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NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

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Forwarded to:

Lt. Gen. J. K. Bratton  
Chief of Engineers  
U.S. Army Corps of Engineers  
20 Massachusetts Avenue, N.W.  
Washington, D.C. 20314

SAFETY RECOMMENDATION(S)

M-83-96 and -97

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.

Valley Towing Service, Inc., entrusted the operation of the CITY OF GREENVILLE to a veteran operator who had a good safety record and to a relief operator who had recent experience in the St. Louis area. The company has recognized the need for its navigating personnel to have experience on the routes to which assigned and to this end assigned a licensed operator to the CITY OF GREENVILLE as a steersman to acquire local experience prior to his being entrusted with operation of a towing vessel in this portion of the Western Rivers.

In the towing industry it is not unusual for a company to acquire a contract which requires it to operate on portions of the extensive Western Rivers navigation system that are not familiar, or recently familiar, to the operators piloting the company's vessels. However, this accident demonstrates that some degree of familiarity with local conditions is important and sometimes crucial even for the most experienced and capable operator. Unfortunately, there is no reference source for an operator to consult in order to obtain information on such phenomena as crosscurrents that may occur at some bridges, locks, channel bends, and other such sites in the Western Rivers. The Safety Board believes that the acquisition, accumulation, and publishing of such data in a format similar to the United States Coast Pilot is warranted. Such a publication could be especially helpful to operators with limited local experience.

The Corps of Engineers regularly is involved in maintaining the navigable waters of the United States and is the repository of extensive data on commercial waterways. Furthermore, through the operation of its vessels, contacts with other government agencies, and the management of contracts, the Corps of Engineers has access to a wide range of data on changing conditions of the nation's waterways. Accordingly, the Safety Board believes that the Corps of Engineers should develop and publish a guide providing navigation information on the Western Rivers. Such a guide could provide information on landmarks used by mariners in navigating various difficult areas and about the proven maneuvers used by mariners to compensate for current or winds during different river stages of the waterway and during different seasons.

Navigation charts prepared by the Corps of Engineers for many waterways, including portions of the Western Rivers, contain profile drawings of bridges crossing the waterways which enable the mariner to ascertain readily the general configuration of the bridge, the location of the navigation openings, and the location of the various bridge piers. Since the charts for the Upper Mississippi River do not contain such profile drawings, a mariner who is unfamiliar with the area can only formulate an estimate of the number and location of the piers based upon the sailing line appearing on the chart, which normally passes through the center of the main span, and the clearances for the navigation spans found on either the charts or in the Light List. The Safety Board believes that an estimate based upon such limited data is not an adequate substitute for a profile drawing, and that the Corps of Engineers should insure that all the river navigation charts it publishes in the future include profile drawings of all bridges. The profiles should show the river mile, clearance data, and include appropriate annotations to aid the mariner.

Therefore, the National Transportation Safety Board recommends that the U.S. Army Corps of Engineers:

Develop and publish a navigation guide or guides for mariners navigating the Western Rivers similar in format to the United States Coast Pilot. (Class II, Priority Action) (M-83-96)

Include profile drawings of all bridges in the next revision of the Upper Mississippi River Navigation Charts. (Class II, Priority Action) (M-83-97)

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" (P.L. 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 recommendations in this letter.

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

By:   
Jim Burnett  
Chairman