



Search and Rescue

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**This chapter provides required knowledge items for the following
NFPA Standard 1001 Job Performance Requirements:**

FFI 5.3.9

FFII 6.3.2

This chapter contains Skill Drills. When you see this icon, refer to your Skill Drill book for step-by-step instructions.



OBJECTIVES

Upon completion of this chapter, you should be able to do the following:

- Identify the necessary tools required to perform a search of a building safely
- Identify the five search priorities in order of importance
- Describe a primary search
- Describe a secondary search
- Describe three primary search techniques
- Describe the three emergency procedures for firefighter safety and survival
- Describe six methods of victim removal

INTRODUCTION

The fire department's primary goal is to protect life (including our own) and property. As firefighters we must perform these actions in a safe and responsible manner. The object is not to win medals, but to protect the people we serve and safely return home to our loved ones. We accomplish these lofty goals through tactics that are well thought out and quickly executed. To the untrained eye it may seem that our actions are arbitrary, but in reality fighting fires is a well-orchestrated event carried out by a highly trained team. Make no mistake about it: The procedures and techniques that make up this chapter are critical for the survival of the rescuers as well as the victims. By definition, to search is to look for or seek out. In the world of the firefighter, it means to seek out or look for victims who require our help to remove them from danger, whether it comes from a fire or any other type of emergency to which firefighters may respond during the course of their duties.

Preparing for a search and search tools

Before beginning any search it is imperative that all firefighters are in full protective gear, including self-contained breathing apparatus. In addition, each firefighter must be equipped with a portable radio, not only to transmit information about search efforts, but also to transmit a Mayday message should the firefighter become trapped. All firefighters must be equipped with a tool such as a set of irons (flathead axe and Halligan) or a hook or pike pole (fig. 19–1). Additional tools may include thermal imaging equipment: ropes for rope guided searches, webbing, and a powerful hand light. Tools such as Halligan, axes, and pike poles should be used to extend the reach of the searching firefighters. Great care should be exercised when searching with these tools. Although these items greatly enhance our ability to perform searches, if used improperly they can injure or kill the very people we are searching for. The searching firefighter must swing the “light end” of whatever tool being used (the fork end of the Halligan tool, for example) toward the victim. The tool can also be used to extend your reach under a table.

The searching firefighter can also use these tools to sound floors for stability. It should be noted that when sounding a floor in a case such as entering a window, the area should be swept gently first in the event that a victim is in the area that the firefighter is sounding. Forcibly hitting a victim with the tool will injure or kill the victim. No firefighter should ever enter a structure without a tool. Whenever a firefighter enters a building without full personal protective equipment (PPE) and a tool, it is not only that firefighter who is in danger, but all other firefighters on the scene.

First in a long line of actions, the firefighter must safely arrive to the scene. Whether firefighters start the response from a fire station or from their homes, they must use some mode of transportation to arrive at the scene. All too often, firefighters are killed or injured in motor vehicle accidents en route to the emergency. The best way to prevent these occurrences is to obey all traffic laws, including using seat belts. No matter what type of policy your department has concerning emergency response, you should always take your safety into your own hands by using all available safety devices and procedures.



Fig. 19–1. Search tools come in a wide variety of shapes and sizes. Many commonly used tools were actually developed by firefighters looking for innovative ways to combine or improve standard tools.

SEARCH AND RESCUE

Search size-up and safety

FFI 5.3.9 FFI 6.3.2 Every firefighter must perform a task analogy or size-up for all events we respond to. These mental notes are critical in keeping us safe. We continually drill and train to hone our physical skills. Although it is imperative to maintain operational readiness, we tend to forget about the mental aspect of our jobs; part of this is taking a critical look at the entire scene as we approach it. Are there any barriers that may impede access or visible signs of structural failure? How well trained am I in building construction? Do I know the signs of failure? What are the fire or smoke conditions telling me? The answers to these and many other questions must be asked and answered long before stepping one boot into the structure.

Upon approaching an event, look for some indications of whether or not the structure is occupied. Some indicators are the presence of cars, time of day, closed window dressings, children’s toys outside, air conditioning operating in windows, and the all-important, yet so often overlooked, relevant preplanning information. Every firefighter should have intimate knowledge of the response district. Every day as you travel through your response area and the areas nearby, make mental as well as written notes that you can use if and when the time comes to respond to an incident.

Every firefighter should make mental notes of window and door locations before entering a building. This information may be a lifesaver should that firefighter become disoriented or trapped and suddenly in need of an emergency escape route. The firefighter should be cognizant of how many floors they may have ascended or descended. This information is a must for two reasons:

1. It keeps the firefighter oriented.
2. This information may help a rapid intervention crew locate the firefighter if necessary.

