



Volunteer Fire Fighter Dies Fighting a Structure Fire at a Local Residence - Texas

SUMMARY

On January 27, 2000, a 74-year-old male volunteer fire fighter (victim) died while fighting a structure fire. At approximately 1316 hours, Central Dispatch notified the volunteer department of smoke in a residence. The Assistant Chief was first to arrive on the scene and confirmed to Central Dispatch that they had a working fire venting out of the roof. He assumed duties as the Incident Commander (IC) until the arrival of the Chief, who took command. The Assistant Chief confirmed to the Chief that they had fire and heavy smoke, and he reported that no one was inside the house. The first engine to arrive on the scene was Engine 608 with a Captain (the victim), two fire fighters (Fire Fighters #1 and #2), and a chauffeur/engine operator. Engine 608 was positioned on the east side of the structure (see Figure), and the victim and two fire fighters pulled a 200-foot, 1 3/4-inch cross lay from the Engine and advanced toward the structure. The victim took the nozzle, and Fire Fighters #1 and #2 followed as backup, and they entered the structure to perform an aggressive interior suppression attack. As the victim applied water to the fire, the two fire fighters went to the door to pull more hose line so that the victim could advance the line deeper into the structure. As the fire fighters were feeding the victim additional line, they felt the hose line drop. The two fire fighters reported to the Chief, who then ordered the Assistant Chief to form a Rapid Intervention Team (RIT) to perform a search and rescue operation. The RIT made four entries into the structure before successfully removing the victim.

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

- *ensure the department's Standard Operating Procedures (SOPs) are followed and refresher training is provided*
- *ensure that a Rapid Intervention Team is established and in position immediately upon arrival*
- *ensure that fire fighters from the ventilation crew and the attack crew coordinate their efforts*

INTRODUCTION

On January 27, 2000, a 74-year-old male volunteer fire fighter responded to a structure fire at a local residence. The fire was started when lightning struck the house during a rain storm. The victim, a chauffeur/engine operator, and two fire fighters responded in Engine 608 and were the first engine company to arrive on the scene. They proceeded with an aggressive interior suppression attack. The victim, who served as the nozzle man, was caught in a thermal heat column and died from smoke inhalation. The victim was removed from the structure approximately 21 minutes after he arrived on the scene. On January

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. 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:

<http://www.cdc.gov/niosh/firehome.html>

or call toll free **1-800-35-NIOSH**



Fatality Assessment and Control Evaluation Investigative Report #F2000-09

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31, 2000, the United States Fire Administration notified the National Institute for Occupational Safety and Health (NIOSH) of the incident. On February 2-3, 2000, two Safety and Occupational Health Specialists from the NIOSH, Division of Safety Research, investigated the incident. Interviews were conducted with the Chief, the Assistant Chief, and other members of the department who were at the fire scene. The incident site was visited, and photographs were obtained. Copies of witness statements, training records, standard operating procedures (SOPs), autopsy results, and a map of the fire scene were obtained. An inspection of the victim's turnout gear and self contained breathing apparatus (SCBA) was conducted. The volunteer department consists of one station and 30 uniformed fire fighters. The department serves a population of 6,500 in a geographical area of 101 square miles. At the time of the incident the victim was wearing full bunker gear including SCBA.

The incident occurred at a local residence approximately 4 miles from the fire station. The structure in which the incident occurred was a one-story, wood-frame house with an attic. The structure measured 48 feet in length by 40 feet in width. The engine in which the victim was riding was the first engine to arrive on the scene. The weather conditions that affected this fire included a relative humidity of 88%, an ambient air temperature of 62°F, and a wind speed of 12 m.p.h., with gusts of up to 40 m.p.h.

The State of Texas does not require volunteer fire fighters to be certified. However, the State Firemen's and Fire Marshals' Association (SFFMA) and the Texas Commission on Fire Protection (TCFP) both offer various levels of certification to volunteer fire fighters. These organizations require fire fighters to complete 167 hours of training to be classified as basic fire fighters. An additional 193 hours, 187 hours, and 400 hours are required to complete the intermediate, advanced, and master levels

respectively. *Note: To achieve basic certification as a fire fighter, the State of Texas requires each fire fighter to complete 32 categories of training totaling a minimum of 167 hours. Due to the availability of equipment and training opportunities, fire fighters may complete more than 167 hours of training; however, they are not certified until all 32 categories and their respective hours have been completed.* The victim had completed 253 hours of training toward his basic certification. However, he lacked an additional 26 hours in 10 specific categories to achieve the designation as a basic fire fighter. The victim had 11 years, 6 months of fire fighting experience.

