



Career Fire Fighter Dies While Exiting Residential Basement Fire - New York

SUMMARY

On January 23, 2005, a 37-year-old male career fire fighter (the victim) died while exiting a residential basement fire. At approximately 1337 hours, crews were dispatched to a reported residential structure fire. Crews began to arrive on the scene at approximately 1340 hours and at approximately 1344 hours, the victim, a fire fighter and officer made entry through the front door and proceeded down the basement stairwell to conduct a search for the seat of the fire using a thermal imaging camera (TIC). At approximately 1346 hours, the victim and officer began to exit the basement when they became separated on the lower section of the stairwell. The officer reached the front stoop and realized that the victim had failed to exit the building. He returned to the top of the basement stairs and heard a personal alert safety system (PASS) alarm sounding in the stairwell and immediately transmitted a MAYDAY for the missing fire fighter. The victim was located at approximately 1349 hours, and numerous fire fighters spent the next twenty minutes working to remove the victim from the building. At approximately 1413 hours, the victim was transported to an area hospital where he was later pronounced dead.

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

- *ensure that the first arriving officer or incident commander (IC) conducts a complete size-up of the incident scene*
- *ensure that fire fighters conducting interior operations provide progress reports to the Incident Commander*
- *establish standard operating procedures (SOPs) regarding thermal imaging camera (TIC) use during interior operations*
- *ensure that MAYDAY procedures are followed and refresher training is provided annually or as needed*
- *ensure that a rapid intervention team (RIT) is on the scene and in position to provide immediate assistance prior to crews entering a hazardous environment*



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



Career Fire Fighter Dies While Exiting Residential Basement Fire - New York

- *educate homeowners on the importance of installing and maintaining smoke detectors on every level of their home and keeping combustible materials away from heat sources.*

Although there is no evidence that the following recommendation could have specifically prevented this fatality, NIOSH investigators recommend that fire departments should:

- *ensure that fire fighting teams check each other's personal protective equipment (PPE) for complete donning.*

INTRODUCTION

On January 23, 2005, a 37-year-old male career fire fighter (the victim) died while exiting a residential basement fire. On January 25, 2005, the U.S. Fire Administration notified the National Institute for Occupational Safety and Health (NIOSH) of this incident. On March 23, 2005, three Safety and Occupational Health Specialists from the NIOSH Fire Fighter Fatality Investigation and Prevention Program investigated this incident. Meetings were conducted with the Chief Officers assigned by the department to investigate this incident and representatives from the Uniformed Firefighters Association and the Uniformed Fire Officers Association. Interviews were conducted with officers and fire fighters who were at the incident scene. The investigators reviewed the victim's training records, autopsy report, and death certificate. NIOSH investigators also reviewed the department's fireground standard operating procedures (SOPs)¹, a transcription of the dispatch tapes, and the department's report of this incident. The incident site was visited and photographed.

Fire Department

This career department consists of approximately

11,500 uniformed fire fighters that serve a population of about 8,000,000 in a geographic area of approximately 321 square miles.

Training and Experience

The department requires all fire fighters to complete the fire department's 13-week Probationary Fire Fighter's School. Candidates must be Certified First Responders to become probationary fire fighters. Probationary fire fighters are instructed in hydraulics and learn the basics of fire suppression systems and fire-fighting tactics.

The victim had 10 years of experience with this department and had completed an extensive list of training courses which included: Fire Suppression and Control, Building Construction and Firefighter Safety, Tactical Roof Operations, Hazardous Material Operations, Ladder Company Chauffeur and Tactical Private Dwelling Fire.

Equipment and Personnel

1337 hours dispatch - Initial dispatch included:

Engine 290 (Officer, fire fighter/driver, Fire Fighter #4, Fire Fighter #5 and two other fire fighters);

Ladder 103 (Officer, fire fighter/driver, victim, Fire Fighter #1, Fire Fighter #2 and Fire Fighter #3);

Engine 332 (Officer, fire fighter/driver and four fire fighters);

Ladder 175 (Officer, fire fighter/driver and four fire fighters);

Engine 236 (Officer, fire fighter/driver and four fire fighters);

Squad 252 (Officer, fire fighter/driver and four fire fighters);

Rescue 2 (Officer, fire fighter/driver and five fire fighters);

and Battalion 44 (Battalion Chief and fire fighter/driver).



Career Fire Fighter Dies While Exiting Residential Basement Fire - New York

1338 hours dispatch -

Engine 231 (Officer, fire fighter/driver and four fire fighters).

1340 hours dispatch –

Ladder 107 (Officer, fire fighter/driver, and three fire fighters);
and Battalion 58 (Battalion Chief and fire fighter/driver).

