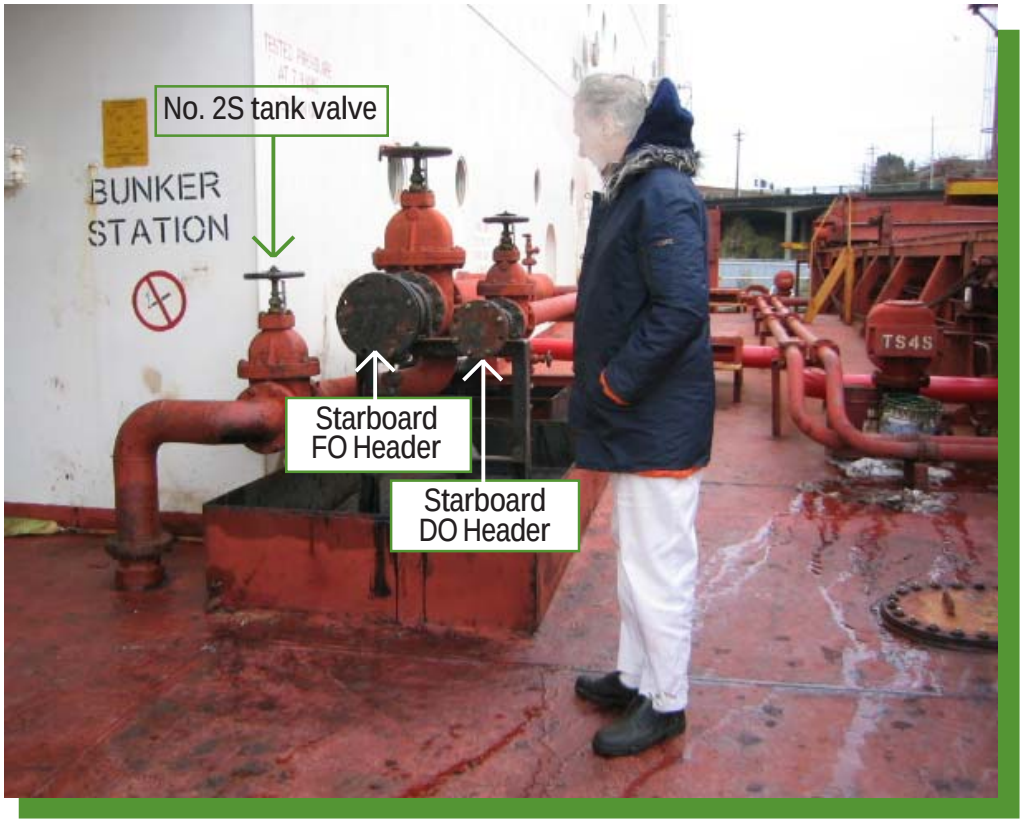

Figure 1.
SEA SYNERGY's starboard side fuel manifold, pictured here with the ship's Chief Engineer. [Note: All photos taken after the ship had shifted to a berth.]

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VESSEL INFORMATION

General

The SEA SYNERGY was a bulk carrier built in 1989 and sailing under the flag of Cyprus. It was approximately 225 meters in length.

Information provided by the ship indicated it was certified under the International Safety Management (ISM) Code.

The ship was bound from Inchon, South Korea to Portland, Oregon to load grain. The crew of twenty-one persons consisted of a Greek Master and Chief Engineer with a mixed crew of Indonesian and Eastern European nationalities.

ENVIRONMENT

The shoreline along the Columbia River in the vicinity is used for a variety of commercial and recreational purposes. The weather on the evening of December 6, 2005 was clear with light southeast winds. Sunset was at 1627.

CHRONOLOGY

On Monday, December 5, 2005 at 2325 the SEA SYNERGY anchored at the Upper Vancouver Anchorage on the Columbia River.

