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Log M-270

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: April 1, 1985

Forwarded to:

LTG E. R. Heiberg  
Chief of Engineers  
U.S. Army Corps of Engineers  
20 Massachusetts Avenue, N.W.  
Washington, D.C. 20314

SAFETY RECOMMENDATION(S)

M-85-26

About 0015 c.s.t. on April 26, 1984, a tow consisting of 12 barges laden with grain, was being pushed ahead by the U.S. towboat ERIN MARIE, when it collided with a pier of the Poplar Street Bridge, which crosses the Upper Mississippi River between St. Louis, Missouri, and East St. Louis, Illinois. The tow, which was proceeding downriver during high water conditions, was arranged three barges wide and four barges long with the towboat pushing at the center aftermost barge. The hulls of the forward two of the four barges on the starboard side were ruptured when the tow struck the bridge pier. These two barges, in addition to the forward two center and forward two portside barges, broke loose from the tow as a group of six barges. The two aftermost barges on the starboard side also separated and floated free down stream. Only four barges remained attached to the ERIN MARIE. One of the two forward starboard barges sank and its cargo was damaged; three barges were punctured and two other barges sustained minor damage. 1/

The barges which had broken free from the tow floated down river, striking a fleet of 23 barges, breaking them from their mooring and causing them to float free down river. The barges in turn struck other fleeted barges and shoreside facilities. More than 150 barges and vessels were broken free of their moorings and cast adrift in the river. The total damage to barges, cargo, fleeting areas, and barge loading facilities was estimated at \$3,000,000. There were no injuries to persons.

The relief operator maneuvered the tow under the Merchants Railroad Bridge, mile 183.2, and the McKinley Highway and Railroad Bridge, mile 182.5, without experiencing any navigational problems. The operator remained in the wheelhouse until the tow was between the two bridges and then went below to his room. The vessel then passed slightly to the right of the green lights of the main span of the Veterans Memorial Bridge, mile 180.2, (slightly right of the center of the river's channel) and then the relief operator steered to the right, to point the starboard row of barges under the right daymark on

1/ For more detailed information, read Marine Accident Report--"Ramming of the Poplar Street Bridge by the Towboat M/V ERIN MARIE and Its Twelve - Barge Tow, St. Louis, Missouri, April 26, 1984" (NTSB/MAR-85/2).

the Eads Highway and Railroad Bridge, mile 180.0, in a maneuver to compensate for a right to left crosscurrent and thereby place the towing vessel near the center of the highest point of the arch on the Eads Bridge. The towboat passed about 10 feet to the left of center of the arch. With the river level gage in St. Louis at 33.3 feet, there was 55.3 feet of vertical clearance at the center of the arch and 40.5 feet of vertical clearance for 150 feet to the left and right of center. The ERIN MARIE had an estimated maximum height above water of 36 feet. The relief operator stated that he was busy maneuvering through the Eads Bridge trying to avoid the arch and to compensate for the crosscurrent which was setting the tow to the left, from the Missouri to the Illinois side of the river, on the downstream side of the bridge. As the tow cleared the bridge, the relief operator steered the tow to the right, to point his tow toward what he thought was the right descending pier of the main navigation span of the Poplar Street Bridge, mile 179.2. However, the operator had misidentified the green light on the Illinois span of the Poplar Street Bridge as that on the main span and was steering instead toward the left descending pier of the main navigation span. There was only 0.8 mile between the bridges, or slightly more than four lengths of the tow. About two tow lengths from the Poplar Street Bridge, the relief operator realized that something was wrong with the tow's position, because he did not feel the current setting his tow to the left as expected. The tow travelled one more tow length before the relief operator determined that he was heading for the Illinois span and not the main navigation span in the center of the river. He then attempted to steer the tow to the left toward the left descending pier of the Illinois span. He stated that at that moment he had a better opportunity to avoid the bridge pier between the two spans rather than try to maneuver the tow to the right for the main span. As he steered to the left, he told the deckhand, who was standing by in the wheelhouse, to call the operator. The operator arrived in the wheelhouse when the tow was about 300 feet above the left descending pier of the main span and took over navigation of the tow from the relief operator. The relief operator told the operator that the tow was out of shape and that he had steered on the wrong bridge lights. The operator told the relief operator to contact via radio the Eagle Marine Service's office (at mile 177.4, UMR), a 24-hour-a-day harbor fleeting service, to tell them that the ERIN MARIE was going to hit the bridge and to request that they send towboats to the bridge. When contacted, the fleeting service responded that it had no towboats immediately available. The operator continued the left turn until the starboard head of the barge had cleared the left descending pier of the main navigation span and then applied right rudder in an attempt to swing the stern of the tow away from the pier. The maneuver was not successful, and the starboard side of the tow, about 100 feet aft of the bow of the first barge, struck the left side of the left descending pier of the main span. This occurred about 0015 on April 26.