1341 hours dispatch –

DC 15 (Deputy Chief and fire fighter/driver).

Additional units were dispatched; however, only those units directly involved in the operations preceding the fatal event are discussed in the investigation section of this report.

Structure

The incident site was a detached two family, two story, wood frame structure measuring approximately 25-feet wide and 50-feet in length. The entrances to the first and second floor residences were located in the front of the building at the top of a concrete staircase approximately 5-feet above grade level. There was an external below-grade entrance to the basement located in the rear (Side 3) of the structure (Diagram 1). There were security bars on the basement and first floor windows, and security gates on both of the front door entrances (Photo 1) and the rear basement entrance. Door “A” allowed access only to the second floor residence. Door “B” only allowed access to the basement and first floor residence. The interior stairwell to the basement was located approximately 3-feet from the first floor entranceway (Door “B”).

Weather

A recent snow storm had deposited 12 to 18 inches of accumulated snow. The department’s report stated that the snow had slowed, but did

not significantly delay response times. The approximate temperature at the time of the incident was 20 degrees Fahrenheit with an estimated wind chill of 0 degrees Fahrenheit. The average wind speed was 24 miles per hour (mph) with gusting winds reaching 48 mph from the north.

INVESTIGATION

On January 23, 2005, a 37-year-old male career fire fighter (the victim) died while exiting a residential basement fire. At approximately 1337 hours, crews were dispatched to a reported residential structure fire. At approximately 1340 and 1341 hours, Engine 290 and Ladder 103 arrived on the scene, respectively. The officer from Engine 290 was informed by the resident of the structure that the fire was in the basement. The officer verified the location of the fire as being in the basement when he opened the interior basement door. The Engine 290 crew began stretching a 1 ¾-inch handline toward the front of the building. Ladder 107, Engine 332, Engine 236, Ladder 175 and Battalion 44 arrived on the scene. At approximately 1343 hours, the officer, victim and Fire Fighter #1 from Ladder 103 donned their SCBA face masks at front door “B” as the Ladder 107 crew made entry through front door “A” to conduct a primary search for occupants on the second floor (Photo 1). Fire Fighter #2 and Fire Fighter #3 from Ladder 103 proceeded to the rear (Side #3) of the structure (Photo 2 and Diagram 1) as Engine 231 arrived on the scene.

At approximately 1344 hours, the Ladder 103 officer, victim and Fire Fighter #1 made entry through front door “B” and proceeded down the basement interior stairwell to conduct a search for the seat of the fire (Diagram 2). The officer carried a thermal imaging camera (TIC). Fire Fighter #1 stopped on the stairwell’s half-landing



Career Fire Fighter Dies While Exiting Residential Basement Fire - New York

while the victim and Ladder 103 officer continued toward the basement. The Engine 290 officer and Fire Fighter #4 advanced a 1 ¾-inch handline down the interior stairwell, until they reached the half-landing. Fire Fighter #5 remained at the top of the stairs and assisted in feeding the handline down the interior stairwell. *Note: The Engine 290 officer's helmet was knocked off of his head by a large loop of hose in the handline. His helmet fell down the stairs and he operated without it for the duration of the interior operations and received first and second degree burns to his forehead while working on the half-landing.* Fire Fighter #2 and Fire Fighter #3 from Ladder 103 forced open the exterior basement door on Side #3. A second 1 ¾-inch handline was stretched from Engine 290 toward the front of the structure. Fire fighters from Ladder 107 began removing the window bars on the front basement window (Side #1). *Note: Several fire fighters reported to NIOSH investigators that they had to don their SCBA face masks while operating on Side #1 of the structure due to the heavy thick smoke pushing out the front door.*

At approximately 1345 hours, the officer from Engine 290 ordered Fire Fighter #4 to open the nozzle in an attempt to cool the stairwell area. Fire Fighter #4 hit the stairwell, leading down into the basement, with a short burst of water. The officer ordered the nozzle to be opened again as the heat increased. Fire Fighter #2 and Fire Fighter #3 from Ladder 103 made entry into the basement on Side #3 as two fire fighters from Ladder 107 vented the middle and rear basement windows on Side #4 while they attempted to remove the window bars (see Photo 2).

At approximately 1346 hours, a heavy fire condition was observed in the basement by interior and exterior crews. The Battalion 44 Chief Officer (Officer in charge) arrived on the

scene and observed fire venting from the basement window on Side #2 and the officer from Ladder 107 observed fire and heavy smoke venting from the basement door and window on Side #3. The officer radioed the Battalion 44 Chief Officer and requested that a handline be brought to Side #3. The Battalion 44 Chief Officer ordered the Engine 332 crew to take their handline to Side #3. His plan was to utilize the basement entrance on Side #3 as the point of access for the attack line (Engine 332 handline).