INVESTIGATION

On January 27, 2000, at approximately 1315 hours, Central Dispatch received a call of reported smoke in a residence, and at approximately 1316 hours, Central Dispatch notified the local volunteer department. The following companies were dispatched as first-alarm companies at 1316 hours:

- The Chief
- The Assistant Chief
- Engine 608 (the victim, chauffeur/engine operator, and Fire Fighters #1 and #2)
- Truck 605 (Lieutenant)
- Truck 606 (Lieutenant and Fire Fighter #3)
- Mutual-aid companies (Fire Fighter #4)
- Two engines from neighboring towns responded to assist in pump operations.
- Four additional fire fighters were on the scene during this incident.

At approximately 1318 hours, the Assistant Chief arrived on the scene by privately owned vehicle (POV), assumed Incident Command (IC), and completed a scene size-up. He reported the following conditions to Central Dispatch: fire venting through the roof of a one-story residential structure, with heavy, dark gray to brown smoke coming



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through the cracks in the roof and through the dormers. At approximately 1320 hours the Chief arrived on the scene, and assuming duties as the Incident Commander, confirmed a working structure fire to Central Dispatch. *Note: No ventilation operations were performed during this operation.* At this time, Engine 608 with a full crew consisting of a Captain (the victim), a chauffeur/engine operator, and two fire fighters (Fire Fighter #1 and Fire Fighter #2) left the station, and while en route, received an updated report from Central Dispatch confirming a working fire. Engine 608 was first to arrive on the scene at 1324 hours and was positioned on the east corner of the structure (see Figure). Upon arrival all fire fighters were wearing full turnout gear, SCBA, and a manual Personal Alert Safety System Device (PASS). As the fire fighters exited the apparatus they gave their accountability tags to the chauffeur/engine operator. At this time Trucks 606 and 605 also arrived on the scene, approximately 1 minute before an engine from a neighboring town arrived as a mutual-aid pumper company.

The crew from Engine 608 pulled 200 feet of 1 3/4-inch cross lay hoseline and proceeded through the door of the enclosed porch and then into the front door of the main structure (see Figure). The victim took the nozzle, and Fire Fighters #1 and #2 followed as backup. The chauffeur/engine operator of Engine 608 called for a supply line to be laid, and one of the mutual-aid companies laid the line. As the crew from Engine 608 entered the structure, the victim called for more hose line. Fire Fighters #1 and #2 went to the doorway of the main structure to pull more hose line into the structure. As Fire Fighters #1 and #2 were feeding hose line to the victim, they felt the hose line drop. *Note: At approximately this time, it is believed that a thermal heat column occurred, causing the hose line to drop as if they were feeding the line directly into the ground.* Fire Fighters #1 and #2 exited the structure and reported to the Chief to notify him of the situation. The Chief

told the Assistant Chief to put on his SCBA, form a Rapid Intervention Team (RIT), and enter the structure and search for the victim. At approximately 1330 hours the Assistant Chief, the Lieutenant from Truck 605, and Fire Fighter #3 entered the structure following the hose line laid by the crew from Engine 608. As they entered the structure, the Assistant Chief heard the hose line burst, and he noted intense heat but not a lot of visible fire. They backed out of the structure and the Lieutenant from truck 605 and Fire Fighter #3 pulled a second 1 3/4-inch hose line into the structure. Upon their second entry into the structure, the Assistant Chief noticed “fire everywhere” accompanied by very intense heat. The Assistant Chief, the lieutenant from Truck 605, and Fire Fighter #3 backed out of the structure and reported the conditions to the Chief. *Note: The Assistant Chief was first through the door, and he recalled his SCBA face piece started to bubble and distort as he entered the main structure. He obtained a new face piece from an apparatus and waited for his instructions to reenter the structure.* At approximately 1336 hours the Chief ordered the deck gun from Engine 608 into action to suppress the fire enough to allow the RIT to safely proceed into the structure. After approximately 3 minutes of hitting the fire with the deck gun, the RIT attempted for the third time to enter the structure. The RIT proceeded through the porch to the main door, where the Assistant Chief could see the victim lying on the floor of the main structure approximately 16 feet away. The Assistant Chief ordered Fire Fighter #3 and the Lieutenant from Truck 605 to stay at the door and extinguish small spot fires. He then went to the victim, who was lying on his side, and tried several times to move him. The victim was still wearing his full array of gear, and he was badly burned. As he exited the structure the Assistant Chief ordered the Lieutenant from Truck 605 and Fire Fighter #3 to stay at the doorway and continue to knock down spot fires so a second RIT could enter. The Assistant Chief then updated the Chief and



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formed a new RIT. The Assistant Chief, a Lieutenant from Truck 606, and Fire Fighter #4 from a mutual aid company made a fourth entry into the structure at approximately 1345 hours and successfully removed the victim, who was pronounced dead at the scene.