When the tow struck the pier, the force of the impact ruptured the hulls of the forward two barges on the starboard side. These two barges and the two forward center and two forward portside barges broke loose from the tow and floated free as a unit passing down river through the Illinois span. The two remaining starboard side barges also broke loose from the tow and together floated down river through the main or center span. Four barges, the after two center and the after two portside barges, remained secured to the ERIN MARIE. The barges that broke away from the tow collided with barges moored in fleeting areas and at docks downstream from the Poplar Street Bridge causing a chain reaction as fleeted and docked barges were in turn broken away from their moorings. The breakaway barges collided with the Monsanto Chemical Company barge facility (mile 178.0, LDB, UMR); the Pillsbury Company barge loading facility (mile 177.6, LDB); the Corps of Engineers (COE) Service Base Dock (mile 176.6, RDB); and various other fleeted barges. An estimated 150 barges and other vessels were set adrift by the domino effect of the breakaway barges from the ERIN MARIE tow.

The relief operator's testimony indicated that he was not well experienced about navigating a large tow through the St. Louis area at night during flood water conditions. He was not familiar with the strength of the crosscurrent at the Eads Bridge during flood water; thus, he was unable to orient his tow correctly during the approach to the bridge in order to compensate for the crosscurrent. When the tow cleared the Eads Bridge, the relief operator did not look for the three white lights over the green light which marked the center of the main span of the Poplar Street Bridge. He expected them to be extinguished as he had misunderstood a Notice to Mariners broadcast the evening before which reported that the three downstream white lights were extinguished (in fact, there are no white lights at this location). He decided to head for the green light that he did see on the assumption that the white lights were still extinguished. However, the green light marked the center of the side span. Had the relief operator possessed adequate local knowledge, he would have been aware of two important factors: (1) because of the crosscurrent, the tow would be headed toward the Illinois-side span as it passed through the center span of the Eads Bridge, and (2) it would be essential to direct the head of the tow to the right after clearing the Eads Bridge, because of the curvature of the river and the effects of the crosscurrent. The Safety Board believes that an operator piloting a large tow through the St. Louis area should be required to have sufficient local knowledge to be able to use aids to navigation effectively to facilitate maneuvering through the numerous closely spaced bridges; for that matter, the operator must have local knowledge of all other areas along his route which are particularly difficult to navigate.

The principal sources of navigation information available to mariners on the Upper Mississippi River are the navigation charts published by the COE and the Light List published by the Coast Guard. The navigation charts, which were last updated in 1982, are contained in a single spiral-bound booklet of 170 charts, which also includes charts of the navigable tributaries of the Minnesota and St. Croix Rivers. Each sequential chart covers about 5 miles of waterway. Effective use is made of colors to identify appropriate features of the waterway. There are no charts of larger scale to display important harbor and navigation channel details. In the 1982 edition, additional pages were added, listing facilities along the waterway, such as fleeting areas, but the facilities are not shown on the charts. The horizontal and vertical clearances provided in the bridge navigation spans are listed on the charts adjacent to each bridge. Unlike some navigation charts prepared by the COE, the charts for the Upper Mississippi River do not show elevation drawings of the bridges crossing the waterway; therefore, the charts do not assist a mariner to determine the number and location of bridge piers, the configuration of a bridge, or the location of the main navigation span.

In addition to bridge profiles, additional hydrographic and topographic chart information is needed to assist the mariner to navigate the UMR safely. A mariner who is unfamiliar with an area can only speculate on the appearance of waterside structures as presently marked on charts or listed on the extra pages following a chart. Such limited data in the UMR Navigation Charts is not a substitute for larger scale charts of certain areas of the river. The COE should include supplemental larger scale charts of harbors, high accident areas, and areas difficult to navigate (due to unusual current conditions, sharp bends or restricted navigation clearances) in its next edition of the UMR Navigation Charts.

As result of its investigation of the M/V CITY OF GREENVILLE accident, 2/ the Safety Board issued Safety Recommendation M-83-96 on February 6, 1984, recommending that the COE:

Develop and publish a navigation guide or guides for mariners navigating the Western Rivers similar in format to the United States Coast Pilot.

On June 29, 1984, the COE replied that they did not plan to develop and publish a guide, but that they would support an appropriate agency in the pursuit of the goal to publish such information.

In view of the COE position the Safety Board has classified Safety Recommendation M-83-96 "Closed--Reconsidered" and directed virtually the same recommendation to the National Oceanic and Atmospheric Administration in view of its experienced with the Coast Pilot publications.

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

In the next edition of the Upper Mississippi River Navigation Charts, provide supplemental large scale charts for harbor areas, and areas difficult to navigate due to current conditions, sharp bends, or restricted navigation clearances; and areas having a higher than average accident rate or where there are recurrent major accidents. Incorporate on all charts the location of fleeting areas and other important waterside features. (Class II, Priority Action) (M-85-26)

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 recommendation in this letter.

BURNETT, Chairman, GOLDMAN, Vice Chairman and BURSLEY, Member, concurred in this recommendation.

By:   
Jim Burnett  
Chairman

2/ 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 3, 1983" (NTSB-MAR-83/10)