

SERIOUS INJURY REPORT

REPORT F2026-01 • April 2026

Four Career Firefighters Injured from a Floor Collapse in an Abandoned Residential Structure Fire – Kansas

Executive Summary

On December 29, 2025, four firefighters were seriously injured when a floor collapsed during interior operations in an abandoned residential structure fire. At 03:44 hours, the public safety answering point (PSAP) received a 911 call reporting a structure fire with visible smoke and flames. The caller stated they did not think anyone was inside. At 03:45 hours, the PSAP dispatched Pumpers 4, 11, 14, 18, 19, Quint 2, Truck 14, Rescue 6, Medics 2, 18, Battalion 1, and Shift Commander for a low-rise alarm. Around 03:49 hours, Pumpers 18, 14, and Medic 18 arrived on scene. Pumper 18 officer gave a size-up of a single-story wood frame with heavy fire showing from Sides Bravo and Charlie. He reported that Pumper 18 would stretch an attack line and directed the second arriving pumper to establish a water supply. As Pumper 18 firefighter stretched the attack line to the front door, the crew of Medic 18 and four members of Quint 2 joined them. As Pumper 18 officer was conducting a 360 size-up, he viewed Side Delta then returned to his crew. Quint 2 firefighter along with a Medic 18 firefighter forced open the front door. Pumper 18 firefighter, Pumper 18 officer, and two Medic 18 firefighters made entry on the first floor. As the attack line entered the structure, Pumper 14 officer reported he had secured a second attack line at the garage with heavy fire showing. He extinguished heavy flames coming from the garage, significantly reducing fire conditions. Pumper 18 crew encountered heavy smoke conditions, no visibility, with no elevated heat. The crew of Quint 2 followed Pumper 18's crew and noticed flames coming through the floor. At 03:53 hours, the Shift Commander arrived on scene and assumed incident command (IC). Around the same time, there was a partial collapse of the living room floor. This caused Pumper 18 firefighter, Pumper 18 officer, and one Medic 18 firefighter to fall into the basement. Pumper 18 officer attempted to declare a Mayday. However, his message was unreadable. Medic 18 firefighter's radio was off. Once he turned the radio on, he declared a Mayday identifying himself. The IC acknowledged the Mayday and made a request



Photo 1: View of Side Alpha of structure, post-fire.
(Courtesy of the fire department)

As the attack line entered the structure, Pumper 14 officer reported he had secured a second attack line at the garage with heavy fire showing. He extinguished heavy flames coming from the garage, significantly reducing fire conditions. Pumper 18 crew encountered heavy smoke conditions, no visibility, with no elevated heat. The crew of Quint 2 followed Pumper 18's crew and noticed flames coming through the floor. At 03:53 hours, the Shift Commander arrived on scene and assumed incident command (IC). Around the same time, there was a partial collapse of the living room floor. This caused Pumper 18 firefighter, Pumper 18 officer, and one Medic 18 firefighter to fall into the basement. Pumper 18 officer attempted to declare a Mayday. However, his message was unreadable. Medic 18 firefighter's radio was off. Once he turned the radio on, he declared a Mayday identifying himself. The IC acknowledged the Mayday and made a request

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to clear the airway. Dispatch announced a second alarm with Mayday. Medic 18 firefighter declared a second Mayday. Crews from Pumper 14, 11 (as the rapid intervention team (RIT)), Quint 2 and Truck 14 entered the basement to extinguish the fire and execute the rescue. Pumper 14 officer reported they located a downed firefighter and were working on extrication. At 04:01 hours, Medic 18 was removed from the basement. Pumper 14 firefighter returned from the hydrant, entered the front door, and fell into the collapsed hole. He declared a Mayday, reporting his location and available air supply. At 04:04 hours, the Safety Officer confirmed two firefighters were rescued from the structure. At 04:06 hours, Pumper 11 officer reported Pumper 14 firefighter was located and out of the structure. Pumper 18 firefighter, Pumper 18 officer, Medic 18 firefighter, and Pumper 14 firefighter were transported to the local hospital. At 04:08 hours, IC announced all personnel to evacuate the structure and ordered defensive operations. IC reported at 05:53 hours, the fire was out and no further units were needed.

Contributing Factors

- *Scene size-up and risk assessment*
- *Basement/below grade fire*
- *Abandoned/derelect/vacant building*
- *Benchmarking of critical information*
- *Proficient use of self-contained breathing apparatus (SCBA) accessories*
- *Mayday operations/firefighter survival*
- *Personnel accountability system*
- *Available personnel/adequate staffing*

Key Recommendations

Fire departments should:

- *Complete an initial scene size-up and risk assessment to inform a risk/benefit analysis.*
- *Ensure the first arriving firefighters choose initial and ongoing operational strategies based on the tactical considerations for basement and below grade fires.*
- *Develop and implement Standard Operating Procedures (SOPs)/Standard Operating Guidelines (SOGs) for operating at abandoned, derelict, and vacant building fires.*
- *Educate personnel on use of radio communication processes for sharing critical information, such as conditions and actions.*
- *Ensure all fire officers and firefighters are properly trained in the use of SCBA accessories, such as radio interface communication capabilities.*
- *Ensure all fire officers and firefighters are trained in Mayday operations and survival.*

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- *Use a personnel accountability system to identify the location and function of all operating personnel.*
- *Ensure that adequate staffing is available to respond to emergency incidents.*

The National Institute for Occupational Safety and Health (NIOSH) initiated the Fire Fighter Fatality Investigation and Prevention Program to examine deaths of fire fighters in the line of duty so that fire departments, fire fighters, fire service organizations, safety experts and researchers could learn from these incidents. The primary goal of these investigations is for NIOSH to make recommendations to prevent similar occurrences. These NIOSH investigations are intended to reduce or prevent future firefighter deaths and are completely separate from the rulemaking, enforcement, and inspection activities of any other federal or state agency. Under its program, NIOSH investigators interview persons with knowledge of the incident and review available records to develop a description of the conditions and circumstances leading to the deaths in order to provide a context for the agency's recommendations. The NIOSH summary of these conditions and circumstances in its reports is not intended as a legal statement of facts. This summary, as well as the conclusions and recommendations made by NIOSH, should not be used for the purpose of litigation or the adjudication of any claim.

For further information, visit the program at www.cdc.gov/niosh/firefighters/ffifpp/ or call 1-800-CDC-INFO (1-800-232-4636).



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Introduction

On December 29, 2025, four firefighters were seriously injured when a floor collapsed during interior operations in an abandoned residential structure fire. On January 5, 2026, the fire department notified the National Institute for Occupational Safety and Health (NIOSH) of this incident. Between January 17-20, 2026, one investigator representing the NIOSH Fire Fighter Fatality Investigation and Prevention Program (FFFIPP) traveled to Kansas to investigate this incident. The NIOSH investigator conducted interviews with command officers, fire officers, and firefighters who were on scene during the incident. The investigator reviewed fire department SOPs, training records, dispatch records, witness statements, and investigation documents.

Fire Department

The career fire department has a 128-square-mile jurisdiction, serves a population of over 156,000 residents, annually responds to an average of 35,000 calls, and provides emergency medical services (EMS) at the advanced life support level. The fire department includes 420 uniformed personnel and maintains 3 shifts. Each shift is assigned an average of 140 personnel, with a minimum of 104 on duty per shift, across the 18 fire stations. Shifts operate on a 24-hour schedule from 08:00 to 08:00 the following day. Each shift is assigned a shift commander (assistant chief) and 3 battalion chiefs. All units are led by a shift captain and staffed by a fire apparatus operator and one or two firefighters. The fire department's leadership contains a fire chief and deputy chiefs who manage three divisions:

- **Fire operations** manages fire suppression, special operations, and EMS response, providing basic and advanced life support at the paramedic level.
- **Fire prevention** leads activities involving prevention, investigation, public education, and a smoke detector program.
- **Administration** is responsible for communications, logistics, training, and maintenance and repair.

