

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

Log M-55

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Forwarded to:

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Commandant
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Washington, D.C. 20590

SAFETY RECOMMENDATION(S)

M-77-15 through 30

At about 2051 (P.d.t.), on September 13, 1976, the PEARL-C, a charter fishing boat, rolled over on its port side, flooded, and sank while being towed across the Columbia River Bar near Astoria, Oregon, by a U.S. Coast Guard 44-foot motor lifeboat (MLB). No one onboard the PEARL-C was wearing personal flotation devices (PFD's). Of the 10 persons aboard the PEARL-C, 2 persons were rescued, 1 person drowned, and 7 persons, including the vessel operator, are missing and presumed dead. 1/

About 1325, on September 13, 1976, the PEARL-C's operator radioed for Coast Guard assistance when a malfunction, apparently in the fuel system, disabled the boat. Although the PEARL-C's loss of propulsion did not pose an immediate danger to its passengers, they were subjected to increased hazard when the boat was taken in tow and towed across the Columbia River Bar. Since many of the 870 search and rescue (SAR) assistance cases that the Coast Guard station at Cape Disappointment responded to in fiscal year 1977 resulted in vessels being towed across the Columbia River Bar, many persons were subjected to this risk. Nationwide statistics indicate that over 43 percent of the Coast Guard SAR cases result from equipment failures. Many of these failures are due to inadequate maintenance, inadequate inspection of equipment, and contaminated fuel. Not only do they expose passengers to danger, but Coast Guard assistance is rendered at great public expense.

The Safety Board believes that it is possible and necessary to reduce the large number of towing assistance cases worked by the Coast Guard. Since most towing assistance cases do not classify as reportable accidents which must be investigated, the Coast Guard does not adequately analyze the causes of equipment failures that require towing assistance to develop and implement effective corrective actions.

1/ For more detailed information, read "Marine Casualty Report: Charter Fishing Boat PEARL-C Sinking on the Columbia River Bar Near Astoria, Oregon, September 13, 1976." (NTSB-MAR-77-1)

Preventive maintenance is necessary to assure the reliable operation of a boat's propulsion system. The operator of the PEARL-C might not have been familiar with the maintenance requirements of his boat. An educational program could inform operators of proper maintenance practices and maintenance records could provide a means of verifying that the propulsion system has been properly maintained.

The search capability of the 44-foot motor lifeboat proved to be inadequate. Visibility from the operator's station in a seaway was poor and the electronic search aids did not operate. Without effective reliable electronic search equipment and because of its slow speed, the 44-foot MLB appears to be an ineffective search boat and the Coast Guard should not depend upon it for search purposes when better equipped vessels or helicopters are available. Even if the PEARL-C's location had been accurately determined, the MLB might not have been able to navigate precisely enough by compass to come within visual range. Coast Guard small boats, especially 44-foot MLB's, may not be suitable for long missions because their riding characteristics and exposed operator stations cause operator fatigue after a few hours.

Since the PEARL-C did not have precise navigation equipment such as LORAN installed, the Coast Guard should not have relied on the location data reported by the PEARL-C without evaluating the reliability of that information; bearings taken with a steering compass to distant points which are near to each other should have been questioned. The PEARL-C's radio-telephone was operational and provided a signal for radio direction finding. Because the direction finding equipment installed on four different Coast Guard units did not operate properly, the Coast Guard was not able to use radio signals to locate the PEARL-C. The Coast Guard program of installing new automatic direction finding and homing equipment on its boats in conjunction with its efforts to have channel 15 VHF dedicated for emergency locating purposes should improve its capability to locate VHF radio-equipped boats.

Personnel at Cape Disappointment had an average time on station of about 15 months. Because of the frequency of personnel rotation the handling of SAR assignments by new personnel who are not familiar with local conditions will occur on a more frequent basis. The Safety Board believes that this frequent rotation is detrimental to conducting an effective search and rescue operation.

