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SF-1
National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: July 23, 1998

In reply refer to: M-98-120 through -122

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On Friday afternoon, January 19, 1996, the U.S. tug *Scandia* had an engineroom fire while towing the unmanned U.S. tank barge *North Cape*, 4.5 miles off Point Judith, Rhode Island. All six crewmembers abandoned the *Scandia* amid 10-foot waves and 25-knot winds; however, no one was injured. The crew was unsuccessful in its attempts to release the anchor of the barge, which ran aground and spilled 828,000 gallons of home heating oil, causing the largest pollution incident in Rhode Island's history, an incident that led to the closing of local fisheries.¹ (The Eklof Marine Corporation, or EMC, was the company that operated the vessels.)

The National Transportation Safety Board determines that the probable cause of the fire damage aboard the tug *Scandia* and the subsequent grounding of and pollution from the barge *North Cape* was the EMC's inadequate oversight of maintenance and operations aboard those vessels, which permitted a fire of unknown origin to become catastrophic and eliminated any realistic possibility of arresting the subsequent drift and grounding of the barge. Contributing to the accident was the lack of adequate U.S. Coast Guard and industry standards addressing towing vessel safety.

After reviewing the *Scandia*'s discrepancy reports, interviewing EMC operations department personnel responsible for the oversight of vessel maintenance, and evaluating the implementation of the EMC's vessel inspection program, the Safety Board determined that the EMC's management oversight of vessel maintenance was poor, which resulted in reducing the safety of its vessels.

Significant delays in making repairs, as evidenced by the crew's repeated complaints on their monthly discrepancy reports, demonstrate that the EMC's management did not oversee the

¹For more information, read Marine Accident Report—*Fire Aboard the Tug Scandia and the Subsequent Grounding of the Tug and the Tankbarge North Cape on Moonstone Beach, South Kingston, Rhode Island, on January 19, 1996* (NTSB/MAR-98/03).

maintenance process and did not have controls to ensure that repairs were done in a timely enough manner to comply with the EMC's own procedures.

Because the EMC, by policy, did not keep maintenance or repair records, the operations department did not have a database with which to track the *Scandia's* history of repairs and maintenance. Without such a history, maintenance managers could not monitor trends in failure rates of the *Scandia's* equipment and could not make informed decisions about the vessel's need for preventative maintenance. The result was poor maintenance of the *Scandia* and repeated complaints from its captains.

Not only did the absence of a planned maintenance program result in the *Scandia* being poorly maintained, the absence probably affected the maintenance of the entire EMC fleet. The EMC's process for exercising vessel maintenance was applied to all vessels in the EMC fleet and was enforced by the same personnel at the EMC.

The International Maritime Organization adopted the International Safety Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code) in 1993. The ISM Code provides important guidance to shipping companies for exercising oversight of the operation and maintenance of oil tankers in international trade. However, no comparable guidance applies to tug-barges involved in domestic oil transportation. Therefore, the Safety Board believes that the Coast Guard and the AWO should cooperate to develop and implement an effective safety management code to ensure adequate management oversight of the maintenance and operation of vessels involved in oil transportation by barges.

The Safety Board analyzed the captain's vessel operations in light of the predicted weather and the actual on-scene weather and found that although a winter storm was rapidly approaching, the captain continued to proceed into the open seas of the "Race," thus reducing his margin of safety for avoiding the storm. (After leaving Long Island Sound, vessels proceed through the Race, which serves as a "gateway" to the next sound--Block Island Sound. Vessels are exposed to high southerly winds, waves, and ocean swells while in the Race because it does not have any islands to provide protective land cover.) Further, the captain did not reassess his decision to continue his voyage beyond the sheltered waters of Long Island Sound to the Race, and neither he nor the EMC had any plan to consider alternatives in case the vessel was endangered by the storm.

Despite the prediction of a sharp deterioration in the weather, the captain of the *Scandia* allowed himself only a narrow margin in which to avoid facing such weather in open seas; consequently, the Safety Board analyzed the EMC's operations to determine whether establishing voyage planning procedures could increase the safety of the operations of the EMC's vessels.

This investigation shows that the EMC had no procedures that would enable the crew to assess weather-related voyage risks or require the captain to obtain updated weather information or require the captain to consult the EMC's shoreside management about the risk of continuing the voyage under the prevailing weather conditions.

The captain and the EMC's shoreside management did not consult about continuing the voyage from Long Island Sound into the Race. Had the EMC's management helped the captain to identify the risks, alternative courses of action could have resulted. An example of an alternative would have been the captain seeking safe harbor while the *Scandia* was sailing in the sheltered lee of Long Island Sound before proceeding into the exposed waters of the Race, where the vessel encountered rapidly worsening weather.

Although the EMC left all weather-related decisions entirely to the captain, the Safety Board points out that current maritime safety management practices, such as those embodied in the ISM Code, emphasize that responsibility for vessel safety cannot be limited to ship captains but must be shared by the upper levels of the company's shoreside management. Therefore, the Safety Board believes that the EMC should develop and implement procedures whereby designated management officials communicate with ship captains at sea in times of potential or actual emergencies and during safety-critical periods of a voyage. The procedures should be directed toward facilitating the making of timely decisions that affect the safety of company vessels and crews. The Safety Board also believes that the Coast Guard should require towing vessel companies to develop and implement procedures whereby management officials communicate with ship captains at sea in times of potential or actual emergencies and during safety-critical periods of a voyage.

