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Death in the line of duty...

National Institute for Occupational Safety and Health NIOSH

A report from the NIOSH Fire Fighter Fatality Investigation and Prevention Program January 11, 2018

Volunteer Fire Fighter Struck and Killed by Tanker Backing into the Bay of the Fire Station—Pennsylvania

Executive Summary

On July 23, 2016, a 60-year-old male volunteer fire fighter died when he was struck by a tanker backing into the bay at the fire station. The volunteer fire department had been assisting the community in a motorcycle benefit for a children's cancer organization. At 1130 hours, the fire department placed three of their apparatus at different route locations to control traffic for the motorcycles riding in the benefit. Approximately 2 hours later, when the event had concluded, Tanker 72 returned to the fire station. The driver was attempting to back into Bay 3 when the fire fighter, near the station's man door approximately 30 feet away, walked toward the rear of the backing tanker. A second fire fighter around Side B of the station heard the fire fighter yelling the driver's name and walked around to Side A to see why he was yelling. The second fire fighter noticed that the tanker's right rear wheels were on the fire fighter's left leg and the fire fighter was horizontal on the parking pad of the fire station. The second fire fighter ran to the driver's door to get the driver's attention to stop. When the driver stopped the tanker, it had completely run over the left half of the fire fighter's body. An ambulance was called that arrived within minutes but the fire fighter was pronounced dead at the scene.

Contributing Factors

- *Unknown location of fire fighter near backing apparatus*
- *Limited visibility on right side of the apparatus*
- *Physical mobility of the fire fighter*
- *Impaired hearing of the driver*

Key Recommendations

- *Fire departments should ensure that standard operating procedures and training for the safe backing of fire apparatus are in place and enforced, including adequate training to ensure fire fighter comprehension.*
- *Fire departments should ensure that all fire fighters wear the appropriate personal protective clothing and equipment, including high-visibility clothing that meets the requirements of NFPA 1500 and NFPA 1971.*
- *Fire departments should consider equipping fire apparatus and vehicles with rear-view cameras, object-sensing devices, or additional mirrors to assist drivers during backing operations.*

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- *Authorities having jurisdiction and fire department SOPs should consider including the role and responsibilities of the vehicle spotter along with the role and responsibilities of the apparatus driver/operator when a spotter is deployed.*
- *The States should consider establishing minimum training requirements for fire fighters.*

Tanker involved in incident. (*NIOSH photo*)

The National Institute for Occupational Safety and Health (NIOSH), an institute within the Centers for Disease Control and Prevention (CDC), is the federal agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness. In 1998, Congress appropriated funds to NIOSH to conduct a fire fighter initiative that resulted in the NIOSH Fire Fighter Fatality Investigation and Prevention Program, which examines line-of-duty deaths or on-duty deaths of fire fighters to assist fire departments, fire fighters, the fire service, and others to prevent similar fire fighter deaths in the future. The agency does not enforce compliance with state or federal occupational safety and health standards and does not determine fault or assign blame. Participation of fire departments and individuals in NIOSH investigations is voluntary. Under its program, NIOSH investigators interview persons with knowledge of the incident who agree to be interviewed and review available records to develop a description of the conditions and circumstances leading to the death(s). Interviewees are not asked to sign sworn statements and interviews are not recorded. The agency's reports do not name the victim, the fire department, or those interviewed. The NIOSH report's summary of the conditions and circumstances surrounding the fatality is intended to provide context to the agency's recommendations and is not intended to be definitive for purposes of determining any claim or benefit.

For further information, visit the program website at www.cdc.gov/niosh/fire or call toll free 1-800-CDC-INFO (1-800-232-4636).

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Introduction

On July 23, 2016, a 60-year-old male volunteer fire fighter died when he was struck by a tanker backing into the bay at the fire station. On July 26, 2016, the U.S. Fire Administration notified the National Institute for Occupational Safety and Health (NIOSH) of this incident. A NIOSH investigator with the Fire Fighter Fatality Investigation and Prevention Program contacted the fire department that was involved in this incident to arrange an investigation. On August 15–17, 2016, a general engineer and a health scientist with the NIOSH Division of Safety Research traveled to Pennsylvania to investigate this incident. The NIOSH investigators met with the fire chief, assistant chief, the director of the county emergency management agency, and the county coroner. The investigators spoke over the phone with the county ambulance driver/paramedic and the investigating Pennsylvania state trooper. Interviews were conducted with the fire department members who were involved in the incident with the exception of the Tanker 72 driver whose statement was provided by the investigating Pennsylvania state trooper. The NIOSH investigators visited the incident site to take photographs and measurements. The NIOSH investigators obtained copies of the fire department's standard operating procedures and vehicle information for the apparatus involved in this incident. The NIOSH investigators also obtained copies of the Pennsylvania state trooper's case report and the county coroner's certificate of death.