The Engine 290 Officer ordered Fire Fighter #2 and Fire Fighter #3 to exit the stairwell. The Ladder 103 Officer, standing near the victim in the basement, approximately 10 feet from the stairs, heard the crews on the half-landing operating their handline. Unable to see the screen on the TIC due to the heavy smoke conditions, the officer told the victim "Let's go." The victim responded with an "Okay." The Engine 290 Officer then ordered Fire Fighter #4 and Fire Fighter #5 to exit the stairwell. As the Ladder 103 Officer and victim reached the stairs they heard the Engine 290 officer yell "Get out." The officer and victim began ascending the lower section of the interior stairwell. Fire Fighter #4 was knocked over while operating on the half landing. His face mask and helmet were dislodged as the members attempted to ascend the stairwell. Fire Fighter #4 was forced to then place the nozzle on the stairwell to adjust his face mask and helmet, and then exited the building. The officer continued up toward the first floor, not knowing that the victim was not with him. Two fire fighters from Ladder 107 vented the basement window on Side #1 after removing the window bars.

At approximately 1347 hours, the victim became separated from his officer while ascending the lower half of the interior stairwell. The Ladder



Career Fire Fighter Dies While Exiting Residential Basement Fire - New York

103 officer exited the structure and found Fire Fighter #1 out on the front stoop. The officer quickly realized that the victim had failed to exit the building.

At approximately 1348 hours, the Ladder 103 officer returned to the interior front basement stairs where he heard a personal alert safety system (PASS) alarm sounding in the stairwell. The officer was unable to descend the stairs due to the extreme heat conditions. He immediately transmitted a MAYDAY for the missing fire fighter. *Note: The Battalion 44 Chief Officer did not hear this transmission.* Ladder 120, dispatched as the fire fighter assist and safety team (FAST), equivalent to a rapid intervention team (RIT), arrived on the scene and heard the MAYDAY transmission. The Battalion 58 Chief Officer also arrived on the scene at this time. The Engine 290 officer, standing next to the Ladder 103 officer at the front door, pulled the handline up the stairs and had members begin spraying water down the stairwell in order to protect the Ladder 103 officer and Fire Fighter #1 as they descended the stairs.

The officer followed up with a second MAYDAY transmission at approximately 1349 hours when he found the victim. *Note: Numerous crews on the fireground believed that the MAYDAY was made by the fire fighter in distress. The Battalion 44 Chief Officer heard this MAYDAY transmission and immediately radioed a request for a second alarm.* The victim's upper body was lying on the half-landing; his facemask was dislodged, and the rest of his body was on the lower half of the stairs (Photo 3). The victim's PASS was in full alarm. The Division 15 Chief Officer arrived on the scene and assumed command (Incident Commander) after a brief exchange of information from the Battalion 44 Chief Officer.

Numerous fire fighters spent the next twenty minutes working to remove the victim from the building. The narrow stairwell, objects on the half-landing and extremely high heat and zero visibility conditions hampered the rescue effort (see Photo 3 and Photo 4). The hook at the end of the life rescue rope was attached to the victim's SCBA harness and stretched to the front lawn where fire fighters were able to assist with getting the victim up the stairs. At approximately 1410 hours, the victim was removed from the building. At approximately 1413 hours, the victim was transported to an area hospital where he was later pronounced dead.

INJURIES

Nine members involved in the rescue effort were injured. Two members suffered from smoke inhalation and seven members received burn injuries.

CAUSE OF DEATH

The autopsy report listed the victim's cause of death as smoke inhalation (Carboxyhemoglobin level was 24% saturation) and burns of the head, torso and upper extremities (third degree burns on approximately 63% of body surface area).

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Fire departments should ensure that the first arriving officer or incident commander (IC) conducts a complete size-up of the incident scene.

Discussion: The initial size-up conducted by the first arriving officer or incident commander (IC) allows the officer to make an assessment of the conditions and to assist in planning the suppression strategy. The following general factors are important considerations during a size-up: occupancy type involved, potential for civilians in the structure, smoke conditions, type

Career Fire Fighter Dies While Exiting Residential Basement Fire - New York

of construction, age of structure, exposures, and time considerations such as time of incident, time fire was burning before arrival, and time fire was burning after arrival.² The evaluation of risk is an assignment that the first arriving officer or Incident Commander is designated to conduct. The Incident Commander or Officer in Charge must perform a risk analysis to determine what hazards are present, what the risks to personnel are, how the risks can be eliminated or reduced, the chances that something may go wrong, and the benefits to be gained.³

The fire department involved in this incident has an established standard operating procedure (SOP) on the requirements and purpose of providing a preliminary report. The SOP defines a preliminary report as: *The report of the Incident Commander at a fire or emergency. The preliminary report shall include a brief description of the situation, the identity of the units at work and the status of the balance of the assignment.*¹ The preliminary report is transmitted to the dispatcher and provides Chief Officers and fire department officials with a clear and accurate sense of the conditions existing at the scene of the fire or emergency.

