

LINE OF DUTY DEATH REPORT

REPORT F2023-09 • September 2024

1000 FREDERICK LANE, MORGANTOWN, WV 26508 • 304.285.5916

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

Executive Summary

On June 27, 2023, a 25-year-old career navy civilian firefighter died after falling into a basement at a residential structure fire. The firefighter, who was the acting officer of Engine 132, was operating an attack line when he fell into the basement inside the front door. Engine 132 responded with automatic mutual aid to Box 119 from the local naval base fire department. At approximately 0400 hours three occupants were awakened to noise and smoke conditions inside the home and self-evacuated to a neighbor's house across the street. During self-evacuation, the monitored fire alarm in the home activated and notified the local public safety answering point (PSAP) at 0404 hours. The fire alarm notification was followed by a 9-1-1 call at 0405 hours from the neighbors across the street reporting the house was on fire. The PSAP was in the process of



A view of the structure from side Alpha after the fire was knocked down.

(Photo courtesy of Fire Marshals Office)

initiating the fire alarm response when the incident was upgraded to a structure fire. Box 119 was dispatched for a residential structure fire at 0406 hours. Engine 1 (PAR 5), Truck 1 (PAR 5), and automatic-aid departments included Tanker 6 (PAR 4), Tanker 3 (PAR 2), Squad 3 (PAR 5), Engine 132 (PAR 4), Truck 13 (PAR 4), Engine 9 (PAR 4), Engine 6 (PAR 3), Engine 7 (PAR 4), Tanker 7 (PAR 6), and Water Supply 5 (PAR 4) were dispatched to Box 119. As responding apparatus were enroute the county fire dispatcher notified Chief 1 (C1), who was enroute to the scene, that several calls had been received indicating a working fire. C1 identified the primary hydrant to be used as a water source due to the home being located in a non hydranted area. At 0415 hours, C1 arrived on scene and provided a building description to indicate a two-story single family, Type V structure, assumed Incident Command (IC) on side Alpha, and began a scene size-up. IC reported a working fire on floors one and two and that a 360-degree walkaround report would follow. At 0416 hours, IC advised the county fire dispatcher and incoming fire apparatus the size-up

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

was complete. The size-up revealed three stories on side Charlie with a walk out basement. IC ordered Engine 1 to forward lay a supply line from the end of the driveway at the street and position on side Alpha out of the way of the responding truck company. At approximately 0418 hours, Engine 1 arrived and laid a dry four-inch supply line down the driveway and positioned on side Alpha. The crew of Engine 1 deployed a 200' 1¾-inch attack line to the front porch. Upon arrival, Engine 132 positioned on the street and deployed a portable dump tank for drafting operations. The acting officer (deceased firefighter) of Engine 132 reported to the command post in the yard on side Alpha. Engine 132 was assigned to Chief 3B, the Division 1 supervisor. Engine 132 was assigned to stretch a second 200' 1¾-inch attack line to the front porch. Both 1¾-inch attack lines were operated in a transitional mode from the front porch prior to making an offensive interior attack. At approximately 0425 hours, two firefighters from Engine 132 advanced their 1¾-inch attack line through a first-floor window to the left of the front door. The Engine 132 officer took the other attack line from an Engine 1 firefighter and entered through the front door. At 0426 hours, emergency traffic was transmitted from the safety officer Chief 9B on the tactical channel that the second floor collapsed on side Charlie. IC requested the county fire dispatcher to transmit the evacuation tone. A Mayday was declared at 0427 hours by Chief 7A reporting a missing firefighter on the first floor who had possibly fallen into the basement. The IC moved the fireground operations communications to ALPHA 4 and assigned Chief 6 to oversee the fireground operations while the IC maintained the Mayday on ALPHA 3. The Rapid Intervention Team (RIT) from Engine 6 was deployed to the front porch while IC announced a defensive strategy on ALPHA 3. C7A confirmed that the missing firefighter was Engine 132's company officer at 0428 hours. After several attempts to rescue the Engine 132 company officer, the strategy was changed from a rescue operation to recovery. Engine 132's company officer was removed from the structure at approximately 0616 hours and transported by an advanced life support (ALS) ambulance to a local hospital where he was pronounced deceased.

Contributing Factors

- *Compromised situational awareness*
- *Ineffective risk/benefit analysis and scene size-up*
- *Ineffective use of appropriate strategy and tactics*
- *Ineffective professional development*
- *Lack of ongoing crew integrity*
- *Lack of information shared from 9-1-1 caller to responding units*

Key Recommendations

- *Support the development and maintenance of effective situational awareness during emergency incidents*
- *Incident commanders should define their fireground strategy, tactics, and goals based upon a risk/benefit analysis and a detailed scene size-up to include known risk, building type and era, smoke conditions, hazardous energy, and capabilities of on-scene resources*

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

- *Fire departments can develop policies to aid in the selection of the appropriate strategy and tactics for offensive, defensive, and transitional attacks*
- *Fire departments should develop and implement a professional development plan to ensure all personnel receive technical and academic competencies relative to the roles personnel are expected to perform on emergency scenes*
- *Incident commanders and company officers should ensure that crew integrity is properly maintained by visual, direct, or verbal (voice or radio) contact when operating in an immediately dangerous to life and health (IDLH) atmosphere*
- *PSAP's should ensure that all information received from 9-1-1 callers is clearly understood and relayed to responding emergency personnel in as close to real time as possible*

The National Institute for Occupational Safety and Health (NIOSH) initiated the Fire Fighter Fatality Investigation and Prevention Program to examine deaths of firefighters in the line of duty so that fire departments, firefighters, 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. 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.

For further information, visit the [program Web site](http://www.cdc.gov/niosh/fire) at www.cdc.gov/niosh/fire or call toll free 1-800-CDC-INFO (1-800-232-4636).

LINE OF DUTY DEATH REPORT

REPORT F2023-09 • September 2024

1000 FREDERICK LANE, MORGANTOWN, WV 26508 • 304.285.5916

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

Introduction

On June 27, 2023, a 25-year-old career firefighter with approximately nine years of experience died while engaged in an offensive/interior fire attack at a single-family, two-story, wood frame structure fire. On June 28, 2023, the U.S. Fire Administration notified the National Institute for Occupational Safety and Health (NIOSH) of this incident. On August 6-14, 2023, two investigators from the NIOSH Fire Fighter Fatality Investigation and Prevention Program (FFFIPP) traveled to Maryland to investigate this incident. The NIOSH investigators met with the state fire marshal office, fire chiefs of responding fire departments, and conducted interviews with fire officers and firefighters that responded to Box 119. NIOSH investigators also met with local officials, the director of the Emergency Communications Center, and the county's building and zoning office. NIOSH investigators inspected and photographed the deceased's personal protective clothing and the self-contained breathing apparatus (SCBA). NIOSH investigators also reviewed the training records of specific personnel involved in the incident and reviewed the department's standard operating procedures (SOP) and professional development model.

Fire Department

The deceased firefighter was part of a career military fire department that has three stations with 62 uniformed members which serve a population of approximately 25,000 within a 23 square mile area. The fire department is managed by the Department of Defense Fire and Emergency Services and is in a geographical region consisting of seven other facilities. Each fire department within the region is supervised by a district chief who serves as the fire chief of the installation. Both military and civilian employees are employed within the Department of Defense Fire and Emergency Services.

The area served by the department consists of varying structures and occupancy types including 24-hour airport operations. The department is surrounded by local volunteer fire departments and preestablished automatic-aid agreements are in place allowing for cross boundary responses. The fire department provides structural fire and aircraft rescue firefighting services, hazardous material response, technical rescue, and emergency medical services (EMS).

All department members work a 48-hour duty shift with 72 hours off, and department members may be assigned to a fire apparatus or aircraft rescue firefighting apparatus. The on-duty battalion chief oversees the staffing and maintenance of two engine companies, one aerial ladder, two foam aircraft

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

units, one hazardous materials unit, one brush unit, and two advanced life support ambulances operating out of three separate firehouses.

Training, Education, and Professional Development

The deceased Engine 132 company officer held the rank of firefighter within the career military department and was also a volunteer firefighter at a local volunteer fire company since the age of 16. The deceased firefighter was responding on an automatic mutual-aid engine company from the military fire department into the district where he served as a volunteer firefighter. The minimum hiring qualifications for a career position within the department include national certification in Firefighter I and II, National Registry Emergency Medical Technician, and Hazardous Material Operations Level. Qualifications for firefighters is largely left to the authority having jurisdiction with certifiable courses available through MFRI.

The deceased firefighter had received Pro Board certifications in various classes to include Firefighter I and II, Airport Firefighter, Driver/Operator of Aircraft Rescue and Fire-Fighting (ARFF) Apparatus, and Driver/Operator of Fire Apparatus Equipped with an Aerial Device. Training transcripts from Maryland Fire/Rescue Institute (MFRI) confirm various certifications in hazardous materials, technical rescue, and fire service instructor levels. Department training records confirm that the deceased had completed the department's internal professional development workbook demonstrating his knowledge, skill, and ability for Driver/Operator, Driver/Operator Aerial, ARFF unit check off, and Brush unit check off since being hired in 2019.

Apparatus, Staffing, and Communications

The minimum daily staffing of the military fire department is comprised of two engine companies (minimum of four personnel), one truck company (minimum of four personnel), two aircraft rescue firefighting apparatus (minimum of three personnel), and two ambulances. Emergency calls are received into a regional dispatch and communications center. The department utilizes an 800-megahertz (MHz) radio system for communications and response. When responding outside the department's boundaries for both mutual and automatic aid responses the department must utilize a separate 800 MHz communications system which is maintained by a local county government PSAP. When a request for mutual or automatic aid service is received, the department is dispatched by the local county government PSAP followed by a phone call to the regional 9-1-1 communications center. The department has two apparatus that can respond to off base structure fire responses. Portable radios are provided to each riding position on the fire apparatus for each 800 MHz system. No formal or integrated mobile-data-terminals (MDT) are incorporated into the fire apparatus or command vehicles. A third-party notification system is widely used within the area to assist with dispatch location, information, and situational updates.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

Table 1: Initial Assignment for Box 119

Resource Designation	Staffing Level
Engine 1	5 personnel
Truck 1	5 personnel
Tanker 6 (automatic aid)	4 personnel
Tanker 3 (automatic aid)	2 personnel
Squad 3 (automatic aid)	5 personnel
Engine 132 (automatic aid)	4 personnel
Truck 13 (automatic aid)	4 personnel
Engine 9 (automatic aid)	4 personnel
Engine 6 (automatic aid)	3 personnel
Engine 7 (automatic aid)	4 personnel
Tanker 7 (automatic aid)	6 personnel
Water Supply 5 (automatic aid)	4 personnel

Table 2: Responding Chief Staff

Resource Designation	Assigned Role at Incident Scene
Chief 1	Incident Commander
Chief 3B (automatic aid)	Division 1 Supervisor
Chief 6 (automatic aid)	Incident Command Team
Chief 7A (automatic aid)	Mayday Group Supervisor
Chief 9B (automatic aid)	Safety Officer

Personal Protective Equipment

Upon arrival at the scene and during the collapse, the deceased firefighter was wearing his department issued turnout coat and pants, gloves, hood, helmet, and boots that met the current requirements of NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting* (NFPA 1971, 2018). The SCBA with an integrated personal alert safety system (PASS) device was certified to the 2013 edition of NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services* (NFPA 1981, 2013). The deceased firefighter was wearing nighttime sleep wear consisting of a fire department t-shirt and fire department athletic shorts underneath his gear. He also carried a portable radio and flashlight.

