

Log M-381A



National Transportation Safety Board

Washington, D. C. 20594

Safety Recommendation

Date: November 17, 1992

In Reply Refer To: M-92-57

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About 1600 on January 9, 1991, the SEA KING, a 76-foot stern trawler, departed Astoria, Oregon, for several days of fishing off the coast of Oregon and Washington. The four-man crew consisted of an operator and three deckhands. According to the operator, the next few days were uneventful. During the early morning hours of January 11, the vessel was en route to the Columbia River entrance near Astoria.¹

The operator stated that about 0500 on the morning of the accident, the vessel's steering had malfunctioned, causing him to have difficulty steering the vessel. About 0600, a crewmember inspected the lazarette. Upon returning to the pilothouse, he reported to the operator that the lazarette's starboard hatch cover had not been properly secured and that the lazarette was full of seawater. He also reported that he had properly secured the hatch cover before returning to the pilothouse.

Soon after the operator learned that the lazarette had flooded, he ordered two crewmen to enter the fish hold and open the lazarette drainage valve.² He stated that he had intended to drain the water from the lazarette into the engineroom where he planned to use the bilge pumps to pump the seawater over the side.

¹For more detailed information, read *Marine Accident Report--Capsizing and Sinking of the Fishing Vessel SEA KING Near Astoria, Oregon on January 11, 1991* (NTSB/MAR-92/05)

²The lazarette drainage valve was at the forward side of the bulkhead that separated the fish hold from the lazarette. When the valve was open and when the hose between it and the aft fish-hold drain was intact and unobstructed, the seawater in the lazarette could flow into the engineroom bilge.

One of the two crewmen sent to open the valve later testified that after opening it, they learned that sediment and debris had collected in the bottom of the lazarette and were blocking the drainage of water through the valve. In order to clear the drain, the flexible hose was removed, and a welding rod was used to clear the line. The hose was not reattached. As a result, the seawater drained directly into the after end of the fish hold and later, as the level of water in the fish hold rose, leaked past the aft engineroom bulkhead³ into the engineroom.

The operator later stated that although he was aware that water was collecting in the fish hold, he made no effort to close the valve or otherwise monitor the amount of water involved. About 0700, the flooding of the engineroom was first detected, and the vessel's bilge pumps were activated. By 0800, it had become clear that the bilge pumps would not be able to keep up with the flooding. An inspection of the fish hold had revealed that more than 4 feet of water and a large quantity of floating debris (fish, bin boards, and chunks of ice) was sweeping the length and breadth of the compartment. The operator said that he ordered a crewmember to enter the hold to close the lazarette drainage valve. However, all efforts to close the valve ceased when the operator, fearing that the crewman could be injured by the debris now floating chest high in the after end of the compartment, ordered him out of the hold.

At 0839 on January 11, 1991, the fishing vessel SEA KING reported to the U.S. Coast Guard that it was taking on water and needed assistance. Search and rescue units were immediately dispatched to the scene. Coast Guard personnel and dewatering pumps were later transferred to the vessel in an attempt to control the flooding. Because the SEA KING was also having difficulty keeping its main engine and steering gear operating, the Coast Guard dispatched the 52-foot motor lifeboat TRIUMPH to take the stricken vessel in tow.

The Coast Guard made two unsuccessful attempts to tow the SEA KING across the Columbia River Bar. It was during the second attempt that the vessel rolled to port, submerged its port bulwark into the sea, capsized, and sank. Of the seven persons on board at the time of the accident three, two crewmembers and one Coast Guardsman, drowned.

The National Transportation Safety Board determined that the probable cause of the sinking of the fishing vessel SEA KING was the Coast Guard's failure to determine the source and scope of the flooding and to dewater the vessel before attempting to tow it across the Columbia River Bar and the operator's failure to inform the Coast Guard of the status of the vessel's drainage system. Contributing to the loss of life was the failure of the on-scene commander (Commanding Officer, IRIS) to remove all unnecessary people from the SEA KING before the second attempt to tow it across the bar.

