



NIOSH
Fire Fighter Fatality Investigation
and Prevention Program

Death in the line of duty...

A summary of a NIOSH fire fighter fatality investigation

August 2, 2001

A Lieutenant Dies and Three Fire Fighters of a Career Department Were Injured When the Truck They Were Responding in Was Struck by Another Vehicle—Illinois

SUMMARY

On April 29, 2000, a 43-year-old male career Lieutenant died as the result of injuries he received when the truck he was responding in was struck by a pickup truck. At approximately 1150 hours, Central Dispatch notified a career fire department of an automatic alarm at a residential structure. Truck 24 (Hook and Ladder) and Engine 121 immediately responded. Truck 24 traveled approximately 7 blocks and approached a four-way-stop intersection. The driver of Truck 24 approached the intersection and made a rolling stop. As the driver proceeded through the intersection, a civilian pickup truck (a Ford F-150) ran the stop sign and collided with the apparatus. The victim was ejected from the passenger-side door of the truck and received massive head injuries. He was transported to a local hospital where he was pronounced dead. The other three fire fighters and the driver of the truck received medical attention for their injuries and were released.

The NIOSH investigators concluded that, to minimize the risk of similar occurrences, fire departments should

- ***ensure that all fire fighters riding in emergency fire apparatus are wearing and are properly belted and secured by seat belts***
- ***ensure all apparatus are taken out of service when defects are identified and are repaired before they are placed in service***
- ***ensure driver/operators of emergency vehicles follow written standard operating procedures by making a complete stop at all intersections***
- ***consider utilizing quiet dispatch until it is determined that life is in danger, persons are injured, or there is a working fire***

Additionally, municipalities should consider

- *adopting public service announcements/training for driver safety (i.e., "Stop Red Light Running") to promote safe driving by the public*



Photo courtesy of the Fire Department.

Apparatus Involved in This Incident

INTRODUCTION

On April 29, 2000, a 43-year-old male career Lieutenant (the victim) was responding to an automatic alarm at a residential structure. En route to the scene, Truck 24 (Hook and Ladder), in which the victim

was riding, was struck by another vehicle. The victim was thrown from the vehicle and died from the injuries he sustained. On May 1, 2000, the U.S. Fire Administration notified the National Institute for Occupational Safety and Health (NIOSH) of this incident. On September 25-28, 2000, three safety and occupational health specialists investigated this incident. A meeting was conducted with the Fire Commissioner, two Assistant Deputy Fire Commissioners, and a representative from the International Association of Fire Fighters (IAFF). Interviews were conducted with the Battalion Chief who was following Truck 24 prior to the fatal incident, and others involved in this incident. Copies of the field sketches and reports from the police department, Illinois Department of Labor (OSHA), the department's standard operating procedures (SOPs), the victim's training records, the driver's training records, the truck's maintenance records, photos of the truck at the incident site, dispatch log, the department's investigative report, coroner's report, and the death certificate were reviewed. The incident site and the truck were visited and photographed.

The career fire department involved in this incident serves a population of 2,500,000 in a geographical area of 228.5 square miles and is comprised of 4,500 uniform personnel consisting of 100 fire stations. The apparatus involved in this incident was a 1982 Seagrave, equipped with a 100-foot ladder. The vehicle's gross weight was 68,000 lbs, with dual wheels on the rear axle. The truck measured 8 feet wide and 33 feet 2 inches long. The truck was equipped with seat belts (2-point lap belt) for every seat. The seat belt for the officer's seat, in which the victim was riding, was not working properly at the time of the investigation. The spring in the releasing mechanism of the seat belt buckle would not release. *Note: It is unknown if the malfunction of the seat belt was a prior malfunction or was not in working order as a result of the collision. However, the department found the seat belt in good working order during their investigation. It is believed that the victim was either not wearing his seat belt or it was on loosely. Although it could not be confirmed, it was stated in the interviews that Fire Fighter #1 (riding in the front center seat) and the victim were sharing a seat belt at the time of the incident.* All other passengers were secured by seat belts. The department has a written policy requiring all personnel to wear seat belts and does not condone personnel sharing of a seat belt. At the time of the investigation, the written maintenance records for the truck were reviewed. It was noted that this truck had a past problem with the latching mechanism on the front passenger door. In interviews conducted, it was stated that the door could not close securely and the fire fighter riding in the officer's seat would have to hold onto the door when turning a corner or going over a pothole to ensure the door did not come open. The door latch had previously been repaired by the maintenance department on August 19 and November 17, 1999.