Fire Department

This volunteer fire department was incorporated in 1950 and has 1 fire station with 14 members, of which 8 are active members. The fire department averages approximately 40 runs a year for fire and motor vehicle incidents and medical calls. The fire department has a 2006 engine, 2008 tanker, 1996 rescue, and a 1999 utility truck. General maintenance on all fire department apparatus is performed in-house. The fire department is 1 of 16 fire departments in the county, which serves a population of approximately 42,000 within an area of about 897 square miles.

In order to become a member, the fire department requires the prospective member to be at least 18 years old and be a district resident. No prior fire service training or experience is necessary. After submitting an application and being selected, the new member would be on a 12-month probationary period during which the new member would be required to complete 24 hours of basic fire fighter training provided by the fire department. All fire department members who are involved in structural fire-fighting operations are required to participate in monthly training.

Training and Experience

The state of Pennsylvania does not have mandatory minimum training requirements for volunteer fire fighters or fire officers. It is up to each fire department or authority having jurisdiction to implement

training requirements to meet their own needs. The county also does not mandate any training requirements. A tri-county fire school, a private nonprofit organization, in addition to some local community colleges offer Fire Fighter Essentials annually.

The state of Pennsylvania does not require fire department personnel who operate an apparatus to have a commercial driver's license (CDL). Three members of the department had CDLs, including the driver in this incident.

The victim joined the fire department in 1997 and had 15 years of fire-fighting experience. (He had a 4-year service interruption.) Departmental records documented the victim had received training in hazardous materials awareness; weapons of mass destruction response—technical rescue awareness; hazardous materials awareness (refresher); Fire Fighter Essentials I and II; various first responder training (pediatrics, diabetics, childbirth); environmental emergencies; understanding the dangers of meth labs; auto extrication, railway safety; IS-00100A Introduction to the Incident Management System (ICS 100); IS-00200 ICS for Single Resources and Initial Action Incidents (ICS 200); and IS-00700 National Incident Management System (NIMS). The fire department documented numerous monthly training sessions held at the department including self-contained breathing apparatus training, pump operations, powered hand tool operations, air bags, lights, and hose tests. The victim was medically cleared for respirator use.

Equipment and Personnel

The incident involved a Peterbilt 2008 model Tanker. The vehicle was equipped with a 500-gallon tank. The truck was not equipped with an audible backup alarm that automatically sounds when the truck is put into reverse (see Photos 1 and 2).

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Photo 1. Rear of Tanker 72.
(*NIOSH photo*)

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Photo 2. Photo of the passenger side mirror on Tanker 72. Photo shows the narrow field of view that the right-side mirror provides. (*NIOSH photo*)

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Timeline

The timeline for this incident is limited to the initial participation of units to support a community service, which included the tanker involved in this incident.

- **1130 Hours**. Fire department dispatched three apparatus, including a tanker, to help slow and coordinate traffic.
- **1138 Hours**. Tanker 72 arrived at their designated location.
- **1335 Hours**. Tanker 72 arrived back at the fire department.
- **1337 Hours**. Tanker 72 was backing toward Bay 3 of the fire station. Approximately 30 feet away, a fire fighter went to assist, presumably to redirect tanker to Bay 2, and was backed over.

Personal Protective Equipment

At the time of the incident, the victim was wearing his normal street clothing, rubber fire boots, and a fire helmet. He was not wearing a turnout coat or self-contained breathing apparatus. *Note: The condition of the victim's attire was not considered to be a contributing factor to this incident. However, the victim may have been more visible to the driver had he been wearing his turnout coat or a high-visibility retro-reflective vest.* The victim's personal protective equipment and clothing were not evaluated by NIOSH. No flashlight was found in the vicinity of the victim upon arrival of the other first responders.