Before entering the structure, pay attention to the smoke conditions. What color is the smoke? Does it contain any indicators that suggest an imminent backdraft or flash-over? Is it drawn back into the building as you open the entry door? If so, this may be an indicator of backdraft. Is the smoke violently pushed out of the building as if under extreme pressure? This may be indicative of an ensuing flashover.

FFI 5.3.9 Once you're inside and beginning your search, pay strict attention to smoke, heat, and fire conditions. They can change rapidly, making a survivable atmosphere into a violent and deadly space that you must escape very quickly. Be ever mindful of construction type, layout, and how fire affects that type of construction (e.g., trusses, lightweight structural members, wide open spaces, and confusing layouts). Watch for missing or burned-through floor boards, or building features that have been purposely removed for whatever reason. Use a hand tool to sound the floor as you walk or crawl, to detect sponginess or weakness before placing your weight on it. Before opening a door to an adjacent room, look for signs of smoke or fire coming under the door, and check the temperature of the door. If it is hot there is likely fire on the other side.

Take notice of door swing. The rule of thumb is that doors that open away from you usually lead into living spaces such as apartments or bedrooms. Conversely, doors that open toward you usually lead into service areas such as utility rooms or can be indicative of an elevation change such as steps that lead to a basement or attic. Doors that lead to utility closets may have ventilation louvers built into them. Doors in places of public assembly, such as theaters, usually swing in the direction of egress for the occupants. Before opening a door, always check it for heat by first feeling the door from bottom to top, and carefully control the door as you begin to open it. Door control offers the opportunity to close it quickly should conditions in the room be untenable. Now where do we begin our search or what areas are our top priority?

Search priorities

- Fire room/fire floor
- Room above/floor above
- Top floor
- Floors in between
- Floors below and the building exterior

The most endangered occupants are in and around the fire room and fire floor. Now this may sound like common sense to most; however, firefighters are easily distracted if other victims cry out for help. We may tend to give those victims our attention first when they are not the ones who require our immediate attention. Of course, we don't want to minimize the fact that the victim calling for help needs it, too. However, firefighters must realize that the victims who can't call for help are the ones who are in the most need. So we must either address both victims simultaneously or prioritize and help the ones in the most danger.

The next area that needs attention is the room immediately above the fire. The room above directly receives all the products of combustion as well as a good amount of the heat. Keep in mind that the amount of heat the room and floor above receives depends on the type of building construction. These factors also determine how much danger the rescuer faces when searching the floor above. Obviously, the rescuer faces more danger in a balloon frame tenement than in a fire-resistive building.

Subsequently, the firefighter must address the top floor. The top floor is the next stop for all the smoke and gases rising through convection. The conditions on the top floor are affected by two factors: the location and extent of the fire, and whether the floor has been ventilated properly.

After the top floor, all the floors in between the top floor and the previously searched lower floors must be searched. In buildings that are more than two or three stories in height, searching all these areas will require multiple search teams and a great amount of coordination.

Lastly, and many times overlooked, are the floors below the fire and the building's exterior. Although people on the floors below the fire are rarely affected by the products of combustion, fire departments are always responsible for the well-being of all occupants within the structure. The outside of the building must also be thoroughly examined for victims who may have jumped from the structure. By this we mean all four sides of the structure must be searched to find any victims who may

have exited the building by other than normal means. Victims have often been located in shrubbery and in other locations outside the structure.

After entering the room to be searched, there are several areas that the searching firefighter must pay strict attention to. The first area is the normal path of egress, in other words, the areas that are directly in line with the door or hallways. Behind doors is another area where victims are often found; any resistance a search team finds in trying to open the door once forcible entry has been completed is probably an indication of a victim located behind the door. Normally if the path to the door or the hallway is blocked the victim will choose to move toward the window. This fact makes it imperative that we check the area below and around the window. Firefighters that are assigned to search must keep all possibilities of victim location in their mind.

Search categories

FFI 5.3.9 Search can be divided into two different categories: primary and secondary searches. Primary search is a rapid search of high-priority areas. Primary searches are often conducted prior to control of the fire. Secondary search is slower and more methodical. Secondary searches are usually conducted after the fire has been controlled.

Primary search. Primary searches are a rapid check of a fire building focused on areas that are normal areas of egress for the occupants. These areas include but are not limited to doorways, windows, and all adjacent areas that lead to these locations. For firefighters to successfully search a structure, they must have an understanding of the mindset of the escaping victim. In times of stress, most people resort to leaving the building by the same routes they use during their everyday routine. In other words, if they normally use the side door daily, they are likely to use that same door during a fire. Humans are creatures of habit, which drives us to think in this manner.

