M-170 A

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: July 23, 1981

Forwarded to:

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SAFETY RECOMMENDATION(S)

M-81-76

About 0842 c.s.t., on January 22, 1980, the upbound Brazilian bulk carrier M/V FROTALESTE, with a New Orleans-Baton Rouge pilot aboard, collided with the anchored Portuguese freighter M/V CUNENE near Bonnet Carre Point, Louisiana, on the lower Mississippi River. As the FROTALESTE was overtaking the upbound U.S. registry tug-barge combination M/V ALICE ST. PHILIP/FAUSTINA, the tugboat's steering system failed. The ALICE ST. PHILIP turned to the right, which led the pilot to turn the FROTALESTE to the right and into a collision with the CUNENE. The hull of the CUNENE was damaged extensively and the bow of the FROTALESTE received moderate damage. Neither the ALICE ST. PHILIP nor the FAUSTINA was damaged. There were no deaths or injuries caused by the accident. 1/

Shortly after rounding Bonnet Carre Point, about 0840, the operator of the ALICE ST. PHILIP observed the rudder angle indicator moving to starboard, while the steering control lever was indicating "amidship." The chief engineer ran to the after steering compartment where he found the male threaded starboard hydraulic actuator rod had separated from the female threads of the rod eye connecting the rod to the rudder tiller arm.

The pilot of the FROTALESTE saw the ALICE ST. PHILIP starting to veer radically to the right and ordered the rudder of the FROTALESTE hard right. As the ALICE ST. PHILIP veered to the right, the FROTALESTE turned to the right. About 30 seconds after the hard right order, the pilot ordered the rudder hard left and, about 20 to 45 seconds later, ordered emergency full astern. The FROTALESTE struck the CUNENE at 0842 at about a 45° angle, measured from the stern to the port clockwise, at about 8 to 9 mph, according to the estimate of the pilot of the FROTALESTE.

1/ For more detailed information read "Marine Accident Report--Brazilian Bulk Carrier M/V FROTALESTE Collision with Portuguese Freighter M/V CUNENE, Lower Mississippi River, near Bonnet Carre Point, Louisiana, January 22, 1980" (NTSB-MAR-81-10).

While the ALICE ST. PHILIP/FAUSTINA was anchored at the right descending bank after the collision, the chief engineer isolated the starboard hydraulic actuator by securing both hydraulic line valves at the hydraulic cylinder and by supporting the hydraulic actuator from the overhead. The ALICE ST. PHILIP/FAUSTINA resumed its voyage during the afternoon of January 22 with the starboard hydraulic actuator secured and proceeded upriver to Uncle Sam's Dock, about mile 157, for offloading and repairs. A welder was hired to assist the chief engineer in repairing the steering system. The chief engineer reported that he checked various parts of the steering system and replaced both port and starboard hydraulic actuator rod eye pins and one port rudder bearing. After the pins were replaced, the welder welded restraining flat bars in place above and below the pins. These bars are not called for in the design prints. The design detail for pin restraint was not followed in the pin replacements.

The ALICE ST. PHILIP got underway from Uncle Sam's Dock about 1700 on January 22. About 2000, the newly welded restraining flat bar on the underside of the port tiller arm failed at the weld, and the pin holding the port hydraulic actuator rod eye to the tiller arm dropped out of position. Steering control was lost, and the rudders moved hard to port. The ALICE ST. PHILIP was then anchored, and the chief engineer replaced both the port and the starboard pins and rewelded the restraining flat bars.

There is no direct evidence indicating that the failure of the starboard hydraulic actuator rod to the rod eye connection on the ALICE ST. PHILIP occurred at the time of the right rudder excursion before the accident. However, the reaction of the rudders, when considered with the coupling failures discovered shortly after the subsequent reported excursions, indicates that the rod eye connection failed and some combination of that failure and rudder control manipulations resulted in the rudder moving to the right. The precise reason why the rudder moved to the right and did not streamline could not be determined.

The Sperry Rand Corporation design of the steering system allows for operation (but at half power) of the rudders with only one of the two installed hydraulic actuators in operation. The followup system should have acted to return any rudder excursion to the ordered position. Despite this, the rudders were able to move hard over following a coupling failure. This collision demonstrates the importance of preventing such a rudder excursion and maintaining rudder control. The Safety Board concludes that a design review of this steering system is warranted.

Therefore, the National Transportation Safety Board recommends that the Sperry Rand Corporation, Marine Systems Division:

> Conduct a thorough technical review of the design of the steering system installed in the ALICE ST. PHILIP to determine if a design anomaly permits the system to move "hard over" upon a hydraulic actuator rod-to-tiller arm coupling failure, and take corrective action. (Class II, Priority Action) (M-81-76)

KING, Chairman, DRIVER, Vice Chairman, McADAMS, GOLDMAN, and BURSLEY, Members, concurred in this recommendation.

By: James B. King
Chairman