While at anchor waiting for bunker fuel on December 6, the ship discharged ballast water. Between 1505 and 1620, the ship received lubricating oil from a stores barge moored to its port side. At 1630, with the stores barge still alongside to port, the tank barge INVESTIGATOR came alongside to starboard to deliver 100 metric tonnes of diesel oil and 880 tonnes of IFO via the ship's starboard side fuel manifold (see Figure 1). The stores barge cast off at 1650.

The hose between the SEA SYNERGY and INVESTIGATOR was connected at 1655. A face-to-face pre-transfer conference between the barge's Tankerman and the ship's Chief Engineer occurred at 1715 and the Declaration of Inspection (DOI) was signed at 1720. The Tankerman reported he asked the Chief Engineer for his bunker pre-load plan, at which point the Chief Engineer left the barge office, and returned "30 to 40 minutes" later with a hand-written note on a piece of paper. According to the tankerman, the hand-written plan indicated that fuel oil (FO) tank No. 2 starboard (No. 2S) would be loaded to 83% of its capacity (501 cubic meters) with IFO. Similarly, FO tank No. 2 port (No. 2P) would be loaded to 80% of its capacity (580 cubic meters) with IFO. The ship's "Pre-Loading Bunkering Plan" indicated that the transfer rate would be 200 to 250 cubic meters per hour, with a topping-off rate of 100 cubic meters per hour. The

Figure 2. No. 2S FO tank vent, view looking aft on starboard side.

transfer was to begin with a transfer of 100 tonnes of diesel oil, followed by a transfer of 880 tonnes of IFO.

At 1755 the transfer of diesel oil began via a 4-inch hose. The transfer of IFO began at 1920 via a 6-inch hose. [Note: The tank barge has two pumps dedicated to diesel and two to fuel oils, allowing simultaneous transfer of two different products.] The transfer of diesel oil was completed at 1950 without incident.

The Third Engineer was assigned to sound and control the valve to the No. 2P tank, while the Second Engineer was assigned to sound and control the valve to the No. 2S tank. According to the Chief Engineer, during the transfer of IFO the Second Engineer was unable to get soundings for the No. 2S tank due to turbulence and bubbling in the sounding tube. No communication between the Tankerman and Chief Engineer (or other engineering crew) regarding the transfer rate occurred during the transfer of IFO.

According to the Second Engineer, when he reached the planned final ullage (the approximate height of free space in the tank) of one meter in the No. 2S tank he partially closed the No. 2S tank valve, and went to the port side of the ship's house to fully open the valve to the No. 2P tank. No request was made to the Tankerman to slow or stop the loading. When the Second Engineer returned to fully close the No. 2S tank valve he found that the tank had overflowed the No. 2S fuel oil tank vent (see Figures 2 & 3), and sounded the air horn to notify the barge to immediately stop the transfer.

Aboard the barge INVESTIGATOR, which was still accompanied by its tug, the Tankerman was in the final stages of emptying the barge's No. 3 starboard (No. 3S) barge tank and the Captain of the accompanying tug was assisting. Both men heard splashing. The tug Captain, standing near the No. 4 barge tank valves saw the oil running down the side of the ship and landing on the deck of the barge. He immediately went into the barge pump room and shut down the barge pumps. The time was about 2035.

Approximately 264 gallons (1,000 liters) of IFO was found spilled on the deck of the SEA SYNERGY from the overflowing No. 2S fuel oil tank via the vent located near the starboard deck edge just forward of the ship's house (see Figures 2 & 3). The oil overflowing the vertical steel plate at the deck edge landed on the deck of the barge, because the position of the barge alongside the ship was under the curve of the ship's stern and the No. 2S tank vent was located directly above. The volume reported recovered from the deck of the barge was two to three gallons. A few additional drops of IFO, according to the barge company personnel, made it to the waters of the Columbia River, but quick action on their part in placing pads against the side of the ship to absorb the flow of oil minimized the pollution impact.