Firefighters only have seconds to get into the heads of the victims and try to determine what they may think while they are in a state of stress and disorientation. For these reasons we search high-probability areas first. These also just happen to be the areas that we normally use for access to the building such as the front door, pathways leading to exterior doors, bedroom windows, and the paths leading to those areas. Because of the speedy nature of this type of search, firefighters must cover these areas

quickly and aggressively to greatly improve the survivability of the victims.

Secondary search. Secondary searches are usually slower, more methodical, and more thorough than primary searches. These types of searches are often done after the fire has been controlled. During secondary searches firefighters must search for victims in every possible spot inside and outside the structure. Areas searched during the primary search are rechecked along with the areas that were not checked. These areas include but are not limited to closets, toy boxes, showers, and under beds or other furniture that could provide a hiding spot for a victim. Hiding spots differ for adult victims and child victims. It is at this point that firefighters must learn a little about how their victims think when they are under the extreme stress of being trapped.

The mind set of adults and children often differs during a chaotic state. Adults try to reason their way out or try to think the problem through; children resort to areas of comfort or protection. Adults may try to escape harm by going into the shower and turning the water on thinking that the water protects them from the fire only to find that the smoke kills them or they wind up steaming themselves to death. Conversely, children try to get to their parents thinking that mommy and daddy can protect them. Parents are often found trying to get to their children. It is for this reason that if a firefighter finds an adult victim that firefighter must also look for any children that may be with that adult. On many occasions firefighters trying to remove the adult victim to safety leave the child behind. In once such case, the child was right underneath the mother. The mother was removed, but the firefighters never saw the child and they left the child behind. So take an extra second and sweep around the found victim just in case a second victim is nearby. Children will also hide from the danger in areas that are comforting to them, such as in toy boxes, under beds, in closets, and any place that provided them refuge in the past.

Children may be frightened by the sight of the firefighter in full protective equipment and hide. The only way for the fire service to overcome these fears is through education. Your fire department must teach children how a firefighter looks when wearing full protective equipment. Fire departments should go to schools and allow children the opportunity to meet firefighters before they are attired in PPE and then again after that firefighter is fully geared. It allows children to face the person in full PPE.

Search techniques



- Light scan search
- Perimeter search
- Lifeline search

Search techniques are designed to keep a firefighter safe as well as oriented during searches. Searching firefighters are exposed to extreme risk, especially during primary search. Disorientation continues to be a deadly problem for firefighters. Each year many firefighters are trapped and either killed or severely injured during search efforts. Ideally, by using the proper search techniques, we can reduce or even eliminate these tragedies. The following techniques used under the correct conditions are designed to help firefighters efficiently search the building as well as keep the firefighter oriented in the structure.

Before beginning any search, it is imperative that all firefighters are in full protective gear as well as self-contained breathing apparatus. All firefighters must be equipped with a tool such as a set of irons (flat-head axe and Halligan) or a hook or pike pole. No firefighter should ever enter a structure without a tool. By entering a building without full PPE and a tool, a firefighter endangers him or herself as well as all other firefighters on the scene.

Light scan search. This technique can be used if the smoke condition in the room is several feet off the floor, allowing the searcher to quickly scan the room with a portable light to check for any victims located on the floor or on any furniture such as couches, beds, or chairs. To properly perform a **light search**, the firefighter must be in full PPE and equipped with a powerful portable light. The firefighter enters the room by first checking the door from bottom to top using the back of the hand. Once inside the room, the firefighter either crouches below the smoke layer or lies down flat on the floor below the smoke condition and uses the light to completely scan the floor area and any furniture for victims. This technique allows the area to be searched in a very short period of time so the firefighter can continue searching other areas. This technique is usually limited for use in rooms that are smaller in size because of the limitations of the light and how far the firefighter can see across the room (fig. 19–2).



Fig. 19–2. A light search involves using a flashlight to quickly and effectively search rooms with only a light smoke condition.

Perimeter search. It can be said that this search technique is the bread and butter of all search operations in the fire service. This technique lends itself well for use in private dwellings, apartments, and relatively small operational areas. Either a two- or three-person search crew can perform this technique (fig. 19–3).

Two-firefighter perimeter search. The two-person perimeter search always begins by checking the door in the same manner: from bottom to top with the back of the hand. The first firefighter enters the room and immediately places the right hand on the right wall and starts to crawl along the right wall. The second firefighter lies on the floor and performs a quick light scan search of the area. The second firefighter then places the light on the floor at the doorknob side of the door near the door jamb. This light serves as a beacon and additional orientation point for the searching firefighters. (Note: The light should not be placed in the path of the door swing in case another firefighter enters the room and knocks it away from the door.) The second firefighter then places a left hand on the left wall and continues to crawl along that wall until the two firefighters meet.