Weather and Road Conditions

The weather at the time of the incident (1335 hours) was clear skies with an approximate temperature of 84 degrees Fahrenheit (84°F) and winds from the northwest at 13.8 miles per hour [Weather Underground 2016]. The incident occurred on the concrete parking area in front of the fire station bays. The tanker was backing off of an asphalt, two-lane road onto a graveled shoulder then over an approximately 2-inch rise onto the concrete parking area in front of the fire station. The 2-inch rise is not believed to be a factor in the victim not being noticed.

Investigation

On July 23, 2016, a 60-year-old male volunteer fire fighter died when he was struck by a tanker backing into the bay at the fire station. The volunteer fire department had been assisting the community in a motorcycle benefit for a children’s cancer organization. At 1130 hours, the fire department placed three apparatus at different route locations to control traffic for the motorcycles riding in the benefit. At 1138 hours, Tanker 72 arrived at their designated location to control traffic. At approximately 1335 hours, Tanker 72 returned to the fire station. The driver was attempting to back into Bay 3 when the fire fighter, near the station’s man door approximately 30 feet away, walked toward the rear of the backing tanker to get the driver’s attention. Fire department members believe that the fire fighter was trying to redirect the driver to another bay. The driver indicated that he saw the fire fighter, who had spotted for him on numerous occasions, in his right side mirror. The driver then looked in his left mirror and back again but did not see the fire fighter. *Note: Speaking with several fire department members, it was mentioned that the fire fighter had limited mobility, specifically knee*

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issues, and that the driver had impaired hearing according to his statement in the state police report, which may have played a role in the incident. At approximately 1337 hours, a second fire fighter was around Side B of the station, heard the fire fighter yelling the driver's name, and walked around to Side A to see why he was yelling. The second fire fighter noticed that the tanker's rear right wheels were on the fire fighter's left leg and the fire fighter was horizontal on the parking pad of the fire station. The second fire fighter ran to the driver's door to get the driver's attention to stop. When the driver stopped the tanker, it had completely ran over the fire fighter's left half of his body (see Diagram). The second fire fighter immediately called 911. The ambulance arrived in minutes but the fire fighter had no pulse and was pronounced dead at the scene.

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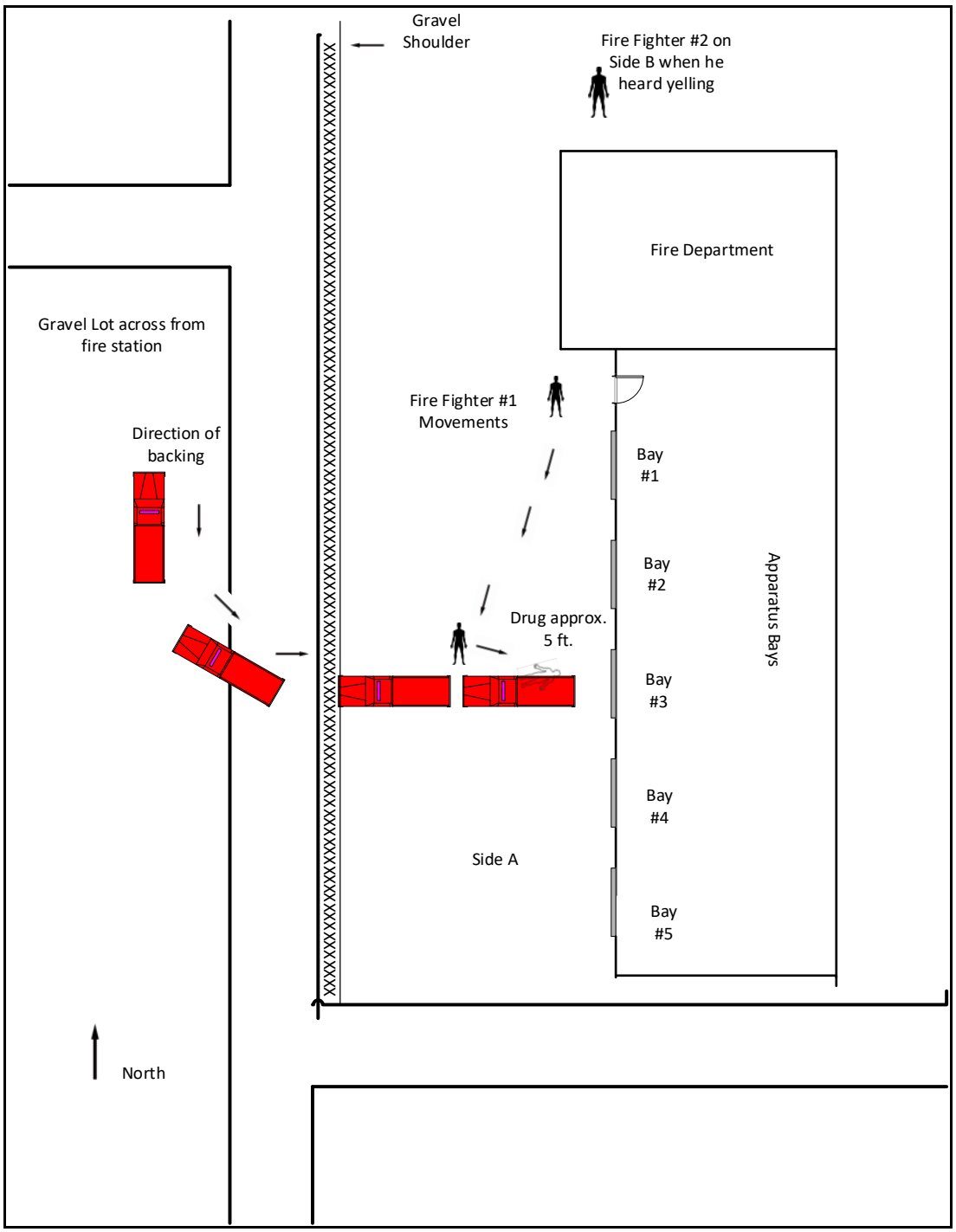