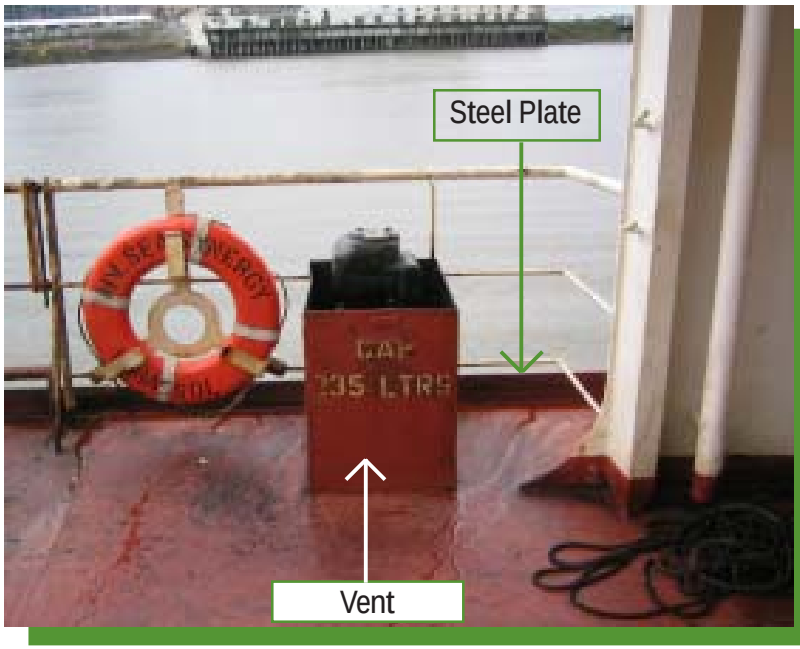

Figure 3. No. 2S FO tank vent, view looking outboard on starboard side, from approximately the location of the starboard fuel manifold.

Transfer Rate

The transfer rate, assuming that the No. 2S tank was overfilled, was about 376 cubic meters per hour. This rate exceeded the 200 to 250 cubic meters per hour specified in the Chief Engineer's "Pre-Loading Bunkering Plan." However, there was no call from the ship to the barge requesting that the transfer be slowed. The DOI, signed by the Chief Engineer, clearly stated that the transfer rate was to be adjusted by direction of the receiving vessel. The Chief Engineer stated to the Ecology investigator that the Second Engineer was not able to get soundings from the No. 2S tank "due to turbulence and bubbling in the sounding tube" yet there was no call to decrease the transfer rate.

Finally, the Second Engineer stated that when the No. 2S tank reached its planned final ullage of 1 meter (how this was determined given the Chief Engineer's statement is unknown) he partially closed the valve to the tank. This allowed the tank to fill beyond the planned ullage while he fully opened the valve to the No. 2P tank while continuing the transfer at 150% of the maximum planned transfer rate.

For the duration of the transfer of IFO, the transfer rate far exceeded the rate specified in the pre-loading plan prepared by the Chief Engineer of the SEA SYNERGY and went uncorrected. The Chief Engineer asserted that the Second Engineer was not able to get soundings for the No. 2S tank. Despite the lack or doubtful reliability of the soundings (and therefore unknown or doubtful reliability of the transfer rate), the Second Engineer did not stop the flow to the No. 2S tank until after the maximum planned final ullage had been reached.

Compliance With Company Procedures

A copy of the company's International Safety Management (ISM) Manual dealing with oil transfers was obtained aboard the ship by the Ecology investigator. Inconsistencies between company procedures and the bunkering operation of December 6, 2005 included:

Company standard: A Bunkering Plan, Pre-Loading Bunkering Plan, and Bunkering Operation Checklist shall be completed by the Chief Engineer in cooperation with the Chief Officer.

Observation: All documents regarding the bunkering operation of December 6, were requested by the Ecology investigator on scene. Only a "Pre-Loading Bunkering Plan" was provided by the Chief Engineer. When that document was shown to the Tankerman following the spill, he indicated it was not the document that the Chief Engineer had produced during the pre-transfer conference when he requested to see the pre-loading plan, and differed notably in the column indicating the tanks' percent full at final ullage. Given the lack of other required documents and the Tankerman's observation, it is possible that the "Pre-Loading Bunkering Plan" was filled out by the Chief Engineer after the spill.