The first arriving officer conducted a partial size-up in terms of evaluating the conditions and type of building, the location of the fire (basement) and exposures. A complete size-up would have involved a walk-around of the entire building allowing the officer to evaluate all four sides of the building. The partial size-up only allowed the officer to see Sides #1, #2 and #4, and not Side #3 that had a basement level access. Entering and attacking the fire on the basement level provides fire fighters with better access and less exposure to high heat conditions and products of combustion. In contrast, an interior stairwell

usually provides the only vent to the below grade fire exposing fire fighters to smoke, heat and flame venting up the stairwell. Taking a hose line down a burning basement stairway makes this type of incident one of the most dangerous jobs a fire fighter must perform.⁴

A size-up report was not provided to Central Dispatch or responding units. There were no reports of civilians inside the structure nor were any civilians located in the building at anytime during or after the incident.

Recommendation #2: Fire departments should ensure that fire fighters conducting interior operations provide progress reports to the Incident Commander.

Discussion: Frequent progress reports are essential to the Incident Commander's (IC's) or Officer in Charge continuous assessment and size-up of the incident and are required as per the fire department's standard operating procedures.¹ Interior crews and crews working in areas not visible to the IC are the eyes and ears of the IC. Progress reports also provide everyone on the fireground with information on other aspects of the fire that relate to their own particular operations (e.g., ventilation, suppression, primary search, etc.).²

The interior crews experienced high heat conditions with zero visibility. The crew advancing the handline down the interior stairwell had difficulty in descending the narrow stairwell and never reached the basement level where the seat of the fire was located. Progress reports were not provided to the IC by the interior crews. This information is needed by the IC in order to establish a plan of action and continually assess the risk versus gain.



Career Fire Fighter Dies While Exiting Residential Basement Fire - New York

Recommendations #3: Fire departments should establish standard operating procedures (SOPs) regarding thermal imaging camera (TIC) use during interior operations.

Discussion: The fire department involved in this incident did not have an established standard operating procedure (SOP) regarding thermal imaging camera (TIC) use at structure fires. The fire department had posted a training bulletin (October 26, 2000) regarding thermal imaging camera use and maintenance prior to the incident. The training bulletin addressed the camera's operating features (e.g. how temperature variations appear on the screen) and when the camera is to be used to augment existing department procedures for search and rescue. The training bulletin listed some possible applications such as whenever a search rope is used, at high-rise fires, etc.

There is no mention in the training bulletin of how the officer utilizing the TIC will coordinate their assignment (e.g., size-up, primary search, etc.) with other crews operating in their vicinity. SOPs would provide a basis for operations involving the use of a TIC in conjunction with other crews operating on the fireground. For example, if the TIC is to be utilized in conjunction with the initial attack line, the user of the TIC must be within the vicinity of the nozzle operator. This serves two purposes: 1) The handline would be in a position to provide protection for the TIC operator and crew members operating in the vicinity of the nozzleman, and 2) The operator of the TIC could guide the nozzleman in stream placement after pointing out the hot spots, the seat of the fire, and any high heat conditions that may pose a hazard to crews operating in the vicinity.

Fire departments should also provide training on the proper use and the limitations of TICs. This

would help fire fighters understand how the TIC can best be utilized to support and enhance basic fire fighting tactics.

The Ladder 103 Officer utilized a TIC as part of the interior size-up as he entered the structure with the victim. The officer and victim entered the structure ahead of the crew advancing the handline, reached the basement level, but were unable to see the screen on the TIC due to the zero visibility environment.

Recommendation #4: Fire departments should ensure that MAYDAY procedures are followed and refresher training is provided annually or as needed.