Diagram. Route of the tanker backing up and travel of fire fighter impacted by tanker.

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Contributing Factors

Occupational injuries and fatalities are often the result of one or more contributing factors or key events in a larger sequence of events that ultimately result in the injury or fatality. NIOSH investigators identified the following items as key contributing factors in this incident:

- Unknown location of fire fighter near backing apparatus
- Limited visibility on the right side of the apparatus
- Physical mobility of the fire fighter
- Impaired hearing of the driver

Cause of Death

According to the death certificate, the coroner listed the victim's cause of death as blunt force trauma due to being backed over by a fire truck.

Recommendations

Recommendation #1: Fire departments should ensure that standard operating procedures and training for safe backing of fire apparatus are in place and enforced, including adequate training to ensure fire fighter comprehension.

Discussion: The International Association of Fire Chiefs (IAFC) *Guide to IAFC Model Policies and Procedures For Emergency Vehicle Safety* provides guidance intended to help fire departments in developing the basic policies and procedures required to support the safe and effective operation of all fire and emergency vehicles; this includes fire apparatus, rescue vehicles, ambulances, command and support units, privately owned vehicles, and any other vehicles operated by fire department members in the performance of their duties [IAFC 2007]. This document covers the backing of fire apparatus and the use of spotters. Page 12 states: “The spotter(s) shall be on the ground, to the rear of the vehicle, and shall remain visible to the driver at all times. If the driver loses sight of the spotter(s) at any time, the driver shall immediately stop the vehicle.” This document also contains the following information related to nighttime backing operations: “The spotter will ensure that the spotlights on rear of apparatus are turned on before allowing apparatus to be backed. A flashlight may be carried, but at no time will it be directed toward the mirror.” Fire fighters acting as spotters should be trained to maintain visual contact with the driver/operator at all times. If the driver loses visual contact with the spotter, the driver should immediately stop the vehicle until it can be confirmed with the spotter that it is safe to resume backing.

The National Fire Protection Association (NFPA) 1500 *Standard on Fire Department Occupational Safety and Health Program* states, "The fire department shall develop standard operating procedures for safely driving fire apparatus during nonemergency travel and emergency response and shall include specific criteria for vehicle speed, crossing intersections, traversing railroad grade crossings, the use of emergency warning devices, and backing of fire apparatus" [NFPA 2013b]. A standard operating

procedure (SOP) on backing fire apparatus should include driver responsibilities (i.e., mirror adjustment and safe path of travel) and the use of a spotter(s). At least one crew member, preferably two crew members, should be positioned to assist a driver during backing operations. A spotter should be positioned at the rear of the fire apparatus on either the driver's or officer's side so that they are visible in the side-view mirrors. If more than one spotter is available, one can be positioned at each end of the fire apparatus or both positioned at the rear, on either side of the apparatus. The use of more than one spotter will assist the driver in negotiating tight spaces such as alleyways. The SOP should state that members assigned to assist in backing apparatus be in communication with the driver/operator through the use of department-approved hand signals, one-on-one communication, intercom system, or two-way radio devices. To avoid confusion, it is important to designate only one spotter to communicate with the driver.