NIOSH investigators examined and photographed the nighttime sleep wear and personal protective clothing at the local office of the Maryland State Fire Marshal. Upon visual inspection of the personal protective equipment (PPE), extensive thermal degradation was noted to the turnout pants and coat both on the outer shell and moisture barriers. The protective hood, SCBA facepiece, and boots suffered extensive thermal degradation as well.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

Although the PPE suffered extensive thermal degradation from being exposed to fire conditions during the prolonged rescue/recovery operation, exceeding its capabilities, the PPE is not considered to be a contributing factor in this incident.

Weather and Road Conditions

The weather on June 27, 2023, at 0404 hours involved light rain and reported isolated thunderstorms with cloud to ground lightning. The temperature was 66°F with winds SE at 1 mph gusting to 1.4 mph. The humidity was 98% with 0.07 inches of precipitation recorded (Weather Underground, 2023).

Structure

This single-family non-sprinkled residential structure was situated on a four-acre lot with no fire hydrant availability within the community. The local government zoning office listed the structure as a 1,285 square foot main floor, the second floor as 1,115 square feet, with a 400 square foot attached garage. The basement covered the entire structure except for the attached garage. (see Photo 1)



Photo 1. Aerial view of structure
(Courtesy of Google Earth)

This wood-framed single-family residential structure was built in 1997, with a vinyl siding exterior with masonry basement walls, wood 1st and 2nd floor joist, 2x4 stud walls, and common drywall interior covering. The sloping roof structure was constructed of wood rafters with wood roof decking covered in asphalt shingles. For the purposes of this report, side Delta is orientated to the north followed by side Alpha to the east, side Bravo to the south, and side Charlie to the west. The fire structure had been demolished and excavated prior to the arrival of NIOSH Investigators. All diagrams and descriptions provided in this report are not to scale and based on scene photographs.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

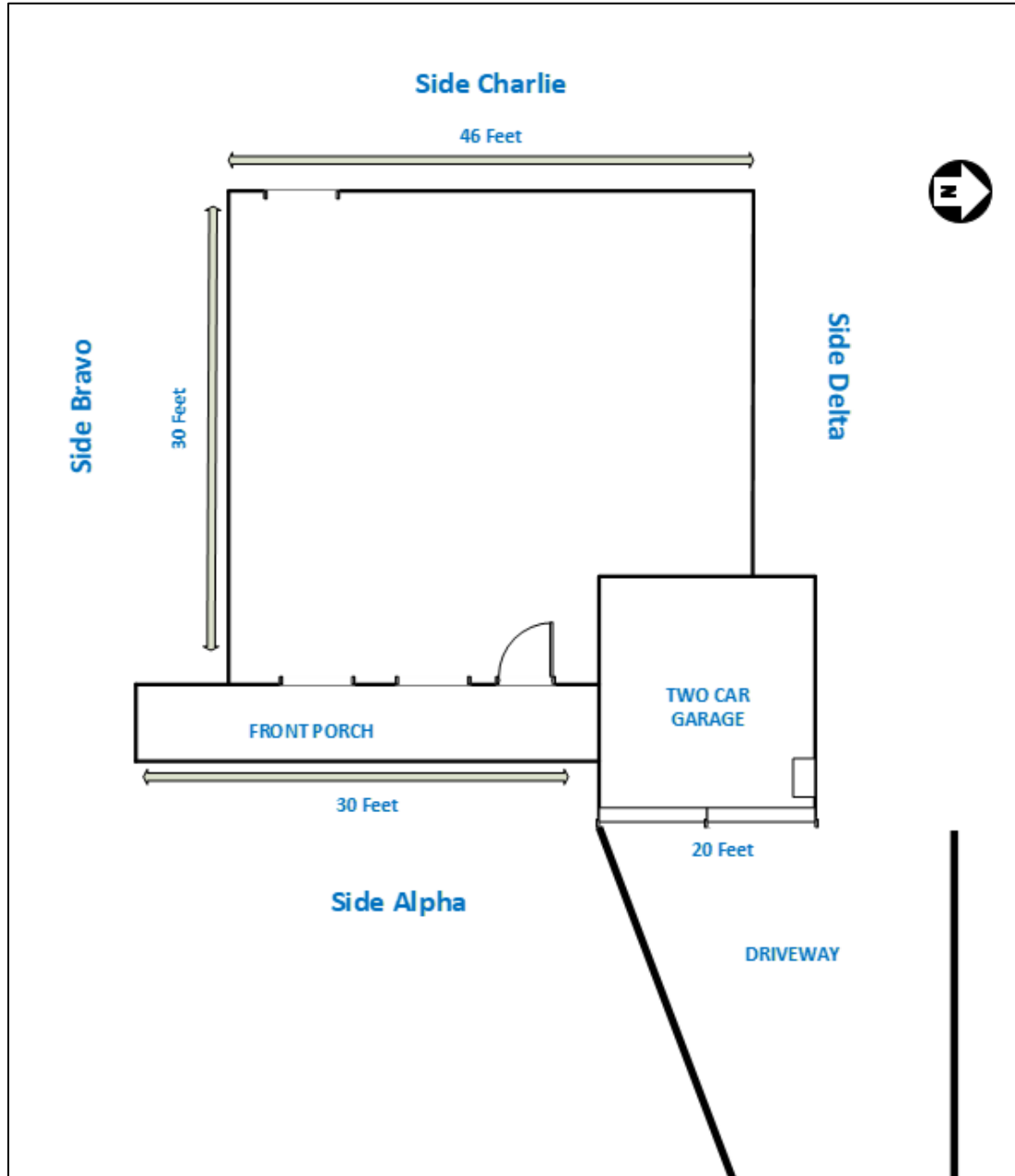


Diagram 1. Diagram of the 1st floor
(Courtesy of: NIOSH)

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

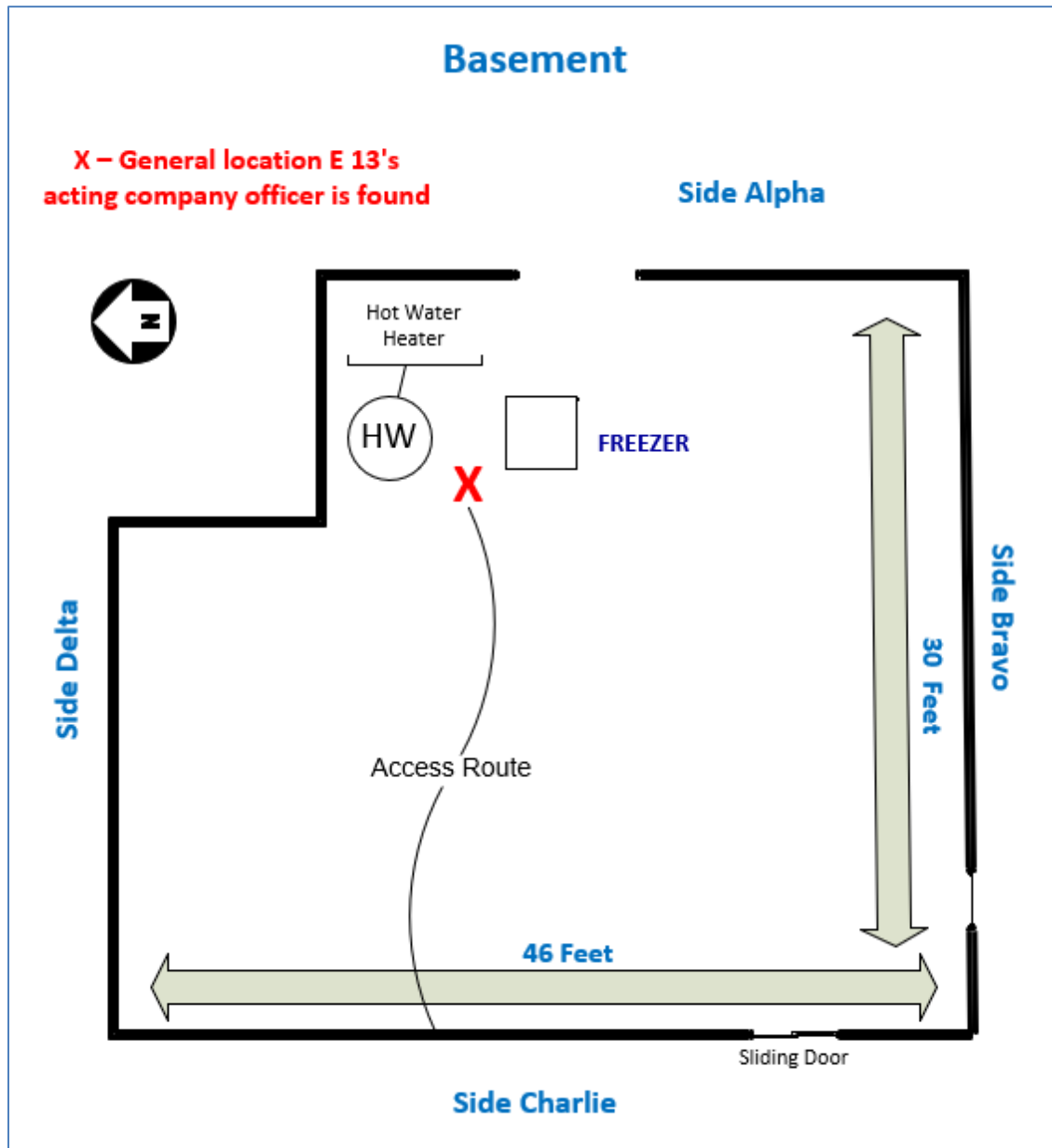


Diagram 2. Diagram of the Basement
(Courtesy of: NIOSH)

Timeline

The following timeline is a summary of events that occurred as the incident evolved. Not all incident events are included in this timeline. The times are approximate and were obtained by examining the dispatch records, audio recordings, witness statements, and other available information. All times are approximate and rounded to the closest minute. The timeline is not intended, nor should it be used, as a formal record of events.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

