Log # M-332

# National Transportation Safety Board

Washington, D.C. 20594

## Safety Recommendation

**Date:** November 6, 1987

In reply refer to: M-87-95 and -96

Admiral Paul A. Yost, Jr.
Commandant
U.S. Coast Guard
Washington, D.C. 20593-001

On December 20, 1986, the U.S. tank barge STC 410 was berthed at the Steuart Petroleum Company (SPC) facility pier at Piney Point, Maryland. Barge tanks Nos. 1, 3, and 5 were being vacuumed or stripped of residual JP-4 jet fuel which was being loaded into a tank truck located on the pier astern of the barge. About 0230, while the vacuuming crew was at the No. 5 tanks and almost completed with vacuuming, an explosion occurred within the No. 5 tanks. The barge tankerman and three persons working on the barge were killed, and a pier gauger located on the pier was injured. The explosion destroyed the after end of the barge from the transverse bulkhead of the No. 4 tanks to the stern and ruptured petroleum pipelines on the pier. A fire ensued that was fueled by petroleum products running out of the ruptured pipelines. The explosion and fire damaged the after end of the barge, a portion of the T-pier, and three vehicles on the pier. The explosion blast caused damage to nearby buildings on shore. Estimated damages to the barge, the pier, vehicles, and nearby facilities exceeded $2 million. 1/

The Valley Lee Volunteer Fire Department firefighters were at the pier about 11 minutes after the explosion. Because of prior training and drills at the SPC facilities, the firefighters were prepared to handle the emergency. However, the damage caused to the firemain as a result of the explosion required that firefighters pump water from the river and the nearby pond. To use these alternate sources of water required numerous lengths of hose to reach the fire and caused a delay in extinguishing the fire. Had a block valve and hydrant been available in the firemain near the shore end of the pier, the damaged portion of the firemain could have been segregated and the undamaged portion used for water supply.

While the firefighters were laying out hose and shifting to other sources of water, the fire was being fueled by the petroleum products that continued to flow from the pier pipelines. Had the petroleum pipeline block valves installed on the pier been adapted to be remotely operated from the tank farm, the flow of petroleum could have been stopped more readily and the fire could have been brought under control more quickly. In this accident, the block valves on the pier were not damaged, but they were inaccessible because of their proximity to the fire. The fire was brought under control at 0435, slightly more than 2 hours after the explosion. Had it been possible to stop the petroleum flow from the pipelines at the pier more quickly and had the firemain not been ruptured, earlier control of the fire could have been achieved.

1/ For more detailed information, read Marine Accident Report--"Explosion and Fire Aboard the U.S. Tank Barge STC 410, Steuart Petroleum Company Facility, Piney Point, Maryland, December 20, 1986" (NTSB/MAR-87/09).

The Safety Board believes that this accident highlights the need to use remotely-operated block valves on piers to limit the amount of petroleum products that may be available to fuel fires or cause pollution. However, since remotely-operated block valves installed on the pier may be subject to damage from explosions, the Safety Board also believes that, where secondary block valves are as remotely located as they were in this case (at the SPC tank farm, about 1 mile away), a secondary control set should be located near the shore end of the pier.

When the explosion occurred, the pier gauger was thrown from the pier shack onto the pier. Dazed and injured, he attempted to go toward shore along the main stem of the T-pier; however, that route was blocked by fire. He then crawled to the downriver end of the T-wing, acquired a lifering, and attempted to swim to the land spit only a short distance away. However, he was unable to get to the land spit because of the river current so he returned to the pier. Because it was nighttime, the pier gauger could not be seen easily in the water.

When the firefighters arrived at the pier, they initially were occupied with attacking the fire. Had the Steuart Transportation Company transportation specialist not walked along the beach and not heard the pier gauger calling for help, there could have been a significant delay in his rescue. Although the U.S. Coast Guard (Coast Guard) boat searched the waters for survivors and victims in the vicinity of the pier, the boat did not arrive at the pier until 0315, or 45 minutes after explosion. By then, the gauger had already been rescued.

The lack of a boat in the vicinity of the pier resulted in an unnecessary delay in rescuing the gauger. Had the gauger been more seriously injured or had the water and air temperatures been colder, he might not have survived.

The Safety Board has been concerned about the need for alternate escape routes from tank vessels moored at waterfront facilities and has addressed the subject in a number of accident reports. 2/ Long T-piers have increased the hazards when crews are forced to leave vessels rapidly in an emergency.

As the result of its investigation of the explosion and fires on board the Panamanian tankship SHOUN VANGUARD and the U.S. tank barge HOLLYWOOD 3013, the Safety Board recommended that the Coast Guard:

> M-87-71
>
> Require operators of U.S. waterfront facilities that handle highly flammable products to provide the person in charge of oil or hazardous materials transfer operations with a means of protection or escape from fire.

2/ Marine Accident Reports—"M/T ELIAS, Explosion and Fire at the Atlantic Richfield Company Fort Mifflin Terminal, Delaware River, Pennsylvania, April 9, 1974" (NTSB-MAR-78-4); "Liberian Tank Vessel M/V SEATIGER, Explosion and Fire, Sun Oil Terminal, Nederland, Texas, April 19, 1979" (NTSB-MAR-80-18); "Explosion and Fire on Board the SS CHEVRON HAWAII with Damages to Barges and to the Deer Park Shell Oil Company Terminal, Houston Ship Channel, September 1, 1979" (NTSB-MAR-80-18); "Explosion Aboard the U.S. Tank Barge TTT 103, Pascagoula, Mississippi, July 31, 1986" (NTSB/MAR-87/05); and "Fires on Board the Panamanian Tankship SHOUN VANGUARD and the U.S. Tank Barge HOLLYWOOD 3013, Pascagoula, Mississippi, July 31, 1986" (NTSB/MAR-87/08).

M-87-72

Require all tankships that intend to transfer highly flammable products at U.S. waterfront facilities to develop emergency contingency plans which set forth the procedures to be followed by the crew in the event of fire or explosion and which describe primary and secondary avenues of escape from the vessel and the conditions under which vessel abandonment action should be taken while the vessel is moored at such a facility.

M-87 73

Require U.S. waterfront facilities that load or discharge highly flammable cargoes on barges to provide the tankermen on board such barges with some means of escape from the barges to a safe location on shore in event of fire or explosion while such barges are moored at such facilities.

The Coast Guard has not yet responded to the foregoing recommendations.

In consideration of the STC 410 accident, the Safety Board believes waterfront facilities should include in their contingency plans some consideration for alternate means of evacuation from piers when normal egress is not possible. In this instance, had the contingency plan provided for a boat to be available at or near the foot of the pier, the injured pier gauger could have been rescued more quickly and could have received earlier medical attention.

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

Require operators of designated waterfront facilities that have piers extending into waterways to maintain a boat suitable for the rapid recovery of persons who may become isolated on the piers because of damage or fire. (Class II, Priority Action) (M-87-95)

Require waterfront facilities that handle highly flammable products to have remotely-operated block valves installed in pipelines that extend onto a pier so that the valves may be closed remotely should they become inaccessible for manual operation because of an explosion or fire on the pier. (Class II, Priority Action) (M-87-96)

Also, the Safety Board issued Safety Recommendations M-87-97 through -101 to the Steuart Petroleum Company, M-87-102 through -104 to the Steuart Transportation Company, and M-87-105 to the American Petroleum Institute.

BURNETT, Chairman, and LAUBER, NALL, and KOLSTAD, Members, concurred in these recommendations. GOLDMAN, Vice Chairman, did not participate.

By: Jim Burnett
Chairman