



National Transportation Safety Board

Washington, D.C. 20594
Safety Recommendation

Date: October 4, 1993

In reply refer to: H-93-34

Ms. Rose McMurray
Acting Administrator
Research and Special Programs Administration
U.S. Department of Transportation
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About 6:55 a.m. on May 12, 1993, a fire started as gasoline was being transferred from a tank truck to an underground storage tank adjacent to a maintenance building at the Brooke Manor Country Club in Rockville, Montgomery County, Maryland. Units from the Montgomery County Fire-Rescue Service responded to the fire.

The tank truck, which sustained minor damage, was a 1979 Kenworth truck with a Department of Transportation (DOT) specification MC 306 cargo tank mounted on the truck chassis. The aluminum tank had three compartments with a total capacity of 4,850 gallons. The maintenance building, which was used for the storage of paint, fertilizer, pesticides, and groundskeeping equipment, was destroyed by the fire. Officials from the Brooke Manor Country Club estimated the total property damage to be \$250,000. There were no injuries or fatalities.

The tank truck arrived at the maintenance building about 6:45 a.m. The driver of the tank truck parked the vehicle about 15 feet from the storage tank fill opening, which was at ground level. The fill opening was about 6 feet from the maintenance building. After the driver measured the amount of gasoline already in the 1,000-gallon storage tank, he began to transfer the gasoline. As the driver was making preparations to transfer the gasoline from a hose on the curb side of the vehicle, an employee of the country club approached the driver and began to converse with him. Moments later, a second employee of the country club joined the driver and the first employee.

The tank truck and the underground storage tank were not required to have or use a vapor recovery system in this operation. Therefore, as liquid gasoline filled the storage tank, gasoline vapors were forced out of the storage tank and into the atmosphere through the fill opening. The ground sloped away from the curb side of the vehicle and the storage tank; as the dense gasoline vapors were displaced from the storage tank, they dispersed along the downhill slope of the ground.

About 6:55 a.m., a third country club employee, who was driving a battery-powered golf cart, approached the truck driver and two country club employees. He momentarily stopped the golf cart between the tank truck and the maintenance building. The driver and one of the country club employees standing next to the driver said that the employee on the golf cart then drove the golf cart toward the fill opening. The truck driver and the three country club employees then saw flames on the ground and spreading around them and the fill opening. The truck driver and the two employees standing next to him ran to safety. The employee on the golf cart also safely escaped on the cart. The driver of the tank truck did not attempt to stop the truck's cargo pump or to close internal shutoff valves to stop the flow of gasoline before he fled the scene.

The position of the golf cart where it had stopped momentarily was on the downhill side of the fill opening. This position was later observed to be in the middle of a V-shaped burn pattern on the ground that fanned out and extended downhill from the fill opening. The grass between the fill opening and the tank truck was not burned, nor was the ground burned where the tank truck was parked. Further, damage to the tank truck was superficial, primarily heat damage to the paint, which is characteristic of a flash fire. Consequently, the Safety Board concludes that the battery-powered golf cart was the ignition source of the gasoline vapors that were displaced from the storage tank and were dispersing downhill along the ground.

The Montgomery County Fire-Rescue Service was notified of the fire about 6:59 a.m., with the first engine company arriving at the scene about 7:05 a.m. A second unit arrived about 7:12 a.m. Firefighters from the first unit noted heavy black smoke from the fire, which indicated to them that gasoline was fueling the fire. By the time the first unit reached the scene, the fire had engulfed the maintenance building but had not involved the tank truck.

Because firefighters from the first unit were concerned about the radiant heat exposure to the tank truck and the potential of the fire to involve the tank truck, they decided that the tank truck should be moved away from the burning building. One firefighter approached the rear of the tank truck from the driver's side and closed all the gate valves in a manifold at the rear of the vehicle. Closure of these valves stopped the flow of gasoline from the cargo tank compartments, but gasoline in the discharge line downstream of the manifold could continue to flow through the cargo hose. The cargo pump, although it was still running, had no effect after the manifold valves were closed.

After closing the manifold valves, the firefighter proceeded toward the cab along the driver's side of the tank truck, entered the cab, but was unable to locate a control in the cab to disengage a cargo pump that was operated by the truck's engine. When he attempted to force the truck into gear, the truck engine was inadvertently stalled, and the cargo pump stopped. The firefighter left the truck and returned to his engine crew.

One of the department's hazardous materials officers arrived at the scene shortly thereafter. He approached the tank truck from the driver's side, entered the cab, disengaged the cargo pump, restarted the engine, and drove the tank truck to safety. Firefighters reported that gasoline drained from the burned end of the cargo hose as the truck was driven away from the site. After parking the tank truck, the hazardous materials officer operated mechanical control levers located beside the cargo hose reel on the curb side of the tank truck to close the internal shutoff valves to the tank's three compartments.

The tank truck was also equipped with controls at three other locations for actuating the internal shutoff valves: a remote control on the front of the tank near the driver's door, mechanical levers by a second hose reel on the road side of the truck, and additional levers at the rear curb side of the truck. None of these controls for closing the internal shutoff valves were marked or identified for emergency use.

The firefighter who initially attempted to move the tank truck was aware that tank trucks are equipped with remote controls to close internal shutoff valves, and that remote controls are usually located at opposite ends and on opposite sides of the vehicle. He later indicated that he would have used the remote control behind the driver's door to close the valves if he had seen the remote control. The hazardous materials officer stated that while his primary concern was to move the tank truck away from the fire, he, too, would have used the remote control behind the driver's door to close the valves before moving the tank truck. He indicated that had the remote control been marked, the marking likely would have prompted him to use the remote control to close the internal shutoff valves before moving the vehicle. Both the firefighter and the hazardous materials officer stated that marking the remote controls for emergency use would be helpful to emergency response personnel, who may be aware that remote controls are required on cargo tank vehicles that transport hazardous materials, but who are not typically knowledgeable about the configuration of specific vehicles. According to the Montgomery County Fire-Rescue Service, firefighters receive general instruction about the number and location of remote control devices on tank trucks.

The Safety Board notes that the Department of Transportation's hazardous materials regulations (49 CFR Parts 171 through 180) do not require the marking of remote controls for internal shutoff valves on cargo tanks authorized for the transportation of hazardous materials. Although the regulations require the driver of a cargo tank vehicle to be knowledgeable about the location and operation of the remote controls, the driver may not be able or available to operate them or to alert emergency response

personnel about their location and operation. Consequently, emergency response personnel will, in some incidents, be required to locate, identify, and operate the remote controls for the internal shutoff valves to minimize the release of a hazardous material.

Emergency management authorities have noted that remote controls for internal shutoff valves on cargo tank vehicles may sometimes be marked for emergency use.¹ The Safety Board believes that such markings on a cargo tank will enable firefighters to more quickly locate the remote controls, close the internal shutoff valves, and stop the release of hazardous materials from cargo tanks.

Therefore, as a result of this accident investigation, the National Transportation Safety Board recommends that the Research and Special Programs Administration:

Require that the remote control mechanisms for internal shutoff valves be marked for emergency use on all cargo tanks authorized for the transportation of hazardous materials. (Class II, Priority Action) (H-93-34)

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



By: Carl W. Vogt
Chairman

¹ Hildebrand, Michael S., Noll, Gregory G. 1992. Gasoline tank truck emergencies: guidelines and procedures. Fire Protection Publications. Oklahoma State University. Stillwater, OK.