Time (hours)	Fireground Operations, Response, and Details
0404	<ul style="list-style-type: none"> • PSAP case created and unit recommendations for fire alarm response initiated <ul style="list-style-type: none"> ○ Alarm company notified local PSAP of residential fire alarm “Smoke detector alarm in main hall and 2nd floor”
0405	<ul style="list-style-type: none"> • PSAP changes response from fire alarm to structure fire <ul style="list-style-type: none"> ○ Neighbor calls 9-1-1 advising “house on fire across the street and everyone is out of the residence”
0406	<ul style="list-style-type: none"> • E1, T1, TA6, TA3, SQ3, E132, T13, E9, TA7, WS5 dispatched for a “Rural water supply box alarm”
0409	<ul style="list-style-type: none"> • Third 9-1-1 call from neighbor “believes everyone is out of the house”
0415	<ul style="list-style-type: none"> • C1 on the scene - Command assumed, 360-walkaround in progress <ul style="list-style-type: none"> ○ Fire showing on first and second floor
0416	<ul style="list-style-type: none"> • IC 360 report complete <ul style="list-style-type: none"> ○ Three stories in the rear with heavy fire, walkout basement access side Charlie
0418	<ul style="list-style-type: none"> • E1 lays supply line from the end of the driveway and stretches one 1¾-inch attack line to side Alpha leaving room for T1 to position • Transitional fire attack of floors one, two, and side Alpha porch
0419	<ul style="list-style-type: none"> • T1 arrives on-scene and positions in the driveway side Alpha <ul style="list-style-type: none"> ○ Deploys two ground ladders to second floor side Alpha to assist E1 with fire attack
No Time Stamp 0419-0421	<ul style="list-style-type: none"> • E132 on-scene and positions on the road at the driveway • Crew deploys a 1¾-inch attack line to side Alpha from E1 focusing on exterior windows to the left of front door – E132 company officer reports to the first deployed 1¾-inch attack line with E1 to the front door. <ul style="list-style-type: none"> ○ Heavy fire is present throughout first and second floors
	<ul style="list-style-type: none"> • TA6 arrived and assigned RIT <ul style="list-style-type: none"> ○ TA6 apparatus operator assist with water relay operations
0421	<ul style="list-style-type: none"> • C3B and C7A arrive on-scene <ul style="list-style-type: none"> ○ C3B assigns Division 1 Supervisor with E1, T1, and E132

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

Time (hours)	Fireground Operations, Response, and Details
0424	<ul style="list-style-type: none"> • Inaudible on-scene unit reporting “getting a good push now” <ul style="list-style-type: none"> ○ Interior fire attack made through the front door and windows to the left of the front door
0426	<ul style="list-style-type: none"> • Chief 9B (Safety Officer) transmits “Urgent Message” <ul style="list-style-type: none"> ○ Second Floor collapses on side Charlie
0427	<ul style="list-style-type: none"> • IC request Evacuation “Long Tone” from PSAP • C7A declares Mayday “missing firefighter on first floor” <ul style="list-style-type: none"> ○ Roof and second floor have collapsed onto the first floor. First floor has partial collapse into the basement
0428	<ul style="list-style-type: none"> • IC announces Defensive Operations after PSAP transmitted the evacuation tones and moves fireground operations to ALPHA 4 • C6 assumes command and control of ALPHA 4 • The IC maintains the Mayday operations on ALPHA 3 and deploys the RIT to side Alpha <ul style="list-style-type: none"> ○ E132 officer was last observed a few feet inside the front door in the foyer with a 1¾-inch attack line working the nozzle
0428	<ul style="list-style-type: none"> • IC conducts personal accountability reports (PAR) for E1 and E132 <ul style="list-style-type: none"> ○ E1 is PAR side Alpha and no response from E132 officer
0429	<ul style="list-style-type: none"> • C7A request resources to side Charlie and believes the firefighter is in the basement <ul style="list-style-type: none"> ○ SQ5, E5, and one additional ALS ambulance added to the box alarm
0431	<ul style="list-style-type: none"> • C7A requests that companies on the front porch keep flowing water into the basement <ul style="list-style-type: none"> ○ Both 1¾-inch attack lines initially deployed to side Alpha are flowing and working from the front porch. The 1¾-inch attack line that E132’s officer was working is pulled back up to the front door on side Alpha • C7A confirms the missing firefighter is E132 officer • TA7 crew makes entry through basement window on side Bravo with a 250ft 2-inch attack line <ul style="list-style-type: none"> ○ TA7 crew observes structural collapse components and fire conditions.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

Time (hours)	Fireground Operations, Response, and Details
	<ul style="list-style-type: none"> ○ Unable to make an offensive push due to limited movement and fire conditions towards last known location of E132 officer
0432	<ul style="list-style-type: none"> ● C7A requests that units on side Alpha continue to flow water into the basement
0433	<ul style="list-style-type: none"> ● C7A requests concrete cutting saws and hand tools to side Bravo for wall breach
	<ul style="list-style-type: none"> ● C6 request medical helicopter support from the PSAP on ALPHA 4
0434	<ul style="list-style-type: none"> ● C7A informed command that side Bravo access is unsuccessful due to collapse and rescue efforts must be done from side Alpha
0435	<ul style="list-style-type: none"> ● PSAP confirms two medical helicopters are enroute with IC
	<ul style="list-style-type: none"> ● C7A updates command – No access from Delta, Bravo, or Charlie and crews require a ladder to access hole inside front door
0437	<ul style="list-style-type: none"> ● E7 personnel begin to breach interior attached garage wall for basement access
	<ul style="list-style-type: none"> ● C7A requests heavy equipment be found and brought to the scene. IC acknowledged and resource was requested from the PSAP
0438	<ul style="list-style-type: none"> ● C6 requests a long tone and PAR of all on-scene units on ALPHA 4
0441	<ul style="list-style-type: none"> ● C7A updates command – members of the rescue group have entered the basement from the hole on side Alpha and three attack lines are working
0444	<ul style="list-style-type: none"> ● Rescue group to IC – E132 officer is in the delta quadrant, buried, and not moving <ul style="list-style-type: none"> ○ E132 officer is observed in the basement with an active PASS device and not moving, covered with debris
0446	<ul style="list-style-type: none"> ● C7A requests two additional on-scene crews to side Alpha
0452	<ul style="list-style-type: none"> ● Escorted by local Sheriff’s office, Excavator arrives on the scene and is brought to side Alpha

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

Time (hours)	Fireground Operations, Response, and Details
0501	<ul style="list-style-type: none"> IC requests a Second Alarm
0505	<ul style="list-style-type: none"> Rescue group firefighter makes RIT Kit universal air connection to the UAC connection of E132 officer's SCBA <ul style="list-style-type: none"> E132 officer is observed with SCBA face piece intact with no helmet. No movement and no communication from E132 officer
	<ul style="list-style-type: none"> C7A assigns C5 as the RIT supervisor <ul style="list-style-type: none"> C7A coordinates excavator access
	<ul style="list-style-type: none"> Rescue group requests battery powered saws be brought to the access hole on side Alpha
	<ul style="list-style-type: none"> Rescue group informs command that only one rescuer will be able to work at a time due to working in a tight space
0510	<ul style="list-style-type: none"> Excavator is positioned on side Charlie to begin removing debris
0512	<ul style="list-style-type: none"> C7A requests IC, RIT supervisor, and Rescue group for planning meeting on side Alpha
0517	<ul style="list-style-type: none"> IC requests a "long tone" from the PSAP – All on-scene personnel to report to front yard for PAR
0521	<ul style="list-style-type: none"> All personnel and equipment are cleared from side Alpha (Alpha wall was unstable) <ul style="list-style-type: none"> Excavator on side Charlie begins to remove debris clearing a path for the rescue group
0526	<ul style="list-style-type: none"> Rescue group requests personnel to operate 1¾ attack lines on side Charlie to extinguish fire for the excavator
0527	<ul style="list-style-type: none"> Transfer of IC <ul style="list-style-type: none"> C7A assumes IC and assigns E5 company officer as the rescue group leader on side Charlie
0531	<ul style="list-style-type: none"> Rescue group leader assigns a recon team <ul style="list-style-type: none"> Recon team makes entry from side Charlie following a path cleared by the excavator towards the location of E132 officer with two 1¾-inch attack lines operating

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

Time (hours)	Fireground Operations, Response, and Details
0533	<ul style="list-style-type: none"> • RIT supervisor has clear line of sight visibility of recon team <ul style="list-style-type: none"> ○ RIT supervisor is on side Alpha monitoring side A wall movement and recon operations
0534	<ul style="list-style-type: none"> • Rescue group leader request all rotary saws be staged on side Charlie
0536	<ul style="list-style-type: none"> • RIT supervisor requests fresh personnel to side Alpha to operate attack line into the basement
0537	<ul style="list-style-type: none"> • IC requests the flight paramedic be brought to the command post
0542	<ul style="list-style-type: none"> • Rescue group leader requests additional metal cutting blades to side Charlie <ul style="list-style-type: none"> ○ Recon team encounters steel beams and columns in the debris pile in the basement
0546	<ul style="list-style-type: none"> • Recon team advised they have reached E132 officer <ul style="list-style-type: none"> ○ E132 officer is found face down. The recon team dig debris by hand to free the officer
0552	<ul style="list-style-type: none"> • Recon team advises IC that E132 officer is free from the head to waist, legs are pinned, but they have good access
0556	<ul style="list-style-type: none"> • Rescue group leader advises IC that the recon team was removing the 14ft roof ladder from the hole near side Alpha <ul style="list-style-type: none"> ○ Recon team requests small shovels and debris buckets to aid in removing debris around E132 officer
0600	<ul style="list-style-type: none"> • Rescue group leader requests the IC to report to side Charlie
0608	<ul style="list-style-type: none"> • E132 officer is removed from debris, transferred to a stokes basket, and carried to on-scene EMS
0616	<ul style="list-style-type: none"> • IC conducts a final PAR and relieves all the 1st alarm companies to debrief

Investigation

On June 27, 2023, at 0404 hours the local PSAP received a fire alarm notification indicating “smoke detector alarms in main hall and second floor” from an alarm monitoring company. As the local PSAP was initiating the fire alarm activation into the computer aided dispatch (CAD) system, a 9-1-1 call was received at 0405 hours indicating that the house across the street was on fire and the occupants had evacuated to the neighbors across the street to call 9-1-1 and get help. The PSAP adjusted the CAD

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

response and dispatched a rural water supply box alarm for Box 119 at 0406 hours with ALPHA 3 assigned as the fireground communications channel. This rural water supply box alarm included five other automatic-aid departments upon the initial box alarm assignment. Other fire apparatus not noted in the dispatch running order below responded to Box 119 as staffing allowed per the county SOP. To distribute resources across the county, the department and district in which the fire is reported is only expected to turn out two pieces of apparatus while being supplemented by other departments in the county.

Companies dispatched included E1 (PAR 5), T1 (PAR 5), TA6 (PAR 4), TA3 (PAR 2), SQ3 (PAR 5), E132 (PAR 4), T13 (PAR 4), E9 (PAR 4), E6 (PAR 3), E7 (PAR 4), TA7 (PAR 6), WS5 (PAR 4). Volunteer Chief staff responding from home included C1 (PAR 1), C3B (PAR 1), C6 (PAR 1), C7A (PAR 1), and C9B (PAR 1). At 0409 hours the PSAP received a third 9-1-1 call indicating the structure was on fire and the caller “believed” everyone was out of the structure. While the assigned fire companies were announcing their responding status and PAR counts on ALPHA 3, C1 was notified that several calls had been received into the PSAP. While enroute, C1 announced the primary water supply point on ALPHA 3. The residence was in an area of the county not serviced by continuous hydrants. Consequently, rural water supply box alarm assignments increased the number of tanker apparatus assigned. The primary water supply point was over two and a half miles from the incident scene. A second water supply point was identified and later used in the incident but played no significant role.

