



Death in the line of duty...

NIOSH
Fire Fighter Fatality Investigation
and Prevention Program

A summary of a NIOSH fire fighter fatality investigation

March 17, 2014

Volunteer Fire Fighter Dies in Tanker Crash En Route to Grass Fire – Indiana



Photo of the crashed tanker at the incident scene.
(Photo courtesy of the police department)

Executive Summary

On November 11, 2012, a 26-year-old male volunteer fire fighter (the Victim) was killed when the tanker he was driving crashed en-route to a grass fire. The Victim drove his personal vehicle to the fire department from his residence upon hearing his department dispatched to the scene of a grass fire. Upon arriving at the department, approximately seven minutes after other fire department members responded, he readied Tanker 64 to respond. He asked other members if they wanted to go with him but they declined saying enough resources were already en route. He boarded the tanker and left the station with lights and siren activated. The apparatus crashed approximately five miles from the department. The Victim was ejected and suffered fatal injuries. He was pronounced dead at the scene.

Contributing Factors

- *Seat belt – an unrestrained driver risks losing control of the vehicle and being ejected*
- *Speed - travelling too fast for required maneuvers such as turning, stopping, swerving*
- *Roadway intersection protocol - not coming to a stop and then proceeding with caution risks a collision*
- *Tanker weight and characteristics – high center of gravity and possible weight shifts affect turning maneuvers and stopping distance*
- *Unnecessary emergency response.*

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Key Recommendations

- *Fire departments should ensure that all persons responding in emergency apparatus are wearing, and restrained securely by, seat belts at all times the vehicle is in motion*
- *Fire departments should provide training to driver/operators, incorporating specifics on rollover prevention and maintaining vehicle control*
- *Fire departments should ensure that all fire service vehicles are operated safely, taking into consideration the type of emergency and route of travel to the scene*
- *Fire departments should develop emergency response deployment protocols to prevent resources from unnecessarily responding, unplanned or unknown, to an emergency scene*
- *Fire departments should ensure that a thorough scene size-up is conducted, incident command is established, and risks are assessed and managed throughout an emergency incident*
- *Fire departments should develop policies and procedures that assist with determining replacement cycles for existing fire apparatus*
- *Fire departments should develop policies and procedures, mission and vision statements, and training programs, which promote an institutional safety culture that ensures that all members are empowered to report unsafe practices or actions.*

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 Web site at www.cdc.gov/niosh/fire or call toll free 1-800-CDC-INFO (1-800-232-4636)

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Introduction

On November 11, 2012, a 26-year-old male volunteer fire fighter (the Victim) died when the tanker he was driving crashed while en route to a grass fire. On November 13, 2012, the U.S. Fire Administration (USFA) notified the National Institute for Occupational Safety and Health (NIOSH) of this fatality. At the department's request, the investigation was delayed until December 6, 2012, when an Occupational Safety and Health Specialist from the NIOSH Fire Fighter Fatality Investigation and Prevention Program traveled to Indiana to investigate the incident.

The NIOSH investigator met with the Chief and Assistant Chief of the department who were on the scene of the grass fire and the Police Officer who investigated the crash. Police and fire department representatives accompanied the NIOSH investigator to view and photograph the scene of the crash and the location of the grass fire. The NIOSH investigator, accompanied by the Assistant Chief, visited the vehicle impound facility where the apparatus was being stored to inspect and photograph it. Copies of the city police department crash report, the department's SOPs, training records, maintenance records, apparatus build sheet, witness statements, dispatch records, incident scene diagrams and photographs were reviewed by the NIOSH investigator.

Fire Department

The combination fire department involved in this incident serves a population of approximately 7,500 residents in an area of about seven square miles of mostly small semi-rural communities and suburban residential dwellings. The fire department maintains one station, Station 60, and has 30 members; nine of whom are career and 21 members who volunteer. They respond to approximately 300 calls per year. The shifts are staffed by 3 career members working Monday through Friday 0600 to 1800 hours, and one career member working the same shift on Saturday and Sunday. All 1800 to 0600 hours shifts are covered by volunteers who meet at the station when the department is dispatched to a call.

Housed at the station are two tankers (Tanker 63, Tanker 64), one engine (Engine 62), one ladder (Truck 67), one heavy rescue (Rescue 68), one basic life support ambulance (Emergency 65), two grass rigs (Grass Rig 69 and Grass Rig 66 - a 6x6 military vehicle), and a squad truck/SUV (Squad 66). The Chief's vehicle is Fire 61. The initial response to the grass fire from the Victim's station included Fire 61, Tanker 63, Grass Rig 69 and Grass Rig 66.

Emergency calls and interagency communications are handled by a single joint city-county communications center. Dispatch and fireground channels are inter-operable among all city and county emergency response entities and are monitored by a call center that is staffed continually by trained professionals.

