

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: June 20, 1980

Forwarded to:

Admiral John B. Hayes
Commandant
U.S. Coast Guard
Washington, D.C. 20593

SAFETY RECOMMENDATION(S)

M-80-42

At about 0400 c.s.t., on February 3, 1979, the outbound Spanish Freighter M/V POLA DE LENA sustained a steering gear failure and collided with the Gretna Ferry terminal and the ferry vessel M/V CITY OF GRETNA, which was moored at the terminal, at New Orleans, Louisiana. The impact of the collision caused the ferry vessel M/V SEN. ALVIN T. STUMPF to break loose from its terminal moorings and drift down stream. There were no deaths or injuries, but property damage was estimated at \$1,310,000. 1/

At the time of the accident, the POLA DE LENA had been in service for about 13 months. The vessel's steering gear, which had functioned satisfactorily before the accident, was a modern design which incorporated redundancy to provide two separate, parallel electric-hydraulic steering systems. However, no operating instructions nor a block diagram was posted on the navigation bridge to explain the procedures to be followed to make optimum use of the available redundancy to correct steering failures.

The steering system failure was caused by a loose setscrew which allowed an electrical connection within the steering console, an Anschutz-Kiel Compilot VI, to become so loose that a critical control circuit to the starboard pump was interrupted. This connection, designated L2-19, probably had never been properly tightened. If the setscrew had been tightened firmly, it would have compressed the copper wiring and, thus, dampened the tendency of vibration to loosen the screw. The Safety Board believes that a reasonably, thorough inspection of the steering system by supervisory building yard personnel and representatives of Anschutz-Kiel during construction of the vessel could have identified this discrepancy for corrective action and thereby prevented this failure.

While the electrical failure made it impossible to steer with the starboard steering pump, steering control could have been regained if the port pump had been energized immediately, or if both port and starboard pumps had been in service at the time.

1/ For more detailed information read, "Marine Accident Report--Collision of Spanish Freighter M/V POLA DE LENA with Two Mississippi River Ferry Boats and Gretna Ferry Landing, New Orleans, Louisiana, February 3, 1979" (NTSB-MAR-80-10).

A survey of the steering system also disclosed that the 220-volt a.c. power supply circuitry to the followup system was not installed in accordance with applicable plans for the system. A 10-amp circuit breaker had been installed in the bridge distribution panel instead of two 6-amp fuses as specified in the Anschutz-Kiel plans. Further, the circuit breaker was mislabeled "Autopilot," although it had nothing to do with the autopilot. This mislabeled circuit breaker was exposed to the risk of being inadvertently tripped by the movement of personnel passing the distribution panel. Unlike the circuit breaker for the gyrocompass, located immediately above it, the circuit breaker was not protected by a plastic shield. If the circuit breaker had been tripped inadvertently or left off before the failure, the wheel mode would have been inoperative, regardless of whether or not the steering pumps were operating properly, and attempts to test the wheel would have been fruitless, consumed critical time, and possibly resulted in confusion.

Regardless of the ambiguity surrounding this additional mislabeled circuit breaker, the one lineup of modes which would have worked was for the steering system to be in the pushbutton mode with the port pump on the line. This required that the port pump be running, which apparently had been accomplished sometime before the collision. The master, who arrived on the bridge moments before the collision, testified that the green indicator lights for both pumps were on. Also, it would be necessary for the mode selector switch to be in the pushbutton position. This mode selector switch was operated by the second mate during his attempts to regain steering, but its position, after the port pump was running, is not known with certainty.

Before the second mate could test the pushbuttons with the port pump in operation, the situation probably was deteriorating rapidly. The vessel was less than 3 minutes from collision, and it was becoming necessary for the second mate to shift his attention to dropping the anchors; hence, it is conceivable that there simply was not sufficient time remaining for the second mate to test the steering after the port pump was in service.

The second mate's uncertainty regarding the sequence of procedures he followed is attributable to the lack of written instructions prescribing the explicit steps to be followed in the event of a steering casualty. The fact that the accident occurred during darkness may have contributed to slowness in analyzing the steering system failure and in operating the various switches for the steering system.

The Safety Board believes that all ships should have operating instructions and a block diagram permanently displayed on the navigation bridge and in the steering engine room to explain the changeover procedures for remote steering systems.

The Safety Board has carefully considered the advantages and the adequacy of providing redundancy in steering systems which allow personnel on the navigation bridge to shift to alternate means of steering in the event of a failure. As a result of its investigation of an accident in New York harbor on June 2, 1973, ^{2/} the Safety Board recommended that the U.S. Coast Guard:

^{2/} For more detailed information read, "Marine Casualty Report - SS C.V. SEA WITCH - SS ESSO BRUSSELS (Belgium); Collision and Fire New York Harbor on 2 June 1973 with Loss of Life" (USCG/NTSB-MAR-75-6).

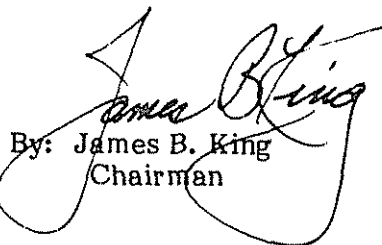
Establish a requirement for oceangoing vessels in designated restricted waters such as New York harbor to have the emergency steering station manned. This also should apply to foreign vessels. (M-76-2)

The POLA DE LENA demonstrates that redundancy in design may not be enough since personnel may fail to analyze the situation and make proper use of alternate systems, even on ships of modern design. Additional documentation on the need for improved reliability of marine steering is provided in the accident report on the steering failure and collision of the Peruvian Freighter INCA TUPAC YUPANQUI with the U.S. Butane Barge PANAMA CITY at Good Hope, Louisiana, on August 30, 1979, ^{3/}and in a September 21, 1979, safety report on steering improvement. ^{4/}The recent steering failures experienced by the POLA DE LENA and the INCA TUPAC YUPANQUI, as well as previous steering failures discussed in the 1979 safety report, continue to confirm the need for oceangoing vessels to man their steering engine rooms when operating in restricted or confined waters. Accordingly, the Safety Board reiterates Recommendation M-76-2.

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

Require each self-propelled vessel of 1,600 gross tons or greater navigating in confined or congested waters of the United States to have operating instructions and a block diagram that clearly and simply explain the changeover procedures for the remote steering gear control systems and steering gear power units on the vessel. The instructions and block diagram should be permanently displayed both on the navigation bridge and in the steering engine room. (Class II, Priority Action) (M-80-42)

KING, Chairman, McADAMS and GOLDMAN, Members, concurred in the above recommendation. DRIVER, Vice Chairman, and BURSLEY, Member, did not participate.


By: James B. King
Chairman

^{3/} For more detailed information read, "Marine Accident Report - Collision of Peruvian Freighter M/V INCA TUPAC YUPANQUI and the U.S. Butane Barge PANAMA CITY, Good Hope, Louisiana, August 30, 1979" (NTSB-MAR-80-7).

^{4/} For more detailed information read, "Safety Report - Progress Toward Improvements in Marine Steering Reliability" (NTSB-SR-79-1).