



**NIOSH**  
Fire Fighter Fatality Investigation  
and Prevention Program

# Death in the line of duty...

A summary of a NIOSH fire fighter fatality investigation

December 17, 2004

## Career Captain/Safety Officer Dies in a Single Motor Vehicle Crash While Responding To a Call - Kansas

### SUMMARY

On November 17, 2003, a 53-year-old male career Captain (the victim) died when the department car he was driving was involved in a single-vehicle crash. The victim was responding to a reported commercial structure fire when his car left the roadway, hit a tree stump, overturned, and slid into a utility pole pinning him in the vehicle. He was extricated from the vehicle and transported to a local medical center where he was pronounced dead upon arrival.

**Although the exact cause of the incident could not be substantiated, the following recommendations are being provided as an example of good safety practice.**

NIOSH investigators concluded that, in accordance with prudent safety operations, fire departments should:

- *provide defensive driver training to all emergency vehicle operators*
- *ensure that all drivers are trained and certified in emergency vehicle operations*

- *develop and implement standard operating guidelines for the safe operation of emergency vehicles*
- *develop and document an inspection, maintenance, and repair schedule that includes verification of appropriate action on all pertinent vehicle safety notifications*

Additionally, vehicle manufacturers should

- *ensure that the distribution of safety recall notifications is not limited in scope, and is inclusive of all affected vehicle owner/users.*

### INTRODUCTION

On November 17, 2003, a 53-year-old male career Captain (the victim) died from injuries he received in a single-vehicle crash. On November 19, 2003, the U.S. Fire Administration (USFA) notified the National Institute for Occupational Safety and Health (NIOSH) of this fatality. On February 2, 2004, a safety and occupational health specialist from the NIOSH Fire Fighter Fatality Investigation and



*Incident Vehicle*

The **Fire Fighter Fatality Investigation and Prevention Program** is conducted by the National Institute for Occupational Safety and Health (NIOSH). The purpose of the program is to determine factors that cause or contribute to fire fighter deaths suffered in the line of duty. Identification of causal and contributing factors enable researchers and safety specialists to develop strategies for preventing future similar incidents. The program does not seek to determine fault or place blame on fire departments or individual fire fighters. To request additional copies of this report (specify the case number shown in the shield above), other fatality investigation reports, or further information, visit the Program Website at

[www.cdc.gov/niosh/firehome.html](http://www.cdc.gov/niosh/firehome.html)  
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## Fatality Assessment and Control Evaluation Investigative Report #F2004-03

### *Career Captain/Safety Officer Dies in a Single Motor Vehicle Crash While Responding To a Call - Kansas*

Prevention Program investigated the incident. The investigator interviewed the Chief and Deputy Chief of the department, fire fighters who were present at the crash scene, the department training officer, head of the maintenance division, and spoke with one of the police officers who investigated the incident. The vehicle was inspected and maintenance records, including safety recall notifications and technical service bulletins, were reviewed. The investigator visited the crash site and reviewed the department standard operating guidelines (SOGs), fire department and police photographs and incident reports, dispatch transcripts, training records of the victim, the coroner's report, and the death certificate.

#### **Background**

The career department is comprised of 368 uniformed fire service personnel. Eighteen fire stations serve a population of approximately 145,000 covering an area of about 127 square miles. The department has a dedicated maintenance facility limited to fire vehicle and apparatus service.

#### **Training**

There are no state minimum fire fighter training regulations. The victim had completed all department training requirements, including a ten-week mandatory curriculum that included National Fire Protection Association (NFPA) Fire Fighter Level I and II, Search and Rescue, Live-Fire, and Apparatus/Engine Operator. He completed over 400 hours of advanced courses including First Responder and Fire Officer. The department driver training refresher program includes defensive-driving classroom sessions and an obstacle course. The victim had been a fire fighter with the department for over 29 years and had served as Captain for the last three years. He was the department safety officer

and had taught the driver training course. There are no licensing prerequisites for fire fighters who drive emergency apparatus in this State.

#### **Equipment**

As Captain, the victim was assigned an officer's car. It was a 1998 sedan that was equipped with a police interceptor package.<sup>a</sup> It had an anti-lock braking system, flashing combination optical warning lights, and an electronic siren. The lights and siren were operational and activated at the time of the incident. The vehicle was equipped with a shoulder harness restraint system that was properly worn by the victim, and a front airbag that deployed upon impact.

#### **Weather and Road Conditions**

The victim was traveling on a State, two-lane asphalt road with a gravel shoulder. The incident occurred where the roadway has a slight uphill grade following a jog to the right. Adjacent to the roadway is an upward-sloped grassy hillside. The street was dark at the point where the vehicle left the roadway, however the intersection near the point of final rest was illuminated by a street light. It had rained earlier in the evening and a mist remained in the air. Sections of the road were covered by a layer of leaves that had fallen from the trees located along the roadway perimeter.