Training, Education, and Professional Development

The initial training for recruits consists of 14 weeks of daily academy type training for a total of 560 hours. All recruits are required to have the minimum EMS certification level of Emergency Medical Technician (EMT) by the start of the recruit school. The Kansas Fire & Rescue Training Institute conducts recruits' certification which is accredited by the International Fire Services Accreditation Congress and Pro Board®. Recruits are trained to meet the job performance requirements (JPRs) of NFPA 1010, Firefighter I and II. The Center for Domestic Preparedness provides additional training to

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meet the JPRs of NFPA 1072 and 472, Hazardous Materials Awareness and Hazardous Materials Operations. The training academy provides professional development beyond entry level firefighter, including officer development, with each program including a task-book program for acting captain and acting battalion chief. The Shift Commander (IC) had 28 years of total fire service experience at the fire department. He had training in command principles, building construction, RIT, and managing a Mayday. Regarding those who sustained injuries:

- Pumper 18 officer had 12.5 years of fire service experience with the department. He held numerous certifications such as Pro Board® NFPA 1001 Fire Fighter I and Fire Fighter II as well as Kansas state paramedic.
- Pumper 18 firefighter had three years of total fire service experience with the department. She held numerous certifications such as Pro Board® NFPA 1001 Fire Fighter I and Fire Fighter II as well as Kansas state EMT.
- Medic 18 firefighter had 11 months of fire service experience with the department. He held numerous certifications, such as Pro Board® NFPA 1001 Fire Fighter I and Fire Fighter II as well as Kansas state EMT.
- Pumper 14 firefighter had five years of fire service experience with the department. He held numerous certifications such as Pro Board® NFPA 1001 Fire Fighter I and Fire Fighter II as well as Kansas state paramedic.

Apparatus, Staffing, and Communications

At 03:45 hours, the following units were dispatched for a low-rise structure fire (see Table 1).

Table 1. Units dispatched and arrival time

Apparatus	Staffing	Arrival On Scene
Pumper 18	3	03:49
Medic 18	2	03:49
Pumper 14	3	03:50
Quint 2	4	03:50
Pumper 11	3	03:52
Truck 14	4	03:52
Pumper 19	3	03:53
Pumper 4	3	03:53
Rescue 6	4	03:53
Shift Commander	1	03:53
Battalion 1	2	03:55
Medic 2	2	03:59

The fire department operates a PSAP (Dispatch) that dispatches all emergency and non-emergency fire and EMS response calls.

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Building Construction

This incident involved a single-family, two-bedroom residential structure built in 1950 (see **Photo 2**). It was wood frame construction containing 1,350 square ft of above grade living space (see **Diagram 1**) and 216 square ft of below grade living space added in 1966. The structure's exterior was constructed with vinyl siding over wood siding and an asphalt-shingled roof. Located on Side Delta of the structure was a 12 ft x 30 ft wood deck. The structure was positioned on a raised lot with steps leading from a large concrete parking area to the main entrance. The parking area led to a below grade, single vehicle garage positioned on Side Bravo.



Photo 2: Aerial view of structure, post-fire.
(Courtesy of the fire department)

The structure was reported to be abandoned for 18 months, with a significant amount of furniture, trash, and debris spread throughout the interior (see **Photo 3 and 4**). Many of the structure openings were unprotected and consequently, there were reports of unauthorized people accessing and using the space.

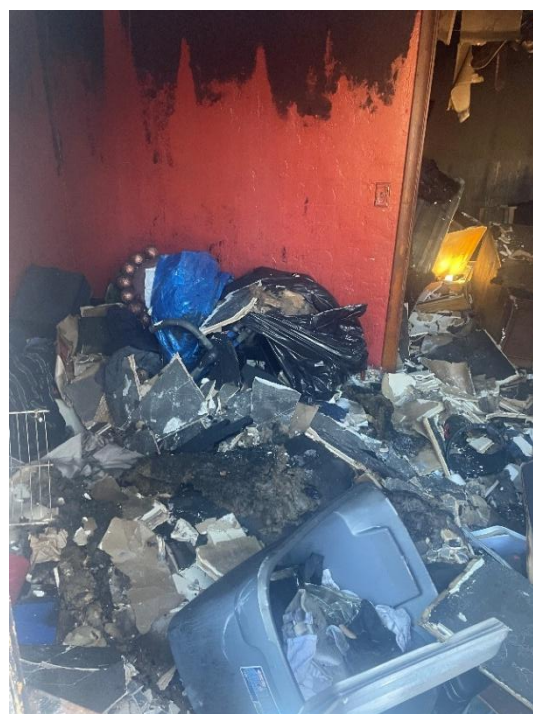


Photo 3 and 4: View of trash on first floor.
(Courtesy of the fire department)

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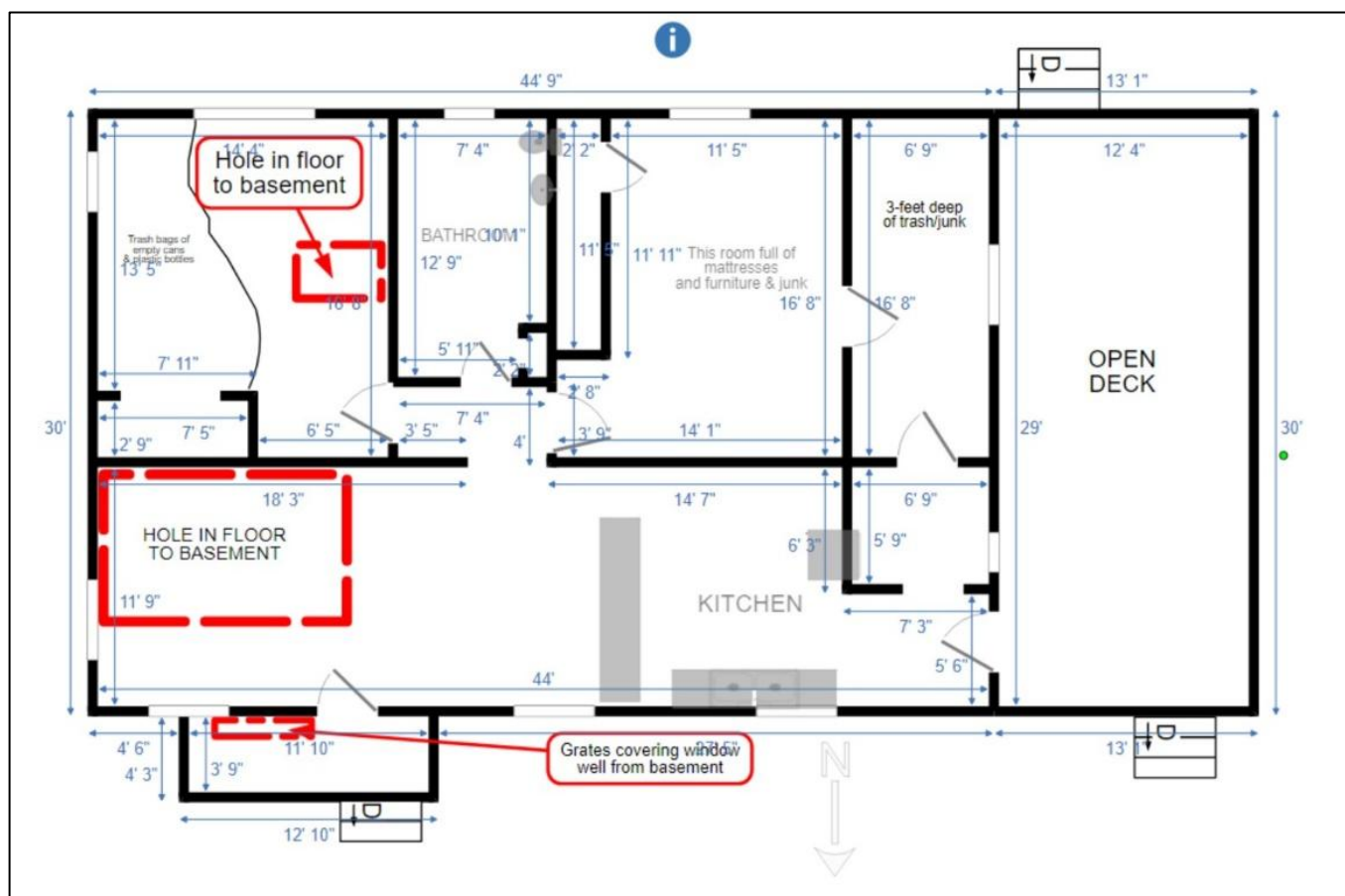


Diagram 1: Floor plan of structure.
(Courtesy of the fire department)

Basement Construction

Examination of the incident structure indicated inconsistencies with typical dimensional lumber construction practices. There were mixed lumber sizes within the floor system, possible replacement or modification of structural members, and overlapping joists fastened together with additional boards. These modifications may indicate this was done due to structural instability to increase load capacity, span distance, or correct sagging of the floor/deck joists. Floor loads were transferred through intermediate supports to the foundation footings. Typical support systems include steel lally columns (3-4 inches in diameter), solid wood posts, built-up wood girders or steel beams. Column spacing was typically 6-8 ft on center. The basement contained a mixture of steel columns and closely spaced round wooden posts, some of which appeared to function both as structural supports and wall framing members. Steel structural members, including lally columns commonly used as vertical load bearing supports in residential construction, are highly susceptible to strength degradation when exposed to sustained high heat.

