



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: May 19, 1998

In reply refer to: M-98-84

Mr. Francis B. Francois
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American Association of State Highway and
Transportation Officials
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The 560-foot-long Liberian tankship *Julie N*, carrying a cargo of heating oil, collided with the south bascule pier of the Portland-South Portland (Million Dollar) Bridge in Portland, Maine, about 1105 on September 27, 1996. The vessel had passed between the piers of the new Portland-South Portland bridge (Casco Bay Bridge) and was en route to the Rolling Mills terminal about 1.2 miles beyond the Million Dollar Bridge. The vessel was under the direction of a State-licensed docking master (pilot). After the collision, the pilot stated that as the vessel approached the bridge, he had issued three orders for port rudder to swing the bow to the left and then intended to order the rudder to hard starboard and to increase the engine speed from slow to half ahead to stop the swing and align the vessel for passage through the drawspan. However, the pilot inadvertently ordered the rudder to hard port instead of hard starboard. He recognized his error within seconds and ordered the rudder to hard starboard; given the narrowness of the bridge span, however, the shifting of the rudder occurred too late to avoid the collision.¹

There were no injuries, but the collision resulted in a 30-foot-long hole in the vessel's hull beneath the waterline. About 4,000 barrels of oil spilled into the harbor. The vessel sustained about \$660,000 in damage, and the cost for cleanup of the oil was approximately \$43 million. Repairs to the Million Dollar Bridge were about \$232,000.

The National Transportation Safety Board determines that the probable cause of the collision with the Portland-South Portland (Million Dollar) Bridge was the pilot's inadvertent order to port (left) rudder instead of starboard (right) rudder. Contributing to the accident was the narrow horizontal clearance of the bridge drawspan, which afforded little leeway for human error.

¹For additional information, refer to Marine Special Investigation Report—*Postaccident Testing for Alcohol and Drugs in the Marine Industry and the Ramming of the Portland-South Portland (Million Dollar Bridge) at Portland, Maine, by the Liberian Tankship Julie N on September 27, 1996* (NTSB/SIR-98/02)

Contributing to the severity of the damage to the vessel and to the amount of oil spilled was a corner of the bridge pier that was not adequately shielded by the timber fender system.

Evidence that navigating through the Million Dollar Bridge was a demanding task is apparent upon examination of the 20-year history of bridge contacts made by various ships and barges under the control of various ships' captains and pilots. According to the October 1986 Maine Department of Transportation *Portland Bridge Fender Damage Summary of Bridge Operator Reports* to the Coast Guard Marine Safety Office in Portland, Maine, 46 cases of bridge damage caused by vessels occurred between January 1976 and May 1986. Two more cases were recorded in 1987 and one in 1988. From 1989 through 1996, 22 collisions with the bridge or fender system were recorded. The bridge tenders logged only those contacts in which damage to the fender system occurred. Frequent contact was a strong indication that the passage through the bridge was too narrow for modern shipping traffic.

The east corner of the south bridge pier, which the vessel struck to produce the 30-foot-long tear in the underwater hull, could have been better shielded by fendering, as it was following the accident. However, the corner had never been a problem before because large inbound and outbound vessels normally maneuver so as to pass very close to the north fender system, a procedure that kept large vessels away from the south pier. Hence, the potential risk to tank vessels posed by the corner was not recognized. However, large vessels proceeding outbound have occasionally made contact with the fender system around the west corner of the north bascule pier. Although occasional damage has occurred to the fender system, there is no record of any vessel being holed.

The bridge's fender system was not designed to protect the bridge from the types of vessels, which have steadily increased in size, that routinely navigate its draw. In addition, the fender system was insufficient to prevent damage to bridge elements from severe impacts. The Safety Board concludes that the bridge's fender system did not provide adequate protection for the bridge or for vessels navigating through its draw.

Improving the chances of successfully navigating the bridge would require altering the procedures, vessels, or environment so that the job is made easier. The Casco Bay Bridge, completed in 1997, accomplished this by doubling the width of the opening for vessel traffic from 98 to 196 feet, which should reduce the number of bridge contacts by relaxing tolerances for passage and allowing pilots to recover from minor errors during lineup. This added space will give pilots a considerably larger margin for correcting an improper lineup.

Also, it is possible to design systems that are more error-tolerant. For example, fender systems can be designed to offer protection to the vessel as well as the bridge in case of an error in lineup or in conning the vessel. The much improved fender system at the new bridge is far more capable of buffering contact than the former timber fender system. Consequently, the Safety Board concludes that the increased horizontal clearance and the improved fender system at the new bridge have greatly improved safety for the class of vessels that normally would have transited the old bridge and should reduce the likelihood of the bridge being struck by similar

class vessels. Therefore, the National Transportation Safety Board recommends that the American Association of State Highway Transportation Officials:

Inform, in cooperation with the Federal Highway Administration, State highway departments of the circumstances of this accident and recommend that the States evaluate the adequacy of fendering systems at bridge piers where the systems were not designed for the type and size of vessel currently using the waterway and may not be adequate to protect the bridge and take corrective action as necessary. (M-98-84)

Also, the Safety Board issued Safety Recommendations M-98-69 through -81 to the U.S. Coast Guard, M-98-82 to the Maine Department of Transportation, and M-98-83 to the Federal Highway Administration.

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 action taken as a result of its safety recommendations. Therefore, it 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-98-84 in your reply. If you need additional information, you may call (202) 314-6457.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in this recommendation.

By: 
Jim Hall
Chairman