#### **INVESTIGATION**

On November 17, 2003, at 2143 hours, the career department was dispatched to a reported commercial structure fire. The victim departed the fire station driving the department safety officer's car with emergency lights and siren activated. A fire truck, manned by three fire fighters and an officer, left the station immediately behind the victim.

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<sup>a</sup>The police interceptor vehicle is a rear-wheel drive, full-sized sedan that, according to the manufacturer, is designed and tested to meet the rugged demands of police use for performance, durability and safety.<sup>1</sup>



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The route to the reported fire location is a two lane asphalt road. The surface was wet from an earlier rainfall and there were leaves covering portions of the roadway. The victim was traveling uphill at an undetermined speed, when following a jog to the right, and for an undetermined cause, the vehicle left the roadway going onto the right shoulder (Diagram). The vehicle continued traveling off of the roadway and ascended up a grassy hillside where the left front wheel struck a tree stump. The impact caused the vehicle to roll to the right, subsequently overturn and land on its roof. The vehicle then continued sliding on its roof striking a guide wire, fire hydrant, and utility pole before coming to a stop. At final rest, the vehicle was facing northeast, on its roof, with the driver's-side door taking the brunt of the impact from the utility pole (Photo 1).

At approximately 2150 hours, the fire truck was proceeding to the alarm location along the same route as the victim, when the driver saw what appeared to be an overturned vehicle off to the right side of the road. Initially, fire fighters who were in the truck thought it was a police vehicle. However, as they slowed to take a closer look, they realized that it was the fire department safety car that had overturned and was resting on its roof (Photo 2). The fire fighters immediately radioed the incident to dispatch and requested that heavy rescue and advanced life support be sent to the scene. They exited the truck and attempted to care for the victim who was unconscious, secured upside-down by his seatbelt, and trapped inside of the car. Rescue units arrived within minutes and were able to stabilize the vehicle, remove the doors, and extricate the victim.

The victim was transported by ambulance to a local medical center where he was pronounced dead upon arrival by emergency room personnel.

**CAUSE OF DEATH**

The cause of death was identified by the coroner as probable positional asphyxia.

*Although the exact cause of the incident could not be substantiated, the following recommendations are being provided as an example of good safety practice.*

**RECOMMENDATIONS/DISCUSSIONS**

***Recommendation #1: Fire departments should provide defensive driver training to all emergency vehicle operators.<sup>2</sup>***

Discussion: Sound defensive driving skills are one of the most important aspects of safe driving. Defensive driver training should address the following basic concepts:

Anticipating Other Drivers' Actions

The driver/operator should know the rules that govern the general public when emergency vehicles are on the road. Most laws or ordinances provide that other vehicles must pull toward the right and remain at a standstill until the emergency vehicle has passed. This does not guarantee that people will follow this procedure. Some drivers may panic at the sound of an approaching siren; others may be unable to hear the siren due to radios, closed windows, or loss of hearing; while others may simply ignore warning signals.

Intersections are the most likely place for an incident to occur. When approaching an intersection, the driver/operator should slow the emergency vehicle to a speed that allows a complete stop in the intersection if necessary. The emergency vehicle should be brought to a complete stop if obstructions, such as buildings or trucks, block the driver/operator's view of the intersection. The emergency



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vehicle should only proceed if the driver can account for all lanes and ascertains that it is safe to proceed.

#### Visual Lead Time

Visual lead time interacts directly with reaction time and stopping distances. As stated in the International Fire Service Training Association (IFSTA) Fire Department Pumping Apparatus Handbook; by “aiming high in steering” and “getting the big picture” it is possible to become more keenly aware of conditions that may require slowing or stopping. The driver/operator is responsible for 360-degree driving.

#### Braking and Reaction Time

Speed directly affects the distance required to stop a vehicle. A driver/operator should know the total stopping distance of the emergency vehicle/apparatus. The total stopping distance is the sum of the driver/operator reaction distance and the vehicle braking distance. The driver reaction distance is the distance a vehicle travels as the driver is transferring the foot from the accelerator to the brake pedal after perceiving the need for stopping. The braking distance is the distance the vehicle travels from the time the brakes are applied until it comes to a complete stop.

#### Combating Skids

Avoiding conditions that lead to skidding is as important as knowing how to correct skids once they occur. The most common causes for skids are traveling too fast for road conditions, failing to properly appreciate weight shifts of heavy emergency vehicles/apparatus, and failing to anticipate obstacles. Proper maintenance of tire air pressure and adequate tread standards for tires are crucial for skid prevention.

