

Log M-376B



National Transportation Safety Board

Washington, D. C. 20594

Safety Recommendation

Date: December 3, 1991

In Reply Refer To: M-91-39 through -42

Mr. Philippe Dunoyer
President
Total Petroleum, Inc.
Post Office Box 500
Denver, Colorado 80201

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

Over the years, many vessels had docked successfully at Total Petroleum's terminal, and its pier and mooring devices had received and passed visual examinations by the Coast Guard. However, the continued use of the wood mooring piles without a proper internal inspection of the piles ultimately resulted in a failure of one of the piles at a critical time. Although a Department of Agriculture laboratory could not quantify the strength of the broken wood mooring pile, the test sample did show evidence of rot, indicating the strength of the wood piling had declined. The Safety Board believes that the annual inspection of the pier and the mooring devices should include probing of the wood pilings to determine whether

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 wood has deteriorated to the extent that the strength of the pile may be affected.

When the JUPITER arrived at the Total Petroleum pier, the crewmembers moored the tankship at the facility as they had done on prior voyages. They used the JUPITER'S No. 2 and 3 mooring cables as spring lines and ran the lines to the Nos. 2 and 3 pile clusters, respectively. They ran the No. 1 and 4 mooring cables to the No. 1 and 4 pile clusters, respectively. They led the bow polypropylene line slightly aft and the stern polypropylene line slightly forward to the same pile clusters as the No. 1 and 4 wire cables. They could not secure the polypropylene lines to separate mooring devices because the facility had only four pile clusters.

When moored, the JUPITER's bow extended beyond the No. 1 pile cluster and its stern extended beyond the No. 4 pile cluster. Because of the tankship's size, crewmembers could not run the bow and stern polypropylene lines in a manner that took full advantage of each line's potential. Placing the after polypropylene on the same pile cluster as the No. 4 steel wire cable gave the line a forward lead which rendered it ineffective after the piling broke.

The Safety Board concludes that the mooring arrangement at Total Petroleum's Bay City terminal should be upgraded so that vessels similar to the JUPITER can be moored using multiple mooring devices for bow and stern lines with proper leads fore and aft.

The JUPITER's crew did not customarily man the navigating bridge or monitor the VHF-FM radio while the vessel was moored, therefore, the watch officer on the tankship was unaware of the BUFFALO's approach. The JUPITER's third mate first became aware of the BUFFALO's presence when he heard its whistle signal requesting the opening of the Independence Bridge and when he sighted the vessel passing the D&M railroad bridge.

Because the JUPITER's crewmembers were busy tending to the cargo transfer, they could easily have failed to notice the BUFFALO, particularly if the BUFFALO's master had opted to call the Independence Bridge by VHF-FM radio rather than sounding a whistle signal. The Safety Board believes that current practices fail to ensure that personnel aboard a vessel moored at the terminal or terminal personnel have sufficient time to suspend transfer operations and take precautionary measures. After the BUFFALO's watch officer broadcast the security call, he established radio contact with Coast Guard Station Saginaw River. The radio watchstander at Station Saginaw River was aware of the BUFFALO's presence in the river and could have telephoned the Total Petroleum terminal to alert terminal personnel that large vessels were moving in the waterway.

Critical functions, such as suspending cargo transfer operations and manning the mooring winches, should not be left to chance. Terminal personnel should share responsibility for notifying vessels at their facility of ships moving in the river when transfer operations are under way. Because the terminal operator and the JUPITER's deck officer were each furnished with a handheld radio, tuned to the radio at the terminal manager's office, the information could have been passed quickly. As a back-up, the terminal operator, who was positioned near the JUPITER with his handheld radio, could also have notified the vessel. The Safety Board believes that as an added back up, operations at the Total Petroleum terminal should include receiving information from Coast Guard Station Saginaw River so that terminal

employees can give timely notice to vessels loading or discharging at the Total Petroleum pier.

Total Petroleum prepared the operating manual used by the Bay City facility in accordance with 33 CFR Part 154. Approved by the Coast Guard, the manual includes descriptions of the types and grades of liquid petroleum products handled at the terminal, the hazards involved, and instructions for the safe handling of the products. It also includes procedures that terminal employees should follow in the event of spills, instructions on how to care for persons exposed to the material, what equipment is available at the terminal for containment and recovery, and the names of persons and agencies, Federal, State, and local, to notify in the event of a spill.

However, the manual does not outline the procedures that terminal employees should follow when a vessel berthed at the terminal during transfer operations is approached by another large vessel. Total Petroleum leaves such procedures to the discretion of the vessel personnel in charge of the transfer operation. Although the Declaration of Inspection Prior to Bulk Cargo Transfer (see appendix C) lists requirements that personnel must comply with before transfer may commence, the terminal's operating manual does not state that transfer operations should cease during passage of river traffic or in the event of other hazards that could affect the operation's safety. The Safety Board believes that the terminal should be more involved with vessel transfer operations that may seriously affect the outcome of a spill or casualty. The Board also believes that the operating manual of the Total Petroleum facility should include a provision for notifying a vessel berthed at the terminal when other vessels of significant size are expected to pass in the waterway so that the crew can halt transfer operations in a timely manner.

Therefore, the National Transportation Safety Board recommends that Total Petroleum, Inc.:

Include probing of the wood pilings during your annual inspection of the pier and the mooring devices to determine whether the wood has deteriorated to the extent that the strength of the pile may be affected. (Class II, Priority Action) (M-91-39)

Require that all vessels using your facility have a forward and aft lead for their bow and stern lines. (Class II, Priority Action) (M-91-40)

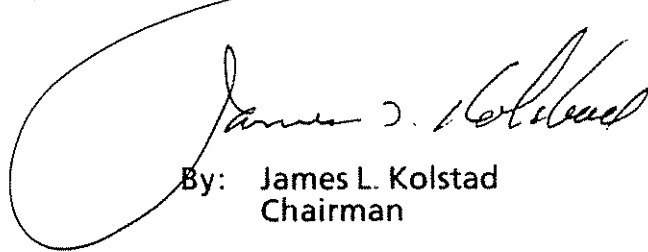
Amend the *Bay City Terminal Operations Manual* to include procedures for shutting down loading/discharging operations in a timely manner aboard vessels moored at the terminal when a danger of surging exists from vessels transiting the waterway adjacent to the terminal. (Class II, Priority Action) (M-91-41)

Establish a procedure for receiving river traffic information from Coast Guard Station Saginaw River when transfer operations are in progress so that terminal personnel can notify vessels at your Bay City facility of such traffic in a timely manner. (Class II, Priority Action) (M-91-42)

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-91-43 to the Lake Carriers Association; 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 Recommendations M-91-39 through -42 in your reply.

KOLSTAD, Chairman, COUGHLIN, Vice Chairman, and LAUBER, HART and HAMMERSCHMIDT, Members, concurred in these recommendations.

A large, stylized handwritten signature in black ink, which appears to read "James L. Kolstad". The signature is written in a cursive style with a large, sweeping initial "J".

By: James L. Kolstad
Chairman