The large number of factors that must be evaluated in SAR cases increases the probability that human error will result in a mishap. Although training and experience will improve proficiency at handling SAR cases, such situations normally impose stresses on personnel that can reduce their effectiveness. The Coast Guard does not appear to have critical SAR procedures in a form which will insure that operations personnel make a timely evaluation of important SAR circumstances and carry out safety instructions.

The coxswains of both MLB's that towed the PEARL-C did not enforce the Commandant instruction which requires persons on boats under tow by the Coast Guard to don PFD's. Although the Officer of the Day at Cape Disappointment ordered the coxswain of the relief tow boat to make sure that the PEARL-C's passengers had PFD's on, at no time did he verify that the order was carried out. Since both MLB's were on scene at the time of the accident, the use of PFD's might have been effective in saving other lives. Compliance with such important safety instructions should not depend entirely upon the memories of SAR personnel. Important safety instructions should be posted where the coxswain, who is ultimately responsible for the safety of passengers on distressed boats, can readily see them from his operating station.

The passengers might not have known where the PFD's were stowed or how to put them on and they were not aware of the hazards associated with towing operations which were greatly increased when the PEARL-C was towed across the Columbia River Bar. In emergencies and distressed situations, the operator may be preoccupied or incapacitated so that he cannot assist his passengers in donning PFD's; also a dangerous situation may develop so quickly that there is not enough time to instruct passengers in the use of PFD's. Once the PEARL-C was taken in tow, its operator probably was too concerned with steering in order to keep the towline properly aligned to look after the passengers. A properly qualified deckhand could have looked after the passenger's safety and assisted them in donning their PFD's.

After the engine of the PEARL-C failed, the engine belt-driven bilge pump was inoperable. Estimates of the leakage rate indicate that the PEARL-C's electric bilge pump, when connected to an adequate power source, would have had sufficient capacity to remove water from the engine compartment. However, the electric bilge pump was not installed so that it could remove water from the engine compartment where seawater leakage through the hatch boards accumulated and its battery was in an unknown condition of charge.

The operator and passengers had no way of determining that there was water in the engine compartment bilge except by removing one of the hatchboards and making a visual check; the effect of bilge water on vessel motions probably would have been masked by other forces on the boat. Because the operator was preoccupied with the towing operation, he was not available to check the bilges. Devices are available to alert vessel operators and passengers of unsafe water levels. The Safety Board has recommended previously that all boats with a capacity for a large number of persons be required to have a means of alerting the operator at his control station of unsafe water levels. Had the operator or passengers of the PEARL-C been made aware that a dangerous water level was developing, they might have had time to don PFD's.

The port and starboard fuel tanks on the PEARL-C were cross-connected by a 3/8-inch fuel line with in-line valves which could shut off the flow of fuel between tanks. The valves were normally

open. The weight shift of fuel which slowly passed through the cross-connection, while wind and towline were heeling the PEARL-C to port, significantly reduced the PEARL-C's resistance to capsizing. Had the operator been aware of this effect, he probably would have closed the cross-connection valve.

Although the PEARL-C had undergone annual inspections since 1959, the total area of its freeing ports and the attachment requirements for the closure for its engine compartment did not comply with Coast Guard regulations. Further, it is doubtful that the engine compartment hatchboards in the main deck met the watertightness requirements of 46 CFR 178.35-1. Leakage through the hatchboards would have significantly reduced the PEARL-C's stability. This lack of compliance indicates that Coast Guard inspection practices do not require strict compliance or rely too much on the assumption that initial and intervening inspections of construction features were adequate.

The permitted route for the PEARL-C, specified in the Certificate of Inspection, corresponded to the definition given for partially protected waters in 46 CFR 178.05-17. This route designation implies that vessels in partially protected waters can reach suitable shelter relatively quickly and that these vessels' requirements should be less than those of vessels that normally operate at great distances from shelter. While "distance to safety" has been adopted as a convenient criterion, the interest should be on "time to safety" and the risk level resulting from local hazardous conditions. During ebbtide on the Columbia River Bar, sea conditions are amplified and vessel progress to safety is slowed. Where a vessel must cross the bar to reach shelter, it must be able to survive the special hazards of the bar. The conditions of the Columbia River Bar are sufficiently hazardous to warrant its classification as exposed waters so that all vessels which must cross the bar will be afforded the maximum degree of seaworthiness afforded by the Small Passenger Vessel regulations.