#### Evasive Tactics

During an evasive maneuver, the drivers' hands should not leave the steering wheel. Drivers should not lean or sway back and forth in the seat, and they should use their arms to steer the emergency vehicle/

apparatus. Drivers should look ahead of the stopped vehicle, concentrating on where they want to be. In the event of a panic stop by a vehicle ahead, emergency vehicle drivers should pass the vehicle on the left side because the civilian driver's likely next move is to pull to the right, as is generally required by law.

#### Weight Transfer

The effects of weight transfer must be considered in the safe operation of emergency vehicles/apparatus. Weight transfer occurs as the result of laws of physics which state that objects in motion tend to stay in motion; objects at rest tend to remain at rest. Whenever a vehicle undergoes a change in velocity or direction, weight transfer takes place relative to the severity of the change.

#### ***Recommendation #2: Fire departments should ensure that all drivers are trained and certified in emergency vehicle operations.<sup>2,3</sup>***

Discussion: All fire department personnel who are expected to drive emergency vehicles should be trained in the safe operation of each emergency vehicle they will be operating. This training should be completed by following a protocol of classroom (written tests and videos) and hands-on (vehicle operations/procedures) experience. Emergency vehicle operators need to realize that most driving regulations pertain to dry, clear roads. Driver/operators should adjust their speed to compensate for conditions such as wet roads, darkness, fog, or any other condition that makes normal emergency vehicle operations more hazardous.

There were no eyewitness accounts, and the exact cause of the incident could not be substantiated. However according to police reports, the wet roadway and fallen leaves may have created a slick road surface that contributed to the victim losing control of the vehicle.



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***Recommendation #3: Fire departments should develop and implement standard operating guidelines (SOGs) for the safe operation of emergency vehicles.***<sup>4,5</sup>

Discussion: Fire departments should develop SOGs that include all department policies and procedures, and any state and local laws and ordinances that pertain to the operation of emergency vehicles. The SOGs should be made available to all vehicle operators and implemented into training. All members of the department should study, and be familiar with, departmental policies and procedures as they relate to department emergency vehicles. All drivers should have a thorough knowledge of the rules governing a safe speed for emergency vehicles in their own jurisdictions and the jurisdictions of their mutual-aid partners. Unless specifically exempt, emergency vehicle driver/operators are subject to the same statutes or ordinances that govern all vehicle operators. Statutes normally describe those vehicles that are in the emergency category and usually cover all fire department vehicles when responding to an emergency. Speed limits that are set for the general public may be exceeded within local policy as long as the driver/operator does not endanger life or property. However, there is no evidence that excessive speed was a contributing factor in this incident.

***Recommendation #4: Fire departments should develop and document an inspection, maintenance, and repair schedule that includes verification of appropriate action on all pertinent vehicle safety notifications.***<sup>6-15</sup>

Discussion: Persons responsible for the maintenance and readiness of emergency vehicles should establish a maintenance schedule and recordkeeping system to facilitate review of each vehicle and ensure an accurate maintenance history. All fire department apparatus and vehicles need to be scheduled for

routine preventive maintenance with a timetable based upon pertinent factors such as number, duration, and type of use. Vehicles should be removed from service until all unsafe conditions are corrected. At a minimum, this inspection should include tires, brakes, warning lights, wipers, and mirrors. Fluid levels should also be checked. Routine preventative maintenance was performed on the incident vehicle during a scheduled inspection three months prior to the incident.

Departments need to be alert for safety recalls involving vehicles that are operated by members and staff. Maintenance personnel must appropriately react to all technical service bulletins and vehicle safety recall notifications. In an attempt to ascertain possible contributory factors, vehicle safety recall notices and technical service bulletins pertaining to the incident vehicle were requested and reviewed.

The department in this incident performed vehicle inspections, took appropriate action on safety recall notifications, and maintained appropriate records. Neither the condition, nor maintenance of the vehicle was found to be a causal factor. This recommendation is provided solely for the purpose of emphasizing the importance of performing and documenting vehicle maintenance activity.

***Additionally, vehicle manufacturers should ensure that the distribution of safety recall notifications is not limited in scope, and is inclusive of all affected vehicle owner/users.***

Discussion: During this investigation, safety recall notifications and technical service bulletins pertaining to the incident vehicle were reviewed. Examination of these documents revealed an attention block that was located in a vehicle manufacturer fuel tank technical service bulletin which read, "This letter is intended for law enforcement fleets. If your



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*vehicle(s) is not currently in active law enforcement duty, you may disregard this letter”.*

Fire department and other emergency service vehicles are often equipped with the police interceptor package. At times these vehicles are exposed to driving conditions and situations that are similar to law enforcement. Limiting safety recall notices and/or technical service bulletins to “*vehicles involved in active law enforcement*” may exclude affected emergency vehicles from receiving necessary attention and thereby potentially exposing fire and emergency medical service personnel to reported vehicle safety hazards. However, there was no evidence that information contained in a technical service bulletin, or safety recall notification, had any bearing on this incident.