Following the accident, the Safety Board learned that the SEA KING's lazarette had a history of flooding, that the bulkhead between the engineroom and the fish hold was not watertight, that a leaking rudder post packing gland was probably the primary source of the flooding, and that the owner of the vessel had been aware of

³Previous modifications to the bulkhead had rendered it nonwatertight. Consequently, the engineroom and the fish hold shared a common bilge.

the problem. The Safety Board also learned that the installation of a fish finding sonar in front of the vessel's starboard pilothouse door had rendered it impassable.

The SEA KING had experienced substantial flooding of the lazarette on at least two occasions prior to the accident. At one point, repairs to the rudder post packing gland were made and the flooding of the lazarette had ceased.

The operator's attempt to dewater the lazarette not only failed but allowed the flooding to spread into the fish hold and the engineroom.

When the operator found out that the lazarette had flooded, he immediately took steps to drain the water directly into the engineroom, where he planned to use the vessel's bilge pumps to pump the water over the side. His decision to open the lazarette drainage valve not only caused the flooding to spread throughout the vessel but significantly reduced the vessel's stability.

He was aware that the engineroom and the fish hold shared a common bilge. He was also aware that the bilge pumps were capable of dewatering only the engineroom bilge and the forward end of the fish hold. As a result of discussions Safety Board investigators had with the operator following the accident, it was determined that he had received no previous training in stability and had little, if any, knowledge or appreciation of factors affecting fishing vessel stability.

The Safety Board believes that because of the operator's lack of knowledge of stability, he was unable to appreciate how the existence of a nonwatertight bulkhead between the engineroom and fish hold and his decision to drain the contents of the lazarette into the fish hold would affect the SEA KING's stability. Had he understood the effect of free surface on a vessel's stability, he probably would not have ordered the valve opened or he might have paid closer attention to the amount of water draining into the fish hold.

Another concern of the Safety Board was the failure of the operator to inform the Coast Guard of the status of the flooding aboard his vessel and the steps he had taken both before and after the Coast Guard had arrived at the scene. Specifically, he failed to tell them:

- Of the existence and purpose of the lazarette drainage valve.
- That the valve had been opened and could not be closed
- That the engineroom and fish hold shared a common bilge

It is critical to the success of any SAR mission to determine the nature of the problem, conduct a risk assessment, and decide on a course of action that minimizes the risk to life and property. For this to occur, it is necessary that all pertinent information be gathered and disseminated to SAR personnel responsible for making decisions or to any other persons whose safety and well being could be affected by such information.

Early in the SAR mission, the SEA KING had informed the Coast Guard that the engineroom and lazarette were flooded. Yet, despite the possibility that the source of the flooding of the two compartments might be related and despite subsequent reports that the vessel's fish hold was also flooding, the Coast Guard failed to question any of the SEA KING's crew further about the source and scope of the

flooding or to take any action to dewater either the fish hold or lazarette. The operator knew all these facts. The Safety Board believes that it would have been reasonable to expect him to volunteer this information to the Coast Guard; however, he did not offer it, and the Coast Guard did not ask.

The Coast Guard's failure to ask the operator questions about conditions aboard the SEA KING or to use the information it already had (that the lazarette and the fish hold were both flooding) impeded its management of the SAR mission in three ways: it distorted the Coast Guard's *understanding of the problem*; it limited the ability of the people in charge of the mission to evaluate the risks to personnel associated with each of the two attempts to tow the SEA KING across the bar; and it hindered the Coast Guard's efforts to thoroughly assess the risks associated with alternative actions.

When the SEA KING heeled over for the last time, the ability of the helmsman, the *injured crewmember*,⁴ and the two Coast Guardsmen inside the deckhouse to escape the sinking vessel was hindered because of the speed with which the vessel capsized, the obstruction of the pilothouse weathertight door by the fish finding sonar, the loose debris in the deckhouse, and the need to release the injured crewman from the confines of the litter.

The forward part of the superstructure contained the pilothouse, where all of the vessel's communications, navigation, and fish finding operations were conducted. On either side of the pilothouse were two steel weathertight doors. According to the owner of the vessel, a fish finding sonar was attached to a steel bracket that spanned the *starboard weathertight door*. The sonar, which was about 3.5 feet above the deck of the pilothouse, rendered the door impassable. The SEA KING's owner stated, "You can't go through that door unless you crawl underneath that stuff [the fish sonar unit]."