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The department had written standard operating procedures that addressed vehicle operations, driver/operator training, emergency response protocol, and the use of seat belts; however consistent enforcement was not evident.

Training and Experience

The state of Indiana has a fire fighter certification program that is applicable to the volunteer fire service as well as to career fire fighters. The purpose of the program is to measure the level of knowledge, skills, and abilities possessed by fire fighters, and to attest that each individual meets the National Fire Protection Association (NFPA), nationally recognized Fire Fighter I and Fire Fighter II standards. However, the state has no specific licensing requirements for drivers of fire apparatus.

The State requires that a fire fighter successfully complete the minimum basic training requirements before the fire fighter may perform the duties of a certified fire fighter. A volunteer fire fighter who has successfully completed the minimum basic training requirements may be elected or appointed to membership in more than one volunteer fire department. The minimum basic training requirements include training in the following areas:

- Orientation
- Personal safety
- Forcible entry
- Ventilation
- Apparatus
- Ladders
- Self-contained breathing apparatus
- Hose loads
- Streams
- Basic recognition of special hazards.

A person who fulfills the certification requirements for NFPA Firefighter I and Firefighter II is considered to comply with the requirements. In addition to the minimum basic training requirements, training for career and volunteer fire fighters must include successful completion of an instruction course on vehicle emergency response driving safety.¹

The Victim had been a fire fighter with the department for five years. He had successfully completed training in many courses including Fire Fighter I and II, Emergency Vehicle Operations Course (EVOC), Hazmat First Responder, Trench and Confined Space Rescue, Search and Rescue and Live Fire training.

The department conducts driver/operator training at least once per year, and the Victim had participated in the training every year for the past five years. At the time of the incident, the fire

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department involved had written standard operating procedures that addressed vehicle operations and driver/operator training. However driver/operator training did not include classroom and hands-on training specific to the apparatus each member may be called upon to operate. The total number is unknown, but prior to the crash the Victim had often driven Tanker 64.

Equipment and Personnel



Photo 1. Photo of a tanker that is similar to the one involved in the crash.
(Photo courtesy of the fire department.)

The apparatus involved in this incident, Tanker 64 (T64), was a 1979 diesel, three-axle tanker/pumper (see Photo 1). Maintenance records reveal that mileage was recorded at 26,171 in August of 2012. The ten tires were in good condition and the front and rear drum brakes were inspected regularly with no reported operational issues. An elliptical 3,500 gallon capacity stainless steel water tank, equipped with transverse and longitudinal baffles, had been installed on the chassis in 1998 by an authorized tanker apparatus company. The tank was reported to be filled to capacity when it left the station on the evening of the incident and would have been within the 54,000-pound gross vehicle weight rating (GVWR) requirement of the truck.

The police inspection did not identify any mechanical defects that would have caused or contributed to the events which led to the fatality. Maintenance records revealed that the tanker was inspected on a regular basis and all required work was performed in a timely manner by certified mechanics when required. The tanker was running with emergency lights and siren activated en route to the call on the evening of the incident.

Timeline

The timeline for this incident details all activities pertaining to the vehicle crash and is a summary of events that occurred as the incident evolved. Not all events are included in this timeline. Times are approximate and were obtained by studying dispatch records, witness statements, and other available information. In some cases, times are rounded to the nearest minute.

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2016	First 911 call came into dispatch for a “fire in the woods.”
2018	City fire department dispatched to fire, unable to locate; Once located, Engine 7 (city fire department) notified dispatch to call the county fire department (Victim’s department) as fire may be in their jurisdiction.
2024	Victim’s department dispatched to the grass fire
2025	Fire 61 (Chief, victim’s department) en route Truck 57 (county mutual aid) en route
2026	E7 (city fire department) on scene
2027	Grass 69 (two officers from Victim’s department) en route
2028	E6, Grass 17, Battalion 17 (city department) dispatched to grass fire
2029	Tanker 63 (driver/operator) en route Grass Rig 66 (officer and fire fighter) en route
2031	Fire 61 on scene
2033	Fire 61 I’ll have command, keep everybody coming, move to white channel
2036	Truck 57 (county mutual aid) on scene Tanker 64 (Victim) en route (20:36:53)
2037	E6 (city) reports to city command “the worst of the brush fire is knocked down Tanker 63 on scene
2039	Tanker 153 (county mutual aid) en route
2042	Tanker 64 Victim radios “which way do you want me to come in?” Incident Commander responded for him to take the “named” road which would bring him to the fire from the west (see Diagram).
2043	The first 911 call reporting the tanker crash.

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Road and Weather Conditions

The two-lane asphalt roadway where the incident occurred runs north to south and is bordered by dirt shoulders. A white fog line is painted adjacent to the shoulders with a yellow line dividing the north/south lanes. At the northern approach to the intersection, the southbound lanes expand to include a left-turn-only lane with the right lane maintaining straight ahead forward passage through the intersection (see Photo 2). Collapsible lane control posts had been recently installed to the immediate south of the intersection to direct traffic flow into and out of a gas station that had been recently constructed on the southwest quadrant. There is an operational four-way traffic signal at the intersection. However, there were no witnesses who stated whether the signal for the Victim was red or green. There is a posted speed limit of 45 MPH in the area. The police crash investigation report did not list an estimated speed for the tanker at the time of the crash.