Fig. 19–3. The two firefighter perimeter search is one of the most common search methods.

Upon meeting, the two firefighters should pause momentarily and listen for any sounds such as a victim breathing, moaning, or crying. After listening for any victims, the two firefighters return to the door by following the beam of the light placed by the second firefighter (fig. 19-4). The two firefighters continue toward the light through the center of the room. Working side by side, the firefighters should stay in physical contact with each other while returning to the door. By following this pattern the firefighters can cover most of an average-sized room.

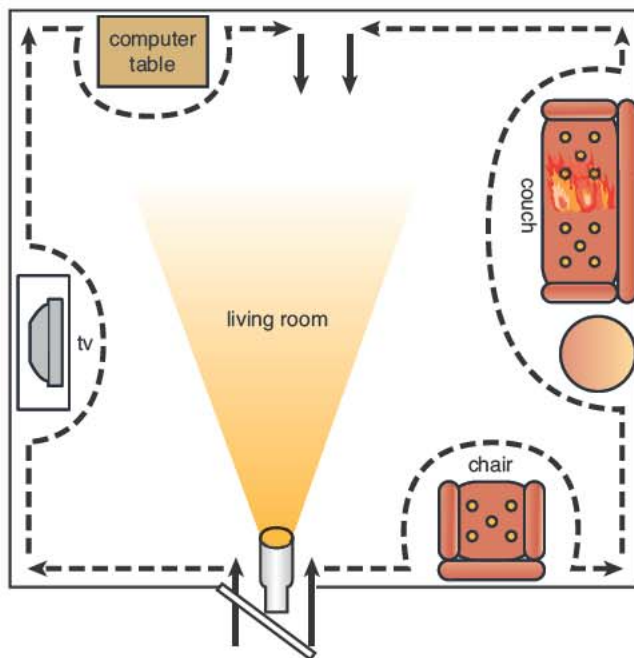


Fig. 19-4. Two-firefighter perimeter search

If the light is not visible to the firefighters from across the room, they should follow one wall back to the doorway. At this point the two firefighters follow the same wall: one firefighter remains in contact with the wall while the second firefighter, keeping contact with the first, stretches out into the middle of the room in an effort to cover as much of the room as possible. While searching, the firefighters should keep mental notes of all doors and windows but should not enter any other doors that would take them into another room. Rooms should be searched one at a time. Closet doors can be quickly swept with a tool to check for any victims. After completing the search of the room, firefighters should pause momentarily at the door of the completed room and quickly discuss any discoveries, such as doorways they may have found or any additional rooms that were encountered. This room is now completely searched and should be marked as such before the firefighters move on to the next room (fig. 19-5).

Marking a room after the search is completed can be done in many ways. For example using a marking pen to mark the door, leaving mattresses folded in half, or any other means dictated by your department's standard operating procedures (SOPs).



Fig. 19-5. In order to prevent a duplication of effort, it is necessary for firefighters performing a search to mark the room as "searched" in a conspicuous manner, according to local policy.

Three-firefighter perimeter search. When the situation arises and there are three firefighters available to perform a perimeter search, the procedure changes. After the door is properly checked, the first firefighter enters the room and starts the search by crawling along the right wall. The second firefighter then enters the room and crawls along the left wall. The third firefighter then enters the room and conducts a light scan search; however, this firefighter remains at the door with the light shining toward the middle of the room so the searching firefighters can use it as an orientation point (fig. 19-6).

FFI 5.3.9 Firefighters engaged in perimeter searches should communicate with each other on a regular basis during the search. This communication allows firefighters to keep check on one another and ensure that each firefighter is safe. Communication also gives each firefighter psychological assurance that they are not alone in the room. This assurance will help keep each firefighter calm during the search, as low visibility and extreme conditions can cause disorientation and panic. The communication does not necessarily need to be verbal at all times, the firefighters could track each other by listening for the other firefighters' movement, listening for sound from the other firefighters' breathing

apparatus, or by tapping on the floor occasionally with a tool. The firefighters should guard against making noise or talking constantly because constant noise will make it harder for the search crew to hear any noises that possible victims may be making.



Fig. 19–6. When possible, using a three-firefighter perimeter search provides the best combination of firefighter safety and victim search methods.

Lifeline or rope-guided search. Lifeline or rope-guided searches should be used whenever it is necessary for firefighters to search large areas such as warehouses, supermarkets, or movie theaters. This type of search should also be used in basements or any place with confusing or mazelike floor plans such as office cubicles. Firefighters should not use any of the previously mentioned search techniques in these types of situations. Disorientation in large area buildings is a constant danger to firefighters. All too often a firefighter becomes complacent because most fires occur in dwellings and the main search technique is the perimeter search. Failing to use a lifeline search in a building with a large or confusing floor plan can and often has proved deadly for many firefighters.