Fire fighters should be made aware that blind areas exist around vehicles and they should receive specific training in the identification of these blind areas. A blind area (or blind spot) is the area around a vehicle or piece of equipment that is not visible to the vehicle operator, either by direct line-of-sight or indirectly by the use of internal and external mirrors. Training on equipment blind areas is important for both equipment operators and fire fighters on foot in proximity to vehicles and equipment. Fire fighters should only approach a backing vehicle after clear contact has been made with the vehicle operator. Fire fighters should approach the vehicle preferably from the drivers' side, adjacent to the door. If the fire fighter must approach the vehicle from the passengers' side, it should be adjacent to the passenger door.

NFPA 1451 *Standard for a Fire and Emergency Services Vehicle Operations Training Program* (2013 editions), Chapter 8.2.8, states that drivers/operators shall be trained in how to adjust mirrors to provide the optimal field of vision and work with a partner to identify the remaining blind spots. These procedures should be followed so that mirrors are properly adjusted at the beginning of each shift or before operating the apparatus [NFPA 2013a]. In addition, NFPA 1002 *Standard for Fire Apparatus Driver/Operator Professional Qualifications* (2009 edition), Chapter 4.3.1(B), 4.3.3, and 4.3.4, all provide job performance requirements for mirror adjustment, backing skills, and the use of spotters [NFPA 2014].

In this incident, the driver was attempting to back into the third bay when the fire fighter walked toward the rear of the backing tanker. It is believed the fire fighter did this to get the driver's attention and direct him to another bay. The driver saw the fire fighter in his right side mirror. According to his statement, as he continued backing, he looked in his left mirror and then back to the right again but did not see the fire fighter. The driver had decades of experience driving fire apparatus and had driven this apparatus since its acquisition in 2008.

Recommendation #2: ***Fire departments should ensure that all fire fighters wear the appropriate personal protective clothing and equipment, including high-visibility clothing that meets the requirements of NFPA 1500 and NFPA 1971.***

Discussion: The need to wear personal protective equipment that includes high-visibility, retro-reflective striping and trim arises from the fact that personnel need to be highly visible while engaged

in fire fighting and emergency operations. NFPA 1971, Chapter 6.2.2 states, “Garments shall have fluorescent and retroreflective trim permanently attached to the outer shells of garments to meet visibility requirements” [NFPA 2018]. Serving as a spotter to aid a backing vehicle, directing or blocking traffic near an incident scene, and other roadside duties are examples where high-visibility protective clothing enhances the safety of the fire fighter by making the wearer more visible to others in the area. Fire department personnel should wear the appropriate clothing that is referenced in the fire departments SOPs and, if relevant, required by state laws. Additionally, the fire department should provide each member with the appropriate protective clothing and protective equipment to provide protection from the hazards to which the member is or is likely to be exposed. Such protective clothing and protective equipment shall be suitable for the tasks that the member is expected to perform [NFPA 2013b].

All responders who are not involved in fire suppression activities should be wearing ANSI-compliant, high-visibility garments when working near moving traffic and don the retro-reflective vests during scene cleanup following extinguishment. To meet minimum requirements for high-visibility apparel, responders should only use vests that meet the Class II requirement of ANSI/ISEA 107-2010 (or subsequent revisions) or the requirements of ANSI/ISEA 207-2006 for Public Safety Vests. These minimum requirements include (1) use of fluorescent background material, (2) the fluorescent material may be yellow-green, orange-red, or red, (3) retro-reflective material arranged for 360-degree visibility, and (4) the garments should be labeled as compliant with ANSI/ISEA 107-2010 or ANSI/ISEA 207-2006. Federal Regulation 23 CFR 634 states, "The purpose of the regulations in this part is to decrease the likelihood of worker fatalities or injuries caused by motor vehicles while working within the right-of-way on federal-aid highways." NFPA 1500, Chapter 8.7.10 states, "When members are operating at a traffic incident and their assignment places them in potential conflict with motor vehicle traffic, they shall wear a garment with fluorescent and retro-reflective material visible from all directions" [NFPA 2013b].