Discussion: As soon as fire fighters become lost or disoriented, trapped or unsuccessful at finding their way out of a hazardous situation (e.g., interior of structure fire), they must recognize that fact and initiate emergency traffic.⁵ They should manually activate their personal alarm safety system (PASS) device and announce a "MAYDAY" over the radio. A "MAYDAY" call will receive the highest communications priority from Central Dispatch, Incident Command, and all other units. Information regarding last known location, crew assignments, and identity of the lost fire fighter provides the RIT with important clues in locating the missing/lost member. The sooner Incident Command is notified and the RIT is activated, the greater the chance of the fire fighter being rescued.⁶

The steps included in the department's standard operating procedures require that "If possible, the officer will immediately press his/her emergency alert button, and then contact the Incident Commander in the following format: "MAYDAY-MAYDAY-MAYDAY. Ladder 103 to Battalion 44, MAYDAY."¹ The SOPs also require that

Career Fire Fighter Dies While Exiting Residential Basement Fire - New York

the person transmitting the MAYDAY identify who they are, what the MAYDAY is for, and the victim's location.

Investigators were unable to determine, through interviews, whether the victim had manually activated his PASS device or if the device had gone into alarm mode. Investigators were also unable to determine if the victim had attempted at any time to transmit a "MAYDAY." The victim's officer radioed "MAYDAY" when he heard a PASS alarm sounding in the stairwell where he believed the victim was located. The victim's location and his identity were not provided in the first "MAYDAY" transmission and the "MAYDAY" was not received or acknowledged by the IC, the FAST team, or Central Dispatch. The victim's officer transmitted a second "MAYDAY" upon finding the victim (approximately 1 minute after initial "MAYDAY") that was heard by the IC and the FAST team staged on the front lawn.

Recommendation #5: Fire departments should ensure that a rapid intervention team (RIT) is on the scene and in position to provide immediate assistance prior to crews entering a hazardous environment.

Discussion: Fire departments should have a rapid intervention team (RIT) standing by during any fire to rescue a trapped, injured, or missing fire fighter.⁵ NFPA 1500, 8.5.5 states "In the early stages of an incident, which includes the deployment of the fire department's initial attack assignment, the rapid intervention crew/company shall be in compliance with 8.4.11 and 8.4.12 and be either one of the following: 1) On-scene members designated and dedicated as rapid intervention crew/company, or 2) On-scene members performing other functions but ready to re-deploy to perform rapid intervention crew/company functions."⁷ NFPA 1500, 8.5.7 states

"At least one dedicated rapid intervention crew/company shall be standing by with equipment to provide for the rescue of members that are performing special operations or for members that are in positions that present an immediate danger of injury in the event of equipment failure or collapse."⁷

A fire fighter assist and safety team (FAST), equivalent to a rapid intervention team (RIT) or rapid intervention crew (RIC), was assigned and en route to this incident. Ladder 120 was the designated FAST and arrived on the scene when the initial "MAYDAY" was transmitted. Fire fighters standing by on the front lawn were the first to assist the Ladder 103 Officer and Fire Fighter #1 with the victim. The narrow stairwell, high heat/low visibility environment and objects on the stairwell landing made it difficult to move the victim up the stairwell. Numerous fire fighters, in an attempt to assist with the rescue effort, blocked the area on the landing to the front door making it difficult for fire fighters entering and exiting the front door during the rescue attempts. The RIT must have an unobstructed entry/egress point in order to facilitate the rescue effort. Assigning a Chief Officer to monitor the entry/egress point would ensure that the area would remain clear and unobstructed and that only those members assigned to the rescue assignment are working in the area.

Recommendation #6: Fire departments should educate homeowners on the importance of installing and maintaining smoke detectors on every level of their home and keeping combustible materials away from heat sources.

Discussion: When fire breaks out, the smoke alarm, functioning as an early warning system, reduces the risk of dying by nearly 50 percent.⁸ In the event of a fire, properly installed and



Career Fire Fighter Dies While Exiting Residential Basement Fire - New York

maintained smoke alarms will provide an early warning signal to occupants. This allows for early reporting to emergency services and a quicker response by fire department personnel allowing fire fighters to reach and attack the fire in an earlier growth stage. Homeowners should follow the manufacturer's installation instructions.⁸

Witness statements provided to investigators from the Fire Marshal's Office mention that there were two smoke detectors and one fire extinguisher located in the basement. However, there were no statements regarding whether the smoke detectors were operational at the time of the fire. There were no reports of anyone hearing a smoke detector alarming at anytime. The homeowners were in the kitchen and dining room area of the first floor when they first noticed the smell of smoke. One of the residents opened the door leading down to the basement and observed smoke in the stairwell. He got the fire extinguisher from the kitchen and attempted to descend the stairs but was turned back due to the high volume of smoke. He closed the basement stairwell door and evacuated his family from the house while calling 911. The fire had been burning for an undetermined time prior to the family discovering and reporting the fire. This delayed report of the fire may have led to the fire growing to a more advanced stage making it more difficult and dangerous for the fire fighters to establish an initial attack.