On the day of the incident, weather conditions were clear and the road was dry. The driver had a current Class B driver's license. The State does not require a commercial driver's license (CDL) for persons operating emergency vehicles or apparatus. *Note: A Class B (non CDL) driver's license is required by the State Department of Motor Vehicles for any single vehicle with a gross vehicle weight rating (GVWR) of 26,001 lbs or more.* The department requires all drivers to possess a driver's license meeting or exceeding the State's minimal requirements and to successfully complete the department's driver training course. The road on which the truck was traveling was a two-lane, asphalt state road marked with a solid double-yellow center line. The truck was proceeding north through a four-way stop intersection ([see Diagram](#)). The road measures approximately 24 feet wide. The eastbound and westbound lanes were approximately 22 feet wide. The section of road on which the truck was traveling did not have a posted speed limit.

Therefore, according to State law, it reverts to 35 mph. The driver is certified through the State as Fire Fighter Level II and has 3 years experience, which includes 1½ years as a certified driver. The victim was certified through the State as Fire Fighter Level II. He had 18 years of experience which included 3½ years as a Lieutenant.

INVESTIGATION

On April 29, 2000, the crew of Truck 24 (Hook and Ladder) consisting of a Lieutenant (victim) riding in the officer's seat, the driver/operator, and three fire fighters (Fire Fighter #1 [riding in the front center seat], #2 [riding in the rear-facing jump seat behind the driver], and #3 [riding in the rear-facing jump seat behind the victim]) were on the scene of a structure fire at which they just completed mop-up operations. They were reviewing fire tactics at the scene when they received the call from Central Dispatch, at approximately 1146 hours. Central Dispatch notified Truck 24 and Engine 121 (with a Lieutenant, driver/operator, and two fire fighters) of an automatic alarm at a residential structure. Both apparatus immediately responded. Truck 24 responded with lights and sirens activated. A Battalion Chief (BC) in unit BC 22, left the fire scene at the same time as Truck 24 and was following the same route as the apparatus; however, the BC was returning to the station. Truck 24 traveled northbound approximately 7 blocks and approached a four-way-stop intersection. When approaching the intersection the driver of Truck 24 could see Vehicle #1 (a red pickup truck), to his right and ahead, several hundred feet from the intersection ([see Diagram](#)). *Note: Vehicle #1 was a Ford F150 crew cab, and the bed of the truck was full of dirt. The driver's line of vision of Truck 24 was partially obstructed due to a tall chain-link fence along the north and east-bound lane ([see Diagram](#)).* The driver of Truck 24 made a rolling stop, and checked in all directions for oncoming traffic. Vehicle #2 (a car) facing southwest (opposite direction from the truck), had come to a stop at the stop sign, noticed Truck 24, and remained pulled over to the right of her lane. The driver of Truck 24 noticed Vehicle #1 approaching; however he continued into the intersection because the pickup was still approximately half a block away. When Truck 24 was approximately three-fourths of the way through the intersection, the driver saw Vehicle #1 proceeding through the intersection without stopping. Since the truck was already traveling into the intersection, the victim told the driver to go ahead and tried to use hand signals to direct the pickup to stop. The BC was traveling behind the truck and was making a right hand turn ([see Diagram](#)). Moments prior to the impact, the BC saw that Vehicle #1 (heading west) did not stop at the stop sign. Vehicle #1 hit the right front fender of Truck 24, went airborne, spun around and struck the truck a second time near the rear axle. The force of the impact threw the victim from the cab of the truck, through the front passenger doorway. After Vehicle #1 struck the truck, the driver/operator tried to keep from striking Vehicle #2, and to keep the apparatus on the road way, but it struck the front corner of Vehicle #2, sending it across the road onto the shoulder ([see Diagram](#)). The BC stopped his vehicle and immediately called Central Dispatch for assistance, at 1151 hours. At approximately 1152 hours, Central Dispatch requested the following units to respond to the scene involving Truck 24's crash: Ambulances 5, 37, and 24, Engine 120, and Truck 27.

The BC could see the victim lying face down in the road at approximately the same location where the

apparatus was initially struck. Fire Fighter #1 crawled out of the open passenger door and immediately went to aid the victim. The BC went to the truck to check on the condition of the remaining crew and saw that the driver and Fire Fighters #2 and #3 were still in the apparatus. The BC noticed that Fire Fighter #3 had serious injuries to his leg but was conscious. The driver and Fire Fighter #2 exited the cab of the truck and went to provide medical attention to the victim. They rolled the victim over and saw that he had extensive head injuries and was not breathing. Fire Fighter #1 and the driver began performing cardiopulmonary resuscitation (CPR). At approximately 1154 hours, Truck 27 arrived on the scene and fire fighters began administering medical care to the victim. Ambulance 5 was the first ambulance to arrive on the scene, at 1154 hours. Within minutes, the victim was loaded onto the ambulance and taken to the hospital where he was pronounced dead upon arrival. Minutes later, Ambulance 37 arrived on the scene and transported the driver/operator and Fire Fighter #3 to the hospital. At approximately 1206 hours, the BC took Fire Fighters #1 and #2 to the hospital in his unit. All injured fire fighters were treated for their injuries at the hospital and later released.