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The first-floor assembly over the basement was a critical structural component in this incident. Typical floor joists used in residential construction from the 1950s include 2-inch x 8-inch (1.5-inch x 7.25-inch), 2-inch x 10-inch (1.5-inch x 9.25-inch), and 2-inch x 12-inch (1.5-inch x 11.25-inch). However, examination of the incident structure revealed that the floor system consisted primarily of 2-inch x 6-inch (1.5-inch x 5.25-inch) and 2-inch x 8-inch joists, with some members measuring less than the expected 1.5-inch thickness, in some cases closer to 1-inch. These smaller-than-normal dimensional members are not typical for floor systems spanning the distances observed in the structure and may indicate there were structural modifications, replacement materials, and non-standard milled lumber. The use of 2-inch x 6-inch joists spanning distances typically designed for larger dimensional members significantly reduces structural capacity, particularly under fire exposure. Joist spacing within the structure varied including 12 inches on center, 16 inches on center and 24 inches on center. This variation indicates inconsistent construction practices or later modification of the floor system. Typical spans range from 2 x 8-10 to 12 ft, 2 x 10-12 to 16 ft, and 2 x 12-16 to 20 ft.

Basement Conditions and Fuel Load

Evidence from the incident indicated that the basement area contained a large fuel load consisting of accumulated combustible materials, which is common in abandoned or unoccupied residential structures. Based upon the degradation and charring depth observed, the fire likely burned for an extended period before being detected. Consequently, the basement fire was able to grow and produce significant thermal exposure to unprotected structural members supporting the first-floor assembly. Extended burn time combined with high fuel loading resulted in the following:

- sustained flame impingement on structural members
- increased heat flux to floor joists and supporting beams, causing degradation and compromise of structural stability
- accelerated charring
- loss of structural cross-section
- significant structural degradation prior to fire department arrival.

These conditions significantly increased the risk of floor system collapse during fire suppression operations.

Fire Behavior

Several factors present in this incident likely accelerated structural degradation including:

- a large fuel load within the basement
- extended pre-suppression burn time
- high heat release rates
- direct flame impingement on floor joists
- undersized structural members spanning longer distances than typical design standards.

Solid-sawn lumber often exhibits predictable charring behavior when exposed to fire, with an average charring rate between 1.2 to 1.9 inches per hour when tested in ASTM E 119 fire resistance test furnace conditions [Babrauskas 2005]. As charring progressed, the effective cross-section of the joists decreased,

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resulting in reduced load-bearing capacity and eventual structural failure (see **Photo 5**). The area of collapse was completely consumed by fire, while surrounding joists exhibited significant charring and thermal degradation (see **Photo 6**). Given the large fuel load in the basement and extended pre-detection burn time, floor joists were likely exposed to direct flame impingement and sustained high heat energy for a prolonged period prior to suppression operations. These conditions likely resulted in a significant reduction in structural cross-section of joists, loss of load-bearing capacity, weakening of joist connections, and progressive structural failure leading to collapse. The Fire Safety Research Institute conducted basement fire experiments to determine times to floor collapse. The collapse times for nominal dimensioned 2 x 12-inch lumber, exposed to the fire was less than 13 minutes after ignition of the fuel in the basement [Kerber et al. 2012].



Photo 5 and 6: View of joist charring.
(Courtesy of the fire department)

During the post-incident assessment of the structure, several steel lally columns located in the basement were observed to have significant bowing and twisting deformation (see **Photo 7**). These conditions are consistent with loss of compressive strength in structural steel due to prolonged exposure to elevated temperatures during the fire event. As temperatures approach approximately 1,000°F (538°C), structural steel can lose roughly 50 percent of its load-bearing capacity, and as temperatures continue to rise toward 1,100-1,200°F, the material begins to experience substantial reductions in both yield strength and modulus of elasticity [AISC 2011]. Based on the fire conditions present in the basement area, it is likely that the compartment experienced significant heat buildup due to limited ventilation and the presence of combustible contents, allowing temperatures to increase rapidly. Fire dynamics within a confined

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basement environment often lead to heat accumulation at the ceiling level, with convective and radiant heat transfer affecting structural members over time.

As the fire progressed, the steel columns would have absorbed heat energy through convective and radiant heat from flame impingement and superheated gases, as well as conduction through connected structural elements. As the steel columns were exposed to elevated temperatures, the internal crystal structure of the metal began to change, causing thermal expansion followed by a progressive loss of tensile strength and stiffness. This weakening allowed the columns to deform under the existing structural loads they were designed to support. The observed bowing of the columns indicates compressive instability, where the steel members were no longer capable of supporting the vertical loads from the structure above. Additionally, the twisting deformation (**Photo 7**) suggests uneven heating and thermal expansion, likely caused by asymmetric fire exposure or varying heat intensities across the surface of the column. As portions of the steel heated more rapidly than others, differential expansion would have produced torsional stresses within the column, contributing to the twisting observed during the examination. These deformation patterns are consistent with heat-induced structural compromise, indicating that the basement compartment was subjected to temperatures sufficient to significantly reduce the load-bearing capacity of the steel support system. Once the tensile strength of the columns was reduced beyond their design limits, the structural members began to deform under load, leading to the visible bowing and twisting noted during the investigation. The condition of the lally columns provides important physical evidence supporting the conclusion that the basement fire produced sustained high-temperature conditions capable of impacting structural stability, and that the failure of these support elements was the result of thermal degradation of the steel rather than mechanical impact or pre-existing structural deficiencies.



Photo 7: Twisting of steel column.
(Courtesy of the fire department)

Incident Timeline

The following timeline is a summary of events that occurred as the incident evolved shortly after 03:44 hours on December 29, 2025. Not all incident events are included in this timeline. The approximate times are to the minute and were taken from the fire department's *National Emergency Response Information System* (NERIS) fire report, dispatch log, on-scene accountability documentation, and interview notes.

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Time	Fireground Operations, Response, and Details
December 29, 2025	
03:44 Hours	PSAP received a 911 call reporting a structure fire with visible smoke and flames. Caller stated they did not think anyone was inside.
03:45 Hours	Dispatch transmitted a low-rise alarm assignment for a residential structure fire. Pumpers 4, 11, 14, 18, 19, Quint 2, Truck 14, Rescue 6, Medics 2, 18, Battalion 1, and Shift Commander were dispatched and assigned radio channel tactical 1.
03:49 Hours	- Pumper 18 and Medic 18 arrived on scene. - Pumper 18 officer gave a size-up of a single-story wood frame with heavy fire on Sides Bravo and Charlie. He announced that they were stretching an attack line to attack the fire. He assumed command and requested the second arriving unit to establish a water supply.
03:50 Hours	- Pumper 14 arrived on scene and announced they were going to lay a supply line from the hydrant. They requested the police department be dispatched for traffic control to protect the supply line from traffic. - Pumper 18 officer reported that a 360 size-up was completed and that flames were showing from the Side Bravo garage door and the Side Alpha front door. He announced that they were going to make entry through the front door on Side Alpha. He reported that the front door was boarded up and the house looked abandoned. - Quint 2 arrived on scene and announced they would conduct a search. - Pumper 18 stretched a 1 ¾-inch attack line. - Pumper 18, Medic 18, and Quint 2 crews gathered at the front door. Quint 2 performed forcible entry on the front door.
03:52 Hours	- Pumper 11 arrived on scene and was assigned RIT. - Truck 14 arrived on scene and assigned ventilation. - Pumper 14 stretched a second 1 ¾-inch attack line to Side Bravo.
03:53 Hours	- Pumper 14 firefighter charged the hydrant and established the water supply to Pumper 18. - Pumpers 4 and 19 arrived on scene. - Pumper 14 officer reported heavy fire in the basement and that his crew were advancing a second line. He requested the attack line to be charged. - Rescue 6 and Shift Commander arrived on scene.
03:54 Hours	- Shift Commander requested a conditions, actions, needs (CAN) report from Pumper 18. - Quint 2 officer and his crew exited the Side Alpha door after feeling the floor move.