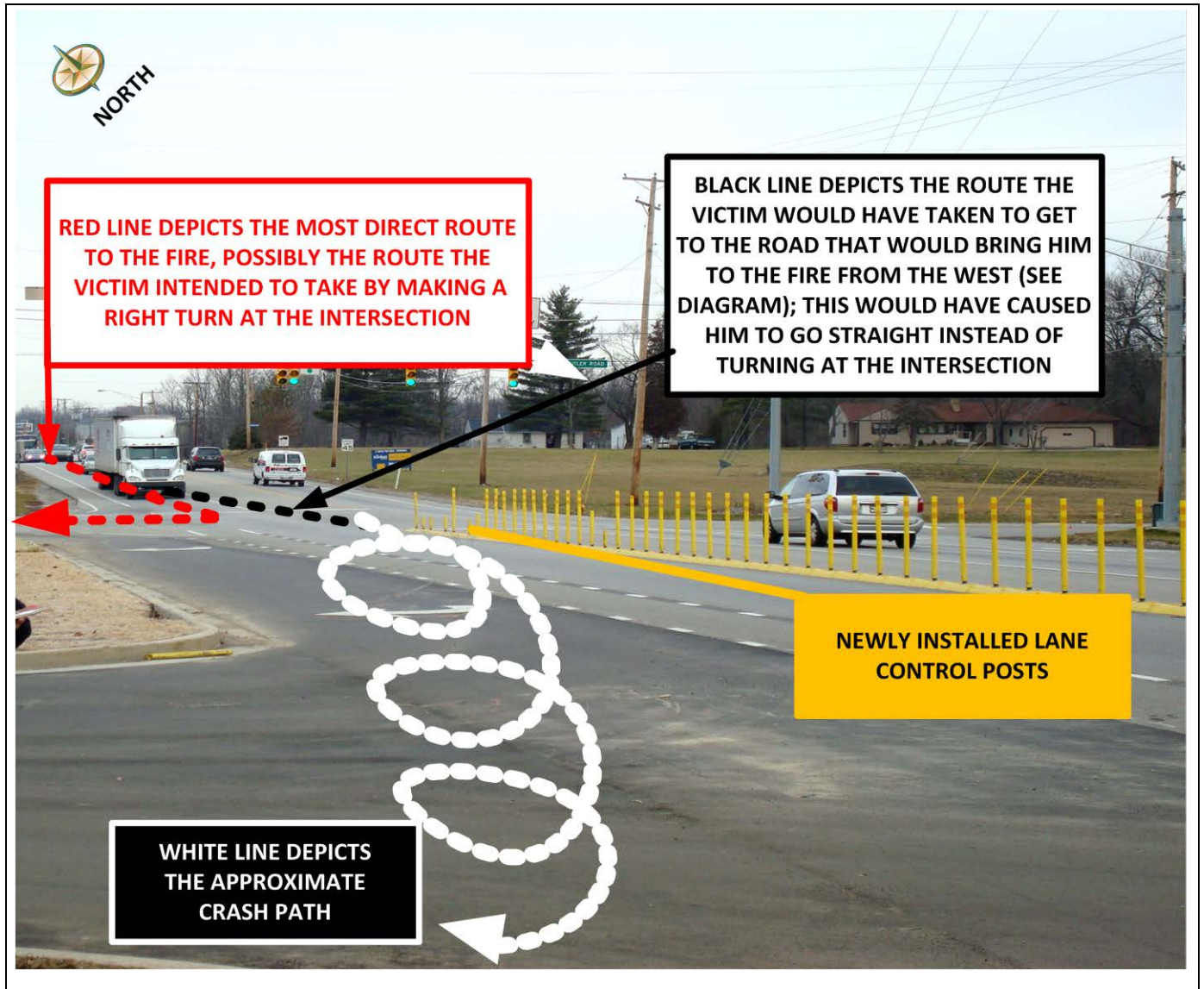
The incident occurred at approximately 2043 hours. It was dark and slightly overcast. The ambient air temperature was approximately 61°F with 42% humidity, and winds were fairly steady at 16 mph. There had been no precipitation within 24 hours prior to the crash.² Neither the roadway condition, nor the weather, appeared to be a factor in this fatality.