CAUSE OF DEATH

The death certificate and medical examiner's report lists the immediate cause of death as multiple injuries sustained due to a motor-vehicle crash.

RECOMMENDATIONS/DISCUSSION

Recommendation #1. Fire departments should ensure that all fire fighters riding in emergency fire apparatus are wearing and are properly belted and secured by seat belts.^{1,2}

Fire fighters make many life-and-death decisions during a tour of duty, and one of the most important is snapping on a seat belt after climbing aboard an emergency apparatus that has been called to respond. The fire department involved in this incident did have a written policy on the use of seat belts at the time of the incident; however, no enforcement policy was utilized. It is believed that the victim was not wearing a seat belt and was ejected from the truck. Fire Fighter #1 recalls himself and the victim sharing a seat belt at the time of the incident. However, due to the fact that the victim was ejected, it is believed that the victim was not wearing a seat belt or had his seat belt on very loosely. Additionally, at the time of the investigation, the victim's seat belt was not in working order.

Recommendation #2: Fire departments should ensure all apparatus are taken out of service when defects are identified and are repaired before they are placed in service.^{3,4,5}

Fire departments should evaluate each apparatus to determine if it is safe/unsafe for response. Upon determining that an apparatus is unsafe, it should be placed out of service until properly repaired. Truck 24's front passenger door had a history of being defective. The door could not close and latch securely. During the interviews, it was stated that the fire fighter sitting in the officer's seat would have to hold the door when the driver turned the vehicle or when the vehicle passed over a pot hole. The door was repaired on August 19th and again during November 1999; however, the repairs were not adequate and the door was still deficient. The police report indicates that it is believed once Vehicle #1 collided with Truck 24, the door came open and the victim was ejected through the door. Although it is not certain if the front passenger (officer's) seat belt was malfunctioning prior to this incident, fire departments should also ensure seat belts for all riding positions are in proper working order prior to each shift.

Recommendation #3: Fire departments should ensure driver/operators of emergency vehicles follow written standard operating procedures (SOPs) by making a complete stop at all intersections.⁶

As per the department's SOPs for driver/operators of all apparatus, the driver is required to complete a momentary stop when entering an intersection against a red light, stop sign, or when the lights are changing. The driver must then proceed through with caution, anticipating the possibility of a motorist ignoring the siren and emergency lights. It is further stated that the driver should exercise extra caution when entering an intersection when the driver's vision is obstructed. During the interviews conducted, the driver stated that he did a rolling stop, then proceeded, after looking in all directions of traffic. Although the driver of the pickup truck was cited by the city police department for failing to stop at a stop sign and failing to yield to an emergency vehicle, it is recommended that drivers of responding apparatus take every extra precaution to ensure their safety.

Recommendation #4: Fire departments should consider utilizing quiet dispatch until it is determined that life is in danger, persons are injured, or there is a working fire.⁵

The St. Louis Fire Department (SLFD) has implemented the quiet dispatch (responding with no lights or sirens) for the following incidents: automatic alarms, sprinkler alarms, natural gas leaks, wires down, calls for manpower, flush jobs, lockouts, carbon monoxide detector alarms, rubbish, weeds, and dumpster fires. If a call is dispatched as a quiet response and Central Dispatch receives additional information indicating that life is in danger, persons are injured, or there is a working fire, dispatch will upgrade the call to "urgent" and the responding apparatus' lights and sirens will be activated. Since SLFD has implemented the silent alarm policy for non-emergency response, the department has reduced the number of intersection vehicle crashes greatly.

Additionally, municipalities should consider the following:

Recommendation #5: Municipalities should consider adopting public service announcements/training for driver safety (i.e., Stop Red Light Running) to promote safe driving by the public.^{7,8}

According to the Department of Transportation, "intersections are among the most dangerous locations on U.S. roads. In 1994, approximately 1.95 million crashes occurred at intersections which accounted for 30 percent of total crashes, causing over 6,700 fatalities and significant numbers of serious injuries." To educate the public on traffic safety, the Federal Highway Administration (FHWA) has developed a program called "Stop Red Light Running." The goal of this program is to reestablish the respect for traffic signals and driver safety. This community-based program is available free of charge and will provide material for public service announcements and education. The city in which this incident took place has since had other incidents involving injuries and deaths involving emergency workers. The lieutenant governor of the State of Illinois has created legislation to "increase penalties for motorists who injure or kill a firefighter, police officer or other emergency roadway worker who is responding to an accident." The city has also implemented public service announcements encouraging motorists to pull to the right when approached by responding emergency vehicles.