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Time	Fireground Operations, Response, and Details
	• Pumper 18 firefighter, Pumper 18 officer, and Medic 18 firefighter fell into the basement due to a partial floor collapse (no one was aware of the collapse at the time). • Pumper 18 officer declared a Mayday (transmission was unreadable, no one aware of the Mayday). • Second firefighter from Medic 18 exited Side Alpha door and verbally told crews in the area that the Pumper 18 crew fell through the floor.
03:55 Hours	• Shift Commander assumed IC and reported a single-story wood frame with heavy fire on Sides Alpha and Bravo. He requested Pumper 4 deploy a third attack line to Side Alpha. • Truck 14 officer reported he would cut a ventilation hole in the roof. • Pumper 18 officer transmitted a second Mayday message stating “Pumper 18, 1st floor, 1st floor” (message was unreadable). • Battalion 1 and Safety Officer arrived on scene and formed a command team.
03:56 Hours	• Medic 18 firefighter transmitted a Mayday, identifying himself. • IC acknowledged the Mayday, reported to Dispatch that he had a Mayday situation, and requested that they clear the airway. • IC transmitted a message to the Mayday firefighter (Medic 18), requesting him to repeat his message with no response. • IC transmitted a second request for the Mayday firefighter to repeat his message. • IC radioed Pumper 18 with no response.
03:57 Hours	• IC requested Dispatch identify which company was calling the Mayday. • Dispatch identified the Mayday as a crew member of Pumper 18 (there were two simultaneous Maydays declared at this time by Pumper 18 and Medic 18). • Pumper 14 officer reported that he found someone who was lost. • IC radioed to Pumper 18 with no response. • IC radioed Pumper 11. • Pumper 11 reported that they were RIT and making entry through basement. • Pumper 14 officer reported they located a downed firefighter (Pumper 18 firefighter) and were working to get them “un-trapped.”
03:58 Hours	• IC acknowledged that a downed firefighter was in the basement. • Dispatch automatically upgraded incident to a second alarm with Mayday. • Safety Officer repositioned up at the scene, radioed he was approaching Side Alpha, and reported that he would be rescue command (group supervisor). • Medic 18 firefighter (Mayday) transmitted an unreadable message on a different radio channel.
03:59 Hours	• IC requested a status on the Mayday firefighter.

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Time	Fireground Operations, Response, and Details
	- Quint 2 officer reported they were in the garage working on finding the downed firefighter. - Medic 2 arrived on scene. - IC requested a second alarm. - Dispatch acknowledged that the second alarm was dispatched.
04:00 Hours	- IC radioed to Pumper 18 with no response. - Battalion 1 radioed to Pumper 18 on the dispatch channel with no response. - Pumper 19 radioed to IC that they were down the street at a hydrant. - IC advised Pumper 19 that a second hydrant was not necessary and to come into the scene.
04:01 Hours	- IC requested an update from Safety Officer, who responded that Pumper 11 was inside attempting to rescue and that it was “unknown if they had made contact.” - Pumper 11 reported that they found one downed firefighter (Medic 18) and exited the structure.
04:02 Hours	- Safety Officer reported that the first downed firefighter was rescued from the structure. - IC acknowledged and announced that one firefighter was out of the structure and a personnel accountability report (PAR) was needed. - IC began PAR by calling Pumper 11.
04:03 Hours	- Safety Officer reported to IC that a firefighter from Medic 18 had been brought out. He reported that they were still looking for the other firefighter. - Pumper 11 responded to IC that they had “PAR x 3” and the second firefighter was removed (Pumper 18 firefighter and Pumper 18 officer). - IC acknowledged that the second firefighter was removed.
04:04 Hours	- Pumper 14 firefighter declared a Mayday. - IC requested Pumper 19 establish RIT again. - IC acknowledged the Mayday. - Pumper 14 firefighter stated he fell through a collapse hole close to the Side Bravo wall, his air was at 2,000 PSI, and he needed help. - IC reported another Mayday and requested Pumper 14’s location.
04:05 Hours	- Pumper 14 again reported that he fell through a collapse hole close to Side Bravo wall, his air was 2,000 PSI, and he needed help. - IC notified Dispatch that he needed an accountability check and started the PAR. - Pumper 14 officer acknowledged the PAR check and indicated he had two personnel, but the third firefighter was the second Mayday (Pumper 14 firefighter is the third Mayday).
04:06 Hours	IC requested two additional Medic units.

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Time	Fireground Operations, Response, and Details
04:07 Hours	- Pumper 14 firefighter (Mayday) reported someone hit him with a water stream “about twenty seconds ago.” - IC requested if anyone had located the downed firefighter from Pumper 14.
04:08 Hours	- Pumper 11 officer (RIT) reported Pumper 14 firefighter (Mayday) was out of the building. He requested the Mayday to be cleared and for EMS to report to Side Bravo. - IC radioed Pumper 14 firefighter, asking if he exited the structure. - Pumper 14 officer responded, advising he saw Pumper 14 firefighter outside of the structure. - IC acknowledged the Mayday was resolved, announced to evacuate the structure, and requested Dispatch to sound the evacuation tones. - Battalion 1 reported that they needed to restart the PAR and complete evacuation.
04:10 Hours	- Dispatch sounded the evacuation tones and repeated directions to evacuate the structure. - IC announced to all units to exit the structure immediately and perform defensive fire attack only. - Battalion 1 reported beginning the PAR. - IC advised Dispatch that they were doing a full PAR of all units on scene.
04:14 – 05:53 Hours	- All personnel had been evacuated from structure and PAR had been completed. - Pumper 18 firefighter, Pumper 18 officer, Medic 18 firefighter, and Pumper 14 firefighter were transported to the local hospital.
	Defensive operations continued until IC reported that the fire was out.

Personal Protective Equipment

At the time of the incident, all firefighters were wearing full structural firefighting turnout gear. The four injured firefighters were wearing NIOSH Approved® SCBA. No evidence was identified to suggest that the structural firefighting turnout gear or SCBA units contributed to the injuries.

Weather Conditions

At 03:54 hours, on December 29, 2025, the outdoor temperature was 14°F, dewpoint was 0°F, the wind was out of the Northwest at 19 mph, there had been no precipitation in the last 24 hours, and conditions were cloudy [Weather Underground 2025].

Investigation

At approximately 03:44 hours, the PSAP received a 911 call reporting a structure fire with visible smoke and flames. The caller did not believe anyone was in the structure. At 03:45 hours, a low-rise alarm was dispatched for a residential structure fire. Pumpers 4, 11, 14, 18, and 19; Quint 2; Truck 14; Rescue 6;

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Medics 2 and 18; Battalion 1; and the Shift Commander were dispatched and assigned to fire channel tactical 1.

At 03:49 hours, Pumper 18 and Medic 18 arrived on scene. Pumper 18 traveled up a long driveway and staged near the structure. Pumper 18 officer gave a size-up of a single-story wood frame structure with heavy fire showing from Sides Bravo and Charlie (**see Photo 8**). He reported Pumper 18 would be stretching an attack line and directed the second arriving unit (Pumper 14) to establish a water supply. He assigned the first truck to search operations. He announced that he would be completing a 360 size-up.



Photo 8: View of Side Bravo garage entrance, post-fire.
(Courtesy of the fire department)

Pumper 18 firefighter deployed a 200 ft 1 3/4-inch pre-connect attack line from a crosslay on the pumper's right side. She stretched the attack line up a moderately steep hill to Side Alpha. Heavy fire came out of a below grade garage and extended past the roof line. Medic 18 firefighters assisted Pumper 18 firefighter with flaking out the attack line. Quint 2 arrived on scene, announced they were search, and proceeded to Side Alpha. Pumper 14 arrived on scene and stopped at a hydrant to establish a water supply. They laid 300 ft of 5-inch supply line up the driveway, connected it to Pumper 18, and charged the hydrant. Pumper 18 officer began a 360 size-up, moving from Side Alpha to Side Delta. As he traveled to Side Charlie, he encountered heavy brush which impeded his path and prevented him from completing the 360 size-up. Pumper 18 officer reported the 360 size-up was complete, flames were showing from Side Bravo garage door as well as the Side Alpha front door. A ground-level grate covered a basement window on Side Alpha (**see Photo 9**). Pumper 18 officer may have seen fire venting from this window and believed it was coming from the front door.



Photo 9: Grate cover over basement window.
(Courtesy of the fire department)

Pumper 18 officer reported that the structure appeared to be abandoned and his crew was going to make entry through the front door. The front door was boarded up with a 2-inch x 4-inch piece of wood. No fire was present at the front door or on the first floor. Quint 2 firefighter along with a Medic 18

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firefighter began forcible entry. Pumper 18 firefighter, officer, two Medic 18 firefighters, and the crew of Quint 2 were positioned at the front door. At the same time, Pumper 14 officer deployed a 200 ft 1 ¾-inch pre-connect attack line from a second crosslay on the left side of Pumper 18. He stretched the attack line to the Side Bravo garage and reported heavy fire in the basement. He requested the attack line to be charged and extinguished the fire in the garage, advancing into the structure. Pumpers 11, 14 and Truck 14 arrived on scene. Pumper 11 was assigned RIT, and Truck 14 was assigned ventilation. Shortly after, Rescue 6 and the Shift Commander arrived on scene. Once the front door was forced open, Pumper 18 firefighter, followed by the Pumper 18 officer and a Medic 18 firefighter, entered and encountered thick smoke conditions with no visibility. The attack line was advanced toward the Side Bravo/Charlie corner of the room. The crew encountered furniture and debris with no clear path. Pumper 18 firefighter reached a couch on Side Charlie and climbed onto it, feeling the wall. At 03:54 hours, Pumper 18 officer heard a crack, and a portion of the floor collapsed (see **Photo 10 and Diagram 2**). Pumper 18 firefighter, Pumper 18 officer, and a Medic 18 firefighter fell into the basement and were covered by furniture and debris. They encountered elevated heat with no visibility.

