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Log M-376C



National Transportation Safety Board

Washington, D. C. 20594

Safety Recommendation

Date: December 3, 1991

In Reply Refer To: M-91-43

Mr. George J. Ryan
President
Lake Carriers' Association
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On Sunday, September 16, 1990, the 392-foot-long U.S. tankship JUPITER was moored at the Total Petroleum, Inc., terminal (Total Petroleum) located on the Saginaw River in Bay City, Michigan, discharging a cargo of unleaded gasoline. While the JUPITER lay moored at Total Petroleum's pier, the 635-foot-long bulk carrier BUFFALO entered the Saginaw River en route to a bulk materials handling facility at Midland, Michigan, to discharge a cargo of coal. As the BUFFALO passed the JUPITER, the tankship broke away from its berth and its stern swung out into the river, rupturing the discharge hose to the pier and damaging the pipeline on the pier. Gasoline spilled on the pier and onto the deck of the JUPITER. The electrical cables to two motor-operated valves that closed off the pipelines at the end of the pier were torn apart, causing sparks that ignited the spilled gasoline. Fire spread to the deck of the JUPITER, causing a series of explosions in the cargo tanks that destroyed the entire midship section of the vessel. One crewmember died during abandonment of the vessel. The JUPITER, valued at \$9 million, was declared a total loss and later sold for scrap.¹

The record of the BUFFALO's transit in the Saginaw River from the time it entered the waterway until it arrived off the Midland Contracting Company's pier did not include the speed of the vessel at various points during the voyage or the times that the vessel passed bridges, landmarks, and navigational aids. The BUFFALO's logbook shows that the vessel passed the front range marker of the entrance channel range at 0800 and that it arrived off the Midland Contracting pier at 0920. Coast Guard Station Saginaw River's records indicate that the vessel passed the station at 0815.

¹For more detailed information, read Marine Accident Report--"Explosion and Fire Aboard U.S. Tankship JUPITER, Bay City, Michigan, September 16, 1990" (NTSB/MAR-91/04).

The BUFFALO's master testified that when he saw the JUPITER at the Total Petroleum facility, he immediately adjusted his vessel's pitch setting to 4 feet and maintained that setting until he passed the JUPITER. The master stated that it was the minimum pitch he could use and still maintain control of the vessel, although he testified that he could not relate pitch to speed and did not know what speed was equivalent to the 4-foot pitch setting in the Saginaw River. Investigators could not verify the the BUFFALO's speed as it passed the JUPITER because, like most Great Lakes vessels, the BUFFALO did not maintain a pitch/speed record during the river passage. Although the Safety Board believes that the BUFFALO had a 4-foot pitch setting on its engine controls when it passed the JUPITER, the Board cannot determine whether the vessel had slowed to the corresponding speed by the time it reached the JUPITER. Based on its estimated transit time (10 minutes) between the D&M Railroad Bridge and the Independence Bridge, a distance of 0.7 miles (1,417 yards), Safety Board investigators calculated tthat the BUFFALO's speed when it passed the JUPITER, was approximately 4.2 knots, or 4.8 mph.

The BUFFALO's master testified that because of the effect of the wind on his vessel's starboard side, he steered closer to the JUPITER than he ordinarily would have to avoid setting over to the opposite bank. He was aware that he passed abeam of the tankship with about 60-65 feet of clearance. Members of the JUPITER's crew corroborated the clearance between the vessels. The port side of the JUPITER was outside, but close to the western edge, of the 200-foot-wide channel. The BUFFALO's beam was 68 feet. Thus, the centerline of the BUFFALO was within a few feet of the center of the dredged channel, placing its port side about 70 feet from the channel's eastern edge. According to the master's testimony, he believed that if he had steered any closer to the eastern side of the channel, the BUFFALO would have grounded. If he had to pass close to the JUPITER, the BUFFALO's master should have used less speed. If a reduction in speed was not a viable option, he should have passed the JUPITER at a greater distance. The Safety Board believes that when the BUFFALO passed closer than normal to the JUPITER without a further reduction in speed, the combination of speed and proximity resulted in hydrodynamic forces that caused the tankship to surge heavily at the berth and subsequently break away.

Because the mate on watch on the bridge of the BUFFALO had limited duties (watching the wake), he could have readily logged the times that the vessel passed buoys and bridges. The Coast Guard regulations in 33 CFR Part 164 for vessels over 1,600 gross tons require that the vessel's position be placed on the navigation chart of the area and that the person directing the movements of the vessel set the speed with consideration for underkeel clearance and damage that might be caused by the vessel's wake and for any local vessel speed limit. Large vessels, such as the BUFFALO, should maintain an accurate record of the engine maneuvers and courses steered, either manually or automatically, so that if the speed of the vessel becomes a safety issue, the appropriate records are available. Moreover, such records would allow investigators to recreate a vessel's trackline, further aiding the investigation of marine accidents. By maintaining accurate records of the vessel's maneuvering, including necessary speed reductions to safely pass vessels berthed in narrow waterways, masters and pilots will become more aware of the hazards of navigating large vessels in narrow waterways. Continuous attention to the vessel's speeds and courses is necessary because of the possible damage from wake or other hydrodynamic phenomena when vessels move. The Safety Board believes that the bridge watch of vessels over 1,600 gross tons that transit the Great Lakes and its tributaries should record the vessel's position at regular intervals and have a means

of recording the times of engine maneuvers, as well as a means of continuously recording the vessel's compass headings (course recorder).

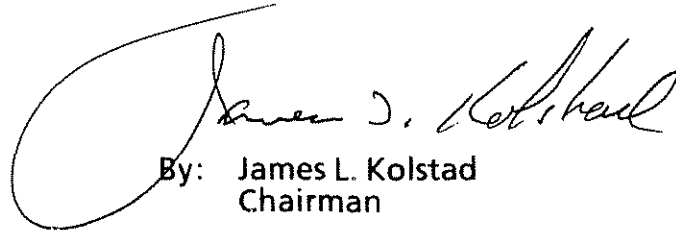
Therefore, the National Transportation Safety Board recommends that the Lake Carriers' Association:

Recommend that your members establish a procedure aboard their vessels to record engine maneuvers, either manually or automatically, when entering or leaving port and at other times during a voyage when maneuvering by engines is required and have a means of continuously recording the vessels' headings (course recorder). (Class II, Priority Action) (M-91-43)

Also, the Safety Board issued Safety Recommendations M-91-31 through -36 to the U.S. Coast Guard, M-91-37 and -38 to Cleveland Tankers, Inc., M-91-39 through -42 to Total Petroleum, Inc. ; M-91-44 to the State of Michigan; and M-91-45 to the Bay County Emergency Services.

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-91-43 in your reply.

KOLSTAD, Chairman, COUGHLIN, Vice Chairman, and LAUBER, HART and HAMMERSCHMIDT, Members, concurred in this recommendation.



By: James L. Kolstad
Chairman