Lifeline searches should begin with a fully equipped firefighter (full PPE, self-contained breathing apparatus [SCBA], and tools) and a search rope that is stored inside a rope bag. The average search rope should be approximately 200 ft (60 m) long. The rope may contain indicator knots that can be tied in the rope at 20-ft (6-m) intervals. These knots allow the firefighter to determine how far they have penetrated the structure by simply counting the knots as they move along the search rope (fig. 19–7).



Fig. 19–7. Search rope can be invaluable on the fire ground. Besides increasing firefighter safety, using a search rope can allow for a faster and more coordinated search. Indicator knots tied at intervals along a rope can help firefighters estimate their penetration distance into a building.

The search rope is tied to an unmovable or substantial object outside the building or fire area, but not a vehicle. Firefighters then enter the area to be searched, and the first firefighter holds the bag and allows the rope to deploy as they move forward into the search area. Any remaining firefighters, whether it is one or more, then guide themselves along the rope, never losing physical contact with the rope. Whenever the search crew takes a turn inside the structure, the rope should be tied off; this keeps the searching firefighters from dragging the rope into areas that the crew did not cover as they move further into the building (fig. 19–8). By dragging the rope across areas not searched on the way in, the search team runs the risk of endangering themselves on the way out. If the firefighters cross areas not covered previously, they may fall into an open shaft, become entangled in furniture, or be trapped by many other obstacles found in burning structures.

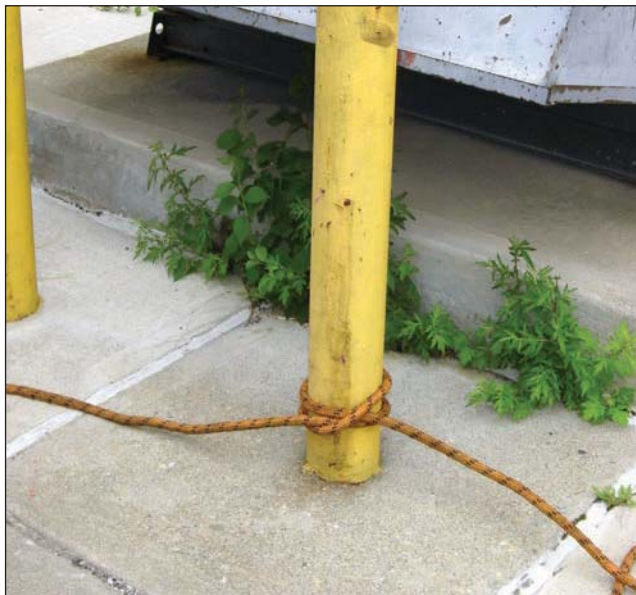


Fig. 19–8. To control the deployment of a search rope, it is recommended that the rope be tied off to a substantial object outside the structure.

Search crews performing a lifeline search can expand the search area by carrying personal **tether lines** that can be attached to the main search line by carabiners. The firefighter simply attaches the tether line to the main search line and searches off the main line to cover areas such as cubicles (fig. 19–9). It must be noted that tether line must be no longer than 10 or 15 ft (3 or 5 m) in length, thus reducing the possibility of the firefighter getting too far off the main line.

Safety is further enhanced by the use of an entry control officer who is positioned at the point of entry. This control officer must be equipped with a clipboard and a timing device (stop watch). The control officer records the names of the firefighters on the entry team, air cylinder duration time (e.g., 30-minute or 60-minute cylinder), and time of entry. The control officer as well as the entry team must be equipped with portable radios preferably on their own tactical frequency. The control officer records the entry time of each member. Following proper air management techniques (described in chapter 10, Self Contained Breathing Apparatus), the control officer reserves enough time for the team to exit the building. For example, a team equipped with a typical 30-minute rated cylinder is allowed a total operational time of approximately 16.5 to 18.5 minutes to enter the building, conduct search operations, and leave the building. This leaves 25% of bottle capacity, the level at which most SCBA low-air alarms activate, in reserve for safety purposes. In reality, a 30-minute cylinder does not last for 30 minutes—for the typical firefighter, they

last the 16.5–18.5 minutes cited above. Use of longer duration cylinders (larger size bottle) will increase these times accordingly. Firefighters must not wait until their low-air alarms activate—they need to be out of the building before alarm activation.



Fig. 19–9. Tether line

Upon being recalled, the firefighters simply reverse their direction on the line by 180° and follow the line out to the starting point. The firefighter maintaining control of the bag leaves the bag on the floor where he or she stopped and follows the rope out, leaving the bag behind. The lead firefighter should make a mental note of the last knot that was past so that he or she can let the control officer know how far into the search area has been searched. The control officer can then use that information to let the second team know where the first team left off, so the second team could proceed immediately to where the bag was left without researching the area that the first team already completed. Finally, lifeline searches are an important tool; all firefighters must be trained to maintain their orientation in large buildings or buildings with confusing layouts (fig. 19–10).