Investigation

At approximately 2016 hours on the evening of November 11, 2012, a passing motorist called 911 to report a fire in the woods along a roadway. The call was originally routed to the city fire department and units, including Engine 7 (E7), were dispatched to the scene. Initially there was confusion as to the location of the fire, with the driver of E7 reporting that they could not locate the fire and were going back in service. However, dispatch advised that they had received several additional 911 calls reporting the fire; and upon further searching, E7 found that the fire was located to the south of the intersection and they had originally been searching to the north. Upon arriving at the fire scene, they reported to dispatch there was a grass fire, but they weren't sure if the fire location was within the city or the county jurisdiction, and they requested that county fire be dispatched. At 2024 hours two county departments were toned out; the Victim's department which was located north of the fire and another county department that was located farther south.

At approximately 2015 hours several members and probationary trainees returned to the county fire station from a live fire training session and were cleaning equipment when the department was dispatched to the grass fire. The Victim did not participate in the training that day, and at the time the department was dispatched, was at his residence approximately eight miles from the station. The first unit to call en route was the Chief (Fire 61), followed by Grass Rig 69 with two officers, and Grass Rig 66 with an officer and fire fighter, and Tanker 63 with a driver/operator. All units were en route to the fire by 2029 hours.

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**Photo 2. Intersection where crash occurred.
(NIOSH photo.)**

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At approximately 2030 hours, after all responding units had departed, the Victim arrived at the station in his personal vehicle. He donned his bunker pants and boots and proceeded to reposition an engine (E62) in order to reach Tanker 64 which was parked behind it. He asked if anyone wanted to go with him to the grass fire and was told by several members that sufficient personnel and apparatus were already en route or at the scene, and an additional tanker would not be needed. According to witness statements, he continued preparing to dispatch to the scene and proceeded out of the station with lights and siren activated. It was reported that he was advised to put his seatbelt on, but no one saw him buckle-up. He radioed that he was en route at 2036 hours. The communication was acknowledged by county dispatch. Radio transmissions occurring after the Victim left the station indicate that the fire was close to being extinguished and some personnel were preparing to leave the scene. Radio traffic reveals that at 20:42:04 the Victim asked Fire 61 “Which way do you want me to come in?” Incident Command responded for him to come in from a road that runs west of the fire (see Diagram). At 20:43:43 the first 911 call came into the dispatch center reporting a fire truck crash.

There were three witnesses who observed the crash. They were travelling north on the same road, and at the same time that the Victim was travelling south. They reported to police that as the tanker was travelling through the intersection, it appeared to attempt a right turn or maneuver. Theories are that the Victim may have swerved to the right to miss the newly installed lane control posts, or may have attempted to change direction at the last minute from making a right turn, to proceeding straight to take the road which would bring him to the fire from the west, as requested by Incident Command (see Photo 2 and Diagram). Following the attempted maneuver, the police report states that the tanker began to roll and struck curbing where it began to rotate before striking a utility pole. The tanker then continued to roll and struck a second utility pole before coming to rest off the west side of the roadway. The speed the tanker was traveling at the time of the crash was not indicated in the police report.

The crash impact caused the water tank to dislodge from the truck frame. The Victim was ejected from the cab. He was found partially under the tank and was pronounced dead at the scene. His body was transported to a forensic center for an autopsy where the cause of death was identified as blunt force trauma due to a motor vehicle crash.

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Diagram. Depicts tanker path-of-travel, fire location, and crash scene.

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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 result in the injury or fatality. NIOSH investigators identified the following items as key contributing factors in this incident:

- *Seat belt – an unrestrained driver risks losing control of the vehicle and being ejected*
- *Speed - travelling too fast for required maneuvers such as turning, stopping, swerving*
- *Roadway intersection protocol - not coming to a stop and then proceeding with caution risks a collision*
- *Tanker weight and characteristics – high center of gravity and possible weight shifts affect turning maneuvers and stopping distance*
- *Unnecessary emergency response.*

Cause of Death

The medical examiner reported the cause of death as blunt force trauma.

Recommendations

Recommendation #1: Fire departments should ensure that all persons responding in emergency apparatus are wearing and restrained securely by seat belts at all times the vehicle is in motion.

Discussion: NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program* states that all persons riding in fire apparatus shall be seated and belted securely by seat belts in approved riding positions at any time the vehicle is in motion. The standard further states that seat belts shall not be released or loosened for any purpose while the vehicle is in motion.³ Fire departments should develop, implement and enforce SOPs on the use of seat belts in accordance with National Fire Protection Association (NFPA) guidelines. Numerous nationally recognized fire service entities have guidance available on implementing a seat belt policy. The International Association of Fire Fighters (IAFF) provides guidance in their document *Fire Department Vehicle Safety, Emergency and Non-Emergency Response, and Safe Emergency Operations on Roadways*,⁴ and recommends that all employees use seat belts at all times and “All personnel shall ride only in regular seats provided with seat belts. The company officer and driver of the vehicle shall confirm that all personnel and riders are on-board, properly attired, with seat belts on, before the vehicle is permitted to move. This confirmation shall require a positive response from each rider.” The International Association of Fire Chiefs (IAFC), *Guide to IAFC Model Policies and Procedures for Emergency Vehicle Safety*, states that “The driver shall not begin to move the vehicle until all passengers are seated and properly secured. All passengers shall remain seated and secured as long as the vehicle is in motion.”⁵ NFPA 1901, *Standard for Automotive Fire Apparatus*, establishes requirements for the minimum length of