The fire was listed by the fire investigators as being accidental in nature as a result of combustibles in close proximity to a portable electric heater. Fire departments can provide public service announcements educating the residents of their communities on the hazards of storing flammable materials close to ignition sources (e.g., portable electric heaters).

Recommendation #7: Although there is no evidence that the following recommendation could have specifically prevented this fatality, NIOSH investigators recommend that fire departments should ensure that fire fighting teams check each other's personal protective equipment (PPE) for complete donning.

Discussion: The key to proper and effective use of PPE is the development of good habits that include fast, proper and complete donning of the appropriate PPE ensemble. Fire fighting teams should check each others' PPE to help ensure that the equipment is fully and completely donned. This team check will help prevent burn or injury. To minimize the risk of burn injuries to the head region, it is important to ensure that the hood is donned correctly to provide maximum protection to the ears, neck and face (not protected by the SCBA face mask). Care must be taken to ensure that the hood does not interfere with the face-to-face seal. Collars must be turned up to protect the wearer's neck and throat (the front of the collar must be fastened to protect the throat area). The ear flaps on the helmet must be pulled down to protect the back of the neck and the ears. The chin strap on the helmet must be fastened around the chin without obstructing the SCBA's regulator hose to ensure that the helmet stays in place upon impact.⁶

REFERENCES

1. New York fire department [2005]. Standard operating procedures.
2. Klaene BJ and Sanders RE [2000]. Structural fire fighting. Quincy, MA: National Fire Protection Association, pp. 57-63.
3. Kipp JD and Loflin ME [1996]. Emergency incident risk management. New York: Van Nostrand Reinhold, p. 253.

Career Fire Fighter Dies While Exiting Residential Basement Fire - New York

4. Dunn V [1999]. Command and control of fires and emergencies. Saddle Brook, NJ: Fire Engineering Books & Videos, p. 257.
5. Dunn V [1992]. Safety and survival on the fireground. Saddle Brook, NJ: Fire Engineering Books & Videos, p. 131.
6. Fire Fighter's Handbook [2000]. Essentials of firefighting and emergency response. New York: Delmar Publishers, pp. 130-131 and pp. 692-693.
7. NFPA [2002]. NFPA 1500. Standard on fire department occupational safety and health program. Quincy, MA: National Fire Protection Association.
8. U.S. Fire Administration [2006]. Smoke alarms. Accessed January 30, 2006 at <http://www.usfa.fema.gov/safety/alarms>

INVESTIGATOR INFORMATION

This incident was investigated by Mark McFall, Virginia Lutz and Steve Berardinelli, Safety and Occupational Health Specialists, Surveillance and Field Investigations Branch, Division of Safety Research, NIOSH. The report was written by Mark McFall.



