

**ADMINISTRATIVE REPORT  
PUBLIC HEALTH SERVICE/CDC/NIOSH/DSR  
FACE 97-09**

**DATE: Sept. 29, 1997**

**TO: Director, National Institute for Occupational Safety and Health**

**FROM: Division of Safety Research, NIOSH**

**SUBJECT: Restaurant/Tavern Fire Results in The Death of One Fire Fighter and Serious Injuries to Three Other Fire Fighters - Indiana**

**SUMMARY**

On August 19, 1997, three male fire fighters (the victim and two injured fire fighters), ages 21-, 27- and 35-years-old, entered a restaurant/tavern structure that had smoke and flames emitting through the roof above the kitchen area. The fire fighters entered the structure by crouching/crawling through the front door and advancing about 15 feet into the interior of the structure. About 10 minutes later, intense heat filled the area. The heat apparently startled or panicked the victim, who tried to run for the doorway entrance. The victim subsequently died from asphyxiation, while the other two fire fighters received serious burns. Also, a fourth fire fighter, age 48 years, received serious burns during a rescue attempt. NIOSH investigators concluded that, to prevent similar incidents, employers should:

- *ensure that defensive (exterior operation) fire fighting tactics are suspended prior to switching the strategic mode of operation to an offensive strategy (interior fire attack with hand lines), and notify all affected personnel of the change in strategic modes*
- *ensure that fire fighters who enter hazardous areas, e.g., burning or suspected unsafe structures, be equipped with two-way communications with incident command*
- *establish and implement an incident-management system with written standard operating procedures for all fire fighters.*

**INTRODUCTION**

On August 19, 1997, four male fire fighters (the victim and three

injured fire fighters) were part of a volunteer fire company that responded to a restaurant/tavern structure fire. The victim eventually died as a result of trying to exit the burning structure, and the other fire fighters received serious burns. On September 17, 1997, the Indiana State Fire Marshall requested that NIOSH provide technical assistance in reviewing the circumstances surrounding the fatality and serious injuries. On September 24-25, 1997, the Chief of the Trauma Investigations Section and a Safety Specialist traveled to Indiana to conduct an investigation of this incident. Meetings were conducted with officers from the two volunteer fire departments and two fire fighters directly involved in the incident. Copies of photographs and measurements of the incident site were obtained along with the Fire Marshall's report, and a site visit was conducted.

The volunteer fire department involved in the incident serves a population of 2700 in a geographic area of 45-square miles, and is comprised of approximately 22 employees. The fire department provides all new fire fighters with 24 hours of mandatory training. The training is designed to cover personal safety, forcible entry, ventilation, fire apparatus, ladders, self-contained breathing apparatus, hose loads, streams, and special hazards. The victim had 1 month of fire fighting experience, and this was the victim's first structure fire.

Although 11 volunteer fire departments were involved in this incident, only those directly involved up to the time of the fatal incident are mentioned in this report.

## **INVESTIGATION**

On August 19, 1997, at 0043 hours, a fire call came into the 911 dispatcher from the occupant of a private residence adjacent to the incident site. The call was immediately directed to the volunteer fire department serving the area where the fire was located. The volunteer fire department arrived at 0050 and the chief immediately called for assistance. The second volunteer fire department, whose fire fighters were to suffer the fatality and injuries, arrived at 0105. The second fire department dispatched five vehicles and 18 fire fighters. The vehicles were Lead Pumper-601, Town Pumper-602, Tanker-604, Grass Unit-606, and Rescue Unit-608. The victim and two of the injured were assigned to Lead Pumper-601, while the injured rescuer was assigned to Town Pumper-602.

The site of the incident, a two-story restaurant/tavern structure with a one-story addition measuring 62 feet by 62 feet total, was located in a rural community. The structure was an old barn (about 100-years old), which had been converted into a restaurant/tavern. The structure had been remodeled several times and at least three partial roofs remained intact in the structure at the time of the fire. The exterior of the structure had been constructed of wood

siding and the roof was covered with asphalt shingles. The structure had been built on a concrete slab and access to the interior was provided by three doorways.