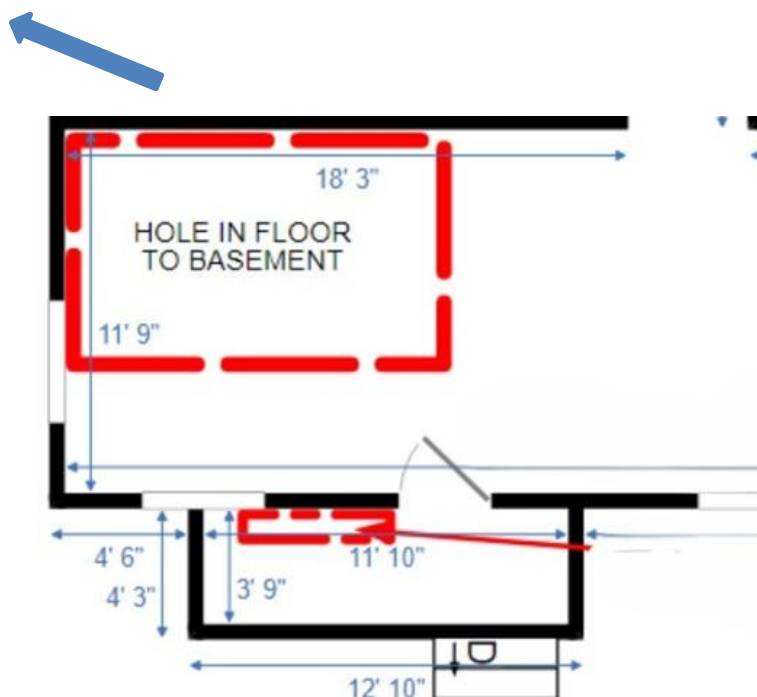


Photo 10 and Diagram 2: View of first floor collapse.
(Courtesy of the fire department)

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Quint 2 officer felt a shift in the floor, which became soft. He ordered all personnel at the front door to exit the structure. A Medic 18 firefighter who was positioned slightly inside the first floor felt a wave of heat and pressure. He verbally told other personnel with him that the Pumper 18 crew fell through the floor. Quint 2 officer and other first floor firefighters exited. The collapse was not reported over the radio.

Pumper 18 officer declared a Mayday (transmission unreadable, no one aware of the Mayday). Pumper 18 firefighter was in a kneeling position with her arms stretched out. Heavy furniture and debris trapped the lower portion of her legs (see **Photo 11**). She managed to move her arms slightly but could not reach her radio. She screamed, trying to alert personnel to her location. Pumper 18 officer was positioned behind her and tried to remove debris.

At about the same time as the collapse, the Shift Commander assumed IC and requested a CAN report from Pumper 18 officer. He reported a single-story, wood frame with heavy fire on Sides Alpha and Bravo. He ordered Pumper 4 to deploy a third attack line to Side Alpha. Pumper 4, located on the parkway, stretched a 2 ½-inch attack line from their pumper approximately 300 ft up the steep hill. Due to the difficulty advancing the attack line up the hill, it was abandoned. Truck 14 reported they were going to the roof to ventilate. Pumper 18 officer attempted to transmit a message reporting “first floor, first floor.” The message was unreadable and not acknowledged. Battalion 1 arrived on scene and joined the command team. As a Medic 18 firefighter attempted to gain composure and transmit a message, he realized his radio was off. He turned on the radio and declared a Mayday, identifying himself. IC acknowledged the Mayday and requested Dispatch to clear the airway. IC radioed Medic 18 and requested him to repeat his message, getting no response. IC sent a second request for Medic 18 to repeat his message, getting no response again. IC then tried to radio Pumper 18 and received no response. At this time, IC did not know who the Mayday was and requested Dispatch to identify the Mayday. Dispatch responded that the Mayday was a crew member of Pumper 18. There were two Maydays declared, one from Pumper 18 officer and the other from Medic 18 firefighter. Both were in the basement near each other. As Pumper 14 advanced the second attack line



Photo 11: View of area of collapse with debris.
(Courtesy of the fire department)

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into the basement (see **Photo 12 and 13**), he located a downed firefighter (Pumper 18 firefighter). IC tried again to radio Pumper 18 and did not get a response. IC radioed Pumper 11 with their officer responding that they were RIT and were making entry into the basement. Pumper 14 officer reported they had found the Pumper 18 firefighter and were working to get her “un-trapped.” IC acknowledged Pumper 14’s message and confirmed the firefighter was located in basement. Pumper 14 officer gave the attack line to a second member of Pumper 14, who continued to extinguish fire in the rear of the basement.



Photo 12 and 13: Basement with debris, post-fire.
(Courtesy of the fire department)

Dispatch upgraded the incident to a second alarm per their operating procedure. Safety Officer reported repositioning at the scene, approaching Side Alpha, and assuming rescue command. Medic 18 firefighter (Mayday) transmitted an unreadable message on a different radio channel. IC requested the status of the Mayday firefighter and tried to ascertain if they were out of the building. Quint 2 officer reported looking for the downed firefighter in the garage. IC requested a second alarm, and Dispatch confirmed the second alarm had already been dispatched. At 04:00 hours, IC radioed Pumper 18 and received no response. Battalion 1 radioed Pumper 18 and received no response. IC requested an update from Safety Officer, who responded that Pumper 11 was inside attempting a rescue, but it was unknown “if they had made contact.” Pumper 11 reported they found one downed firefighter and were exiting the structure. The rescued firefighter was identified as the Medic 18 firefighter. Safety Officer reported the first

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downed firefighter was rescued from the structure. IC acknowledged the message and requested a PAR, starting with Pumper 11.

At 04:03 hours, Safety Officer reported that a firefighter from Medic 18 had been removed from the structure and they were continuing to search for the remaining downed firefighters. Pumper 11 responded to IC that they had “PAR x 3” and the second firefighter was just removed. IC acknowledged the message. Pumper 14 firefighter, who was at the hydrant establishing a water supply, returned to the structure to look for his officer. He approached Side Alpha, moving to Side Delta, and was unable to locate him. He returned to Side Alpha and entered the front door. He encountered low visibility and fell into the collapse hole. He declared a Mayday, which was acknowledged with IC assigning Pumper 19 as a second RIT. Pumper 14 firefighter reported he fell through a hole close to the Side Bravo wall, his air was at 2,000 PSI, and he needed help. IC announced another Mayday and requested Pumper 14’s location. Pumper 14 firefighter acknowledged IC’s request, he repeated that he was close to the Side Bravo wall and his air was at 2,000 PSI.

IC notified Dispatch that he needed an accountability check and started the PAR. Pumper 14 officer acknowledged the PAR check and reported he had two personnel from the collapse, but the third firefighter was the third Mayday. Pumper 14 firefighter (Mayday) reported someone hit him with a water stream “about twenty seconds ago.” IC requested if anyone had located the downed firefighter from Pumper 14. At 04:07 hours, Pumper 11 officer reported Pumper 14 firefighter was out of the building, requested the Mayday to be cleared, and for EMS to report to Side Bravo. IC radioed Pumper 14 firefighter and asked if he had exited the building with Pumper 14 officer confirming that Pumper 14 firefighter was out of the structure.

IC acknowledged the Mayday was resolved. He requested all personnel to evacuate the structure and for Dispatch to sound the evacuation tones. Battalion 1 reported that they needed to restart the PAR, which was interrupted by Pumper 14 firefighter’s Mayday. Dispatch sounded the evacuation tones and repeated directions to evacuate the structure. IC repeated his message for all units to evacuate the structure immediately and perform defensive fire attack only. Battalion 1 announced beginning the PAR. IC advised Dispatch that he was doing a full PAR of all units on the scene. All personnel exited the structure, and the full PAR was completed. Pumper 18 firefighter, Pumper 18 officer, Medic 18 firefighter, and Pumper 14 firefighter were transported to the local hospital. From 04:10 to 05:53 hours, defensive operations continued. The incident was declared under control at 05:53. **Diagram 3** shows final apparatus placement at the incident.