Career Fire Fighter Dies While Exiting Residential Basement Fire - New York

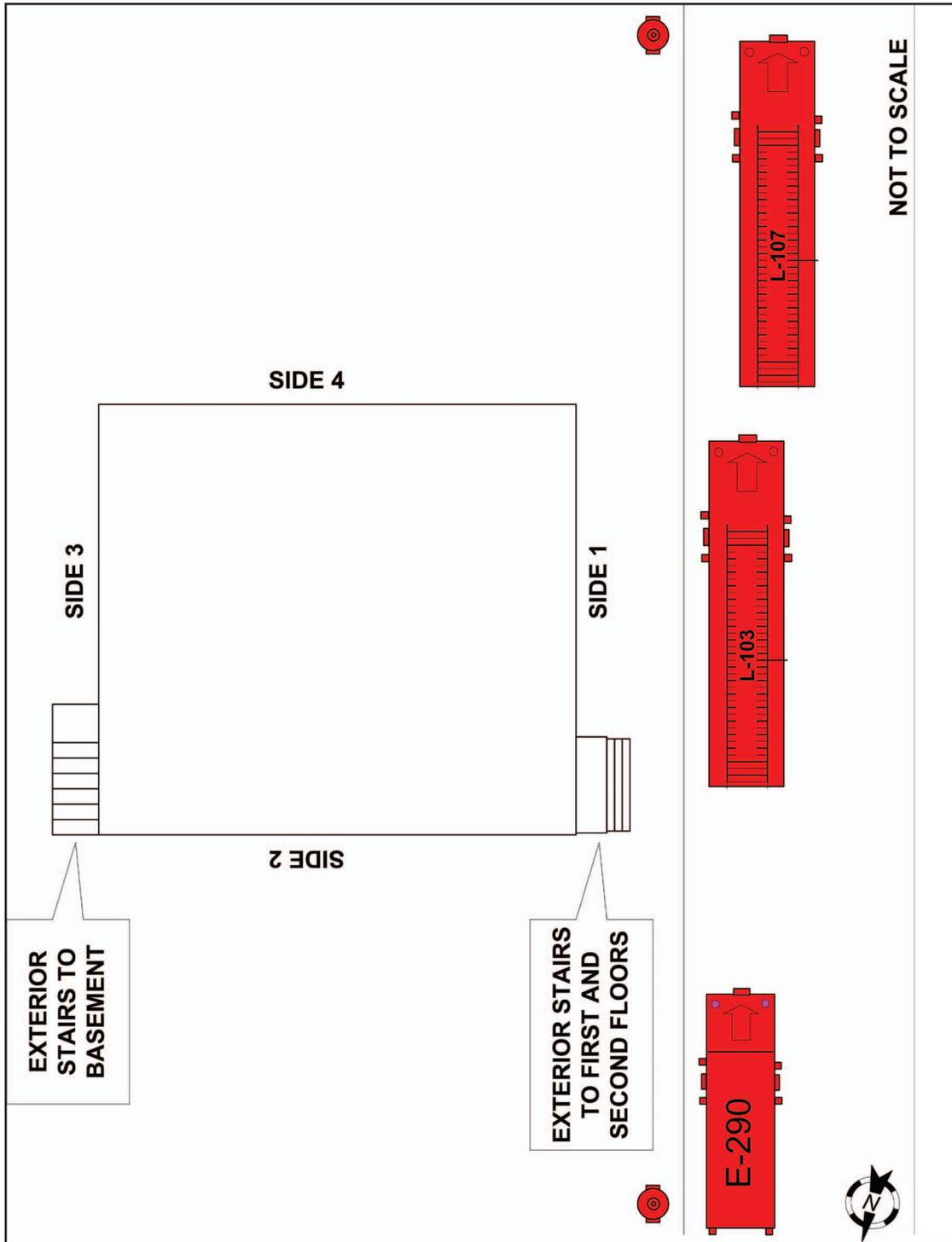


Diagram 1. Aerial view of incident scene



Career Fire Fighter Dies While Exiting Residential Basement Fire - New York

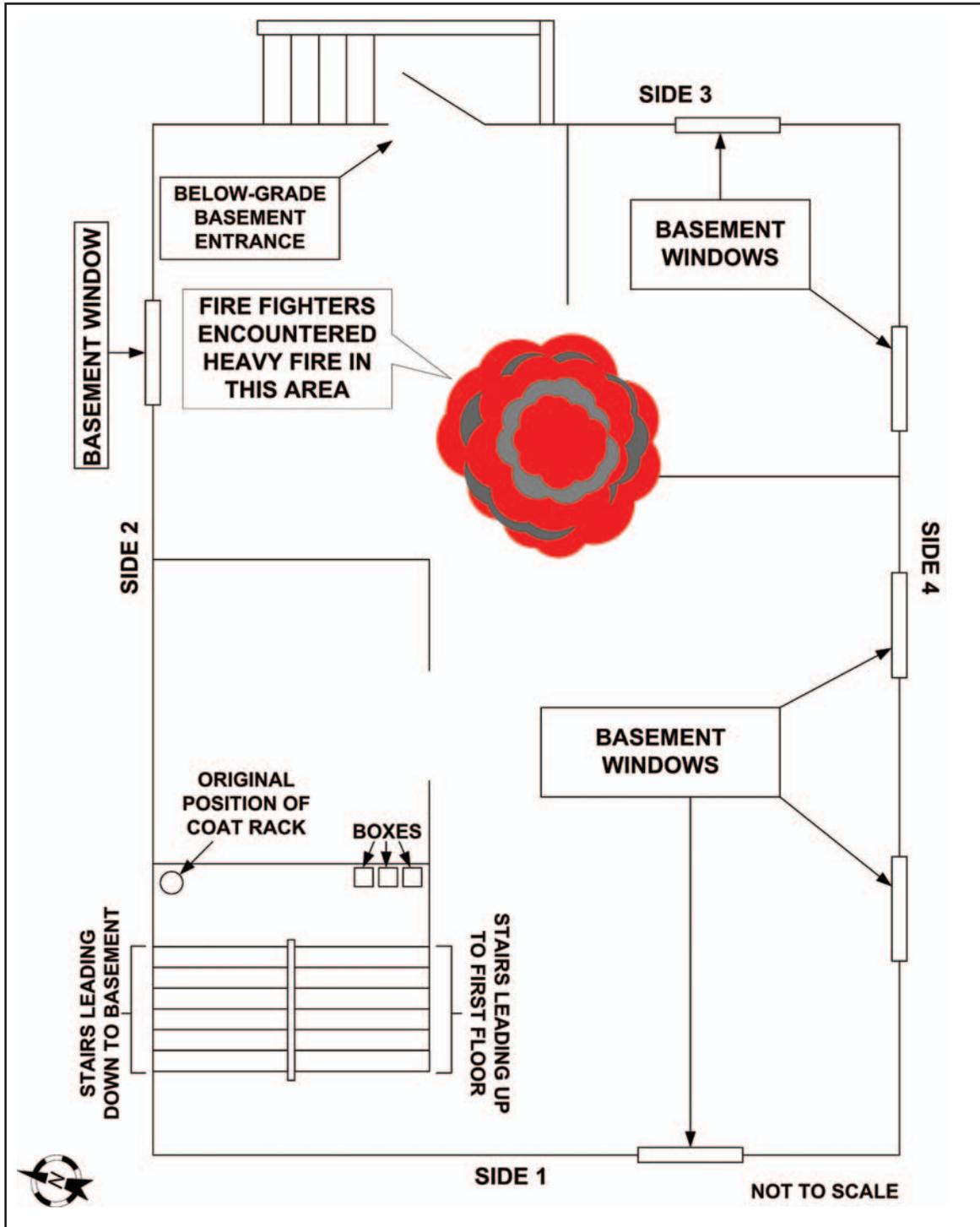


Diagram 2. Aerial view of interior stairwell and basement



Career Fire Fighter Dies While Exiting Residential Basement Fire - New York



Photo 1. View of Side 1 of incident building



Photo 2. Rear view of incident building (Side 3)