It should also be noted that in June 2009, the Federal Highway Administration (FHWA) adopted as final, an interim final rule that amended its regulations to address safety concerns raised by the fire-fighting community regarding high-visibility safety apparel [FHWA 2009]. The purpose of adopting the interim final rule as final was to reflect the exemption of fire fighters from the requirement to use high-visibility safety apparel, as defined in 23 Code of Federal Regulations, Part 634, when exposed to hazardous conditions where the use of such apparel may increase the risk of injury to fire-fighter personnel. In other words, fire fighters who are engaged in fire fighting and other emergency response activities are not required to wear high-visibility safety vests if the vest would interfere with the performance of their activities, such as donning a self-contained breathing apparatus, or present an additional hazard, such as increased risk of burn injuries.

In this incident, the fire fighter wasn’t engaged in fire-fighting activities. The use of high-visibility safety apparel and a flashlight or other signaling device could have also helped to increase his visibility.

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Recommendation #3: Fire departments should consider equipping fire apparatus and vehicles with rear-view cameras, object-sensing devices, or additional mirrors to assist drivers during backing operations.

Discussion: Modern technology has provided motor vehicles with a variety of electronic devices that can assist in safe backing, parking, and general maneuvering. These technologies can be added to fire apparatus to aid in improving fire fighter and fire apparatus safety. Fire apparatus are currently being equipped with additional mirrors, cameras, and apparatus-mounted sensing devices to aid in backing maneuvers. Additional mirrors mounted and angled so that blind spots are reduced or eliminated can assist the driver while backing. A rear-view camera mounted on the rear of the apparatus provides a view of the blind area directly behind the vehicle on a video monitor in the cab. Radar or sonar sensing systems designed as backing aids provide an alarm in the cab when an individual or other obstacle is detected at the rear of an apparatus. A combination of a camera and a sensor system may offer the best protection, especially on a congested fireground or at a motor vehicle incident [IFSTA 2013]. Even though these technological devices may provide an additional measure of safety, they do not substitute for visible spotters. NFPA 1901 Annex D and NFPA 1906 Annex D both contain guidelines to assist fire departments and authorities having jurisdiction with the determination of how to properly equip older fire apparatus with safety equipment to assist drivers during backing operations [NFPA 2016a,b; USFA 2003].

***Recommendation #4: Fire departments should ensure that all fire apparatus drivers/operators are trained by a program complaint with NFPA 1451* Standard for a Fire and Emergency Services Vehicle Operations Training Program *and achieve certification to NFPA 1002* Standard for Fire Apparatus Driver/Operator Professional Qualifications.**

Discussion: This recommendation is being offered as a recommended best safety practice for the fire service. The purposes of both NFPA 1451 *Standard for a Fire and Emergency Services Vehicle Operations Training Program* and NFPA 1002 *Standard for Fire Apparatus Driver/Operator Professional Qualifications* are to ensure that persons who drive and operate fire apparatus are properly trained and qualified [NFPA 2013a, 2014].

Recommendation #5: Authorities having jurisdiction and fire department SOPs should consider including the role and responsibilities of the vehicle spotter along with the role and responsibilities of the apparatus driver/operator when a spotter is deployed.

Discussion: It is important that the local authorities having jurisdiction take an active role in providing the fire department with policies, guidance, and/or procedures that identify roles and responsibilities. As noted in previous recommendations and discussion text, various NFPA standards identify the need for a spotter during fire apparatus backing procedures. Current NFPA standards do not address the role and responsibilities of the spotter in the same detail that the role and responsibilities of the driver/operator are defined. Fire departments SOPs should address the spotter's roles and responsibilities. Additionally, the authority having jurisdiction who is responsible for developing and enforcing backing procedures should consider adequately addressing spotter roles and responsibilities in guidance to fire departments.

Recommendation #6: The states should consider establishing minimum training requirements for fire fighters.

Discussion: States without training requirements for fire fighters should consider establishing minimum training standards to increase competency of fire service personnel; improve and expand the professional training available to fire service personnel by developing uniform minimum standards for basic, in-service, advanced in-service, and promotional supervisory training programs, with emphasis on proper subject content; encourage the active participation of local governments in the fire service training standards process; and develop training criteria that will enhance each local government's fire prevention and life safety activities.

States could also consider developing a certification process that includes written/practical testing and proficiency/recurrent training requirements to maintain the certification.