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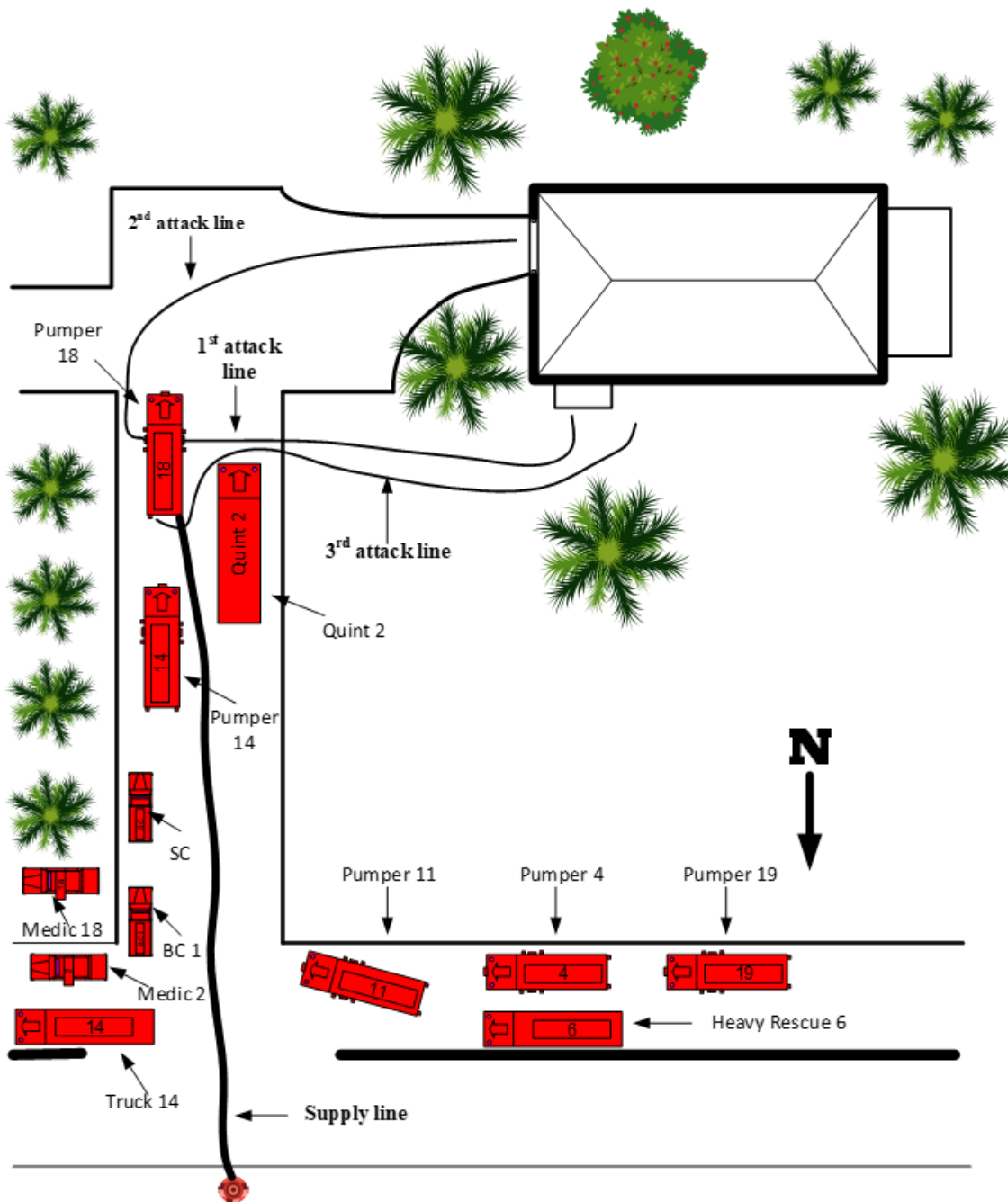


Diagram 3: Apparatus placement on scene.
(Courtesy of NIOSH)

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Fire Cause and Origin

The fire department's cause and origin investigation determined that the fire started in the below grade portion of the structure and was classified as incendiary.

Cause of Injuries

Pumper 18 firefighter sustained second degree burns to both wrists and forearms and third degree burns to the lower right leg. Pumper 18 officer sustained second degree burns to both wrists and a 50% medial collateral ligament tear. Medic 18 firefighter sustained second degree burns to the right arm as well as second and third degree burns to the right leg. Pumper 14 firefighter suffered second degree burns to both arms and a strained left shoulder.

Contributing Factors

Occupational injuries and fatalities are often the result of one or more contributing factors or key events in a larger sequence of events that ultimately result in injuries or fatalities. NIOSH investigators identified the following items as key contributing factors in this incident that ultimately led to the injuries:

1. Scene size-up and risk assessment
2. Basement/below grade fire
3. Abandoned/derelict/vacant building
4. Benchmarking of critical information
5. Proficient use of SCBA accessories
6. Mayday operations/firefighter survival
7. Personnel accountability system
8. Available personnel/adequate staffing

Recommendations

Recommendation #1: Fire departments should complete an initial scene size-up and risk assessment to inform a risk/benefit analysis.

Responding units faced two of the most dangerous types of structure fires. A below grade fire combined with an abandoned structure significantly raises the life safety risk to firefighters. The first arriving officer reported completion of a 360 size-up. Side Charlie gave no indication there was fire on the first floor, and Side Bravo had a garage opening showing significant fire conditions present throughout the entire basement. Accurate completion of the 360 size-up and risk assessment may have warned the officer of a significant below grade fire in the abandoned structure, allowing the IC to consider alternative tactical options.

An important duty of the first officer on scene is to conduct an initial size-up and risk assessment. This lays the foundation for the entire operation. A risk assessment can help determine whether a strategy should be offensive or defensive and help with tactics development to achieve the desired objective(s). Some primary considerations in conducting a size-up and risk assessment include fire department assets, life hazard, fire development (and forecasting), time of day, building type/occupancy, and building

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condition [NFPA 1700 2026; NIOSH 2025a]. Others include an evaluation of factors, such as fire size and location, length of time the fire has been burning, fuel load and presence of combustible or hazardous materials, exposures, and weather conditions. Information on the structure itself can affect whether an offensive or defensive strategy is employed. This includes size, construction type, age, condition (evidence of deterioration, weathering, etc.), evidence of renovations, lightweight construction, loads on roof and walls (air conditioning units, ventilation ductwork, utility entrances, etc.), and available pre-plan information [NIOSH 2009]. It is important to get fire department resources to Side Charlie as quickly as possible.

A 360 size-up is essential to determine the possible location of occupants, fire dynamics, and firefighter safety information [NFPA 1700 2026] and contributes to a complete risk assessment. The International Association of Fire Chiefs' *Rules of Engagement for Structural Firefighting* identify a rapid 360 size-up as the first priority for ICs. This size-up provides the IC and personnel knowledge of the building layout, construction, access/egress points, fire location and direction of spread, and obstacles or hazards [NIOSH 2025a].

Continuous communication supports effective risk assessments. Communication also supports awareness among the IC and all personnel operating at an incident of changing conditions and adjustments needed to avoid hazards or mitigate risks. A risk/benefit analysis uses hazard identification and situation assessment from the scene-size up to compare potential risks to benefits [NFPA 1670 2017]. ICs can use the results of this analysis to inform initial and ongoing actions [NIOSH 2025a]. A sound risk management plan ensures that risks are evaluated and matched with appropriate actions and conditions. NFPA 1550 [2024] states the IC should determine the life safety profile of the incident and level of risk consistent with the established principles. Risk management should follow these principles [NFPA 1550 2024]:

- Limit member risk to situations where there is potential to save endangered lives.
- Recognize routine activities that are utilized to protect property as potential risks to the safety of members. Limit, reduce, or avoid these risks when possible.
- No risk to members is acceptable when there is no possibility of saving lives or property.
- In situations where risk to fire department members is excessive, limit all activities to defensive operations.

Recommendation #2: Fire departments should ensure the first arriving firefighters choose initial and ongoing operational strategies based on the tactical considerations for basement and below grade fires.

Recognizing a below grade fire is essential to developing proper strategy and tactical objectives. There was indication of a significant fire in the basement. Below grade fires can be one of the most dangerous and challenging fires. Operating over a below grade fire exposes firefighters to intense heat and no visibility. To effectively suppress the fire, personnel must find access to the basement, which may cause a critical delay. As time progresses, the fire builds in intensity, exposing below grade structural components to intense heat and degradation which can cause a collapse. The most effective and safe

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tactical option is attacking the fire through a below grade opening or using external fire control from an opening to the basement area.