Fig. 19–10. Here firefighters use a search rope or “lifeline” to guide their search of a structure.

Thermal imaging equipment

Thermal imaging cameras (TICs) are devices that see through smoke by reading heat signatures, using very slight variations in temperature that exist between different objects to create an image on the camera's screen. In other words, cameras read the temperature difference between a victim and the victim's surroundings. By using this heat differential, the user can view outlines of the objects within the camera's range. Thermal imaging cameras are available in many designs. The camera can be handheld or helmet mounted. However, no matter what their differences, they all work on the principle of heat differential.

Thermal imaging must *never* take the place of any of the tried-and-true search techniques. Although thermal imaging technology has added a new dimension to how firefighters work on the fireground, the fire service must guard against becoming too reliant on this equipment. Remember, thermal imaging cameras can still fail unexpectedly, leaving any firefighter not using proven search techniques lost and disoriented inside a structure. Searching firefighters should use perimeter or lifeline search techniques in conjunction with thermal imaging cameras. Combining both standard search techniques and thermal imaging equipment optimizes the search safety. By doing this, both firefighters and the public will benefit (fig. 19–11).

Firefighters must know how to operate the controls on their thermal imaging camera and be completely competent in the recognition of different objects viewed through the camera (e.g., what a person, door, or different types of openings look like). The firefighter should be trained in what the different heat signatures look like when viewed through the camera. Some cameras read heat signatures on a black and white screen: the brighter the white, the hotter the object. Newer cameras read heat on a color screen using oranges and reds to indicate levels of heat. No matter how your camera operates, you should be thoroughly trained in its operation before trying to operate it in a hostile environment. The best training combined with the latest technology results in a safe and successful search. When the thermal imaging camera is assigned to the officer that is directing a search crew, the officer can use the advantage of the camera to direct the searching firefighters. The officer can direct them toward any victims that he sees and away from any encumbrances the searching firefighters will encounter. This will greatly reduce the amount of time required to search an area. It should be noted that the searching firefighters still must exercise great care to keep from becoming disoriented.



Fig. 19–11. Thermal imaging camera technology is arguably the most important innovation to search and rescue. The use of TICs has spread to nearly all fire departments, small and large. (Courtesy of Bullard)

Searching with a hoseline

A hoseline may be used in conjunction with firefighters' individual tether lines if a rope is not available. One advantage to this method is that the hoseline will protect the firefighters that are searching. A disadvantage is that the search will be limited to the area covered by the hoseline. In addition, a hoseline will be cumbersome and difficult to relocate, thus slowing the entire search operation to a slow crawl. However given a choice between no rope and searching off a hoseline, choose the hoseline every time. It's better to be safe than sorry.

MASK CONFIDENCE AND EMERGENCY PROCEDURES

Mask confidence or emergency procedures are techniques that each and every firefighter must learn and become highly competent in using. Techniques such as the reduced-profile maneuver, swim method, and the quick-release maneuver must be practiced and mastered by each and every firefighter. The use of these methods at a moment's notice may mean the difference between life and death. Every firefighter should also be intimately familiar with

the emergency operation of the particular SCBA that they are using. All these procedures and methods must be mastered before a firefighter enters a hostile environment.

Reduced-profile maneuver

**SKILL
DRILL**

The **reduced-profile maneuver** enables the firefighter to move through areas that would normally be too small to fit through, such as stud channels (fig. 19–12). The normal spacing for stud channels is 16 in. (40 cm) on center, leaving the firefighter a little bit less than that amount to squeeze through. The firefighter executes the following steps:

- Start by loosening the waist strap of the SCBA.
- Loosen the SCBA's strap (the strap opposite the unit's regulator) and remove your arm from that strap.
- Reach back with one hand and grab the bottom of the unit's bottle near the valve. Then turn the SCBA unit in the direction of the strap that is still in use.
- Tuck the top of the air bottle under your armpit, thus aligning the bottle with the side of the firefighter.
- After the firefighter moves through the restricted area, reverse the previous steps and redon the SCBA.



Figs. 19–12. In emergency situations, firefighters may have to reduce their profile in order to fit through wall studs or other tight spaces.

Swim method

**SKILL
DRILL**

The **swim method** is used when firefighters encounter an entanglement hazard but are not yet entangled. Turn the SCBA unit toward the corner where the wall and the floor meet (fig. 19–13). This allows the air bottle to be directed toward an area and reduces the probability of it catching on the hazard. This also forces you onto your back and in the correct position for the next step in this maneuver.