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seat belts, together with how they are measured. The standard also recommends that a seat belt warning device be installed to indicate when seat belts are not being properly used.⁶

Vehicle crashes have historically been the second leading cause of fire fighter line of duty deaths. Seat belts are not only important for protecting occupants in the event of a crash, but they may be useful in helping to avoid crashes. The U.S. Fire Administration's *Safe Operation of Fire Tankers* states, "Some crash reconstruction specialists have speculated that particular incidents may have occurred after the unrestrained driver of a truck was bounced out of an effective driving position following the initial contact with a bump in the road or another object."⁷ In the same publication, the USFA also cites a Department of Transportation (DOT) study of seat belt use which revealed the following statistics: 1) 75 percent of the people ejected from vehicles suffer fatal injuries; 2) 80 percent of fatalities in rollover incidents involve occupants being ejected from the vehicle; and 3) in a rollover incident, occupants are 22 times more likely to be thrown from the vehicle if they are not wearing their seat belts.

To increase the use of seat belts by fire fighters, the National Fire Service Seat Belt Pledge campaign was created.⁸ The United States Fire Administration, National Fallen Fire Fighters Foundation, National Institute for Occupational Safety and Health, International Association of Fire Chiefs, National Volunteer Fire Council, and the National Fire Protection Association support the campaign as a method of raising awareness of the importance of mandatory use of seat belts by all fire fighters.⁹ Fire fighters wearing seat belts are an essential component of efforts to ensure the safety of all occupants of apparatus or department vehicles. Fire fighters who take the pledge, and fire departments who achieve 100% pledge participation, show their individual and organizational commitment to fire fighter safety.

In this incident the use of a seatbelt is not verified. However, since the Victim was ejected from the apparatus it is unlikely that he had been wearing a seatbelt. A properly worn seatbelt could have secured his position behind the wheel and possibly assisted him in maintaining greater control of the apparatus and reduce the likelihood of being ejected in a crash.

Recommendation #2: Fire departments should provide training to driver/operators, incorporating specifics on rollover prevention and maintaining vehicle control.

Discussion: NFPA 1451, Standard for a Fire Service Vehicle Operations Training Program, states that fire department personnel must be trained in, and exercise, applicable principles of defensive driving techniques under both emergency and non-emergency conditions.¹⁰ SOPs for driving fire department vehicles during non-emergency travel and emergency response should include, but not be limited to:

- principles of skid avoidance
- effects of liquid surge
- load factors
- general steering reactions

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- speed
- the ways in which all factors impact vehicle control.

Common causes for loss of control are driving too fast for road design or conditions, failing to properly react to weight shifts of heavy emergency vehicles/apparatus, driver distraction, and failing to anticipate obstacles.

Driver training should incorporate vehicle characteristics, capabilities and limitations. Tankers, for example, tend to be heavier and to have a higher center of gravity than other fire vehicles. Both of these factors affect the driver's ability to control a tanker. Based on simple physics and inertia, a top heavy vehicle, like a tanker, is inclined to tip over if driven through a curve at an unsafe speed or if the driver suddenly turns the steering wheel. The U.S. Fire Administration's *Safe Operation of Fire Tankers* lists some vehicle rollover prevention points to increase a driver's ability to maintain control of a vehicle.⁷

Driver training should be documented and given in accordance with NFPA 1451, *Standard for a Fire Service Vehicle Operations Training Program* and NFPA 1002, *Fire Apparatus Driver/Operator Professional Qualifications*.^{10,11} These standards state that departments should establish and maintain a driver training education program and each member should be provided driver training on each vehicle they may be called upon to drive, not less than twice a year. During this training, each driver should operate the vehicle and perform tasks that the driver/operator is expected to encounter during normal operations to ensure the vehicle is safely operated in compliance with all applicable State and local laws.

The department conducts driver/operator training at least once per year, and the Victim had participated in the training every year for the past five years. At the time of the incident, the driver/operator training was not formalized to include classroom and hands-on training specific to the apparatus each member may be called upon to operate. Although the exact number is unknown, it was reported that the Victim had driven Tanker 64 many times prior to the fatal crash.

Recommendation #3: Fire departments should ensure that all fire service vehicles are operated safely, taking into consideration the type of emergency and route of travel to the scene.