Between 1998 and 2017, NIOSH documented 24 below grade fires that resulted in 32 firefighter fatalities and 19 serious injuries. Typically, these cases involved firefighters falling through a wood floor assembly into a burning basement (as was the case in this incident) or firefighters being overwhelmed by high velocity hot gases flowing from the basement to an upper level [Madrzykowski and Weinschenk 2018]. Project Mayday conducted by Don Abbott reported that 20% of more than 2,700 career department Maydays and 24% of more than 1,900 volunteer department Maydays reported to the project involved firefighters falling into a basement [Project Mayday 2021].

Early identification of basements and their access points are critical during the initial on-scene size-up and a component of the 360 size-up. If the use of basements is a common component of building design within a particular community, then a basement should be considered as part of the scene size-up. The presence or lack of a basement must be communicated to everyone involved in the incident to minimize or eliminate the opportunity for fire crews to end up working above a basement without their knowledge. The immediate dangers include falling through the floor and working in the exhaust portion of a flow path [NIOSH 2025b].

If there is a chance of a basement fire, risk management decisions and tactics should reflect this scenario. These fires are low frequency/high risk events for several reasons. Below grade fires may be difficult to detect initially and access; require additional staffing for hoseline placement, operation, and ventilation; and firefighters may be working over the fire [NIOSH 2025b]. There is increased risk to firefighters due to:

- Limited entry and egress into a basement
- Unusual and/or unanticipated void spaces
- Working above the fire on potentially weakened floor joists and flooring materials
- Being caught in the fire's exhaust portion of the flow path
- Unknown and frequently excessive fire loading
- Restricted ventilation options
- Utility panels and meters plus connections
- Separate areas connected by non-fire stopped utility penetrations
- Hanging wires and ductwork
- Distribution of contents (e.g., furniture, appliances).

NFPA 1700 [2026] provides firefighters with building construction information, critical factors, observations, and science-based tactical considerations needed to develop the initial and ongoing operational strategies required for fire control based on occupancy type and structures with special circumstances. NFPA 1700 [2026] offers the following tactical considerations for basement fires:

- The position of the neutral plane at the first-floor entryway door of a building may indicate a basement fire.
- Sounding the floor and using thermal imagers are not reliable means of determining the structural integrity of the floor system, especially in buildings using lightweight construction materials.

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- When initiating fire control, firefighters should control the basement fire from an exterior opening on the same level as the fire.
- Any potential ventilation operations, including opening doors to the basement or breaking windows, should be performed in coordination with effective water on the fire.

Fire departments can integrate the fire-specific tactical considerations listed in NFPA 1700 into training and SOPs to aid in developing initial and ongoing operational strategies at structure fires.

Recommendation #3: Fire departments should develop and implement SOPs/SOGs for operating at abandoned, derelict, and vacant building fires.

This incident involved a known abandoned structure. These structures present significant life safety concerns caused by neglect, resulting in unstable structural components and unknown content. Many times, these structures may not have operating utilities and can be illegally occupied. The added life safety hazards associated with abandoned, derelict, and vacant buildings require added strategic and tactical decisions. A policy designed specifically for these added life safety hazards can provide personnel with additional strategic and tactical options when operating at these structures.

NFPA 1700 [2026] states that abandoned or vacant structures are often in an unknown state of condition or compromise, which could result in weakened structural components, holes in floors, and structural deficiencies. When controlling fires in these structures, a defensive strategy should be considered to avoid entry, and early collapse should be anticipated. Structural deficiencies in these buildings may result in unpredictable and increased fire activity [NFPA 1700 2026; USFA 2023].

NFPA 1700 [2026] offers the following tactical considerations for abandoned and vacant building fires:

- Exterior fire control should be considered prior to entry
- Early collapse should be anticipated
- Deteriorated and modified interiors can result in unpredictable and increased fire activity and may impede normal firefighting operations
- Occupancy by squatters and individuals experiencing homelessness should be considered; as such, an evaluation of occupant survivability and rescue potential should be made

Fire departments should develop fireground operations procedures that are clear and understood by all firefighters. Established procedures create better structure and accountability of actions during an incident. To ensure the proficiency and competency of fire department members, fire departments should conduct annual training and skills evaluations to verify firefighters understand the established fireground operations procedures. Proficiency training for fireground operations and emergency incidents should occur annually [NFPA 1400 2026].

Recommendation #4: Fire departments should educate personnel on use of radio communication processes for sharing critical information, such as conditions and actions.

Accurate and critical information was not communicated during this incident. Initially, there was communication that a 360 size-up was completed and the tactical decision was to make entry on the first

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floor. When the collapse occurred, personnel operating nearby on the first floor recognized it, but the critical information was not relayed or announced, delaying the deployment of essential resources and necessary tactical adjustments. Effective communication is essential for risk management and recognition of changing conditions. Command is strengthened when all vital information is provided, received, and comprehended by those involved.

Safety hazards, such as the deteriorating conditions in this incident, may dictate an immediate change in strategy and tactics to preserve life and safety [IFSTA 2015]. Consequently, firefighters on scene should immediately communicate safety hazards through the chain of command so they can be brought to the attention of those working in the hazard zone, IC, incident safety officer (ISO), and operations [NFPA 1550 2024]. Because the IC is located at the Command Post (outside the hazard zone), interior crews should communicate the interior conditions to the IC as soon as possible. Interior conditions can change the IC's strategy and incident action plan. Interior crews can aid the IC in this process by providing reports of the interior conditions as soon as they enter the fire building and by providing regular updates, especially when benchmarks are met (e.g., "primary search complete, all clear," "the fire has been knocked down," or "water on the fire").

Communication of critical incident factors and their possible consequences offer the basis for a standard incident management approach. A standard incident management approach is the launching pad for effective incident decision making and operational performance. ICs should use the critical factors in their order of importance as the basis for making the specific assignments in the incident action plan. ICs should not assume that the action-oriented responders engaged in operational activities will stop what they are doing so they can feed the IC with a continuous supply of objective information. It is the IC's responsibility to do what is required to stay informed [NFPA 1561 2020; NIOSH 2025c].

In terms of task-level management, fire departments should develop communication plans specifying how to share critical information on a fire scene. When firefighters report hazardous conditions, the division/group supervisor should relay this information to operations and the IC to document tactical decisions and objectives. Division/group supervisors can provide the best assessment of hazard zone conditions for the IC and provide ongoing CAN reports. It is important to have visual observation of all four sides and the interior of an incident to influence the incident action plan. Without observations and CAN reports, the IC has limited information to make decisions [NIOSH 2025c].

Recommendation #5: Fire departments should ensure all fire officers and firefighters are properly trained in the use of SCBA accessories, such as radio interface communication capabilities.

During this incident, the fire department used SCBA with a two-way radio voice communication system that used Bluetooth technology. This SCBA accessory was only being trialed and utilized by some companies, such as Pumper 18. Only companies trialing the accessory were trained in its operation. Pumper 18 officer was serving as an acting officer from a company that was not participating in the accessory trial.

SCBA manufacturers offer many accessories with their units, such as telemetry and monitoring systems, personnel location systems, and emergency egress systems for bailout. These also include

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communication capabilities, such as radio interfaces [NFPA 1850 2026]. The accessory used in this incident allows firefighters to transmit keyed on-air communications wirelessly using Bluetooth technology from the SCBA through the portable radio. The SCBA regulator contains two microphones and noise canceling technology [MSA 2015]. This provides an alternative to a firefighter physically bringing the portable radio's remote speaker microphone within hearing distance of the SCBA voice amplifier to transmit a message. The use of this accessory requires a Bluetooth pairing process to ensure a connection between the portable radio and SCBA. The manufacturer offers a radio pairing guide for fire departments which includes troubleshooting information [MSA 2019].

Repetitive skills training with an SCBA is vital for the safety of firefighters working inside an immediately dangerous to life and health (IDLH) environment [NIOSH 2025a]. NFPA 1400 [2026] requires fire departments to maintain a respiratory protection training program to ensure firefighters are trained on how to use an SCBA. This training includes understanding the components of an SCBA, its safety features and limitations, and techniques for use in an emergency. This program also includes practical application training to evaluate the ability of firefighters to demonstrate knowledge and use of an SCBA [NFPA 1400 2026]. Use of SCBA accessories, including radio interface communication capabilities, should be integrated into regular training for firefighters. This should include understanding how to perform the pairing process between the portable radio and SCBA as well as troubleshooting. Firefighters should not use SCBA accessories in an IDLH environment until they are trained and proficient in their use. At this incident, it is believed that the portable radio and SCBA used by Pumper 18 officer were not paired. The computer-aided dispatch system recorded two transmissions from Pumper 18 officer, but they were unreadable.

