



National Transportation Safety Board

Washington, D. C. 20594

Safety Recommendation

Date: April 29, 1991

In Reply Refer To: H-91-11

Mr. Arthur Cole
 Secretary, Standards Council
 National Fire Protection Association
 Betterymarch Park
 Quincy, Massachusetts 02269

On May 10, 1990, a 1974 Hahn custom pumper fire engine operated by the Waterbury Fire Department (WFD), while responding to an emergency call in Waterbury, Connecticut, ran off the road and hit a large tree when the driver lost control on a steep downgrade. The fire engine carried five paid firefighters and 500 gallons of water. Two firefighters were fatally injured, one firefighter sustained moderate injuries, and the driver and remaining firefighter sustained only minor injuries. The pavement was wet from previous rain.¹

This accident and several others involving emergency fire apparatus² responding to alarms prompted the Safety Board to conduct a special investigation to determine the adequacy of fire apparatus maintenance and inspection, fire department operating procedures, and occupant seatbelt use. National Fire Protection Association (NFPA) data indicate that between 1980 and 1989, 15 percent³ of all firefighters who died in the line of duty died as a result of accidents involving fire apparatus that were en route to alarms. As part of this special investigation, the Safety Board examined 8 separate fire apparatus accidents and conducted an informal survey of the 50 States and the District of Columbia to determine their requirements for inspecting fire apparatus.

About 7:38 p.m. on September 28, 1989, wagon 7 of the Catlett Volunteer Fire Company was struck on its left side by a southbound National Railroad Passenger Corporation (AMTRAK) train. The accident occurred at a private-driveway grade

¹For more detailed information, read Special Investigation Report--"Emergency Fire Apparatus," (NTSB/SIR-91/01).

²For the purposes of this report, "fire apparatus" refers to the heavy fire vehicles, such as pumpers/engines, ladder trucks, heavy squad units, 10,000 pounds and over, that transport people, and specialized equipment, such as foam/crash units used at airports.

³One hundred and seventy-nine firefighters.

crossing off Virginia Route 28 about 1 mile south of Catlett, Virginia.⁴ The cab and chassis of the apparatus rotated counterclockwise 450 degrees during the collision and came to rest facing north about 80 feet southeast of the crossing. Most of the apparatus was destroyed; however, the passenger compartment of the canopy cab remained intact. The unrestrained driver and the other firefighter seated in the cab were ejected and fatally injured, and two unrestrained firefighters riding in the rear-facing canopied jumpseat behind the cab were ejected and sustained moderate to severe injuries. A fifth firefighter riding in the rear-facing jumpseat remained within the apparatus following the collision. He received serious injuries.

About 6:09 a.m., on January 30, 1990, a Crow Valley Fire Protection District 1989 Pierce pumper fire engine responding to a house fire overturned while traversing a residential driveway which collapsed. The engine-pumper overturned 1.5 times down a 20-foot incline and came to rest on its roof. The apparatus was occupied by three firefighters, who were restrained by seatbelts. All of the firefighters remained within the apparatus during the overturn. Following the accident all of the firefighters were treated for minor injuries and released from the hospital.

On March 1, 1990, engine 91, a Seagrave firetruck of the Los Angeles City Fire Department, left the station house on a nonemergency run (no lights or siren) and was struck broadside at the intersection of Borden Avenue and Polk Street in the Sylmar section of Los Angeles by an automobile that failed to stop for a red light.

The fire apparatus was hit on the right side behind the rear axle. The police estimated that the automobile's speed was "well in excess of 55 mph." As a result of the collision, the apparatus rotated approximately 90 degrees and overturned onto its roof. The driver and an officer were seated in the forward cab section, and the two firefighters were seated facing rearward in the jumpseat in the enclosed rear cab section. The firetruck cab remained intact during the crash, and all of the firefighters were wearing their seatbelts. The firefighters received only minor injuries. The driver of the automobile was fatally injured.

About 2:45 p.m., on May 17, 1990, the Cresson Volunteer Fire Company responded to an emergency call about a motor vehicle accident. As the 1968 Chevrolet firetruck was traveling northbound downhill on State Route 53, the driver lost control of the vehicle. The rear of the vehicle struck and rode up on a guardrail, and the vehicle overturned more than 360 degrees. The vehicle then struck a bridge abutment, traveled over the side of the bridge, and came to rest on its left side in a creek bed. Both occupants were ejected onto the roadway and were fatally injured.