Discussion: Fire departments should consider developing programs using a risk benefit analysis to prioritize emergency vehicle response by auxiliary or fire support vehicles, and ensure that all department personnel who drive vehicles/apparatus understand the specific road-handling dynamics of each vehicle they may be called upon to drive. Following are excerpts taken from *The IAFC Guide to Model Policies and Procedure for Emergency Vehicle Safety* that provide guidance in developing a SOP for responding to incidents.⁵

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"Fire department vehicle operations are classified as either emergency or non-emergency. During non-emergency operations, fire department vehicles shall comply with all of the traffic laws and rules of the road that apply to all other vehicles. The specific exceptions to traffic laws that apply to emergency vehicles shall only be exercised during authorized emergency operations.

Emergency response creates an increased risk to firefighters and to other users of the roadways. The increased risk must be balanced against the potential benefits of faster response in situations where lives and/or property are at risk. Emergency response shall be limited to situations where prompt response is likely to reduce the risk of death, serious injury or disability, or preventable damage to property.

Each response to an incident shall be classified as either emergency or non-emergency at the time of dispatch, based on the nature of the reported situation. The response classification shall be assigned according to pre-established criteria. The response classification may be changed by the communications center at the time of dispatch or while units are en route, based on the receipt of additional information. The change of response classification may apply to all units or only to specified units. The officer in charge of a department or unit that is en route to an incident is also authorized to change the response classification, based on reliable information that the change is appropriate. The communications center and all other responding units will be advised immediately of a change in response classification.

When multiple units are responding in emergency mode, the officer arriving at the scene and assuming command of the incident shall determine if it is appropriate to downgrade the response of any units that are still en route. The additional units shall be directed to continue "at reduced speed" or non-emergency when the situation does not urgently require their presence at the scene.

The determination of which types of calls justify emergency response must consider local factors and traffic conditions. In some cases, the difference between emergency response and non-emergency response could be measured in seconds, while in other cases the difference could be several minutes. In jurisdictions where traffic congestion is a major problem, a reduced speed policy could be implemented to reduce the risks of emergency response, while maintaining the ability to move through traffic.

Examples of incident classifications are provided below:

Emergency Response Classifications

- Smoke or fire in a building
- Outside fire with exposures
- Gas leak inside a building
- Hazardous materials release with persons in distress
- Critical medical incident

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Non-Emergency Response Classifications

- Automatic fire alarm system activation – no human report of smoke or fire
- Residential smoke alarm sounding – no indication of smoke or fire
- Carbon monoxide alarm – no indication of person(s) in distress
- Outside fire without exposures
- Smoke in the area – no indication of source
- Outside gas leak
- Electrical wires arcing
- Hazardous materials release – no indication of person(s) in distress
- Water leak
- Unknown odor – no symptoms or persons in distress
- Relieve units at the scene of an incident that is under control

Fire departments should consider the adoption of policies that limit certain vehicles, such as tankers (water tenders), support units and large / heavy vehicles to non-emergency response mode while ensuring that response protocols limit apparatus to those identified as critical to each situation. The USFA publication *Safe Operation of Fire Tankers* concludes that by slowing the apparatus down during the response and knowing how to react in the event the right-side wheels leave the roadway will prevent a significant number of crashes from occurring.⁷

Emergency Response Driving

State traffic laws include specific provisions for emergency vehicles, while they are engaged in emergency operations. Department policies and procedures should specify when and how these exceptions will be applied by fire department members. Responding to emergency incidents does not in any manner reduce the responsibility to operate vehicles safely. While prompt response to emergency incidents is an organizational priority, safety is always a higher priority. The responding units must arrive safely at the location where they are needed before they can deliver the required services. Unsafe operation of an emergency vehicle creates an unacceptable risk to fire department members, to the public, and to the individuals who are in need of assistance.”⁵

A good rule to follow is to limit the use of lights and sirens, but when emergency response is required, ensure that at minimum two persons are responding in the apparatus. Additionally, always reduce the speed of vehicles and apparatus when approaching turns and/or bends in the roadway, remembering to come to a stop and proceed with caution when entering a roadway intersection. Always take into consideration that road surfaces may be worsened by weather conditions.¹²

In the State where the incident occurred, motor vehicle regulations provide exemptions for highway use of emergency vehicles. It states that the operator of any emergency vehicle may exceed the lawful speed so long as the driver does not endanger life or property. The section

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further states that the provisions of this section shall not relieve the driver of an authorized emergency vehicle from duty to drive with due regard for the safety of all persons.¹³

Department SOP's for response to grass, woods, or brush fire call for two tankers, two brush rigs and an engine. However, by the time the Victim departed the station, multiple emergency response apparatus were already at the scene of the grass fire with a tanker and rescue from a neighboring department en route. Radio transmissions occurring after the Victim left the station indicate that the fire was close to being extinguished and some personnel were preparing to leave the scene. Given these circumstances, and the size of the grass fire, an emergency response by Tanker 64 may not have been needed (see Photo 3).



Photo 3. Photo shows the grass fire area.
(NIOSH photo)

Recommendation #4: Fire departments should develop emergency response deployment protocols to prevent resources from unnecessarily responding, unplanned or unknown, to an emergency scene.