C1 arrived on the scene at 0415 hours and provided the PSAP and incoming apparatus an on-scene size up. C1 reported fire showing on the first and second floors from a two-story, single-family type V structure. C1 assumed IC and positioned on side Alpha in the front yard to establish the incident command post. IC advised the PSAP and incoming apparatus that he would be conducting a 360-degree walkaround of the structure and a report would follow. At 0416 hours, IC advised incoming apparatus that the 360-degree walkaround was complete and reported three stories in the rear (side Charlie) with heavy fire and walkout basement access.

The company officer from E132 requested a change in the running assignment order due to E132’s proximity to the scene. E132 requested to be assigned as the second due engine company instead of being assigned to the water supply point. IC approved this request and reassigned E9 from second due engine assignment to the water supply point. IC advised E1 to lay a four-inch supply line from the end of the driveway, to be positioned in the driveway but out of the way for the first arriving truck company. E1 arrived on the scene at 0418 hours, laid a four-inch supply line with a connected humat valve down the driveway. E1 stretched a 200-foot 1 ¾-inch preconnected attack line to side Alpha and began a transitional fire attack of the porch, first, and second floors where heavy fire conditions were observed. (see Photo 2)

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland



Photo 2. Conditions upon arrival of E1
(Courtesy of Southern Maryland News Network)

T1 arrived at 0419 hours as the first due truck, positioned in the driveway on side Alpha deploying two roof ladders to windows on side Alpha second floor, and assisted E1 with a transitional fire attack. C3B arrived on-scene and was assigned as the Division 1 supervisor on side Alpha and assigned both E1 and T1. E132 arrived as the third apparatus on-scene and positioned on the street to assist with water supply operations. IC attempted to make radio contact with E132's company officer but was unsuccessful. E132's company officer reported to the incident command post established on side Alpha. E132 was instructed by the IC to deploy a second 200-foot 1¾-inch preconnected attack line to assist with fire attack on side Alpha and report to the Division 1 supervisor.

TA6 arrived on-scene and attempted to supply the humat (water appliance) valve at the end of the driveway to initiate a continuous water supply from the tanker but was delayed due to connection issues. The crew from TA6 was assigned by the IC to deploy a third 400-foot 1¾-inch preconnected attack line from E1 to side Charlie. TA14 (self-initiated company not originally assigned on the box) arrived on-scene and assumed the role of the water supply officer as instructed by the IC and was assigned the ALPHA 5 fireground talk group to coordinate all water shuttle operations. TA14 successfully supplied the humat device to E1 and was supplemented by TA6. Personnel assisting with the water supply assisted E132's apparatus operator with deploying a 2,500-gallon portable dump tank for drafting operations. A continuous and uninterrupted water supply was established to E1 throughout the entire incident.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

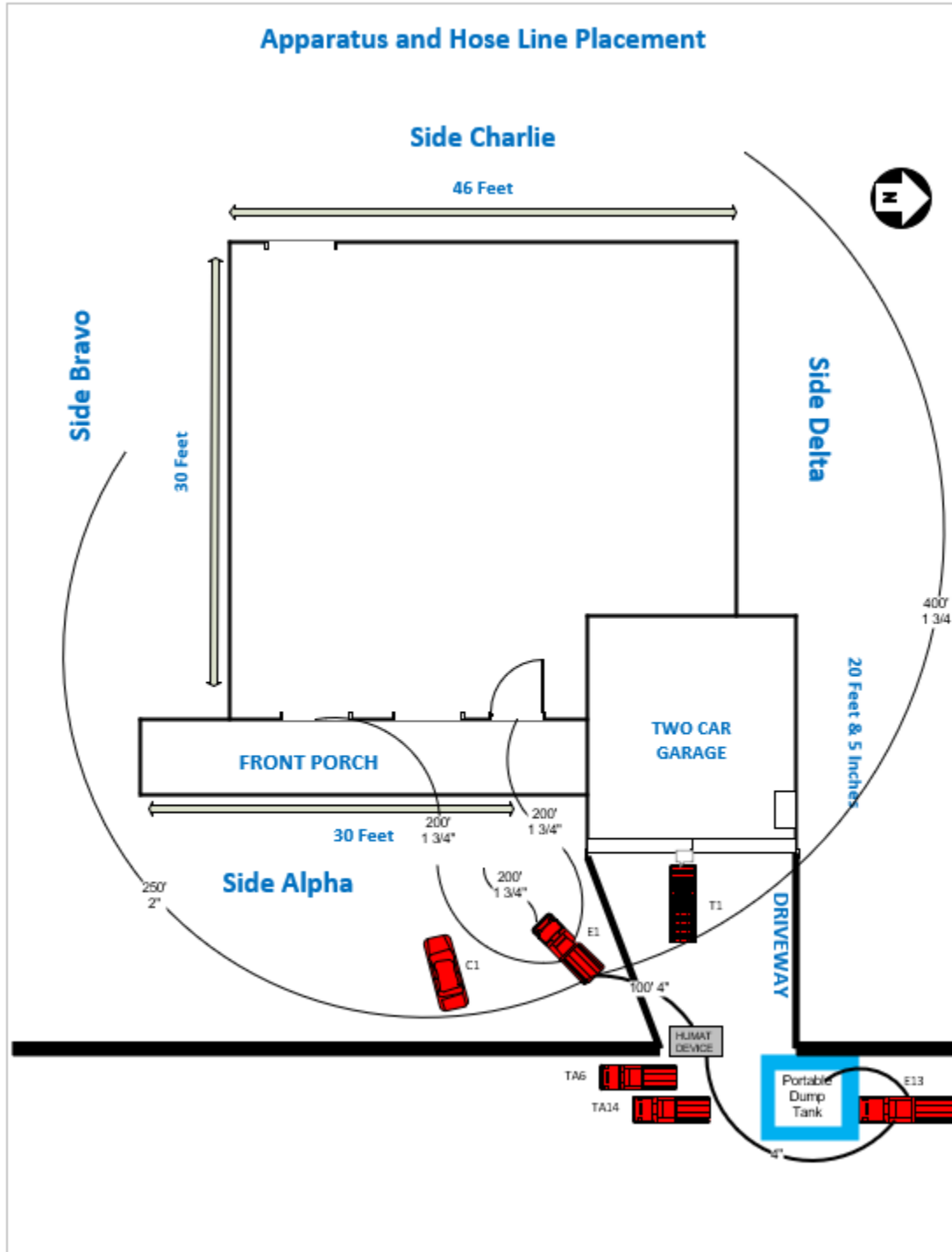


Figure 1 Scene Diagram (Courtesy of: NIOSH)

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

At 0424 hours a broken radio transmission was reported “getting a good push now” from an inaudible company as E1 and E132 crews began an interior fire attack. E1 began to make entry through the front door while one firefighter from E132 made entry through a standard residential window opening into a den to the left of the front door on side Alpha. The company officer from E132 joined the crew from E1 while one firefighter from E132 made entry through the porch window on side Alpha. Fire conditions indicated a fully involved first floor, stairwell, and second floor. A unidirectional flow path was observed on camera drawing into the structure at the front door as a firefighter from E1 made entry into the structure.



Photo 3. E1, E132 and T1 Transitional Fire Attack
(Courtesy of Southern Maryland News Network)

The nozzle firefighter from E1 advanced approximately three to five feet into an open foyer on his knees while flowing water from a 1¾-inch adjustable fog nozzle. Heavy fire conditions were present throughout the structure with compromised drywall along the framed walls and ceiling. The nozzle firefighter from E1 became thermally saturated and withdrew from the structure, passing the nozzle to a second firefighter from E1 who was in the threshold. The second firefighter from E1 resumed working the fog nozzle with little impact on the fire. The second firefighter continued attempting to extinguish fire on the first floor, den, stairwell, and second floors from a kneeling position before becoming thermally saturated and withdrawing to the exterior. The second firefighter passed the nozzle to the company officer of E132 upon withdrawal. E132’s company officer advanced approximately

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

three to five feet into the structure on his knees to attempt an offensive fire attack. The Division 1 supervisor also entered the structure and followed alongside the side Alpha wall to the left.

E6 arrived on-scene and was assigned as the RIT with the company officer from E6 assigned as the RIT group leader. At 0426 hours C9B, who had arrived on-scene and been assigned as the Safety Officer by the IC in a face-to-face meeting, was obtaining a 360-degree walkaround when the Safety Officer transmitted a priority message to IC indicating “we just lost the second floor on side Charlie.” A firefighter from E132 who entered through the window on side Alpha into a den observed a line working from E1 and a “fireball” over his head to the right towards the E132 officer. The E132 firefighter felt the first floor “settle” as he retreated to the window and exited headfirst. At 04:26:56 and 04:27:00 hours there were inaudible radio transmissions of yelling in the background on-scene. IC requested that all companies evacuate the structure and the local PSAP initiated the evacuation tone at 04:27:10 hours.



Photo 4. Fire conditions after second floor collapse
(Courtesy of Southern ScanMD.org)

C7A who had arrived on-scene and initially assisted with the humat valve connection, reported to the incident command post when the priority message of collapse was transmitted. C7A immediately reported to the front porch on side Alpha and observed pressurized smoke coming from the front door threshold. C7A observed the Division 1 supervisor being assisted out of the structure through the door and that the Division 1 supervisor’s gear was off gassing and burned. At 04:27:30 hours C7A declared

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

a Mayday of a missing firefighter who was possibly on the first floor and instructed on-scene companies to flow water through the front door on side Alpha immediately.

IC acknowledged the Mayday and moved the fireground operations to the ALPHA 4 fireground talk group. C6, who had arrived on-scene and assumed a support role inside the IC vehicle, assumed operations of the fireground while IC maintained the Mayday on ALPHA 3.

Table 3: Assigned Communication Talk Groups

Talk Group Designation	Assigned Role at Incident Scene
ALPHA 3	Original assigned fireground channel/Mayday operations
ALPHA 4	Fireground operations post Mayday incident
ALPHA 5	Water supply/Shuttle operations

At 0431 hours C7A confirmed with IC that the missing firefighter was the E132 company officer and was still believed to be missing on the first floor. C7A continued to obtain accountability of crews that had been assigned to the Division 1 supervisor (E1, T1, E132) when the IC requested that the front porch be cleared of personnel, changed to a defensive strategy, and deployed the RIT to the front door on side Alpha.

Table 4: Tactical Assignments

Unit Identifier – Talk Group	Task/Strategy
C1 – ALPHA 3	Incident Command
C3B – ALPHA 3	Division 1 supervisor
C9B – ALPHA 3	Safety Officer
C7A – ALPHA 3	RIT supervisor
C6 – ALPHA 4	Fireground operations post Mayday
E1 – assigned to Division 1 supervisor – ALPHA 3	200' 1 ¾ attack line Transitional & Offensive
T1 – assigned to Division 1 supervisor – ALPHA 3	Support E1, Search/Transitional & Offensive
E132 Crew – assigned to Division 1 supervisor – ALPHA 3	200' 1 ¾ attack line Transitional & Offensive
E132 – assigned to water supply – ALPHA 5	Pumping/Drafting operations
TA6 – assigned to water supply – ALPHA 5	Supply humat device/water shuttle
TA6 Crew – ALPHA 3	400' 1¾-inch attack line to side Charlie
TA14 (Self-initiated) – assigned water supply officer – ALPHA 5	Water shuttle Operations

The local PSAP dispatched a RIT Task Force assignment to the Mayday Box at 0429 hours which added SQ5, E5, and an additional ALS ambulance. At 0433 hours the PSAP contacted state police air

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

medical services to request helicopter support be placed on standby. Two air medical helicopters were dispatched and provided a safe landing zone at a nearby school supported by local fire departments.