The crew's living quarters were aft of the pilothouse. The quarters consisted of two (two-person) staterooms, a water closet, a galley, and a small work area where the crew could take shelter from the weather. Outside access to and exit from the pilothouse and the crew living quarters were through either the port pilothouse door or one of the three weathertight doors.

Just before the accident, the helmsman was in the pilothouse, and two of the *four Coast Guardsmen on board* were tending the injured crewman, who remained strapped into the Stokes litter atop the table in the vessel's galley area. Because of the small area, the placement of the injured crewman atop the table partially blocked access to the aft weathertight doors.

The SEA KING took 15 seconds to roll over and submerge three of its five weathertight doors. Because the fish finding sonar was mounted in front of the starboard pilothouse door, the only means of escape for the helmsman was either through the port pilothouse door or through one of the aft doors. When it became apparent that the vessel was going over, the ensuing scramble of the helmsman and the two Coast Guardsmen to release the *injured crewman* from the litter consumed valuable seconds.

⁴The crewmember had been injured during the Coast Guard's earlier attempt to use a helicopter to hoist him from the SEA KING

Under normal circumstances, unstrapping someone from a litter takes about 10 seconds. In this case, however, 10 seconds was about all the time the people inside the deckhouse had to get free of the vessel. One of the Coast Guardsmen, who was the only person able to successfully escape the deckhouse, stated that he was able to escape only because he happened to be standing at the entrance to the weathertight door on the port side aft and that as the vessel went over and water began to stream into the deckhouse, he was somehow sucked out of the cabin.

The owner's decision to permanently affix a fish finding sonar in front of the starboard pilothouse door, rendering it impassable, especially in an emergency, and the fact that neither he nor the operator recognized the importance of the aft engineroom bulkhead being watertight showed poor judgment on their parts.

According to the Coast Guard, many accidents involving uninspected fishing industry vessels occur because operators fail to account for structural and/or equipment modifications to the vessels and for their effects on stability and because operators fail to recognize safety hazards affecting the vessel or its crew.⁵

The SEA KING's operator did not appreciate the consequences of opening the lazarette drainage valve because he did not understand the effect of free surface on stability. It is apparent that his more than 10 years' experience in the industry had not prepared him for the situation he faced. His training and experience were not unlike those of many commercial fishermen. His background included no formal training or experience in how to respond adequately to flooding and its attendant stability issues, nor was he required to have a Coast Guard license or certificate or a merchant mariner's document.

The circumstances of this accident indicate that the SEA KING's operator lacked the knowledge necessary to operate a fishing vessel safely. Specifically, he failed to appreciate the need to keep all means of egress clear of obstructions and the vessel's bulkheads watertight. His understanding of the effect of the flooding on the SEA KING's stability was particularly deficient.

Therefore, the National Transportation Safety Board recommends that the North Pacific Fishing Vessel Owner's Association and the National Council of Fishing Vessel Safety and Insurance:

- Inform their members of the circumstances of the SEA KING accident so as to encourage them to:
- o Keep all means of egress aboard their vessels clear of obstructions;
 - o Inform their crewmembers in the event they have an emergency requiring the assistance of the Coast Guard, of the need to gather and disseminate all pertinent information to search and rescue personnel;

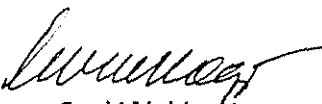
⁵U S Coast Guard, *A Plan for Licensing Operator's of Uninspected Federally Documented Commercial Fishing Industry Vessels*, January 1992

- o Educate their crewmembers about those factors that could affect the material condition and stability of their vessels.
(Class II, Priority Action) (M-92-57)

Also, the Safety Board issued Safety Recommendations M-92-54 through -56 to the U.S. Coast Guard. The Safety Board is also reiterating Safety Recommendations M-87-51 and -64 and M-92-29 to the U.S. Coast Guard.

The National Transportation Safety Board is an independent Federal agency with statutory responsibility "to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is vitally interested in any action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with respect to the recommendation in this letter. Please refer to Safety Recommendation M-92-57 in your reply.

VOGT, Chairman, COUGHLIN, Vice Chairman, and LAUBER, HART, and HAMMERSCHMIDT, Members, concurred in this recommendation.


By: Carl W. Vogt
Chairman