Career Fire Fighter Dies While Exiting Residential Basement Fire - New York



Photo 3. View of interior stairwell half-landing

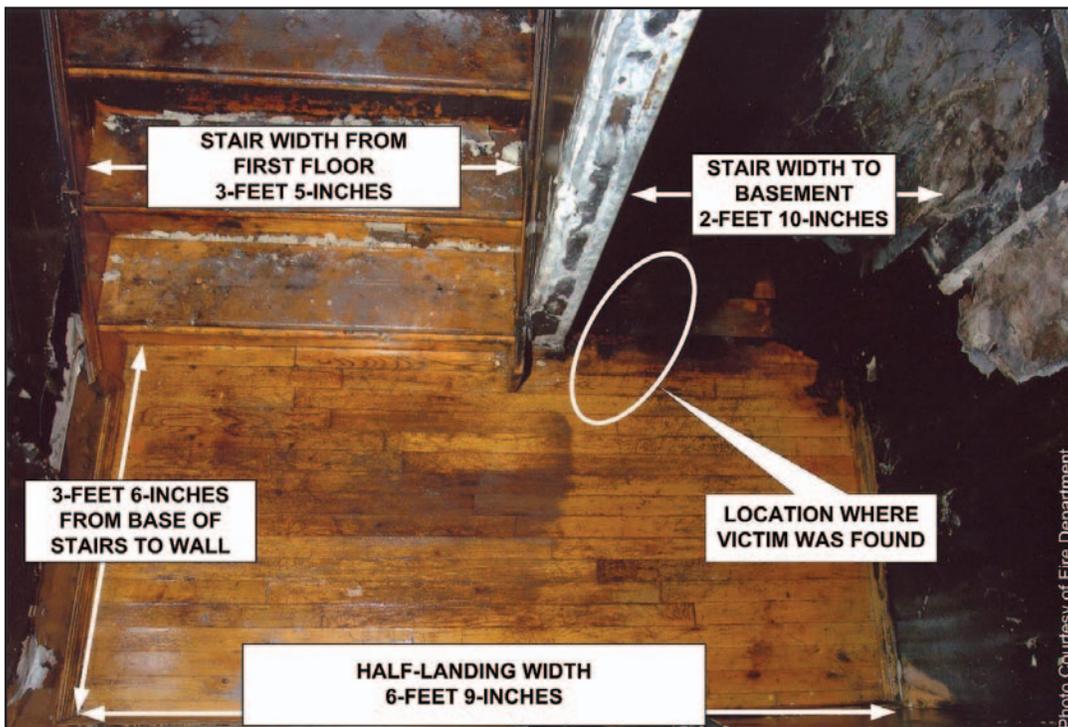


Photo 4. View of half-landing after removal of debris

U. S. Department of Health and Human Services
Public Health Service
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health
4676 Columbia Parkway, MS C-13
Cincinnati, OH 45226-1998

OFFICIAL BUSINESS

Penalty for private use \$300



**Delivering on the Nation's promise:
Safety and health at work for all people
through research and prevention**