Beginning around 0428 hours, IC attempted twice to radio E132's company officer for a PAR report with no response. IC informed C7A that no response had been received from the company officer of E132. C7A requested the crew from E6, and one additional 1¾-inch attack line be relocated to side Charlie. He believed the company officer from E132 was in the basement towards side Alpha possibly in the Alpha/Bravo quadrant.

At 0431 hours, the IC attempted to contact E132's company officer again via the radio with no response. C7A advised IC that a crew from E7 (self-initiated company not originally assigned on the Box) would be attempting to enter the basement from a window on side Bravo. C7A requested that the two 1¾-inch attack lines that were flowing on side Alpha continue to flow in the direction of the Alpha and Bravo quadrants. Two firefighters from E7 entered the basement from a window on side Bravo with a charged 250-foot 2-inch pre-connected attack line. This first attempt to locate the company officer from E132 was met with heavy fire conditions, zero visibility, and collapsed debris. Due to these factors, the two firefighters from E7 withdrew back to the side Bravo window and exited the basement. At 0433 hours C7A requested concrete cutting saws and breaching equipment to side Bravo with anticipation of breaching the exterior basement wall for better access into the basement. Due to the limited resources and time to breach the masonry wall, C7A redirected E7 and all rescue efforts back to side Alpha.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

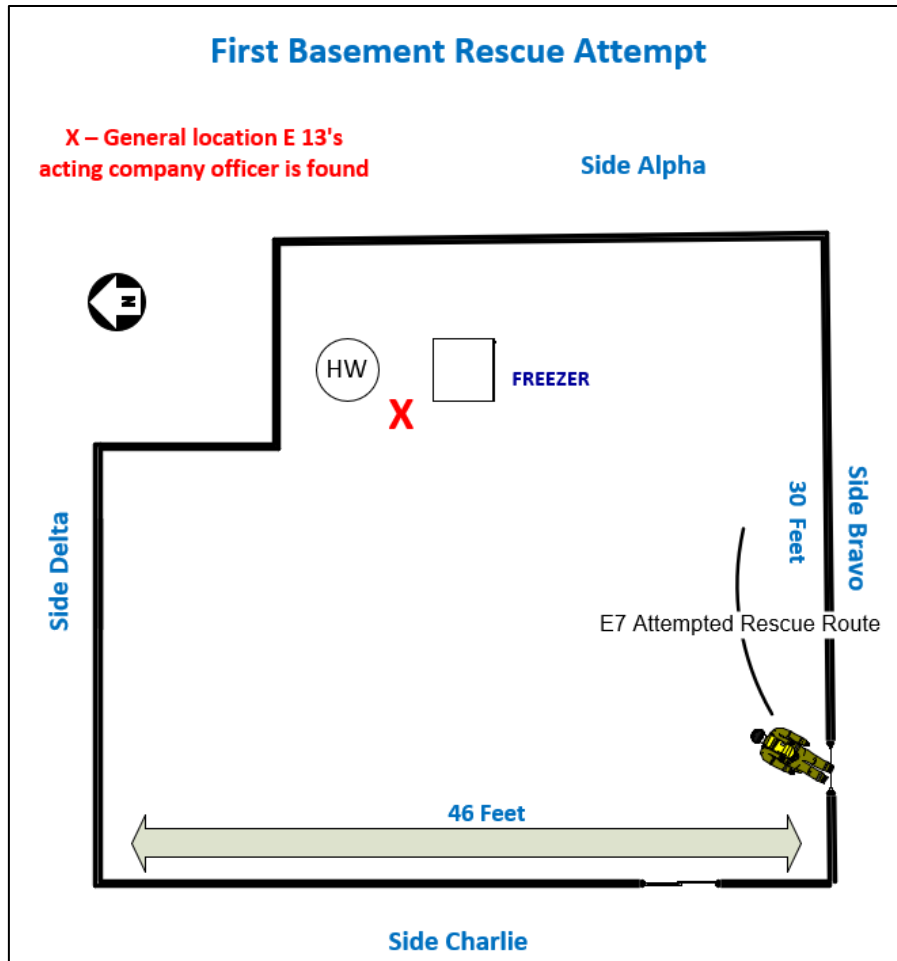


Diagram 3. First Basement Rescue Attempt

(Due to collapse and excavation this drawing is not to scale nor are any interior walls marked)

(Courtesy of NIOSH)

At 0437 hours C7A updated IC that there was no access to E132's company officer from sides Delta, Bravo, or Charlie and that alternative locations for breaching the masonry wall needed to be identified. C7A assembled a rescue group comprised of specific personnel from varying departments that had arrived on-scene. First alarm companies were staged in the yard on side Alpha and were also working various tasks on-scene such as fire attack, staging tools, and equipment. C7A requested a ladder be brought to the front door of side Alpha so that personnel from the rescue group could try and get into the basement from the front door. The collapse had created a void space that the rescue group accessed via ladder and descended into the basement. C7A suggested that IC request heavy equipment, such as an excavator, to assist in the removal of debris and rescue operations. IC made the request for heavy equipment to the local PSAP.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

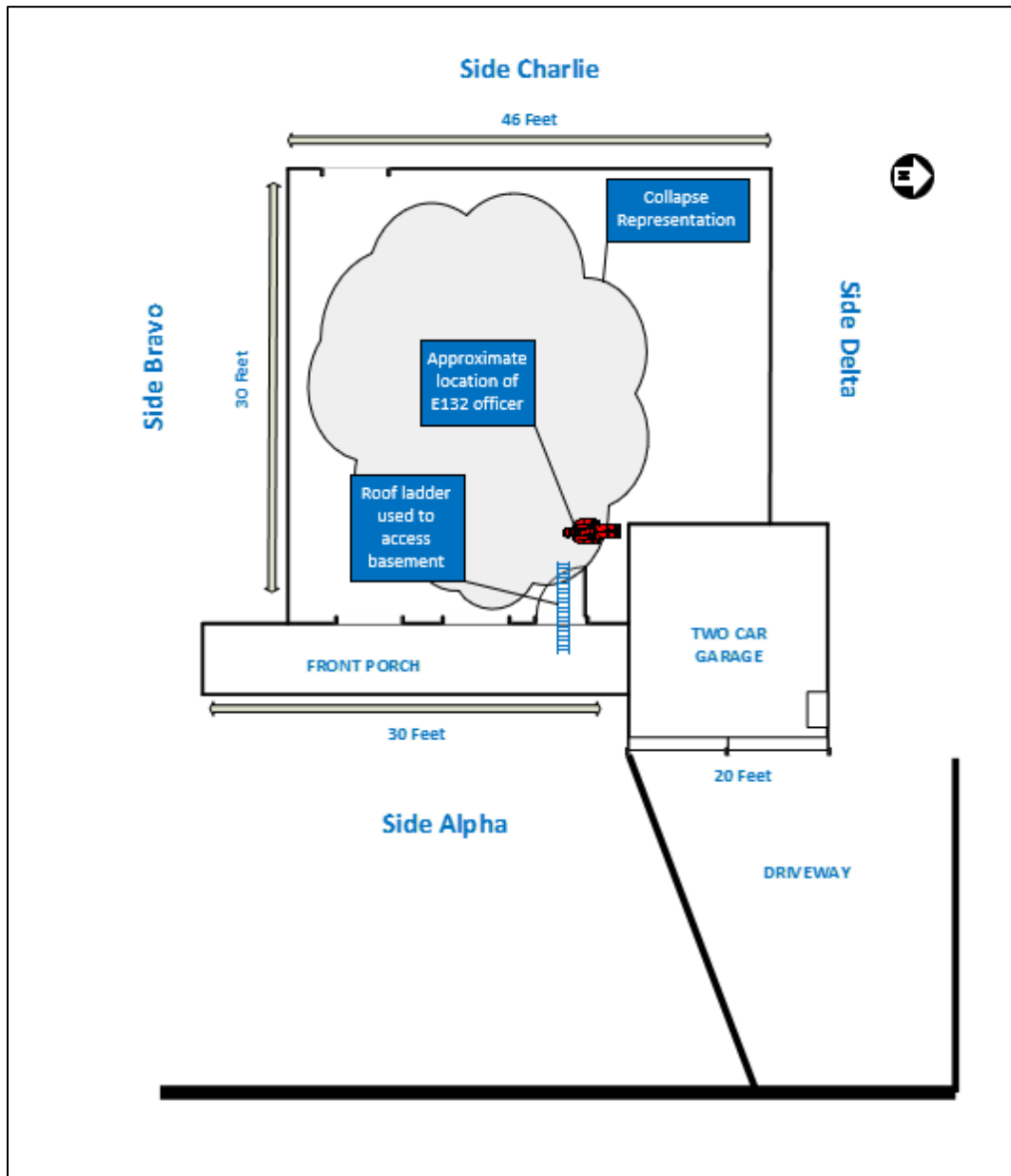


Diagram 4. Side Alpha First Floor Access
(Diagram is not to scale and is approximate based upon interviews)

(Courtesy of NIOSH)

