

SP-20  
Log M-260

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: December 18, 1984

Forwarded to:

Admiral James Gracey  
Commandant  
U.S. Coast Guard  
Washington, D.C. 20593

SAFETY RECOMMENDATION(S)  
M-84-41 and - 42

About 1530 P.d.t. on October 27, 1983, the U.S. ocean towing vessel EAGLE, with two barges in tow, was proceeding on a southeasterly course en route from Anchorage, Alaska, to Seattle, Washington. When the EAGLE was about 25 miles west-southwest of Cape Fairweather, Alaska, it suddenly heeled about 50° to starboard and sank within a few minutes. At the time, a severe storm was sweeping through the area, and the vessel and tow were encountering 50- to 60-knot winds and 25- to 35-foot seas from the southeast. Of the nine persons on board the EAGLE, only one person survived. The estimated value of the EAGLE was \$2 million. 1/

The suddenness of the 50° heel to starboard experienced by the EAGLE about 1530 on October 27 strongly indicates that the tug was tripped by its towing hawser tending sharply to starboard, and suggests that the fairlead system which guided the towing hawser over the stern of the vessel failed in some manner, allowing the direction of the tension force exerted by the towing hawser to be transferred from astern to starboard. The fact that the vessel continued to heel, although a few times it appeared that the vessel might right itself, suggests that the towing hawser continued to exert a continuous overturning force on the vessel's starboard side.

A failure of the holddown device would have allowed the towing hawser to come out of the towing pins. Failures of holddown devices are not uncommon on U.S. ocean towing vessels, and operators undertake a wide range of measures to adapt or strengthen various components of the holddown device as casualties occur to reduce the possibility of future similar failures. In the case of the EAGLE, the padeyes connecting the holddown device to the deck had failed on several occasions and stronger padeyes had been installed. Installation of stronger padeyes should have reduced the possibility of future failures; however, deck fittings could have failed due to improper welding, metal fatigue, and high stress. Also, other parts of the holddown device, such as the chain, shackles, and roller, were subjected to stress and fatigue and, therefore, could have failed.

1/ Marine Accident Report—"Capsizing and Sinking of the U.S. Ocean Towing Vessel M/V Eagle in the Gulf of Alaska, October 27, 1983" (NTSB/MAR-84-07).

A failure of one or both towing pins to remain upright would have resulted in very high stress being placed on the holddown device as the vessel yawed, which probably would have caused some part of the device to break. Because the pneumatic rams which raised and lowered the pins were not designed to keep the pins upright under conditions of loading that the towing hawser might impart, it was essential that the brace or locking bar be securely fastened. A failure to properly fasten the brace, such as a failure to insert the cotter key or bolt, could have resulted in the brace becoming disabled, thereby allowing the pin to be depressed by the towing hawser in the event the vessel yawed excessively.

Once the tension of the towing hawser shifted from astern to starboard, it would have been essential for the navigation watch in the pilothouse to release immediately the brake on the towing winch to allow the towing hawser to run out. However, this would not have been an easy task to accomplish during a severe storm and with the vessel being heeled to 50° or more. Once the vessel was heeled beyond 50°, it would have been exceptionally difficult for the crew to reach the winch controls, and such a heel would have made operation of the mechanical override nearly impossible. If the EAGLE had been equipped with the capability to release the brake on the towing winch remotely from the pilothouse, at the first indication of a serious heel, tension on the towing hawser could have been released immediately.

The U. S. Coast Guard (USCG) does not have any standards for towing systems or towing equipment even on those ocean towing vessels that are subject to USCG construction and inspection regulations. The EAGLE was an uninspected vessel, but it was built in accordance with ABS rules; however, the ABS has no standards for towing systems and towing equipment installed on ocean towing vessels. If recognized standards were available, it would be possible for operators of ocean towing vessels to refer to them in order to insure that all components of the towing system, including such items as the towing pins and holddown device are adequate. Proper engineering design could have provided a workable fairlead system capable of withstanding the rigorous conditions encountered in the Gulf of Alaska. The Safety Board believes that the USCG and the ABS jointly should develop standards for towing systems and towing equipment on ocean towing vessels and that the standards should be published by the USCG as voluntary guidelines for uninspected ocean towing vessels and as regulations for inspected ocean towing vessels, and by the ABS as classification rules.

Stability calculations conducted by the USCG revealed that the order of taking oil from the fuel tanks resulted in raising the vessel's center of gravity and the creation of free surface in some tanks, both of which reduced the vessel's ability to withstand a heeling moment. These calculations also revealed that the EAGLE, as loaded at the time of the accident, failed to meet USCG stability standards. USCG calculations also determined that if the fuel oil on board the vessel at the time of the accident had been in tanks having the lowest centers of gravity, the EAGLE would have exceeded all USCG stability standards. However, no written instructions on the sequence of drawing fuel oil from various tanks in order to meet USCG stability standards had been required by the USCG and none were on board the vessel. In the absence of written instructions, the chief engineer was guided primarily by verbal instructions from the master--to keep the bow of the vessel trimmed higher than the stern and to keep the vessel from listing. Neither the chief engineer nor the master apparently were aware that the stability of the vessel was decreased substantially by the sequence followed in drawing oil from the fuel tanks. Similarly, the masters and chief engineers of other vessels operated by Pacific Western Lines, as well as vessels of other operators, may be in need of improved procedures and written guidance regarding the sequence of drawing fuel from various tanks in order to

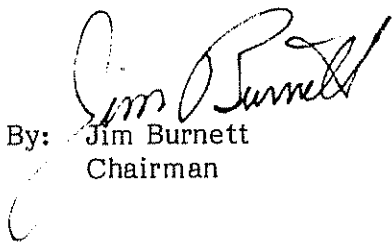
provide optimum stability. Therefore, the USCG should review its approval procedures for vessels similar to the EAGLE and require that guidance be provided to the operators of all existing and new tugboats where improper loading can result in the vessel's stability falling below USCG standards.

As a result of its investigation, the National Transportation Safety Board recommends that the U.S. Coast Guard:

In conjunction with the American Bureau of Shipping, develop standards for towing systems on all ocean towing vessels, including the means used to lead and restrain the towing hawser over the stern of the vessel and the means for releasing the brake on towing winches remotely from the pilothouse and each steering station. Publish these standards as voluntary guidelines for uninspected ocean towing vessels and as regulations for inspected ocean towing vessels. (Class II, Priority Action) (M-84-41)

Review for possible withdrawal all waivers of 46 CFR 42.15-1(b) which have been granted previously on the basis of arrangement and employment of vessels without full consideration of the effects of improper loading. Require that written guidance be provided operators of all new and existing ocean towing vessels where it is found that improper loading can result in the vessel's stability falling below U.S. Coast Guard standards. (Class II, Priority Action) (M-84-42)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and BURSLEY, Member, concurred in these recommendations.

By:   
Jim Burnett  
Chairman