The police report indicated that the occupants were not wearing seatbelts. Following the crash, the State Police Motor Carrier Inspection Division officer inspected the accident vehicle. The only problem noted was that the "female ends of both seatbelts were found tucked under the seat, rendering them unusable." The cab was intact after the accident.

About 1:54 p.m., on August 5, 1990, Dallas Fire Department engine 9, a 1990 Quality firetruck with four occupants, was responding to a medical emergency and was traveling south on South Beltline Road. The driver released the accelerator

⁴See docket HY-514-89 for further information concerning this accident.

while he was traveling down a hill that curved to the left; the rear of the apparatus began to skid to the right. The apparatus skidded sideways down the road until the right front tires hit the soft dirt shoulder on the left side of the road and the apparatus rolled over and came to rest 30 feet from the road facing north. It was drizzling rain, and the pavement was wet. The driver and officer in the cab and the two firefighters in the jumpseat were wearing their seatbelts. Although the damage to the apparatus was extensive, there were no injuries.

The 1987 NFPA Standard 1500, "Fire Department Occupational Safety and Health Program," Chapter 4, "Vehicles and Equipment," Section 3, "Persons Riding on Fire Apparatus," states:

4-3.1 All persons riding on fire apparatus shall be seated and secured to the vehicle by seat belts or safety harnesses at any time the vehicle is in motion. Riding on tailsteps or in any other exposed positions shall be specifically prohibited. Standing while riding shall be specifically prohibited.

In the Catlett, Virginia, accident four unrestrained firefighters were ejected from the apparatus, and two of these firefighters were fatally injured. Even though the fire apparatus was heavily damaged, the cab section remained intact. In the Gallitzin Township, Pennsylvania, accident, both unrestrained occupants were ejected. However, the apparatus passenger compartment remained intact. The NHTSA Fatal Accident Reporting System (FARS) 1988 data concerning fatal accidents indicate that 17.4 percent of the unrestrained passenger-car occupants were ejected from the vehicle; of those ejected, 73.5 percent were fatally injured. Although there is no similar data concerning occupant ejection as a result of accidents involving fire apparatus, it is clear that ejection from a vehicle during a collision is likely to cause a serious or fatal injury.

In contrast, several accidents in which fire apparatus overturned and the restrained occupants remained within the apparatus and were not injured illustrate the benefits of using seatbelts. In the Los Angeles, California, accident and in the Eugene, Oregon, accident, the vehicles overturned, yet the firefighters, who had used their seatbelts, received only minor injuries. In the Dallas, Texas, accident the fire apparatus rolled over and came to rest 30 feet from the road; however, the four firefighters were uninjured. Accordingly, it is likely that had the occupants of the Catlett, Virginia, and Gallitzin Township, Pennsylvania, accident vehicles been restrained, they might not have been ejected and might have been less severely injured.

NFPA voluntary standard 1500 clearly states that all persons shall be seated and restrained while riding on fire apparatus, and most departments have policies requiring the use of seatbelts. Yet, firefighters continue to be injured and killed because they are not restrained. Fire apparatus are frequently operated at higher speeds than conventional vehicles are and, therefore, are prone to overturn and high-speed accidents. It is essential for firefighters to wear available seatbelts to prevent ejection and injury. Although there are voluntary standards that encourage seatbelt use, there is no nationwide program to educate the firefighting community concerning the benefits of seatbelts. Thus, the Safety Board believes that the USFA, in cooperation with the IAFC and the NFPA, should encourage fire departments to establish and enforce mandatory seatbelt policies and to develop programs that promote the use of seatbelts in fire apparatus.

Therefore, the National Transportation Safety Board recommends that the National Fire Protection Association:

In cooperation with the U.S. Fire Administration and the International Association of Fire Chiefs encourage fire departments to establish and enforce mandatory seatbelt policies and to develop programs that promote the use of seatbelts in fire apparatus. (Class II, Priority Action) (H-91-11)

Also, as a result of its investigation, the Safety Board issued Safety Recommendations H-91-3 through -6 to the U.S Fire Administration of the Federal Emergency Management Agency, Safety Recommendations H-91-7 through -10 to the International Association of Fire Chiefs; and Safety Recommendation H-91-12 to the Governors and legislative bodies of those States without fire-apparatus inspection programs.

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 Recommendation H-91-11 in your reply.

KOLSTAD, Chairman, COUGHLIN, Vice Chairman, and BURNETT, LAUBER, and HART, Members, concurred in this recommendation.

By: James L. Kolstad
Chairman