Extend an arm with the palm facing the floor above the head, similar to the motion a swimmer would use to perform the backstroke. The extended arm then lifts the entanglement above your head as you continue to crawl forward under the entanglement. Continue this maneuver until you clear the area of the entanglement hazard.



Fig. 19–13. The swim method is used to help a firefighter avoid becoming entrapped in an entanglement hazard. It is always preferred for firefighters to learn to avoid hazards rather than have to learn how to recover from them.

Quick release maneuver

**SKILL
DRILL**

To avoid entrapment, use the **quick release maneuver** (fig. 19–14). It should be employed if the firefighter has already become entangled and needs to escape.

1. Backtrack in a straight line. Drop down on your stomach try to move forward again. If you are still entangled, start over.
2. Fully extend both shoulder straps.
3. Slip your right arm through the right shoulder strap.

4. Grasp your left shoulder strap *and regulator hose* with your left hand.
5. Disconnect waist belt buckle with right hand.
6. Turn 180° *to the left* to face entanglement, maintaining *grip with left hand*.
7. Free yourself from the entanglement.
8. Redon unit.



Fig. 19–14. Entanglement hazards have caused serious injuries and deaths to firefighters over the last several decades. Because of this, it is essential that all firefighters learn basic disentanglement techniques.

VICTIM REMOVAL

Drags and carries



Victim removal is an important part of our job, which is often not practiced enough. Keep in mind that when performing these techniques, you must use your leg muscles, *not* your back, to prevent injury to yourself.

The goal of victim removal is to prevent further injury to the victims and remove them as quickly and safely as possible. It is easy to practice these techniques in a controlled environment; however, it is extremely challenging when firefighters are in a stressful situation with zero visibility, high heat, and limited knowledge of the layout of the building. Victims that are located by searching firefighters should be removed to a clean area or removed to the outside of the structure as soon

as possible. When removing said victim, the firefighters should make every effort to keep the victim's head as low to the floor as possible, thereby keeping the victim closer to the cleanest air.

FFI 5.3.9 The practice of a firefighter removing his/her face piece to give it to the victim is strongly discouraged. The reason for this is that the victim might not want to give it back and then the firefighter would be in a life-and-death struggle to get the face piece back from the victim. In addition, firefighters should try to remove victims to the exterior of a building by the path that gets the victim safely out of the “immediately dangerous to life and health (IDLH)” atmosphere to medical treatment as quickly as possible. For example, when a fire is located on the first floor of a single family home and has not yet been knocked down, it is usually better to remove a victim through a second-floor exterior window rather than down the stairs to the first floor and then to the exterior. Similarly, it may be advisable to take a victim to the public hallway in a multiple dwelling *when the hallway is relatively clear of smoke*.

There are multiple procedures for removing victims from an IDLH atmosphere and many carrying techniques, depending on your environment. Some carries are more feasible than others, depending on the conditions. These include the following:

- The blanket drag
- The seat carry
- The firefighters carry
- The extremity carry

The blanket drag. If the victim is laying on his or her back, spread the blanket next to the victim, fully opened. Roll the victim toward the rescuer and roll them back onto the blanket. Roll the blanket around the patient, supporting the head and neck. The patient should now be dragged head first, with head and shoulders slightly off the ground (fig. 19–15).



Fig. 19–15. The blanket drag can be used to move unconscious or heavy victims. This maneuver can be attempted by a single firefighter, but is most effective with two firefighters.

The seat carry. Two firefighters are required for this carry. The rescuers are to face each other. With your left hand, grasp your own right forearm just around your wrist. When both have done this, face each other. With your right hand grasp the other firefighter's left forearm firmly, and he or she should grasp yours. This forms a square seat (fig. 19–16).



Fig. 19–16. The seat carry can be accomplished with two firefighters on a conscious victim.

The firefighter carry. The firefighter carry can be performed by one firefighter on either a conscious or unconscious patient (fig. 19–17).

This carry is not recommended for a smoke-filled environment because you may subject yourself and the victim to extreme heat and toxic gases. Firefighters performing this carry should make sure that the victim weighs less than their own weight.



Fig. 19–17. The firefighter carry can be used on a conscious or unconscious patient, but should *not* be used under smoke or fire conditions.



The extremity carry. The extremity carry requires two firefighters and uses victims' extremities to carry them to safety (fig. 19–18).



Fig. 19–18. The extremity carry

The next set of carries should only be done when conditions warrant it:

- Clothing drag
- Webbing drag
- Downed firefighter drag
 - Using SCBA
 - Using turnout coat harness

Clothing drag. The firefighter should squat or kneel at the head of the victim grasping firmly on the clothing on each side of the victim's head. Drag the victim across the ground. Support the victim's head on your forearms when using this technique. It is important to stay as low to the ground as possible so that the victim's head does not push downward toward the chest and cause the victim to have difficulty in breathing (fig. 19–19).