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

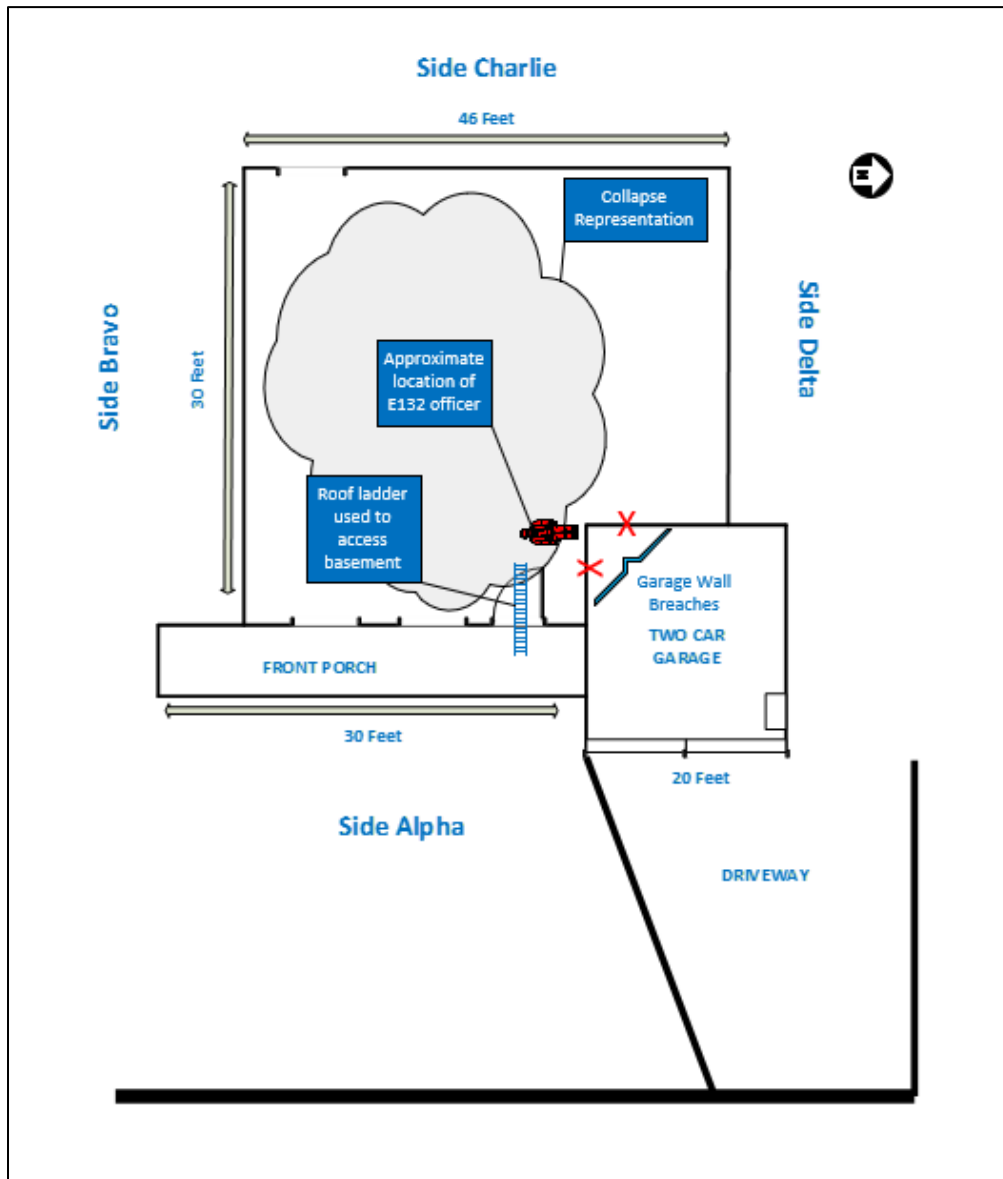


Diagram 5. First Floor Garage Wall Breaches

(Drawing not to scale and approximate based upon interviews) (Courtesy of NIOSH)

The rescue group first used a folding ladder to descend into the basement. However, the ladder was narrow and unstable. It rested on top of debris in the basement and not the basement floor. After two firefighters from the rescue group descended the ladder into the basement, it was replaced with a roof ladder. Basement conditions were described as having moderate heat and zero visibility requiring working by feel. At 0439 hours C7A requested that additional rapid intervention kits, stokes basket, and rope bags be brought to the porch area of side Alpha for staging. The company officer from E7 (assigned to the rescue group) worked with other personnel to breach the attached common garage wall to gain access and a visual of the rescuers in the basement.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

At 0441 hours C7A updated the IC that three personnel were working as part of the rescue group. Two were in the basement and one was in the garage to maintain both visual and voice contact. At 0444 hours C7A requested that every wood cutting gas saw be brought to the front porch and staged. The rescue group continued to work by feel and attempted to cut through floor joist and debris to try and locate the company officer from E132. A firefighter from the rescue group could hear the muffled sound of a PASS device. At 0444 hours the rescue group reported to IC that they could see the SCBA bottle of the company officer from E132 in the Delta quadrant to the right of the front door, the company officer was completely buried in debris and not moving. The rescue group was unable to reach him and needed to cut and remove debris for access.

A civilian in the neighborhood with local connections to the fire department arrived on-scene with an excavator and was directed to side Alpha with assistance to ensure that attack lines were not damaged. C7A instructed the excavator operator to begin removing the hedges on side Alpha. Within just a few minutes the excavator work was stopped due to fear of creating a secondary collapse into the basement. At 0501 hours IC requested a second alarm for the incident, specifically for manpower. The PSAP worked to coordinate resources, staging location, and fireground talk groups for out of county resources.

After cutting, digging, and removing debris, a rescue group firefighter crawled as close as possible to the SCBA bottle being worn by the company officer from E132 trying to determine the position of E132's company officer, check the air supply on the neck of the SCBA bottle, and establish contact. After several attempts to establish communication, it became apparent that the company officer from E132 was unconscious. The rescue group firefighter was unable to get any closer to assess the company officer from E132 but observed that his helmet was off while his SCBA facepiece was on and intact. The rescue group firefighter attempted to shut the PASS device off but was unsuccessful. The rescue group firefighter noted that E132's company officer had suffered thermal degradation to his PPE, primarily on the right shoulder, arm, and SCBA.

At 0505 hours the rescue group firefighter crawled back to the base of the roof ladder and obtained the rapid intervention crew universal air connection filling hose (RIC/UAC) and returned to the company officer from E132. The rescue group firefighter made a positive connection to E132's company officer's RIC/UAC but was unable to tell if the company officer from E132 was breathing. C7A transferred the RIT supervisor position to C5 (arrived on the RIT Task Force on SQ5) so that he could work with the excavator on side Bravo. The rescue group in the basement made a request for reciprocating saws and other equipment. At 0510 hours a radio transmission was made from the rescue group that the working space was small and would only accommodate one rescuer. The rescue group informed C7A that they were low on air, exhausted, and would need fresh crews.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

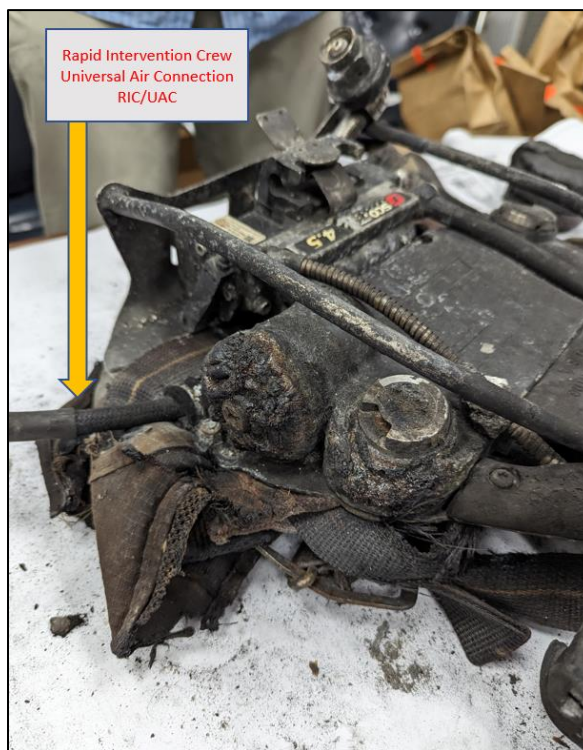


Photo 5. E132's Company Officer SCBA
(Courtesy of NIOSH)

At 0510 hours C7A announced that there was a plan for the excavator on side Charlie which included removing the rear deck and porch. Second alarm resources that were coordinated by C3 were enroute and arriving. At 0512 hours C7A requested the company officer from E7, IC, RIT supervisor, and a firefighter from the rescue group report to the front porch of side Alpha for a face-to-face meeting.

At 0517 hours command requested a “long” tone from the PSAP on both ALPHA 3 and ALPHA 4 announcing that all personnel on-scene should report to the front yard on side Alpha. Between 0521 hours and 0530 hours a command planning meeting was held to discuss the best access route to the basement, structural stability, resources, and reorganization of the incident management team. At 0527 hours IC announced to the PSAP that he was transferring command to C7A. C7A assigned C6 as the accountability officer and relocated the rescue group to side Charlie to coordinate rescue efforts with the excavator to try and reach the location of E132’s company officer.

At 0531 hours the rescue group leader informed IC that a recon team was in place on side Charlie with two personnel preparing to enter the basement from side Charlie through the access created by the excavator. The excavator had removed portions of a collapsed deck and debris from side Charlie while being careful not to create a secondary collapse into the basement near the location of E132’s company officer. The rescue group leader informed IC that they currently had two 1¾-inch attack lines flowing in the rear with personnel staged to assist. At 0533 hours the RIT supervisor advised IC that he had a clear line of sight of the recon team entering side Charlie from side Alpha near the front door. The RIT

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

supervisor continued monitoring the side Alpha exterior wall for any movement. IC acknowledged and warned the RIT supervisor that the side Alpha wall near him looked unstable as well.

At 0534 hours the rescue group leader requested all rotary saws and chainsaws on the fireground be brought to side Charlie and staged. Rescue group firefighters advanced approximately fifteen feet into the basement while the fire was still being extinguished in and around the area the rescue group was working.

At 0536 hours the RIT supervisor requested fresh crews from the second alarm to side Alpha to work the 1¾-inch attack line that was being directed into the basement to support the rescue group. IC requested a flight paramedic be brought from the landing zone to the incident command post at 0537 hours. After advancing approximately halfway through the basement from side Charlie, the rescue group encountered metal supports that were blocking access to E132's company officer. At 0542 hours the rescue group leader requested additional rotary saw blades capable of cutting metal. Personnel assigned to logistics continued to gather and stage the requested equipment on side Charlie.

At 0546 hours the rescue group reported to both the IC and the rescue group leader that they had located the company officer from E132 and still needed to remove some debris before being able to totally access him. At 0552 hours the rescue group reported to the IC that they have been able to uncover and remove enough debris to free the company officer from the waist up but were still working to free his legs. IC acknowledged and sent C13 (arrived late in the incident) to side Charlie to meet with the rescue group leader about the plan for removing the E132 company officer. The rescue group advised that they now had four to five personnel with room to work on debris removal and crews from E132 and T13 should be ready to handle the extrication once the E132 company officer was free.

At 0556 hours the rescue group requested small shovels and buckets in the basement to aid in debris removal. The rescue group leader advised the IC that the 14' roof ladder that was deployed into the hole from side Alpha needed to be removed as it was in the way of the firefighter removal. At 0600 hours the rescue group leader requested that the IC report to side Charlie. The rescue group was able to free the E132 company officer and placed him face down in a stokes basket. The personnel from E132 and T13 met with the rescue group and carried E132's company officer out of the structure following the path created by the rescue group. At 0608 hours the IC reported to the PSAP that the company officer from E132 had been removed from the structure and was being taken to EMS on-scene. The company officer was transported by ground ambulance to a local hospital where he was pronounced deceased.

Fire Origin and Cause

The origin of the fire for Box 119, was listed as undetermined by the State Fire Marshals office.

Contributing Factors

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

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

- Compromised situational awareness
- Ineffective risk/benefit analysis and scene size-up
- Ineffective strategy and tactics
- Ineffective professional development and lack of experience
- Lack of ongoing crew integrity
- Lack of shared information from 9-1-1 caller to responding units

Recommendations

Recommendation #1: Support the development and maintenance of effective situational awareness during emergency incidents.

Discussion: Throughout this incident all personnel needed to maintain situational awareness to make effective decisions. During this incident, compromised situational awareness at one or more levels resulted in negative outcomes.

- Level 1 – Perception: Ineffective observation of critical information during the initial scene size-up and during the creation of the IAP in relation to the active fire in the basement including lack of awareness that firefighters were becoming thermally saturated upon entry to side Alpha.
- Level 2 – Comprehension: Inadequate recognition of fire conditions upon arrival and how that was directly impacting the structure.
- Level 3 – Prediction: Inaccurate forecasting of the fire conditions; major collapse which resulted in a firefighter falling into the basement was not anticipated.