Therefore, the National Transportation Safety Board recommends that the U.S. Coast Guard:

Conduct field investigations to determine the causes of vessel equipment failures which require assistance from Coast Guard Station Cape Disappointment and implement a program of corrective actions which includes publishing maintenance and repair guidelines for the operators of charter boats to reduce the number of assistance cases. (Class II, Priority Followup) (M-77-15)

Require the operators of inspected charter boats to keep a record of service and repairs in a suitable form for Coast Guard examination. (Class II, Priority Followup) (M-77-16)

In cooperation with the States of Oregon and Washington, establish a program of safety education for the operators of charter boats which includes training in preventive maintenance and in at-sea repair of machinery and equipment that is necessary for safe operation. (Class II, Priority Followup) (M-77-17)

Evaluate the effectiveness of its motor lifeboats in search operations offshore in comparison with its aircraft, and establish criteria for selecting specific boats and aircraft according to existing SAR conditions. (Class II, Priority Followup) (M-77-18)

Institute at Cape Disappointment an equipment failure reporting and maintenance program to provide for early detection and repair of SAR equipment problems and insure higher management provides support for corrective action required which is beyond the station's capability. (Class II, Priority Followup) (M-77-19)

In conjunction with the Federal Communications Commission, expedite the dedication (allocation) of channel 15 VHF for the sole purpose of emergency location. (Class II, Priority Followup) (M-77-20)

Install a checklist of procedures necessary for safe towing operations at the operator steering station of Coast Guard boats that are used for towing. (Class II, Priority Followup) (M-77-21)

Determine the feasibility of increasing the assignment periods for military personnel or, in lieu thereof, using civilian employee rescue personnel as an alternative to give the station more continuity and higher capability. (Class II, Priority Followup) (M-77-22)

Establish a comprehensive checklist to insure that personnel evaluate important SAR circumstances and carry out established safety procedures. (Class II, Priority Followup) (M-77-23)

Require the operators of inspected charter boats to give instructions to their passengers in the location and use of personal flotation devices before getting underway and to both notify the Coast Guard of the situation and distribute these devices to their passengers before crossing a bar or waterway when conditions are determined by the Coast Guard to be hazardous. (Class II, Priority Followup) (M-77-24)

Require inspected passenger vessels to have a means to alert the operator at his control station, by both visual and audible signals, of unsafe water levels in each decked-over compartment, which if flooded would have a significant effect on stability. (Class II, Priority Followup) (M-77-25)

Determine whether electric bilge pumps which are actuated automatically by water in the bilges and which have an independent energy source should be required to be installed in each compartment of inspected small passenger vessels. (Class II, Priority Followup) (M-77-26)

Advise operators of the possible adverse effects of cross-connections between fuel and other liquid tanks on a vessel's stability when wind or other forces heel the vessel, and identify corrective measures. (Class II, Priority Followup) (M-77-27)

Require Coast Guard inspectors to strictly enforce the regulations regarding watertightness of weather decks, including the requirements for securing devices and means of attachment. (Class II, Priority Followup) (M-77-28)

Designate the Columbia River Bar as a specially hazardous area per 46 CFR 178.05-15(a) and require vessels which operate across it to have the maximum degree of seaworthiness afforded by the Small Passenger Vessel regulations. (Class II, Priority Followup) (M-77-29)

Require a deckhand on inspected charter fishing boats and set minimum qualification standards for deckhands. (Class II, Priority Followup) (M-77-30)

BAILEY, Acting Chairman, McADAMS, HOGUE, and HALEY, Members, concurred in the above recommendations.



By: Kay Bailey
Acting Chairman