Organizations such as the National Fire Protection Association develop national consensus standards to educate fire fighters on knowledge, skills, and abilities, and the International Fire Service Training Association provides training materials, teaching resources for instructors, online training programs, and an instructor registry to increase competency and reliability.

References

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NFPA [2013a]. NFPA 1451 Standard for a fire and emergency services vehicle operations training program. Quincy, MA: National Fire Protection Association.

NFPA [2013b]. NFPA 1500 Standard on fire department occupational safety and health program. Quincy, MA: National Fire Protection Association.

NFPA [2014]. NFPA 1002 Standard for fire apparatus driver/operator professional qualifications. Quincy, MA: National Fire Protection Association.

NFPA [2016a]. NFPA 1901 Standard for automotive fire apparatus. Quincy, MA: National Fire Protection Association.

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USFA [2003]. Safe operation of fire tankers. Emmitsburg, MD: Federal Emergency Management Agency, United States Fire Administration, Publication No. FA 248.

Weather Underground [2016]. Weather history for KBFD, July 2016. Atlanta, GA: The Weather Company LLC.

Investigator Information

This incident was investigated by Matt E. Bowyer, General Engineer, and Jennifer E. Lincoln, Health Scientist, with the Fire Fighter Fatality Investigation and Prevention Program, Surveillance and Field Investigations Branch, Division of Safety Research, NIOSH located in Morgantown, West Virginia. An expert technical review was provided by Dave Dodson, Lead Instructor/Owner of Response Solutions. A technical review was also provided by the National Fire Protection Association, Public Fire Protection Division.

Additional Information

Emergency Responder Safety Institute

The Emergency Responder Safety Institute (ERSI) serves as an advisory group of public safety leaders and transportation experts committed to reducing deaths and injuries to America's emergency responders. Every day, our nation's fire fighters, EMTs/paramedics, state troopers, police officers, sheriff's deputies, tow operators, and departments of transportation responders are exposed to the grave hazards inherent in emergency responses on the nation's highways and roadways. ERSI is dedicated to the safety of these men and women by engaging in and promoting activities that include developing educational material to support responder safety training; promoting the National Unified Goal for Traffic Incident Management (TIM) including responder safety; safe, quick clearance and interoperable communications; encouraging the development of TIM teams; promoting collaboration, communication, and cooperation among the nation's emergency responders; and keeping emergency responders up to date on national rules, regulations, and trends related to safe roadway incident operations. http://www.respondersafety.com/

Be Right Be Bright is a training video showing the safety benefit of wearing high-visibility clothing while working along roadways. This video can be found on the Emergency Responder Safety Institute website. http://www.respondersafety.com/Videos/Be-Right-Be-Bright.aspx

International Association of Fire Chiefs, *Guide to IAFC Model Policies and Procedures For Emergency Vehicle Safety*

This document provides guidance and template SOGs for developing the basic policies and procedures required to support the safe and effective operation of all fire and emergency vehicles; this includes fire apparatus, rescue vehicles, ambulances, command and support units, privately owned vehicles, and any other vehicles operated by fire department members in the performance of their duties.

https://www.iafc.org/topics-and-tools/resources/resource/guide-to-model-policies-and-procedures-for-emergency-vehicle-safety

Emergency Vehicle and Roadway Scene Safety

The International Association of Fire Fighters, Division of Occupational Health, Safety & Medicine, in conjunction with the U.S. Department of Homeland Security, United States Fire Administration, developed an on-line training module to help ensure that fire fighters have a greater awareness of the issues affecting fire fighter safety relative to riding on fire apparatus and operating at roadway emergency scenes. The fire fighter will also understand basic strategies for improving safety during vehicle and roadway incident operations.
http://www.iaff.org/hs/EVSP/PowerPoint%20Presentation%20in%20PDF.pdf

Vehicle Backing Safety Fact Sheet

The Texas Department of Insurance, Division of Workers' Compensation, in conjunction with the National Safety Council, developed a vehicle backing safety fact sheet. The use of safe vehicle backing tips by employers and employees can help prevent accidents while on the job. This fact sheet provides a number of recommendations for safely backing a vehicle, including a walk-around, use of spotters, the installation of rear-vision cameras, and the need to practice safely backing a vehicle.
http://www.tdi.texas.gov/pubs/videoresource/fsvehiclebackin.pdf

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