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National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: February 18, 1987

In reply refer to: M-87-5

Mr. Jose Rendento
President
Zodiac of North America, Inc.
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On May 14, 1986, the U.S. sailing vessel PRIDE OF BALTIMORE capsized and sank in the Atlantic Ocean, about 250 nmi north of Puerto Rico while en route from St. John, U.S. Virgin Islands, to the Chesapeake Bay, Maryland. The vessel, a replica of a Baltimore clipper, was returning to Baltimore, Maryland, after an extended European good will tour promoting the port of Baltimore.

The PRIDE OF BALTIMORE left St. John about 1100 on May 11, 1986, and after clearing the harbor, set sails and proceeded out to sea. After experiencing some calm periods during the first night, the wind filled in during the nights of May 12 and 13 and by the morning of May 14, the wind had increased to about 25 to 28 knots. The sails were shortened accordingly and all hands, except for the cook, were on deck coiling lines, clearing away gear, and securing all but two of the sails.

Shortly after noon, a sudden gust of wind struck the PRIDE OF BALTIMORE heeling it to port until it was on its beam end with the masts and sails lying on the water. Crewmembers were thrown into the water and the cook managed to escape from below. Two inflatable liferafts deployed but did not remain inflated. One raft was damaged by the ship's rigging while the second raft deflated through the open topping-off valves. The PRIDE OF BALTIMORE, valued at $1,080,000, flooded and sank in a matter of minutes.

After about 6 hours, the eight surviving crewmembers managed to inflate one of the six-man liferafts by mouth. After drifting for over 4 days, the survivors were rescued on May 19, 1986, by the crew of the M/V TORO, a Norwegian tanker, who notified the Coast Guard of the accident. 1/

The two Zodiac MPUS-6 standard liferafts in use aboard the PRIDE were considered sufficient lifesaving equipment for open ocean survival. The design and equipment incorporated in this model were believed to be adequate for the rigorous requirements of ocean service by the manufacturer as described in their product literature. The replacement of these liferafts with models containing additional equipment more suitable

1/ For more detailed information read Marine Accident Report—"Capsizing and Sinking of the U.S. Fishing Vessel PRIDE OF BALTIMORE in the Atlantic Ocean, May 14, 1986" (NTSB/MAR-87/1).

The liferaft malfunction, specifically the deflation of the liferafts after they were initially deployed and inflated, is related to the design and service requirements of the topping-off valve (plug) assembly. The topping-off valve design, which is not used on rafts currently manufactured by Zodiac, caused the difficulty the survivors experienced in keeping the plugs seated when they were adrift in the ocean. Once the plugs are removed from the valve, which is routinely required for increasing air pressure in the raft due to ambient temperature variations, they are difficult to re-seat securely. When they are not re-seated securely, they are susceptible to accidental dislodging with resultant pressure loss.

The difficulty in securing the plug manually in the valve opening is addressed in the Zodiac Liferaft Manual servicing instructions. These instructions require that during servicing, the plugs must be inserted in the topping-off valve openings using a special procedure with a mallet. This procedure assures that the valve plugs are properly seated in the valve openings during initial inflation. Experiments conducted at the headquarters of Zodiac of North America indicated that the liferaft malfunction described by the survivors could be traced to the servicing of the liferafts conducted in Algeciras, Spain, 3 months before the accident. Once again, the design of the topping-off valve assembly is considered to have indirectly contributed to the liferaft malfunction reported by the crew of the PRIDE. The design of the plug precluded any positive closure, which a threaded fitting would provide. Without a threaded or similar type fitting to ensure proper closure of the valve opening, the seating of the plugs in the PRIDE's liferafts could not be taken for granted. As a result of the experiments it is concluded that the topping-off valve plugs were not inserted into the topping-off valve during servicing in accordance with the requirements of the servicing manual. This is further substantiated when the damaged liferaft deflated completely instead of retaining air in the undamaged chambers according to its design. The liferaft deflation can be attributed to the failure of servicing personnel to install the plugs resulting in the loss of pressurized air through the opening and deflation.

Zodiac liferafts incorporating this topping-off valve assembly design are no longer manufactured, but it is estimated that over 300 of these liferafts are currently in use in the U.S. Although proper servicing of this equipment may eliminate the potential for deflation following deployment of the raft, it would be appropriate for Zodiac to require a retrofit installation of a valve assembly with a different design when servicing rafts that are currently in use. A valve design, which eliminates the problems encountered as a result of hand-seating the valve plug after removal for topping-off purposes is available and would eliminate the design-induced limitations of the equipment.

The drowning of the ship's carpenter can be attributed to the failure of the liferafts to function properly and his lack of survival swimming skills. Although he was in the water for 30 minutes before he was located and he appeared to be suffering from the effects of ingestion of seawater, he may have survived the immersion if a liferaft had been available. It is doubtful, however, if he could have withstood the rigors of 4 days in the overcrowded liferaft. The Safety Board believes that the ship's carpenter would not have drowned if the liferaft malfunction had not occurred, but his chances of survival in the overcrowed liferaft were minimal.

The loss of various items of survival equipment stowed in the liferaft also could be attributed to improper servicing as a result of a failure of servicing personnel to properly tie and secure the equipment bags to the interior of the raft. However, it is more likely that survivors may have inadvertently released the equipment during their initial attempts to board the liferafts.

Therefore, the National Transportation Safety Board recommends that Zodiac of North America, Inc.:

> Provide material to and require that authorized Zodiac service stations retrofit Zodiac MPUS-6 standard liferafts with improved topping-off (inflation/deflation) valves when servicing to eliminate the potential hazards of improper valve-plug placement during servicing and inadvertent valve-plug unseating and pressure loss experienced with the current valve design. (Class II, Priority Action) (M-87-5)

Also, as a result of its investigation, the Safety Board issued Safety Recommendations M-87-1 through -4 to the Coast Guard, M-87-6 to the Society of Professional Sailing Ship Masters, M-87-7 and -8 to Pride of Baltimore, Inc., and M-87-9 and -10 to the National Weather Service.

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 actions taken as a result of its safety recommendations and 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-87-5 in your reply.

BURNETT, Chairman, LAUBER and NALL, Members, concurred in these recommendations. GOLDMAN, Vice Chairman, did not participate.

By: Jim Burnett
Chairman