When the first fire department arrived on the scene, the chief reported smoke and flames coming through the roof at an area in the back of the structure which would later be identified as the kitchen. He directed fire fighters to attack the fire from the exterior of the structure, through a doorway (which had to be forcibly knocked down) leading into the kitchen area. Upon the arrival of the second fire department, including the victim and injured fire fighters, they donned their turnout gear and self-contained breathing apparatus to enter the structure. It was determined that the victim, who did not have any structural fire-fighting experience, would be the middle person on the hose line as the three entered the structure, and one other fire fighter would be a standby at the front doorway. The three fire fighters pulled a 1 1/2" charged hose line and moved to the front doorway entrance at about 0110 hours. They crouched/crawled about 15 feet (see Figure) into the structure, with the charged line between their legs. They were spraying water near the kitchen area when the standby approached them and asked for further instructions. He was told to pull another line into the structure to "blow the fire out the back." The standby then noticed fire emanating from the ceiling about 15 feet away and perpendicular to the fire fighters. He brought this to the attention of the other fire fighters and then left the area. After extinguishing the flames on the ceiling, the fire fighter in charge ordered everyone out of the structure. As the fire fighters were still crouching and now turning to exit, following the hose line out through the dense black smoke, intense heat from the kitchen area inundated the area above and around the fire fighters. The intense heat apparently startled/panicked the victim, who crawled/jumped over the top of the fire fighter directly in front of him in an effort to vacate the structure. The victim, disoriented and unable to see because of the dense black smoke, stumbled to his right toward the dining area of the restaurant away from the entrance. Unable to find the doorway entrance, he collapsed from smoke inhalation and died. The two remaining fire fighters tried to locate the doorway entrance but were also disoriented and unable to see. After about 3 to 4 minutes, one of the fire fighters found a wall and was able to exit the structure. The other fire fighter "disoriented" wandered around until he located the rest room area, where he collapsed and became unresponsive.

In the interim, the standby had notified the chief as to the situation. The chief directed search and rescue efforts for the two fire fighters who remained in the structure. On one rescue attempt another fire fighter followed the line into the structure but could not locate anyone. In his attempt, he turned on the hose and scalding steam rolled over him. He lost his helmet and before he could exit the structure he received second and third degree

burns of the face and head. Another rescue attempt located the third fire fighter near the rest room and he was removed from the structure. On the final rescue attempt, the victim was found and brought outside. The victim was unconscious and not breathing. The emergency medical service initiated and continued cardiopulmonary resuscitation for about ½ hour. The coroner arrived at that time and pronounced the victim dead at the scene.

It was also reported that the victim had manually activated his personal alert safety system (PASS) device. However, due to the noise of the engines, pumps, positive pressure ventilation fans, etc., the rescuers could not hear the alarm.

#### **CAUSE OF DEATH**

The cause of death was listed by the medical examiner as asphyxiation.

#### **RECOMMENDATIONS/DISCUSSION**

***Recommendation #1: Fire departments should ensure that defensive (exterior operation) fire fighting tactics are suspended prior to switching the strategic mode of operation to an offensive strategy (interior fire attack with hand lines), and notify all affected personnel of the change in strategic modes.***

Discussion: When the second volunteer fire company arrived on the fire scene and prepared to enter the structure, orders should have been given to suspend the exterior fire attack. In such an instance, it is essential to notify all affected personnel of the change in strategic modes. In this case two volunteer fire companies were directing their streams of water at the origin of the fire, from opposing angles. The heat/smoke may have been pushed from the kitchen area into the dining room area where the three fire fighters were located. The inexperienced victim apparently was startled and panicked, and tried to run for the doorway entrance. After becoming disoriented and running into the dining area, he collapsed on the floor and died from asphyxiation. If the exterior fire attack had been suspended, the flames/heat/smoke may have naturally vented through the roof and the fire may have been controlled by the interior attack.

***Recommendation #2: Fire departments should ensure that fire fighters who enter hazardous areas, e.g., burning or suspected unsafe structures, be equipped with two-way communications with incident command.***

Discussion: When the fire fighters entered the burning structure none were equipped with two-way communications. If the fire

fighters had been equipped with a portable radio, then incident command may have been able to determine that the fire fighters had experienced a problem and needed immediate assistance.

***Recommendation #3: Fire departments should establish and implement an incident-management system with written standard operating procedures for all fire fighters.***

Discussion: The NFPA recommended standard states the purpose of an incident-management system is to provide structure and coordination to the management of emergency incident operations to provide for the safety and health of fire fighters. An incident-command system may be more difficult when several volunteer fire departments respond to the same incident; therefore, a type of unified command system may have to be established. The unified command system can be used to coordinate command of the incident when several departments arrive on the scene.

**References:**

- 1. NFPA 1500, 1992 Edition, Standard on Fire Department Occupational Safety and Health Program, National Fire Protection Association, Quincy, MA.***
- 2. NFPA 1561, 1995 Edition, Standard on Fire Department Incident Management System National Fire Protection Association, Quincy, MA.***
- 3. 29 CFR Part 1910.120, Code of Federal Regulations, Washington, D.C.: U.S. Government Printing Office, Office of the Federal Register.***

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Fire Fighter Fatality Project - Using the Fatality  
Assessment and Control Evaluation (FACE) Model

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), performs Fatality Assessment and Control Evaluation (FACE) investigations when a line-of-duty Fire Fighter Fatality is reported. The goal of these evaluations is to prevent fatal work injuries in the future by studying the working environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact.

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