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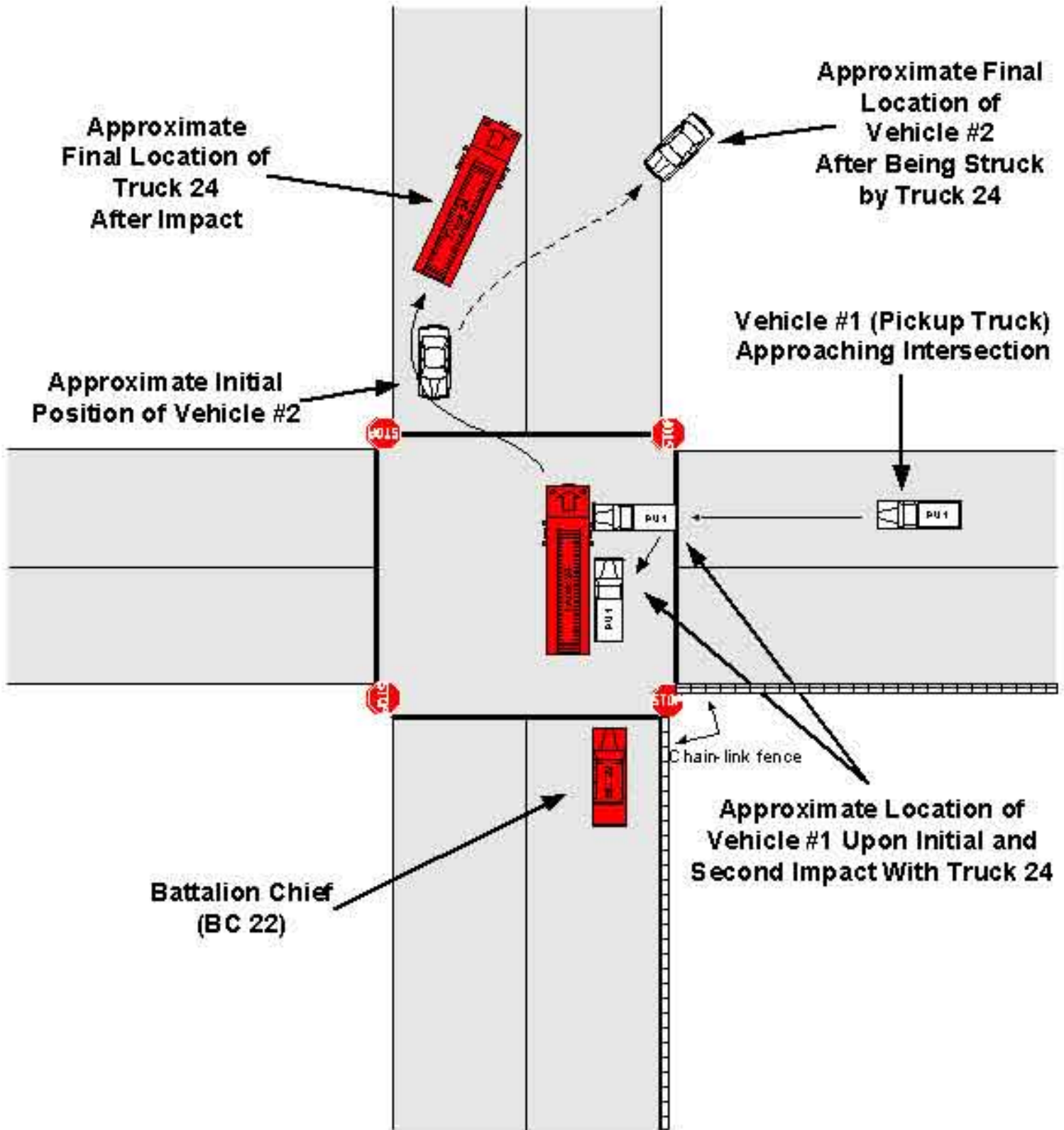
INVESTIGATOR INFORMATION

This investigation was conducted by Kimberly L. Cortez, Nancy T. Romano and Mark McFall, Safety and Occupational Health Specialists, NIOSH, Surveillance and Field Investigations Branch, Division of Safety Research.



Photo courtesy of the Fire Department.

Photo. Final Resting Places of the Three Vehicles Involved in This Incident



Not to Scale

Diagram. Aerial View of Incident Site



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