CAUSE OF DEATH

According to results revealed in the autopsy, the cause of death was listed as smoke inhalation.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Fire departments should ensure that the department's Standard Operating Procedures (SOPs) are in place and refresher training is provided.¹

Discussion: *"Written SOPs are only effective if they are used. A SOP that management does not enforce isn't a true SOP. An official SOP is one that is sanctioned by the department, as demonstrated by a written general order from the Fire chief establishing or enacting it. An SOP becomes official only after every member has been notified of it in writing."*¹

Officers should keep in contact, physically or verbally, with their crews at all times while performing fire ground operations.¹

Members operating in a hazardous environment (one which requires the use of SCBA or where a member could become trapped, lost, or injured by the environment) should maintain company or crew integrity and shall use the buddy system. This requires that

1. Company or crew members enter and exit the environment together.
2. Members remain within either sight, voice, or tactile distance of each other while they are within

the environment. No one should ever be left alone.

3. Incident Commanders and sector officers shall not direct members to operate independently of their companies or crews.

4. Task assignments should be made through the company officer or crew leader.

Fire fighters should be equipped with a PASS device and it should be activated during fire fighting operations.¹

Department SOPs state that PASS devices should be used and activated at all times when SCBAs are in use. Department SOPs should also state that whenever a fire fighter becomes disoriented, trapped, or low on air he/she should activate his/her PASS device to aid in rescue efforts. PASS devices found missing or deficient in operation should be reported without delay to the Company Officer. If the PASS device is taken out of service, a new PASS device should be issued. In this incident, all fire fighters on the fire ground were equipped with manual PASS devices. The victim was wearing his PASS device; however, it was not activated.

Recommendation #2: Fire departments should ensure that a Rapid Intervention Team is established and in position immediately upon arrival.²

Discussion: A Rapid Intervention Team (RIT) should respond to every major fire. The team should report to the officer in command and remain at the command post until an intervention is required to rescue a fire fighter(s). The RIT should have all tools necessary to complete the job, e.g., a search rope, first-aid kit, and a resuscitator to use if a fire fighter becomes injured. Many fire fighters who die from smoke inhalation, from a flashover, or from being caught or trapped by fire actually become disoriented first.



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They are lost in smoke and their SCBA runs out of air, or they cannot find their way out through the smoke, become trapped, and then fire or smoke kills them. The primary contributing factor, however, is disorientation. The RIT will be ordered by the IC to complete any emergency searches or rescues. It will provide the suppression companies the opportunity to regroup and take a roll call instead of performing rescue operations. When the RIT enters to search and rescue, they should have full cylinders on their SCBAs and be physically prepared. When a RIT is used in an emergency situation, an additional RIT should be put into place in case an additional emergency situation arises. This additional RIT should be comprised of fresh, well-rested fire fighters. In this incident, the Chief ordered the Assistant Chief to form a RIT and enter the structure to perform a search-and-rescue operation. To enter the structure, the Assistant Chief had to finish gearing up and find two additional fire fighters who were wearing their full array of personal protective equipment and clothing. The Assistant Chief served as a member on both of the Rapid Intervention Teams that entered the structure.

Recommendation #3: Fire departments should ensure that fire fighters from the ventilation crew and the attack crew coordinate their efforts.^{3,4}

Discussion: Fire can quickly spread upward into the structure, causing potential problems such as a flashover, a backdraft, or a weakened structure. Ventilation timing is extremely important and must be carefully coordinated between both fire attack and ventilation crews. Ideally, ventilation should occur just prior to interior crews advancing their hose lines. Proper venting of heat and smoke from buildings can reduce the possibility of dangerous

situations that confront fire fighters. The fire fighters performing ventilation tasks should be in communication with the fire fighters attacking the fire or entering the structure to coordinate their efforts. In this incident no ventilation was performed on the fire ground. Had proper ventilation taken place, the amount of heat and smoke trapped inside the structure could have been reduced. Ventilation could have decreased heat and smoke and potentially have affected the outcome of events. This reduction in heat and smoke would have aided in the rescue efforts. Because of the heat, the Rapid Intervention Teams had to make three attempts before successfully gaining access to the structure, wasting valuable time.