Voyage planning does more than improve the communications between a captain and his company's shoreside management; voyage planning can significantly improve a company's oversight of operations and its evaluation of weather-related risks, thereby reducing, at the planning stages of a voyage, the risk of an accident. The *Scandia* accident shows that EMC's inadequate oversight of vessel operations resulted in the *Scandia*'s lack of preparedness to encounter the predicted bad weather and contributed to the accident. For example, if the EMC had had a checklist to ensure that the loose equipment and material aboard the *Scandia* were secured in heavy weather, to ensure that flammable materials were not stored in the engineroom, and to ensure that the *North Cape* was adequately equipped for the anticipated weather, the crew might have thought through the process of preparing for heavy weather and taking the necessary precautions, thus significantly improving the safety of operations.

The Safety Board, therefore, concludes that because the EMC did not have adequate voyage planning procedures to ensure that adequate weather information and operational precautions were considered in its decisionmaking, the risk reduction measures that could have been taken before the voyage began were not taken. Consequently, the Safety Board believes that the EMC should develop and implement voyage planning procedures and checklists for its towing vessels to ensure that adequate risk reduction measures are taken before starting a voyage, including an assessment of weather risks, of the adequacy of the vessel's equipment, and of operational precautions. Further, the Safety Board believes that the Coast Guard, in conjunction with the towing vessel industry, should develop and implement requirements for voyage planning standards and checklists for towing vessel companies to ensure that adequate risk reduction measures are taken before starting a voyage, including an assessment of weather risks, of the adequacy of the vessel's equipment, and of operational precautions. Moreover, the AWO should encourage its member towing vessel companies to develop and implement such standards and checklists.

The *North Cape* had a 6,000-pound bow anchor. On the day of the accident, it was temporarily held in place on the bow anchor sled by a wire rope sling and shackle attached to an A-frame just behind the sled. The temporary arrangement was used while the windlass and its brake--which normally secured the anchor--were being repaired ashore. An appropriately designed and installed anchoring system may have reduced the possibility of grounding and pollution.

It is difficult to say with certainty whether the drifting *North Cape* could have been completely stopped before running aground even if the anchor and windlass had been properly installed and operable. The ability of an anchor to stop a vessel depends on various unknown factors, such as the holding power of the sea bottom compared to the magnitude of the drag forces exerted on the barge by the seas and wind. While an anchor is often ineffective in stopping a self-propelled vessel within a limited distance when the vessel is traveling at speed, the *North Cape* was drifting slowly, and there was a considerable distance for the anchor to take hold on the bottom before the barge grounded. Having an anchor drag along the bottom would have slowed the barge down and may have stopped it before it reached shore, thus giving the assist tugs much more time to reach it. The Safety Board therefore concludes that an operable anchor may have reduced the chance of the barge grounding.

Anchors are routinely used to hold (to "anchor") a vessel in a waterway and are safety devices. Just as Coast Guard regulations require anchors on manned barges to enhance their safety, so would anchors increase the safety of unmanned barges. The Coast Guard, however, does not require an unmanned barge to have an anchor because the Coast Guard recognizes that normally there is no one on an unmanned barge to release the anchor.

Nevertheless, the *North Cape* was not unique in having an anchor and windlass because many owners equip their unmanned barges with an anchor and windlass for operational convenience. On such a barge, a crewman jumps from the tug to the barge. While the jump is usually safe under routine conditions, in rough seas or unfavorable conditions, the probability of injuries and deaths can be unacceptably high. In this accident, the lives of two tug crewmen were seriously endangered by the turbulent seas when they jumped aboard the *North Cape* to release the anchor. Even if the anchor and windlass had been properly installed, the Safety Board would have considered the risk to the crewmen's lives to be just as excessive. The Board's determination is supported by Coast Guard accident statistics, which show that slips and falls overboard are the largest cause of deaths and injuries in the towing industry.

The Safety Board believes that such risk reduction strategies as remotely operated quick releases for barge anchors should be considered as a way of avoiding the risks associated with transferring people to an unmanned barge. The Safety Board concludes that when a tug is disabled, modern devices, such as radio-frequency transmitters, that are suitably located on the tug may be effective in releasing the barge's anchor by remote control and that the use of such transmitters does not involve imposing risks on the crew. A remotely operated mechanism can be designed to operate independently of the tug's primary power systems so that the device is not dependent on the tug's ability to propel or steer itself. A remote device can be activated quickly even if a tug has lost propulsion or steering, is involved in a fire, or is sinking.

The Safety Board, therefore, believes that the Coast Guard, in conjunction with the towing vessel industry, should develop modern remote anchor release devices for barges in emergencies that do not expose crewmen to unnecessary risk, and require their utilization. Further, the Safety Board believes that the AWO should encourage its members to work with the Coast Guard to develop a means of releasing anchors on unmanned towed barges by remote control from the towing vessel.

Therefore, the National Transportation Safety Board issues the following safety recommendations to American Waterways Operators, Inc.:

Develop an effective safety management code for your member companies to implement to ensure adequate management oversight of the maintenance and operation of vessels involved in oil transportation by barges. (M-98-120)

Encourage your member towing vessel companies to develop and implement voyage planning standards and checklists to ensure that adequate risk reduction measures are taken before starting a voyage, including an assessment of weather risks, of the adequacy of the vessel's equipment, and of the operational precautions. (M-98-121)

In cooperation with the Coast Guard, develop a means of releasing anchors on unmanned towed barges by remote control from the towing vessel. (M-98-122)

Also, the Safety Board issued Safety Recommendations M-98-103 through -116 to the U.S. Coast Guard and M-98-117 through -119 to Eklof Marine Corporation.

The National Transportation Safety Board is an independent Federal agency with the 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 recommendations in this letter. Please refer to Safety Recommendations M-98-120 through -122 in your reply. If you need additional information, you may call (202) 314-6450.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in these recommendations.

By:


 Jim Hall
 Chairman