Fig. 19–19. Firefighters using the clothing drag to move a victim must monitor and support the victim's head.

Webbing drag. The webbing drag can be performed by either one or two firefighters. One-inch tubular webbing is one of the most important tools a firefighter carries. This webbing should be joined by way of the water knot to make a complete loop of the webbing and should be carried this way (fig. 19–20).

Steps for these and other drags and carries are in your skill drills book.



Fig. 19–20. Using 1-in. (25-mm) tubular webbing, one or two firefighters can assemble a makeshift harness and drag a victim to safety.

FIREGROUND NOTE

Search quickly; search thoroughly! We owe this to the citizens we are sworn to protect (if you forget this, refer back to the oath you took when you were sworn in). Remember to protect yourself, stay oriented, and, most of all, keep your head in the game. If you lose your cool, you may next lose your life!



LESSON FROM THE FIREGROUND

The time is 0230 hours. Your ladder company is dispatched to a report of a dwelling fire. As you step on the rig and try to shake the cobwebs from your head, you begin to run through a million scenarios. The radio breaks in, stating that a patrol officer is reporting a confirmed structure fire with possible entrapment. Your ladder company is riding with one officer and three firefighters. Per SOP, you and your partner are assigned to roof ventilation and the officer and remaining firefighter are to provide forcible entry and begin the primary search. As you approach the scene you find a three-story multiple dwelling with fire showing from the second floor and heavy smoke showing from the third floor and cockloft.

You and your partner position the aerial and begin to ascend to the roof position to open up the scuttle and provide much-needed relief to the firefighters trying to make the stairs. Suddenly the radio comes alive—it's your company officer ordering you to change tasks and place the aerial to the front bedroom window in order to vent, enter, and search for missing 7-year-old twin boys. You obey the officer's request and remove the bedroom window, allowing the smoke to vent. You sweep under the window before sounding the floor, just as you were trained to do. You enter the room, climbing over a box located under the window, and immediately proceed to the bedroom door and close it. As you begin the search, the heat becomes unbearable, so you quickly perform a perimeter search and exit back out to the aerial just before the room flashes. As you push yourself out the window onto the aerial you knock over the box that you climbed over on the way in—something that will change your life forever.

The engine company makes the room shortly after your exit and quickly knocks the fire down. As they enter the room, they find victim number one partially hiding under the bed. Remember the box you knocked over? A second victim is found under the box. It was a toy box that the child used to hide from the fire. You are still unaware of these tragic deaths as you return to the roof and complete your original assignment. Upon exiting the roof you hear the tragic outcome and begin to second-guess every move you made during that search. You wonder what you could have done differently. Did I search thoroughly enough in the amount of time I was in the room? Did I give those children every chance to survive that I could have? This author was that firefighter. This is an event that I will question for the rest of my life. Remember: You will not be able to save everyone, but you must give every victim the best chances possible.

Remember: Search quickly, but search thoroughly. We owe that to the people we protect and to the oath we took. My hope to all that read this is that you will never have to wonder whether you did a you can!

Stay safe, search well, and Godspeed.

QUESTIONS

1. When performing a size-up, what are possible indicators that could lead an emergency responder to believe a structure is occupied?
2. When searching a multi-story building involved with a fire, why would searching the floors above the fire be of a higher priority than the bottom floor?
3. When performing a primary search, it is helpful if rescuers are aware if they are looking for an adult or a child. What are some different reactions that adults and children tend to demonstrate?
4. Secondary searches are usually slower, more methodical, and more thorough than primary searches. Why are these attributes not exhibited during the primary search?
5. Before entering into a room or structure with a closed door, why is it recommended that the rescuer check the door prior to entering with the back of a closed hand?
6. How can door construction and direction of swing provide clues to the type of space located on the other side?
7. When performing a search for victims, why is it important to search the outside of the structure as well?
8. How do the stages of fire within a structure affect your choice on the technique to be used to perform a search?
9. What are some of the advantages for rescuers to occasionally pause when performing search operations?
10. Why is it important that marking procedures showing when a room search is/has been conducted are dictated in the standard operating procedures?
11. What are some of the risks of using a thermal imaging camera that a rescuer is unfamiliar with?
12. How does the fire stage affect the choice of drag or carry when removing unresponsive victims for heated atmospheres?
13. How can the dangers of using lifeline searches increase or decrease when searching large structures?
14. Why is it important for rescuers to train in using mask confidence or emergency procedure techniques before rescue situations?