Discussion: Situational awareness is an ongoing process; all personnel need to maintain SA to make effective decisions throughout the emergency incident. SA has been defined as, “*The ability to perceive and understand what is happening in the environment around you, in relation to how time is passing, and then using your understanding of the situation to accurately predict future events in time to prevent bad outcomes.*” [Gasaway 2019]. As hazards rapidly increase and change as an incident progresses new stressors may emerge, requiring the need to reestablish situational awareness.

Situational awareness is an ongoing process at all three levels:

Level 1 – Perception: The ability to sense and subsequently perceive the situation. Perception must always be deliberate, and continual for success. In the fire service, perception is often correlated with size-up. Size-up usually focuses on visual observations; however, if safe to do so, personnel may use hearing, taste, touch, and smell in addition to sight.

- *Perception quick tip:* When possible, personnel may use technology to enhance perceptual cues (e.g., a thermal imaging camera may enhance sight in certain scenarios such as heavy smoke or darkness).

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

Level 2 – Comprehension: The ability to fully understand the meaning of the situation. Personnel must have the proper knowledge and then ability to effectively apply that knowledge, which comes from education and past experiences.

- *Comprehension quick tip:* Given the broad and dynamic range of incidents that firefighters respond to, departments should establish an ongoing training program that provides a range of education and hands-on experience to aid comprehension during stressful situations.

Level 3 – Prediction: Also referred to as forecasting or projecting, prediction is the ability to form an understanding of a situation and determine what actions are appropriate to mitigate future negative outcomes. The fireground is constantly changing and evolving. Inaccurate predictions occur when the ability to consistently reestablish situational awareness and keep pace with the speed at which the incident is developing becomes too difficult.

- *Prediction quick tip:* Seeking input from someone else who has more extensive education and experience in similar incidents may be useful to support accurate forecasting.

Several barriers can negatively impact situational awareness (Gasaway R, 2013; Gasaway R, 2017; Gasaway R, 2023) including: 1) sense of urgency to respond; 2) physical and mental stressors; 3) ineffective or lack of communication; 4) distorted sense of time and fixation; 5) task overload; 6) sense of complacency; and 7) use of improper procedures. Effective situational awareness may be supported by several activities, some of which are adapted from Gasaway [2013, 2017, 2019, 2022].

Considerations for fire service management to support incident response:

- Provide ongoing professional development that provides academic and technical education and hands-on experience.
 - *Example:* Use the three situational awareness levels as a tool to work through case examples of emergencies. This may include training personnel on critical hazards to identify, how those hazards inform an understanding of the event, and possible outcomes based on what is known. Over time, a list of optimal response strategies for a variety of scenarios can be developed.
 - *Example:* During realistic expectations training in simulated or mock fire scenarios, fire instructors can work through the three levels of situational awareness with personnel to understand decision making during immediate or high-risk actions and discuss how decision making could be impacted.

While there is a significant reliance at most incidents on the Incident Commander and the Incident Safety Officer to maintain situational awareness, it is critical that everyone maintain situational awareness at their respective levels and within their areas of operation. Considerations for personnel while responding to an incident:

- Take periodic, brief intentional opportunities to reassess and evaluate incident cues and mentally document what is changing in real time. Any unexpected changes in the incident's progression might alter future decision making.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

- Employ relevant stress management techniques (e.g., controlled breathing) and operational techniques (e.g., workload management utilizing Field Incident Technicians to assist the IC during fire ground operations) to support ongoing awareness.
- Use technology and other vetted procedures to ensure that all messages are received and understood.
- Ensure personnel within the incident management system at the task, tactical, and strategic level are not deviating from assignments or failing to execute assignments.

In summary, all personnel should strive to maintain situational awareness throughout an incident response, effectively communicate their findings with key personnel throughout the response and seek to establish and reestablish shared situational awareness as the incident evolves to support effective decision making.

Recommendation #2: Incident commanders should define their fireground strategy, tactics, and goals based upon a risk/benefit analysis and a detailed scene size-up to include known risk, building type and era, smoke conditions, hazardous energy, and capabilities of on-scene resources.

Discussion: In this incident the IC was the first to arrive on the scene. An initial on-scene report was provided describing the fire conditions and building construction. The IC immediately conducted a 360-degree walkaround starting on side Alpha and walking a clockwise path around the structure. The IC noted the change in grade on side Charlie and the basement access. The IC informed the PSAP and incoming resources of the basement access and that the structure was three stories in the rear with heavy fire. Approximately 14 minutes had passed since the activation of the home fire alarm to arrival of the fire department allowing for rapid fire growth. The IC observed “blackout” conditions through a window on side Bravo and through a sliding door on side Charlie but observed no fire conditions. No further investigation of the basement was conducted during the 360-degree walkaround or size-up.

Operational risks and hazards are inherent to the fire service and cannot be fully eliminated; however, ICs should create IAPs that are evaluated through a risk management process while considering various internal and external factors. For example, fire department geographic and personnel size impacts the risks and hazards that a department can reasonably assume. A department with sizeable resources may be willing to assume a greater risk compared to a department with fewer on-scene resources since personnel are available to help reduce or eliminate risks and hazards. There are situations in which the risk is too great for firefighting personnel so taking defensive and reserved actions is appropriate for protecting personnel. NFPA 1550, Standard for Emergency Responder Health and Safety Annex J (NFPA 1550a, 2024) provides guidance for the development of an operational risk management plan to include:

- Risk identification
- Risk evaluation
- Establishing priorities
- Risk control
- Other control methods
- Risk monitoring

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

The Fire Department Safety Officers Association (FDSOA) recommends these [5 reads](#) to manage risks and hazards on a fire scene (FDSOA, 2024).

- Reading risk – Identify, evaluate, plan, prioritize risks, communicate, controls, monitor, and adjust
- Reading buildings – Type, era, use, size, and fire involvement
- Reading smoke – Volume, velocity, density, and color
- Reading hazardous energy – Kinetic (thermal, mechanical, wind), potential (chemical, gravity, nuclear), electrical, and water
- Reading firefighters – Knowledge, skill, ability (KSA), physiological and psychological, environmental factors, work, and rest cycles

Incident strategy and tactics (offensive, defensive, transitional) should be dictated by the initial size-up of the first arriving chief or company officer. Unless the first arriving unit is faced with an obvious life safety issue (e.g., visible victims), a detailed scene-size up and 360-degree walkaround should be conducted to better facilitate the IAP. If physical barriers, the size, and/or shape of a structure prohibit a detailed scene size-up to side Bravo, side Charlie, and side Delta the IC may delegate this responsibility to other arriving resources on the initial alarm assignment. The continuation of a 360-degree walkaround of the emergency scene should be assigned to a trained Safety Officer.

At any fireground incident the three main priorities are life safety, incident stabilization, and property conservation. Information obtained from a detailed scene-size up should assist the incident commander in developing the IAP. Ensuring the safety of the firefighters on-scene should be a constant process that is continually evaluated with the use of the risk management principles as stated in NFPA 1550 Standard for Emergency Responder Health and Safety Section 10.4 (NFPA 1550b, 2024):

- Activities that present a significant risk to the safety of firefighters shall be limited to situations where there is a potential to save endangered lives.
- Activities that are commonly employed to protect property shall be recognized as inherent risks to the safety of firefighters, and actions shall be taken to reduce or avoid these risks.
- No risk to the safety of fire department members shall be acceptable when there is no possibility to save lives or property.
- In situations where the risk to fire department members is excessive, activities shall be limited to defensive operations outside of the hazard zone

Recommendation #3: Fire departments can develop policies to aid in the selection of the appropriate strategy and tactics for offensive, defensive, and transitional fire attacks.

Discussion: In this incident, the IC arrived to find a two-story, single family, non-sprinkled, type V constructed home well involved in fire. There were cars in the driveway and no occupants outside of the home upon fire department arrival. The IC observed active fire on floors one and two from side Alpha and active fire on floors two and three from side Charlie. The front door on side Alpha had already burned halfway through and fire was well advanced on multiple floors.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

Those who assume the role of IC should consider many factors when developing an IAP such as conditions and challenges faced, staffing, and resources. These suggestions will assist in dictating the appropriate strategy and tactics to control a fire event.

Personnel arriving on-scene and assuming IC should conduct a thorough size-up. Size-up is defined in NFPA 1700 *Guide for Structural Fire Fighting* as “the ongoing observation and evaluation of factors that are used to develop strategic goals and tactical objectives” (NFPA 1700a, 2021). The IC developing the IAP should take into consideration the structure, fire involvement, concealed spaces, thermal decomposition, and time in relation to how long the fire has been burning and how long corrective tactics will take to accomplish.

NFPA 1700 Strategic Considerations: (NFPA 1700b, 2021)

Pre-arrival factors

- Pre-incident plans and maps
- CAD resources
- Weather conditions
- Occupancy status
- Time of day

Initial arrival factors may include:

- Fire location, size, and extent
- Civilian and firefighter life safety
- Flow path of fire and smoke

Once a command post and IC have been established, the IC should maintain situational awareness (recommendation #1), risk management analysis (recommendation #2), and the above-mentioned strategic considerations to determine the appropriate strategy or operational mode that should be executed on the fireground to include either offensive or defensive strategies. The IC must feel empowered to adjust or change the IAP’s strategy based on risk management principles and prediction of negative outcomes for the incident. ICs should ensure that the strategy has been announced and is clear to all on-scene personnel either through verbal or radio communications.

NFPA 1700 Tactical Considerations: (NFPA 1700c, 2021)

In the exterior fire control (i.e., transitional attack), reliable approaches that could have been considered to fight the quickly changing fire conditions include:

- Compartments inside a structure can be cooled which disrupts pyrolysis
- Reduction of surface temperatures to unburned fuels
- Production of steam will assist with absorbing energy

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

Transitional attacks will not disturb the flow path when deployed correctly. Underwriters Laboratory Fire Safety Research Institute (ULFSRI) has conducted research into the correct application of exterior streams to aid in victim survivability and fire control. More information can be found at [UL FSRI Fire Safety Academy](#) (Underwriters Laboratories Fire Safety Research Institute, 2023).

When an IC has determined that a defensive strategy is the safest strategy due to any factors including but not limited to structural integrity, no occupant survivable space, or volume of fire for the resources on-scene consideration should be given to exterior or transitional tactics. These include the use of Blitz attack lines and aerial master streams flowing more than 300 gallons per minute. Personnel working in a defensive strategy should be outside the collapse zone.

