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Fire Fighter Deaths from Tanker Truck Rollovers

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Hazard ID

Fire Fighter Deaths from Tanker Truck Rollovers

From the National Institute for Occupational Safety and Health

Description of Hazard

Mobile water supply vehicles, known as tankers or tenders, are widely used to transport water to areas beyond a water supply system or where the water supply is inadequate. Incidents involving motor vehicles account for approximately 20% of U.S. fire fighter deaths each year; cases involving tankers are the most prevalent of these motor vehicle incidents. During 1977–1999, 73 deaths occurred in 63 crashes involving tankers. Of those deaths, 54 occurred in 49 crashes in which tankers rolled over (no collision), and 8 occurred in 6 crashes in which the tankers left the road (no collision). The other cases involved collision with another vehicle (10 deaths in 7 crashes) and collision with stationary object(s) (1 death) [NFPA 2000].

Tanker drivers may not be fully aware that tanker trucks are more difficult to control than passenger vehicles. A tanker truck requires a much greater distance to stop. Tankers weigh substantially more, and their air brake systems take more time to activate than the hydraulic/mechanical brake systems on smaller passenger cars. The effect is influenced by the amount of water the tanker is hauling and whether the tanker is baffled.

Case Studies

Under the Fire Fighter Fatality Investigation and Prevention Program, NIOSH investigated two separate incidents involving fire fighters who were killed in tanker truck rollovers during 1999 and 2000 [NIOSH 2000a,b]. Both incidents involved volunteer fire departments providing mutual aid with water tanker trucks.

Case 1

On October 28, 1999, a Captain and a fire fighter (the driver) responded to a mutual-aid call in a full, elliptical-shaped, 1,800-gallon water tanker truck equipped with baffles [NIOSH 2000a]. The tanker was traveling west, and as it approached a curve, the driver lost control. The vehicle drifted toward the shoulder of the road as the driver tried to correct the direction of travel. Just past the curve, the tanker veered off the road into a corn field. The tanker rolled onto the passenger side and continued to roll over several times (see Figure 1). The driver was ejected from the tanker. The Captain was trapped in the crushed, upside-down cab and had to be extricated. He was taken to a local hospital and died 7 days later. The driver was taken to a local hospital then flown by helicopter to a trauma center. He died 86 days after the incident.

Case 2

On January 17, 2000, a fire Chief died after responding to a mutual-aid call in a full, T-shaped, 641-gallon, handmade water tanker truck that was not equipped with baffles and was attached to a converted pickup truck [NIOSH 2000b]. The tanker was traveling west when the Chief lost control of the tanker as he approached a slight curve in the road. As the tanker began to skid, the right tires left the pavement and entered the shoulder. The tanker continued on the shoulder until it entered a ditch and became airborne. Next the tanker crossed a lane on a side street, struck a center median, and crossed a second lane on the side street. The tanker then struck a guard rail and flipped end-over-end until it landed in a concrete culvert. The Chief was killed instantly.

FIGURE 1
Tanker truck involved in incident.

Recommendations for Prevention

To reduce the risk of tanker truck rollovers, NIOSH recommends that fire departments take the following precautions:

- Develop, implement, and enforce standard operating procedures (SOPs) for emergency vehicles—particularly with regard to the use of seat belts.
- Ensure that drivers have necessary driving skills and experience and provide them with periodic refresher training.
- Consider terrain, weather, and bridge and road conditions when purchasing a mobile water supply vehicle.
- Adhere to the requirements of NFPA 1915 for keeping a vehicle on a maintenance schedule and documenting the performance of the maintenance [NFPA 2001].
- Inspect the complete vehicle at least once per year to comply with federal and state motor vehicle regulations.

- Adhere to the requirements of NFPA 1901 for an approved mobile water supply vehicle [NFPA 2001].
- Equip all vehicles with seat belts.
- Ensure that water tank capacity is adequate and has proper tank mounting and sufficient front and rear weight distribution.
- Ensure that the weight of the fully loaded vehicle does not exceed the gross axle weight rating of any axle and the gross vehicle weight rating of the chassis.
- Ensure that the center of gravity of the vehicle does not exceed the chassis manufacturer's specified center of gravity.
- Provide proper baffles to control water movement for all vehicles equipped with water tanks.
- Verify that vehicles are of proper design and have adequate suspension, steering, and braking ability.

All drivers should do the following:

- Recognize that they are responsible for the safe and prudent operation of the vehicle under all conditions.
- Wear a seat belt when operating a vehicle.
- Take training to meet the job performance requirements stated in NFPA 1002 before driving and operating the vehicle [NFPA 2001].
- Take refresher driver training at least twice per year.
- Understand the vehicle characteristics, capabilities, and limitations.
- Be aware of the potential for unpredictable driving by the public (excessive speed, failure to yield to emergency vehicles, inattentiveness, etc.).
- Adjust speed when driving on wet or icy roads, in darkness or fog, or under any other conditions that make emergency vehicle operation especially hazardous.

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NIOSH is the federal agency responsible for conducting research and making recommendations to prevent work-related illness and injuries. NIOSH conducts the Fire Fighter Fatality Investigation and Prevention Program to determine factors that cause or contribute to fire fighter fatalities suffered in the line of duty and to develop strategies for preventing similar incidents in the future. More information is available at www.cdc.gov/niosh/firehome.html.

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