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**INVESTIGATOR INFORMATION**

This incident was investigated by Virginia Lutz, Safety and Occupational Health Specialist, NIOSH, Division of Safety Research, Surveillance and Field Investigations Branch.



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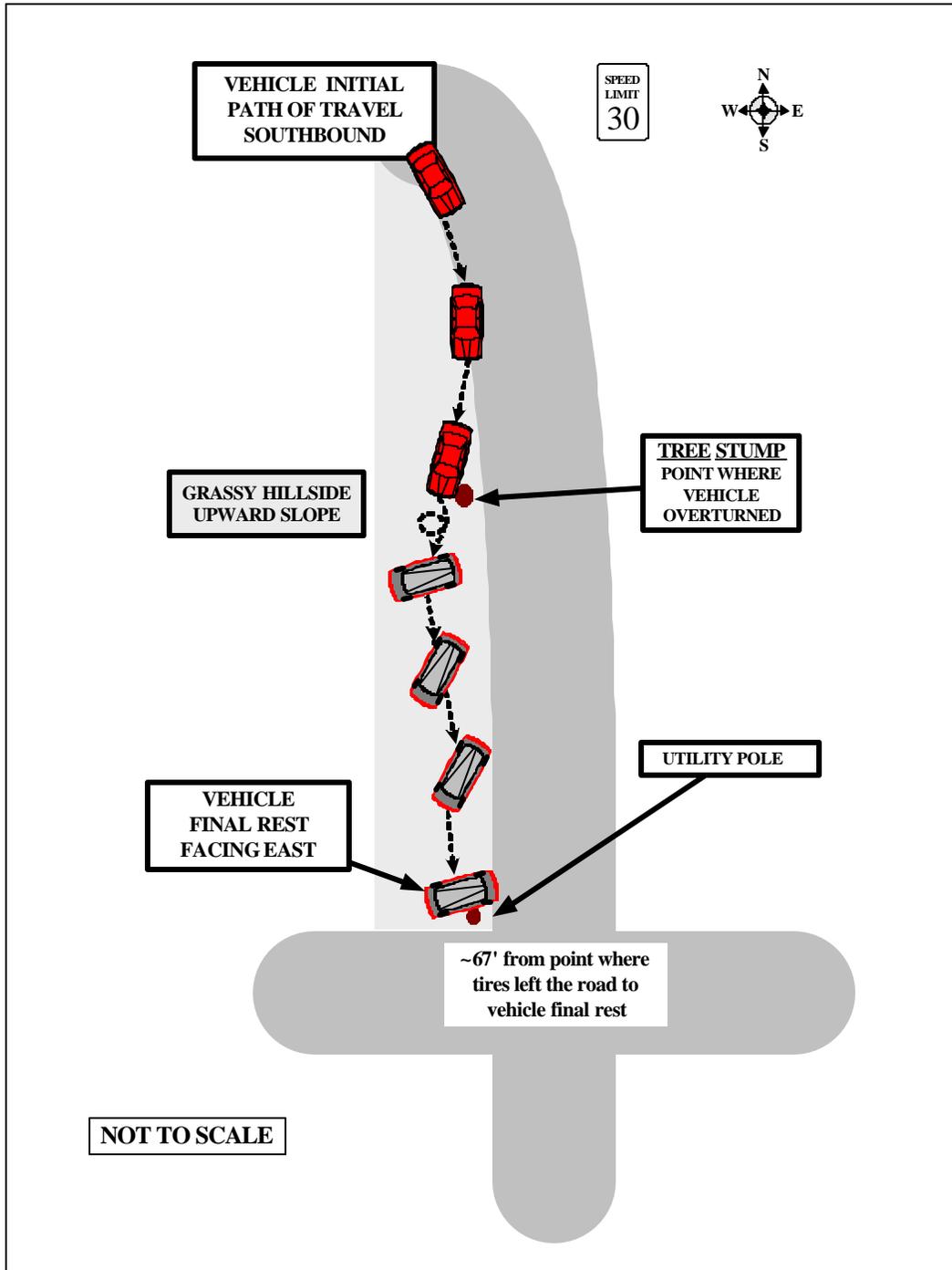


Diagram. Incident Scene



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*Photo 1. Incident vehicle path of travel*



*Photo 2. Incident vehicle Final Rest*

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