

Log M-238

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: February 6, 1984

Forwarded to:

Admiral James S. Gracey
Commandant
U.S. Coast Guard
Washington, D.C. 20593

SAFETY RECOMMENDATION(S)

M-83-93 through -95

About 2320 c.s.t. on April 2, 1983, a tow consisting of four single-hull tank barges in tandem laden with crude oil, being pushed by the towboat CITY OF GREENVILLE, collided with one of the piers of the Poplar Street Bridge, which crosses the Mississippi River between St. Louis, Missouri, and East St. Louis, Illinois. The tow was proceeding downriver during high water conditions, en route from Wood River, Illinois, to Memphis, Tennessee. At least one of the two middle barges in the tow was ruptured by the impact of the collision. Crude oil was released and ignited almost immediately. One barge remained connected to the towboat, but the other three barges broke loose and floated downriver. One barge sank about 1 mile from the bridge, a second barge collided with barges moored at a Monsanto Chemical Company barge loading facility, and the other barge collided with a Pillsbury Company grain barge loading terminal. The Monsanto and Pillsbury facilities, both located on the Illinois side of the river, sustained severe damage. The burning oil ignited several fires along about 2 miles of waterfront on the Illinois side of the river and polluted approximately 10 miles of the river. There were no deaths, and only one person, who was working on barges at the Monsanto facility, received minor injuries as a result of this accident. The damage to the barge loading facilities, the damage to grain barges and their cargoes, the damage and loss of cargo sustained by the tow of the CITY OF GREENVILLE, and the cost of oil cleanup operations were estimated to be about \$9 million. 1/

As the tow approached the Veterans Memorial Bridge and the Eads Bridge in the St. Louis area, the operator maneuvered the tow to pass through the center arch of the Eads Bridge, while attempting to keep the tow aligned with the general axis of the river. As the tow passed under the closely spaced Veterans and Eads Bridges, the operator recognized that a crosscurrent was setting the tow to the left. The steersman, a trainee who was observing the operation in the pilot house, stated that, as the towboat passed under the Eads Bridge, the towboat was very close to the triangular-shaped mark which indicated the extreme left edge of the usable span of the bridge's center arch. About the

1/ For more detailed information read Marine Accident Report--"Ramming of the Poplar Street Bridge by the Towboat M/V CITY OF GREENVILLE and Its Four-Barge Tow, St. Louis, Missouri, April 2, 1983" (NTSB/MAR-83/10).

time that the towboat emerged from beneath the Eads Bridge, the operator saw two green lights on the Poplar Street Bridge, which was about 0.8 mile downstream, and he began to steer the tow toward them. The operator stated that he steered a fairly straight course toward the green lights, that he thought the span he was heading for might be the main navigation span, and that the white lights he expected to see above the green lights might be burned out, which he said occasionally happened on other bridges.

Actually, the green lights that the operator was steering toward marked the center of the left side span of the Poplar Street Bridge, which is adjacent to the Illinois bank, and not the center of the main span. When the tow was about midway between the Eads and Poplar Street Bridges, the operator noticed two white lights in a vertical line off the starboard bow of the tow. Shortly thereafter, he also saw that there were two green lights located below the white lights. At this time the operator recognized that the combination of white and green lights indicated the location of the main navigation span. (It was determined subsequently that the upper white light was not illuminated.) However, because he believed that there was not sufficient distance ahead between the tow and the Poplar Street Bridge to permit moving the tow sufficiently to the right to align it for passing through the main span, he continued to steer toward the green lights marking the center of the left side span. The operator said that, as the head of the tow approached the left side span, he noticed that the tow appeared to be encountering a crosscurrent pushing him away from the Illinois side and that the tow was approaching very close to the right descending pier of the left side span. The starboard side of the tow, at about the point where the second and third barges were coupled, struck the right bridge pier of the left side span at about 2320.

The operator testified that he was aware that a draft, or crosscurrent, could exist near the Eads Bridge, but that he did not know from which direction it might come. The investigation revealed that it is common knowledge among operators familiar with the St. Louis area that high water conditions will produce a crosscurrent that will set a tow toward the left descending side of the bridge's center span opening, and that for a successful transit it is essential for a downbound tow to be to the right of the centerline of the span as it approaches the Eads Bridge in order to compensate for a set to the left. A lack of knowledge of conditions at the Eads Bridge resulted in the operator aligning his tow with the center of the bridge span rather than being offset to the right of the sailing line. As the tow passed beneath the bridge, it was set to the left, necessitating the use of left rudder to move the stern of the tow to the right to prevent the pilothouse or other structure of the towboat from colliding with the low steel of the left side of the arch. As the tow cleared the Eads Bridge, he began to steer straight toward some green lights that appeared ahead of the tow. The straight course that the operator steered toward the left side span of the Poplar Street Bridge resulted in a diagonal trackline across the river from a position near the center of the river toward a point on the left side of the river.