Recommendation #6: Fire departments should ensure all fire officers and firefighters are trained in Mayday operations and survival.

The floor collapse involved three personnel, with a fourth firefighter falling into the hole 10 minutes later. There were two unreadable transmissions from Pumper 18 officer declaring a Mayday. The third Mayday announcement came from Medic 18 firefighter. He identified himself but gave no indication of the collapse and his location. There was no information provided in the Maydays identifying the cause or location of the injured and trapped personnel. Resources and tactical decisions are made by the information provided by the personnel involved in the critical event. The IC's decisions were hindered and delayed by the lack of information. The first indication of the collapse and Maydays were the screams of Pumper 18 firefighter, which were heard by Pumper 14 crew. No radio transmissions were made providing an update of critical information.

Firefighters should be trained and have confidence in how to call a Mayday when in danger [IAFF 2020]. Any delay in calling a Mayday reduces the chance of survival and increases the risk to other firefighters trying to rescue the downed firefighter. When a Mayday is transmitted, ICs have a narrow window of opportunity to locate the lost, trapped, or injured member(s) and may need to restructure the strategy and tactics to include a priority rescue [NFPA 1550 2024]. A Mayday tactical worksheet can serve as a tailored guide to any fire department's Mayday procedures. It can remind the IC to prompt the firefighter to activate their emergency alert button for priority radio transmissions and their personal alert safety system. It also prompts collection of other important items such as air status and location

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information. This Mayday section is located on the back of a tactical worksheet to assist ICs in ensuring the necessary steps are taken to clear the Mayday as quickly and safely as possible. This process is too important to operate from memory and risk missing a vital step that could jeopardize the outcome of the rescue of a firefighter who is missing, trapped, or injured [IAFF 2020; NIOSH 2025c].

Recommendation #7: Fire departments should use a personnel accountability system to identify the location and function of all operating personnel.

At this incident, the fire department used an accountability passport system to track personnel. Pumper 11 officer (RIT) was designated to retrieve the accountability passports from each unit during the incident. As he was collecting passports, the Mayday was transmitted and he joined the RIT, making entry into the basement. Not all passports were collected, leaving the accountability system incomplete.

A personnel accountability system is a system that identifies the location and function of all members operating at an incident scene [NFPA 1550 2024]. This system is activated during an incident to collect and maintain the status and location of personnel that may be working in an IDLH environment. All personnel operating at an incident are responsible for understanding and participating in this system. The IC is responsible for all personnel but may delegate certain responsibilities to another person, such as the accountability officer. An integral part of the accountability system is to make sure that the firefighters who are assigned and operating in the hazard zone are accounted for throughout the entire incident. A properly initiated and enforced personnel accountability system can improve firefighter safety and survival [NIOSH 2024]. A functional personnel accountability system can identify [NIOSH 2025d]:

- Members operating in the hazard zone
- Where members are in the hazard zone
- Conditions in the hazard zone
- Actions used in the hazard zone
- Paths of access and egress in and out (i.e., exits) of the hazard zone
- Rapid intervention teams/crews and their assignments

Different methods and tools are available for resource accountability, including [NIOSH 2025d]:

- Tactical worksheets
- Command boards
- Company responding boards
- Electronic bar-coding systems
- Accountability passports or keys

Completion of personnel accountability can be assigned to an accountability officer by the IC. Functions of the staff aide include maintaining the tactical worksheet; maintaining personnel accountability of all members operating at the incident (resource status and situation status); monitoring radio communications on the dispatch and operations channels; control information flow; and accessing reference material and pre-incident plans. Some fire departments use firefighters as staff aides and other fire departments use fire officers to serve as a staff aide for a command officer. This position can be

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appointed, or fire departments can consider increasing staffing to fulfill this position [NIOSH 2016; NIOSH 2025d].

Recommendation #8: Fire departments should ensure that adequate staffing is available to respond to emergency incidents.

At this incident, the second arriving unit (Pumper 14) stopped at a hydrant and left a firefighter to connect the supply line to the hydrant. Pumper 14 then traveled up the driveway to Pumper 18 and laid the supply line. The driver disconnected the supply line from Pumper 14 and connected it to Pumper 18's intake. Pumper 14's officer stretched the second attack line alone and extinguished the heavy fire conditions, making entry into the basement. After connecting the supply line to Pumper 18, the driver had to don his structural firefighting turnout gear and SCBA, which caused a delay in staffing the second attack line. Staffing pumpers with four personnel, per NFPA 1750 [2026], may have allowed for a second firefighter to be prepared to assist in advancing the second attack line.

NFPA 1750 [2026] states that the number of on-duty fire suppression members should be sufficient to perform the necessary firefighting operations given the expected firefighting conditions. It further states that the number of personnel should be determined through task analyses that take the following factors into consideration [NFPA 1750 2026]:

- Life hazard to the populace protected as well as potential property loss.
- Provisions of safe and effective firefighting performance conditions for the firefighters.
- Nature, configuration, hazards, and available internal protection of the properties involved.
- Types of fireground tactics and evolutions employed as standard procedure, type of apparatus used, and results expected to be obtained at the fire scene.

Adequate staffing is necessary to meet the needs of the community and ensure safe, effective, and efficient emergency operations. NFPA 1750 [2026] states that both engine and truck companies should be staffed with a minimum of four on-duty personnel. These numbers ensure that all primary functions of these companies can be completed without resource strain such as pumping and delivering water, basic firefighting, search and rescue, forcible entry, overhaul and salvage work. In terms of deployment, NFPA 1750 states that an initial full alarm assignment to a structure fire in a low-hazard occupancy should contain a total response force of a minimum of 20 members. These numbers include the provision of an IC with an aide, a rapid intervention crew/team, ISO, and initial emergency medical support and transport [NFPA 1750 2026].

Post-Incident Fire Department Prevention Actions

After this incident, the fire department implemented changes to incident response and fireground operations. These changes were based on the department's critique of the incident on December 29, 2025.

- **Adjusted response assignment:**

The low-rise alarm assignment adds one additional battalion chief assigned as the incident's accountability officer to maintain crew integrity. The additional arriving safety officer assumes

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the role of staging area manager. The fourth, fifth pumpers and third truck will standby in staging.

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Four Career Firefighters Injured from a Floor Collapse in an Abandoned Residential Structure Fire – Kansas

Investigator Information

Incident investigators and report authors were Louis (Rick) Lago, Investigator, and Dr. Wesley R. Attwood, Senior Investigator, with the Fire Fighter Fatality Investigation and Prevention Program, Surveillance and Field Investigations Branch, Division of Safety Research, NIOSH. Tristan Tricarico Captain, Unit Commander Rescue 1, Baltimore City Fire Department, MD, provided a subject matter expert review of the investigation report. Douglas Cline, Assistant Chief, Horry County Fire Rescue, SC, provided an assessment of the building construction and fire behavior sections as well as a subject matter expert review of the report. Dan Madrzykowski from the Fire Safety Research Institute, part of the UL Research Institutes, provided an expert review of the investigation report. The Kansas State Fire Marshal's Office provided a state partner review of the investigation report.

Additional Information

NFPA 1700, Guide for Structural Fire Fighting (2026 edition)

NFPA 1700, *Guide for Structural Fire Fighting*, 2026 edition, is the first NFPA document connecting fire dynamics research and its application to strategy, tactics, and best practices for firefighters in controlling fires within a structure.

Underwriters Laboratories (UL)

The Fire Safety Research Institute (FSRI), part of the UL Research Institutes, continues to work with fire departments and fire service organizations to conduct research on fire dynamics, fire safety issues, and fire ground operations. Understanding and Fighting Basement Fires (free online course) examines the dynamics of below-grade fires and explores the most effective research-based tactics for fighting residential basement fires. The course can be accessed here:

<https://training.fsri.org/course/83/understanding-and-fighting-basement-fires>

Disclaimer

The information in this report is based upon dispatch records, audio recordings, witness statements, and other information that was made available to the National Institute for Occupational Safety and Health (NIOSH). Information gathered from witnesses may be affected by recall bias. The facts, contributing factors, and recommendations contained in this report are based on the totality of the information gathered during the investigation process. This report was prepared after the event occurred, includes information from appropriate subject matter experts, and is not intended to place blame on those involved in the incident. Mention of any company or product does not constitute endorsement by NIOSH, Centers for Disease Control and Prevention (CDC). In addition, citations to websites external to NIOSH do not constitute NIOSH endorsement of the sponsoring organizations or their programs or products. Furthermore, NIOSH is not responsible for the content of these websites. All web addresses referenced in this document were accessible as of the publication date. *NIOSH Approved is a certification mark of the U.S. Department of Health and Human Services (HHS) registered in the United States and several international jurisdictions.*