Company standard: "Bunker transfer operations:…Should always be carried out in accordance with Company instructions."

Observation: Ecology's investigation uncovered departures by the Chief Engineer from the company's ISM Manual instructions dealing with oil transfers. The instructions required the bunkering forms to be completed.

Company standard: The Bunkering Plan stated "Bunker tanks level monitoring: On commencement of bunkering up to topping off procedure and during topping off at frequent intervals."

Observation: The Chief Engineer stated to the Ecology investigator that the Second Engineer was not able to get soundings from the No. 2S tank "due to turbulence and bubbling in the sounding tube."

Company standard: The Pre-Loading Bunkering Plan stated the duties of the Second and

Third Engineers were, respectively, to align the fuel piping valves and monitor tank levels.

Observation: The Ecology investigator on scene was told the Third Engineer was to sound and control the No. 2P tank, while the Second Engineer was to sound and control the No. 2S tank. This was not what was stated on the Pre-Loading Bunkering Plan and, according to the Second Engineer, was not how the transfer was conducted. The Second Engineer stated that he, not the Third Engineer, went to the No. 2P valve to open it and during the Second Engineer's absence, the No. 2S tank overflowed.

CAUSAL INFORMATION

Based on the information gathered, the immediate cause of the spill was the Chief Engineer's inattention to the transfer rate, to the status of the No. 2S fuel oil tank, and to the timing of actions by the Second Engineer. Factors contributing to the spill included:

- A failure by the Chief Engineer to follow the company procedures contained in the ISM Manual and **to use** the associated forms and checklists for the bunkering operation.
- The absence of the Third Engineer, which necessitated the Second Engineer's trip to the port side of the ship to further open the No. 2P fuel oil tank valve.

LESSONS LEARNED

- Maintaining situational awareness is critical for watchstanders and Persons-in-Charge. In this case, regular and accurate tank soundings would have improved the Chief Engineer's situational awareness.
- Persons-in-Charge of a vessel receiving bunkers should regularly calculate the transfer rate, compare it the planned rate, and contact the delivering vessel or facility immediately to have the rate changed if it is found unacceptable, and especially if it is in doubt or higher than the planned safe transfer rate.
- Bunker planning documents establish expectations for a transfer, including transfer rates. **Departures from the plan during the bunkering process require a heightened standard of care by the Person-in-Charge** authorizing the change to ensure that a spill does not occur as a result.
- Regulations, company policy, plans, and checklists set standards for safe bunkering. **One must comply with them to assure safe bunkering.**

PREVENTION RECOMMENDATIONS

To ship owners and operators:

- Ensure crew members conduct soundings and record innages (the height of liquid in the tank) at regular intervals and that Persons-in-Charge use the information to calculate and record the rate of transfer. Ensure that the calculated rate is compared to the planned rate, and if the rate of transfer is unacceptable, ensure that Persons-in-Charge of the bunkering operation are instructed to contact the delivering vessel or facility immediately to change the transfer rate.
- Ensure that bunkering personnel understand the importance of following procedures, and do not become complacent about using standard checklists.
- Ensure the company's procedures for bunkering contained within the company's Safety Management Manual and all federal and state regulations, are understood and complied with by ships' crews.
- Ensure that personnel involved in an oil transfer are aware of, and fully understand, their duties and their assigned duty stations.
- Emphasize the dangers of complacency during oil transfers to crews by publicizing lessons-learned from this spill throughout your company's fleet.

As a result of the SEA SYNERGY oil spill, the vessel operator:

1. *Conveyed and advised vessels in their fleet of Ecology's report on the spill and reminded them to implement their bunkering procedures properly.*
2. *Moved up the date of the SEA SYNERGY's next internal audit by about 2 months.*
3. *Required ship superintendents to verify compliance with company bunkering procedures and bunker form use when visiting their fleet.*
4. *Added checks of actual transfer rates versus planned transfer rates during vessel inspections and audits.*

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- ☐ PB 06-02: The NOHO HELE (WDOE #06-08-037)
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