The operator demonstrated that he was not well informed about how to navigate a large tow through the St. Louis area at night during high water conditions. He did not know the direction of the crosscurrent normally found at the Eads Bridge during high water; thus, he was unable to position his tow during the approach to the bridge in order to compensate for the crosscurrent and to prevent his towboat from being set close to the low steel of the left side of the main arch as he passed underneath. When the tow cleared the Eads Bridge, the operator did not see the three white lights over green lights which marked the center of the main span of the Poplar Street Bridge as he expected, but he decided to head for the green lights he did see on the assumption that the white lights were extinguished. In fact, these green lights marked the center of the side span. If the operator had possessed adequate local knowledge, he would have been aware of three crucial factors: (1) that the tow would be headed in the general direction of the Illinois

side span as the towboat exited the center span of the Eads Bridge, (2) that it is not a recommended practice for large downbound tows to use the Illinois side span during high water conditions, and (3) that it was essential to direct the head of the tow to the right after clearing the Eads Bridge, due to the curvature of the river, in order to head for the main span of the Poplar Street Bridge located in the center of the river. The Safety Board believes that an operator piloting a large tow through the St. Louis area must have sufficient local knowledge that he can locate the main spans of all bridges and navigate safely through them without regard to whether the navigation lights marking the center of each main span are illuminated, and that the operator must have a similar high level of local knowledge of all other areas along his route which may be difficult to navigate.

The practice followed by the Coast Guard of licensing operators of towing vessels to operate anywhere on the Western Rivers without requiring that an applicant for a license be examined on his knowledge of the area in which he will operate does not provide an adequate safeguard to prevent accidents like this particular one. It would be preferable that an operator be required to demonstrate to the Coast Guard that he has local knowledge of the routes for which he seeks to be licensed. The testing procedure for knowledge of a particular route would not need to be as rigorous as that required for a first-class pilot's license, but the applicant should be tested on specific critical areas, such as the St. Louis area and other similar metropolitan areas, certain bends, and areas where current or other conditions severely affect the safety of navigation. The Coast Guard should identify critical areas of the Western Rivers and require that an applicant for a license as an operator of uninspected towing vessels be examined for local knowledge of any of the critical areas covered by the license.

In this case it appears that the operator did not know where the main span of the Poplar Street Bridge was located until he finally saw the two white lights. The operator could have used the searchlight effectively to locate the bridge piers on either side of the main navigation span, if he had recognized that he might not be headed in the right direction and if he had been familiar with the configuration of the bridge. Retro-reflective material near the navigation lights could have been beneficial since it would have produced a reflection when illuminated by the searchlight of a towboat that is considerably more brilliant than the bridge navigation lights. Retroreflective material near the lights marking the center of the main span would enable an operator to locate the main span by sweeping the length of the bridge until the material was illuminated. The Safety Board believes that the Coast Guard should give a high priority to reinstituting the use of retroreflective material to supplement navigation lights on bridges over navigable waters.

Also, it appears that measures could be taken to make navigation spans of bridges more prominent and easier to identify. This could be accomplished by augmenting or modifying existing bridge lighting. The Safety Board believes that the Coast Guard should study means to enhance the mariner's ability to identify lights marking the navigation spans of bridges where such lights may be difficult to detect due to interference from other lights or due to impaired visibility or where it is essential that the mariner locate a span quickly.

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

Identify critical areas of the Western Rivers which are difficult to navigate due to unusual current conditions, sharp bends, navigation clearance restrictions, or similar circumstances, and require future

applicants for licenses as operators of uninspected towing vessels to take an examination regarding local knowledge of these areas. (Class II, Priority Action) (M-83-93)

Expedite the promulgation of regulations to require installation of retroreflective material on bridges to supplement navigation lights. (Class II, Priority Action) (M-83-94)

Study the use of auxiliary lighting to enhance the mariner's ability to identify lights marking the navigation spans of bridges where such lights may be difficult to detect due to interference from other lights or due to impaired visibility or where it is essential that the mariner locate a span quickly. (Class II, Priority Action) (M-83-95)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and McADAMS, BURSLEY, and ENGEN, Members, concurred in these recommendations.


By: Jim Burnett
Chairman