REFERENCES

1. Cook, J L Jr. [1998]. Standard Operating Procedures and Guidelines. Saddle Brook, New Jersey: Fire Engineering Books and Videos.
2. National Fire Protection Association [1997]. NFPA 1500: standard on fire department occupational safety and health program. Quincy, MA: National Fire Protection Association.
3. Brunacini, A V [1985]. Fire Command. Quincy, MA: National Fire Protection Association.
4. Dunn V [1992]. Safety and Survival on the Fireground. Saddle Brook, NJ: Fire Engineering Books & Videos.

INVESTIGATOR INFORMATION

This incident was investigated by Tom Mezzanotte and Frank Washenitz, Safety and Occupational Health Specialists, NIOSH, Division of Safety Research, Surveillance and Field Investigations Branch.

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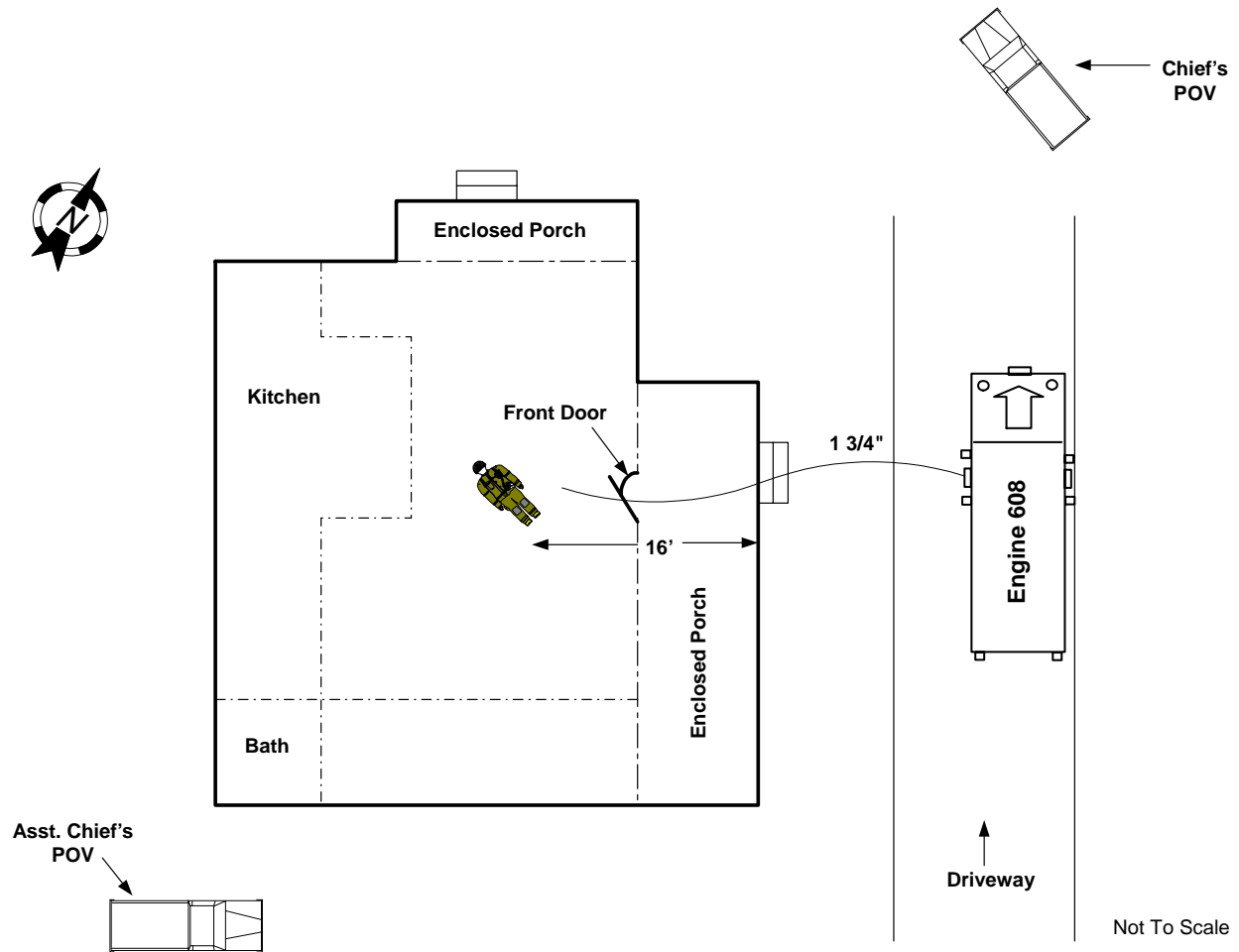


Figure. Overview of Incident Site