Discussion: The International Association of Fire Chiefs and the National Volunteer Fire Council discourage the practice of self-dispatch among emergency response personnel to emergency incidents without notification or request. They have issued a joint policy statement stating that, “Uncontrolled and uncoordinated arrival of resources at emergencies cause significant accountability issues as a result of personnel freelancing and creating additional safety risks to

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firefighters, civilians and others who are operating within the parameters of the incident action plan. Chaos at the scene occurs, creating additional safety risks because these companies or individuals are not aware of the overall strategic plan. Further, unrequested emergency units and emergency personnel at incidents disrupt the accountability and incident management system. An incident management system requires that a formal structure is utilized to determine the needs of an incident. The needs of the incident are in most cases directly related to personnel and equipment. When resources show up that have not been requested, the incident management system fails. Unplanned resources in many cases block roads, create traffic jams, restrict access and ultimately affect the safety of those fire fighters who are operating at the scene by denying them needed resources. Freelancing of personnel and fire companies adversely impact incident management systems and require that the Incident Commander assign more personnel to control and coordinate these resources that were not requested.”¹⁴

It is not clear if the Incident Commander, or any other responders who were en route or at the scene, were aware that the Victim had taken the tanker and was on his way to the fire because he was not at the station when the initial apparatus responded. His radio transmission, when he left the station, was acknowledged by dispatch. It is possible that when the victim radioed, “which way do you want me to come in”, the IC may have thought that he was replying to the mutual aid unit that was responding from the south.

Recommendation #5: Fire departments should ensure that a thorough scene size-up is conducted, incident command is established, and risks are assessed and managed throughout an emergency incident.

Discussion: The management of an incident involving multiple agencies can be difficult. There is always a possibility of disagreement when determining who is in charge of what. Pre-incident planning to identify each responding agency and their particular role and responsibility can avoid disagreements when an incident occurs. In addition, mutual aid agreements should be established that identify specific responses to deliver appropriate equipment and staffing for the incident. Depending on the size and complexity of the incident, the option of single command or Unified Command must be considered. Regardless, the Incident Command System (ICS) must be used as this process is a systematic tool for the command, control, and coordination of an emergency response. ICS allows agencies to work together using common terminology and operating procedures for controlling personnel, facilities, equipment, and communications at an incident scene. Additionally, the Incident Commander needs to be able to radio regular status reports to dispatch so they in turn can advise any later responding units if they are needed at the scene.

During incident response, the ICS allows the transition to large and/or multiagency operations with only minimal adjustment for the agencies involved. While the ICS structure may be small initially, its flexibility allows the structure to expand and adapt to real-time conditions at the scene. As in any other operation, accountability of personnel is mandatory. However in an

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incident where multi-agencies have personnel and resources at the incident scene, accountability is even more difficult.¹⁵

In this incident, the city fire department was dispatched on the initial 911 call, followed by the county departments. There appeared to be some confusion beginning with the initial dispatch to the fire, and incident command may have been unaware of all apparatus en route to the scene.

Recommendation #6: Fire departments should develop policies and procedures that assist with determining replacement cycles for existing fire apparatus.

Discussion: It is a generally accepted fact that fire apparatus have a finite life. The length of that life depends on factors such as vehicle mileage, engine hours, preventative maintenance program, and driver/operator training. The tanker truck chassis involved in this incident was 33 years old and had a relatively low mileage of just over 26,000 miles. However, NFPA 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus*, 2012 edition, recommends that apparatus older than 25 years of age should be replaced.¹⁶

While it is important that fire departments seek constant improvements and upgrades to their fire apparatus and equipment through enhancements of their apparatus maintenance program and personnel training, some departments may not have the resources or programs to adequately maintain, upgrade, or replace their apparatus and equipment as often as they should. Alternative funding sources, such as federal grants, are available to purchase fire apparatus and equipment. Additionally, there are organizations that can assist fire departments in researching, requesting, and writing grant applications (see the *Additional Information* section of this report.)

Recommendation #7: Fire departments should develop policies and procedures, mission and vision statements, and training programs, which promote an institutional safety culture that ensures that all members are empowered to report unsafe practices or actions.

Discussion: Everyone Goes Home, Firefighter Life Safety Initiative #4 states that, “*All Firefighters must be empowered to stop unsafe practices.*” which means allowing the members of each department to speak up with regard to personal and organizational safety, without negative consequences for doing so (within a prescribed context), and without decentralizing the authority of the formal leader.¹⁷ The resources needed for all fire service organizations to institute Initiative #4, regardless of type or size, are already available to them, and are free. All that is required is for departments to develop policies and procedures that officers encourage and enforce, and fire fighters have the courage to help each other by speaking up.