Interior Fire Control

- Applied water cools the surface of fuels to interfere with pyrolysis
- Surface temperatures are reduced in unignited fuels
- Secondary steam production helps to absorb energy from the environment and to cool the smoke

Interior fire control is the most common tactic when conditions and risk allow for an offensive strategy. Interior fire control, also known as an interior attack, allows for the direct placement of water to the seat of a fire and should be conducted as quickly as possible upon arrival. Firefighters should train to introduce water utilizing the reach of the stream from an attack line while also remaining mindful of introducing air into the seat of the fire area. ULFSRI has conducted research into the Air Entrainment by Fire Service Hose Streams. More information can be found at [UL FSRI Fire Safety Academy](#) (Underwriters Laboratories Fire Safety Research Institute, 2023)

Basement Fires

- Basement fires can be difficult to control and extinguish once the fire has progressed beyond the incipient stage.
- Ventilation options are limited in standard basements, and floor plans are not standard
- Basements may often be used for storage and can be unpredictable with unknown fire loads adding to the fuel load of incipient stage fires

ICs should ensure that all structures that have a basement, cellar, crawl space, or underground vault are quickly identified as a hazard and work rapidly to identify whether fire is present in these spaces. Vincent Dunn, a contributing editor for Firehouse Magazine, and fire service building construction expert notes “An out of control below grade fire creates a first-floor collapse danger and fire spread problem to upper floors and to adjoining buildings on each side” (Dunn, 2019).

A common threat to interior firefighting personnel in single and multi-family dwelling fires involving basements is the limited ingress and egress of interior stairs. Tactics should be considered to attack basement fires from the exterior or, the utilization of special nozzles designed to penetrate the above floor openings. Interior attacks made from the interior steps should be conducted with caution while observing smoke and fire conditions utilizing the stream of an attack line to cool the environment.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

Recommendation #4: Fire Departments should develop and implement a professional development plan to ensure all personnel receive technical and academic competencies relative to the roles personnel are expected to perform on emergency scenes.

Discussion: In this incident, some on-scene apparatus was commanded by firefighters in an “acting” role as company commanders. Each department that responded to this incident had separate requirements and policies. A fire department’s staffing is dependent upon available resources. Fire departments should ensure that training and professional development are offered to any personnel who may be expected to perform outside of their normal functional area but within their experience level. In this specific case, the lack of experience and knowledge prevented critical task level information from being shared with the IC as it relates to the rapidly changing fire conditions and environment.

The primary focus of training, education, and professional development programs is to reduce injuries, illnesses, and fatalities in the fire service by providing the needed technical and academic competencies. Fire departments should understand that training should incorporate both technical skill and hands-on task completion, while also addressing academic knowledge and the understanding of “why” things are happening.

When developing a professional development plan, each department must recognize the needs of the community, services offered by the fire department, and available resources such as funding, staffing, and experience levels. A goal to establishing a professional development plan should be to meet or exceed the NFPA professional qualifications. NFPA 1550, *Standard for Emergency Responder Health and Safety*, states in paragraph 7.1.2, “The fire department shall provide training, education, and professional development for all department members commensurate with the duties and functions that they are expected to perform” (NFPA 1550c, 2024).

Professional development plans should be customized to fit within a fire department’s resources and capabilities while striving to reach a national standard. A successful professional development plan might include:

- Training programs on technical competencies (Hands-on skills)
- Task and mentoring books (Technical and academic competencies)
- Mentorship programs (Experience)
- Self-guided study classes and programs (Academic competencies)

Fire departments are encouraged to seek the resources of local, state, and federal training opportunities to include classes such as Instructor I and II, Fire Officer I and II, and National Fire Academy classes. The National Fire Academy currently works with both 2- and 4-year academic fire and EMS degree programs through the [Fire and Emergency Services Higher Education \(FESHE\) initiative](#) to assist with the standardization of training, education, experience, and certification (U.S. Fire Administration, 2022). The matrix below could assist fire departments in developing a professional development plan that fits the needs and resources of a fire department.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland



Figure 2. Fire and Emergency Services Higher Education Professional Development Model
(Courtesy of USFA)

Recommendation #5: Incident commanders and company officers should ensure that crew integrity is properly maintained by visual, direct, or verbal (voice or radio) contact when operating in an immediately dangerous to life and health (IDLH) atmosphere.

Discussion: In this incident, the company officer of E132 instructed two crew members of E132 to deploy a 1¾-inch attack line to the windows left of the front door on side Alpha. The company officer of E132 then proceeded to work with E1 and T1 near the front door on side Alpha. After two firefighters from E1 independently withdrew out of the structure due to thermal saturation, the company officer of E132 proceeded into the foyer of the home while one firefighter from E132 made entry through the windows into a den. This lack of crew integrity led to confusion immediately after the collapse as to who was missing and from what crews.

It is the responsibility of all on-scene personnel to follow the department's personnel accountability policies. However, each company officer has the responsibility of maintaining crew integrity to ensure no crew members are lost or separated. Company officers should receive their assignments from the IC and not be initiating tasks without the IC's knowledge. Since this incident, the impacted department has adopted a good practice for company officers to announce the location and number of personnel

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

when making entry into an IDLH atmosphere and again when exiting. This practice can serve as a tool in the tracking of personnel and maintaining situational awareness on the fireground.

Crew integrity is essential to fireground accountability. Fire departments should have personnel accountability policies and procedures in place to track both crews and individuals. A departments accountability system should have the capabilities to track and identify who is operating in the hazard zone, their assignment, and their location. The collection of personal accountability tags or passports simply placed on an apparatus will not assist in maintaining awareness to the fireground location of crews or individuals. NFPA 1550 *Standard for Emergency Responder Health and Safety, Section 17.7* provides guidance on accountability for all resources (NFPA 1550d, 2024):

- Specific means to identify and track responders entering hazardous areas
- The tracking of resources as they are moved around the fireground
- Accounting for personnel who arrive on-scene by other means besides apparatus
- Providing a process to rapidly account for all responders on-scene

Recommendation #6: PSAP's should ensure that all information received from 9-1-1 callers is clearly understood and relayed to responding emergency personnel in as close to real time as possible

Discussion: In this incident, the PSAP received a fire alarm activation from a third-party monitoring service and was working to initiate the alarm response when they received a 9-1-1 call reporting a structure fire. The PSAP upgraded the “alarm” to a “rural box alarm” and dispatched the appropriate resources. The PSAP received several 9-1-1 calls reporting the single-family home was on fire and on two occasions were told by 9-1-1 callers that it was believed that all occupants were evacuated from the structure. This information was entered into the CAD; however, responding departments had limited ability to read CAD updates and this information was not relayed to the IC via the radio while enroute or on-scene. This lack of information may have impacted decision making when creating the IAP.

It is not uncommon for emergency responders to respond to incidents with limited information, but if additional information is received from a PSAP it's critical that the information be shared in real time to responding units. Incoming information plays a critical role in the decision-making process of IC's and company officers upon arrival. Jim Spell, founder of HAZPRO Consulting and retired firefighter notes, “While most firefighters agree that communication plays an important role on the fireground and during incident operations, it can be argued that communications is THE critical element in determining the successful outcome of any situation or emergency” (Spell, 2023). Information received while enroute can assist local fire departments in decision-making and understanding possible threats, situations, or different probable scenarios that could be unfolding, especially those concerning active aggressor, hazardous materials, or suspicious devices.

Fire departments and local PSAP's should develop policies and embrace technology that is user friendly in the field to incorporate near instant information sharing. The use of computer aided dispatch systems, mobile data terminals, and other third-party software designed for pre-incident preplanning

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

could be utilized to assist fire departments with real time data and information to enhance on-scene situational awareness. ICs should incorporate the help of others in creating an incident management team to aide in managing information and data to prevent both task fixation and saturation.

References

1. Dunn, V. [2019, July]. Below-Grade Fires. pp. 20-25.
2. FDSOA. [2024]. [The 5 Reads](#). Retrieved March 2024, from Fire Department Safety Officer Association.
3. Gasaway, R. [2013]. Situational Awareness for Emergency Response. Tulsa, OK: PennWell.
4. Gasaway, R. [2017, May 17]. Flawed Situational Awareness: The Stealth Killer of First Responders.
5. Gasaway, R. [2019]. How Smart Workers Use Situational Awareness to Improve Safety. St. Paul, MN: Gasaway Consulting Group.
6. Gasaway, R. [2023]. [Situational Awareness Matters](#). Home Page - First Responder. Retrieved March 2024, from Situational Awareness Matters.
7. NFPA 1550a. [2024]. NFPA 1550 Standard for Emergency Responder Health and Safety, Annex J. Quincy, MA: National Fire Protection Association.
8. NFPA 1550b. [2024]. NFPA 1550 Standard for Emergency Responder Health and Safety, Section 10.4. Quincy, MA: National Fire Protection Association.
9. NFPA 1550c. [2024]. Standard for Emergency Responder Health and Safety Chapter 7, Section 1. Quincy, MA: National Fire Protection Association.
10. NFPA 1550d. [2024]. NFPA 1550 Standard for Emergency Responder Health and Safety, Section 17.7. Quincy, MA: National Fire Protection Association.
11. NFPA 1700a. [2021]. NFPA 1700 Guide for Structural Fire Fighting. Quincy, MA: National Fire Protection Association.
12. NFPA 1700b. [2021]. NFPA 1700 Guide for Structural Fire Fighting Chapter 9 Strategic Considerations. Quincy, MA: National Fire Protection Association.
13. NFPA 1700c. [2021]. NFPA 1700 Guide for Structural Fire Fighting Chapter 10 Tactical Considerations for Fire Control and Extinguishment. Quincy, MA: National Fire Protection Association.

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

14. NFPA 1971. [2018]. NFPA 1971 Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting. Quincy, MA: National Fire Protection Association.
15. NFPA 1981. [2013]. NFPA 1981 Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services. Quincy, MA: National Fire Protection Association.
16. NFPA 1410. [2020]. NFPA 1410 Standard on Training for Emergency Scene Operations Chapter 3, Section 3. Quincy, MA: National Fire Protection Association
17. Spell, J. [2023, February 17]. [Dispatch centers: The first of the first responders](#). Retrieved January 2024, from FireRescue1.
18. U.S. Fire Administration. [2022]. [Fire and Emergency Services Higher Education Initiative](#). Retrieved January 2024, from United States Fire Administration.
19. Underwriters Laboratories Fire Safety Research Institute. [2023]. [Research for the Development of More Effective Tactics](#). Retrieved February 2024, from Underwriters Laboratories Fire Safety Research Institute.
20. Weather Underground. [2023, June 27]. [Weather History for KMDLEONA35](#). Retrieved January 2024, from Weather Underground.

Investigator Information

This incident was investigated by Patrick R Montague, Investigator and Murrey Loflin, Investigator, both with the Fire Fighter Fatality Investigation and Prevention Program, Surveillance and Field Investigations Branch, Division of Safety Research, NIOSH located in Morgantown, WV. The report was written by Patrick R Montague. An expert technical review was provided by Richard Carlson, Fire Chief (retired) Okolona Fire Protection District in Louisville, Kentucky. A technical review was also provided by the National Fire Protection Association, Public Fire Protection Division.

Additional Information

National Institute of Standards and Technology (NIST) and [Underwriters Laboratories \(UL\)](#) Over the past decade, NIST and UL's Firefighter Safety Research Institute has worked with fire departments and fire service organizations to conducted research on fire behavior, fire safety issues, and fireground operations. Since 2019, UL's website has made available [training videos](#) on these, and other topics. Videos relevant to this incident include, [Exterior Fire Attack to maximize tenability](#) and [Air Entrainment by Fire Service Hose Streams](#).

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

Career Acting Fire Officer Dies from Floor Collapse during Interior Fire Attack – Maryland

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.