4-133

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: October 16, 1980

Forwarded to:

Admiral John B. Hayes
Commandant
U.S. Coast Guard
Washington, D.C. 20593

SAFETY RECOMMENDATION(S)

M-80-90 through -92

At 1412 c.d.t., on September 1, 1979, while discharging cargo at the Deer Park Shell Oil Company terminal on the Houston ship channel, the American tankship SS CHEVRON HAWAII exploded, burned, and sank after it was struck by lightning. A hull fragment from the exploding vessel penetrated a petroleum product tank at the terminal and caused the tank to explode and the contents to burn. The vessel fire spread into a barge slip where four barges were discharging cargo; all four caught fire, three of which exploded and sank. One crewmember and 2 radar repairmen aboard the vessel were killed, and 13 persons were injured. Damage to the CHEVRON HAWAII was estimated at $50,000,000. Damages to the terminal, barges, and other vessels, and accident related claims exceeded $27,000,000. 1/

The CHEVRON HAWAII explosion and fire set off a chain of events which resulted in massive damage to the vessel and widespread damage about the Shell Oil Company terminal. The waterborne cargo oil fire from the vessel extended into the terminal barge slip where four barges at dock No. 1 were discharging or awaiting to discharge crude oil and gasoline. Although there was sufficient time after the tankship explosion to remove the barges from the barge dock, no action was taken to do so. The Shell Oil Company dockman, who was monitoring the cargo transfer of the barge dock, left his station without stopping the cargo operation even though he could have done so by activating an emergency switch located at the approach to the dock. Two Coast Guard pollution team investigators from the Houston Port Safety Station arrived at the Shell terminal about 15 minutes after the explosion and proceeded to the barges at dock No. 1. They found the barges with cargo tank expansion trunk and ullage hatches open, and flame screens lying on the deck. Before leaving, they closed the hatches and replaced the flame screens, but they were not sure if they had closed or covered all of the tank openings on all four barges. They did not consider having the barges removed from the fire threatened barge slip. Although the Shell Oil Company requires towboats to remain on standby when they deliver barges to the terminal for cargo transfer, and several towboats and tugs were available, the towboat operators did not initiate action to remove the barges from the slip.

1/ For more information, read "Marine Accident Report—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).

The widespread accident damage required action at a number of terminal locations, and the actions were generally well-controlled. The failure to remove the barges from the fire threatened barge slip appeared to be the result of inadequate preplanning for such an emergency. Consequently, the barges not only became casualties, but they compounded the firefighting problems both ashore and afloat when all four burned, three of which exploded and sank. The Safety Board believes that Coast Guard port and waterway contingency plans should include operational control procedures and define authority to initiate action, using available vessels at the scene of an accident.

When the CHEVRON HAWAII exploded and burned, the only means of escape from the vessel to the shore terminal — the gangway, located amidships near the portside cargo manifold — was destroyed. In its moored position, the tankship's after crew accommodation was about 125 feet from a catwalk, parallel to the tankship, which was used by shore personnel while handling mooring lines, or about 175 feet from the terminal shoreline which had a high bank slope. Since the vessel's port lifeboat had been demolished, the crew launched the starboard lifeboat, which was made difficult because of the vessel's starboard list; the lifeboat had to be hauled aft to the stern for safe boarding. It was then found that the lifeboat engine had been damaged by flying debris and was inoperable. Special care had to be taken in placing an injured crewman into the boat. It took 15 minutes to abandon the vessel in the lifeboat, and the crew had to row into the wind and current to keep clear of the burning vessel. At the time of the accident, the channel current was flowing contrary to its normal downstream direction. Had the current been flowing toward the stern, the vessel fire would have engulfed the starboard lifeboat and the crew accommodations. Under such circumstances, every person on the vessel would have been trapped aboard or faced with the prospect of diving into the burning oil fire. The practice of designing T-type berthing piers has created a hazard to crews on vessels with accommodations aft in emergencies.

As the result of its investigation of the M/T ELIAS accident, 2/ the Safety Board recommended that the Coast Guard:

> Study the positioning of shipborne gangways and shoreplaced brows to determine ways to provide for rapid personnel escape from vessels during emergencies. (M-78-39)
>
> Study the feasibility of providing safer means of escape from tankers across piers to safe terminal locations, to improve chances of survival for shipboard personnel when lifeboats cannot be used and swimming ashore is not possible. (M-78-41)

There has been an exchange of correspondence between the Coast Guard and the Safety Board relative to these recommendations since October 31, 1978. In this accident, we believe that the lack of a safe gangway contributed to the deaths of the two radar repairmen who were leaving the tankship when it exploded.

During the firefighting effort, which involved containment of the waterborne cargo fire about the CHEVRON HAWAII and at the Shell Oil Company barge slip, one Coast Guard boat assisting at the scene experienced problems with the thick surface layer of

2/ For more information, read "Marine Accident Report--M/T ELIAS Explosion and Fire at the Atlantic Richfield Company Fort Mifflin Terminal, Delaware River, Pennsylvania, April 9, 1974" (NTSB-MAR-78-4).

cargo oil which clogged the boat's engine, water intake, and the firepump, thereby limiting the effectiveness of the boat. The Safety Board believes that the Coast Guard boats involved in this accident may have design deficiencies which need correcting.

Therefore, as a result of its investigation, the National Transportation Safety Board recommends that the U.S. Coast Guard:

> Include in Coast Guard and terminal operator fire contingency plans emergency procedures which provide for the removal of barges from threatened berths and the safe evacuation of personnel from vessels when normal ship-to-shore transit routes are severed or hazardous. (Class II, Priority Action) (M-80-90)
>
> Require that waterway terminal operators provide a gangway or brow between vessel accommodations and the terminal facility which does not require crewmembers to cross vessel cargo tanks or decks. (Class II, Priority Action) (M-80-91)
>
> Correct design deficiencies which limit the capability of the 32-foot boats to use their firefighting equipment or keep their engines operating properly in water thickly polluted with petroleum product. (Class II, Priority Action) (M-80-92)

KING, Chairman, DRIVER, Vice Chairman, and McADAMS, Member, concurred in these recommendations. GOLDMAN and BURSLEY, Members, did not participate.

By: James B. King
Chairman