In this incident, the victim responded to the fire station from his home after receiving the page. Several probationary/trainees, and one full department member were at the station having recently returned from a training session and were monitoring the incident radio traffic. Three

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apparatus had already departed the station by the time the Victim arrived. When he began to prepare Tanker 64 to respond to the fire, several members advised him that additional resources probably would not be needed at the scene due to sufficient apparatus already en route, as well as on the scene. He was also advised to put his seatbelt on, but no one saw him buckle-up. The Victim departed the station with lights activated engaging the siren once on the roadway.

Although several members questioned the Victim as to the necessity of another unit responding to the incident scene, there was no discussion and he continued preparing to leave. A departmental guideline was not in place that would give weight to their requests that he not proceed to the fire. Developing and enforcing departmental safety culture policies that describe procedures for similar circumstances would help to define expected outcomes and provide all members with the knowledge of what is expected of them.

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Investigator Information

This incident was investigated by Virginia Lutz, Safety and Occupational Health Specialist, Fire Fighter Fatality Investigation and Prevention Team, Surveillance and Field Investigations Branch, Division of Safety Research, NIOSH located in Morgantown, WV. This report was authored by Virginia Lutz. An expert technical review was conducted by Chief Richard Marinucci, Deputy Director of Fire Services, Northville Township Fire Department and the National Fire Protection Association, Public Fire Protection Division.

Additional Information

Fire departments should be aware of programs that provide assistance in obtaining alternative funding, such as grant funding, to replace or purchase fire apparatus and equipment.

Discussion: While it is important that fire departments seek constant improvements and upgrades to their fire apparatus and equipment, some departments may not have the resources or programs to replace or upgrade their apparatus and equipment as often as they should. Alternative funding sources, such as federal grants, are available to purchase fire apparatus and equipment. Additionally, there are organizations that can assist fire departments in researching, requesting, and writing grant applications.

Federal Emergency Management Agency (FEMA), Assistance to Firefighters Grant (AFG) Program

<http://www.fema.gov/welcome-assistance-firefighters-grant-program>

The primary goal of the Assistance to Fire Fighters Grant (AFG) Program is to provide critically needed resources such as emergency vehicles and apparatus, equipment, protective gear, training for responders, and other needs to help fire departments protect the public and emergency workers from fire and related hazards. FEMA grants are awarded to fire departments to enhance their ability to protect the public and fire service personnel from fire and related hazards. The Grant Programs Directorate of FEMA administers the grants in cooperation with the United States Fire Administration. This Web site offers resources to help fire departments prepare and submit grant requests.

National Volunteer Fire Council (NVFC), Grants & Funding

<http://www.nvfc.org/hot-topics/grants-funding>

The NVFC provides an online resource center to assist departments applying for various types of fire grants, including narratives from successful past grant applications and a listing of federal grant and funding opportunities.

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FireGrantsHelp.com

www.firegrantshelp.com

A nongovernmental group, FireGrantsHelp's mission is to provide firefighters and departments with a comprehensive resource for grant information and assistance. FireGrantsHelp.com provides an extensive database of information on federal, state, local, and corporate grant opportunities for first responders.

Additional resources related to staffing and training include:

FEMA, Staffing for Adequate Fire and Emergency Response (SAFER) Grants

<http://www.fema.gov/welcome-assistance-firefighters-grant-program>

SAFER grants provide funding directly to fire departments and volunteer firefighter interest organizations to help them increase the number of trained, front-line fire fighters in their communities and to enhance the local fire departments' abilities to comply with staffing, response, and operational standards established by NFPA and the Occupational Safety and Health Administration.

National Fire Protection Association (NFPA), Safer Act Grant

www.nfpa.org/categoryList.asp?categoryID=999&itemID=24345

NFPA provides excerpts from NFPA 1710 and NFPA 1720 and other online resources to assist fire departments with the grant application process.

Federal Excess Personal Property Program

www.fs.fed.us/fire/partners/fepp

The Federal Excess Personal Property Program is administered by the US Forest Service. This program refers to Forest Service-owned property that is on loan to State Foresters for the purpose of wildland and rural fire fighting. Most of the property originally belonged to the US Department of Defense. Once acquired by the Forest Service, property is loaned to State Coordinators for fire fighting purposes. State Foresters may place property with local fire departments to improve local fire programs.

Department of Defense Firefighter Program

<http://www.fs.fed.us/fire/partners/fepp/DODprogram/index.html>

In cooperation with the US Forest Service, excess Department of Defense equipment is made available for wildland and rural fire fighting purposes through the Federal Excess Personal Property Program.

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Rural & Volunteer Fire Assistance

<http://www.fs.fed.us/fire/partners/vfa/>

The US Forest Service, Volunteer Fire Assistance Program (VFA), formerly known as the Rural Community Fire Protection Program (RCFPP) can provide Federal financial, technical, and other assistance to State Foresters and other appropriate officials to organize, train, and equip fire departments in rural areas and rural communities to suppress fires. A rural community is defined as having 10,000 or less population.

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