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The Most Dangerous Fireground Activity, Part 1

Question: What necessary fireground activity do you believe is the most dangerous for firefighters, and how can that activity be made safer?

Safety has been a buzzword for most of us for many years now. Great strides have been taken to ensure that what we do is done as safely as the situation would allow.

There are several means by which we could rank the dangerousness of the tactics and evolutions we do. One way would be to recall our experiences. Having been assigned to each of our three major units (engines, trucks, and heavy squads), I have some recollection of events I would consider the most dangerous. However, this information might be tainted by some personal phobias, such as the fear of heights. If that were the case, I could say that possibly venting a roof is the most dangerous task.

Another way to determine which evolutions are the most dangerous is by the frequency of injury or death to firefighters while performing them. If this were the case, stress, in the case of a heart attack or stroke-not a specific evolution-would top the list.

Or, we could simply look at evolutions that repeatedly put firefighters in dangerous situations.

To my way of thinking, search evolutions are the most dangerous. Most often, the search crew seldom takes a hoseline in at residential fires. The thinking is that the search crew usually follows the attack line into the fire. That will get a charged line between the fire and the victims (and the search crew as well). If the search crew is not comfortable because of heat or fire conditions and with all their bunker gear, what is the likelihood of finding a viable victim in that area?

I would say you're looking in the wrong area and wasting the precious time of any victims in areas where life could still be sustained. We use the oriented search in which the officer is not searching but instead maintaining an awareness of the crew's safety, fire conditions, and the progress of the search.

-John "Skip" Coleman, deputy chief of fire prevention, Toledo (OH) Department of Fire and Rescue, is author of *Incident Management for the Street-Smart Fire Officer* (Fire Engineering, 1997) and *Managing Major Fires* (Fire Engineering, 2000), a technical editor of *Fire Engineering*, and a member of the FDIC Educational Advisory Board.

**Rick Lasky, chief,
Lewisville (TX) Fire Department**

Response: So many dangers are associated with what firefighters do that it almost bears making a list and going through each one in detail. One huge one, though, is actually off the fireground. That's being struck by a vehicle. We have to do whatever we can to protect our firefighters while operating in or near traffic. It has gotten to where you can't go a week or sometimes a day or two without hearing about a firefighter or police officer's being struck by a vehicle.

As for the fireground, interior fire operations are the most dangerous. The more we look at what happens each time we lose a member or one is seriously injured while operating inside at a fire, we notice several things:

- Before they ran out of air, they usually were lost.
- Before they were overrun by fire and burned, they usually were lost.
- Before the floor went out from underneath them, they usually were lost.

I know that this is not always the case, but it is often the situation that precipitated the death or injury. What was going on before any of this happened? Were they oriented as to where they were, or were they turned around?

We all have had that time or two where we were turned around inside while in the smoke. Even if it was just for a minute, you felt a little frustrated or nervous. I know there are times when we are in too long or have gone in too far, and it does appear that many training officers are working toward addressing those issues. But we have to get better at staying oriented while operating inside a structure fire. Instructors have found that young and old firefighters going through a search drill have poor search skills. They have a hard time working their way through the room, floor, or building and have difficulty staying oriented. Instructors are advocating that as many firefighters as possible be trained in staying oriented.

It doesn't take much to conduct such a drill—a building or a room with furniture and a firefighter. The firefighter can be taught to read a room by feel, to find windows and stairwells, to follow the hose out, and all the other areas that need to be addressed.

We all know that we are supposed to stay together, but there are times when a firefighter gets separated from his partner or crew and becomes lost. And there are times when the entire crew gets lost or disoriented. With all that we're expected to do for our people and all the training we are expected to provide, teaching our firefighters to stay oriented and to use the proper methods for performing a search has to become a priority. If that isn't a priority for your department, you need to get busy. Make your personal commitment to getting better at staying oriented.

**Gary Seidel, chief,
Hillsboro (OR) Fire Department**

Response: This question brings up numerous potential topics that impact the ability to be successful in fireground operations. The basic fundamentals must be in place, understood, accepted, and practiced on a daily basis. They include wellness programs, prefire planning, all-hazard training, community risk analysis, emergency response, driving, and command and control of emergency operations.

Specifically, when I evaluate fireground operations, I would say that the most dangerous activity is entering the immediately dangerous to life and health (IDLH) atmosphere. It is here that the decisions

and the plan of operation are formed. This is where we give the initial size-up, assign the resources, and begin to attack the fire.

When we evaluate firefighting injuries and fatalities, we see several commonalities, including communications, accountability, the action plan, and transition of command.

Making the fireground safer begins with receiving and acknowledging clear communications. Do we have accountability of all our personnel, and are we tracking them throughout the incident? Have we eliminated self-dispatching and freelancing at the incident? On transition of command, is the briefing complete, are issues resolved, and is there a good understanding of the situation and our plan of attack? Once the aforementioned are completed, the plan must be communicated to everyone on the incident; it must be understood and followed through the overhaul phase (my second choice for source of dangers in fireground operations; this is often where firefighters let down their guard).

**John Salka, battalion chief,
Fire Department of New York**

Response: The most dangerous activity, and the one that causes many more firefighter injuries and fatalities than we realize, is operating in smoke-filled environments-entering and operating inside a burning building. The reason this is so dangerous is that there are more than a few ways to get into trouble after entering a burning building wearing an SCBA and performing one of several operational tactics. To enter, operate safely, and leave a serious smoke condition requires firefighters to successfully perform several activities.

First, they must stay oriented-know where they are, how they got there, and how to get out, if necessary. This is a basic yet vital tactic every interior structural firefighter must know and one in which few have been instructed. Many firefighters who die in the line of duty get lost first. Then they run out of air, the building falls on them, or they are burned to death.

Second, they must manage their air supply and properly operate and use their SCBA. We give little thought to these basic yet technical pieces of equipment when they are operating properly, yet it is the only thing that can save us when we get into trouble while wearing one. How many firefighters have taken a mask confidence or SCBA emergency skills course? Not many!

Knowing and understanding the hazards involved in these atmospheres-the visibility limitations, the smoke movement, and the heat development-are vital to a firefighter's ability to survive these encounters. Learning how to stay oriented, knowing everything about your SCBA and how much time you have when working and wearing one, and continuously training on these skills will help to keep you alive after an encounter with our deadly shadow at a fire, smoke! As we used to say to each other years ago while responding to a job in the Bronx with Rescue 3, "We're going to see Mr. Smoke." Even we knew to call the smoke "Mister"!

Craig H. Shelley, fire protection advisor, Saudi Aramco

Response: I think extinguishment is the most hazardous phase. During extinguishment, we are more likely to lose focus of the big picture while concentrating on the immediate fire situation. Firefighters are like moths looking for the flame. We see the flame and are drawn toward it, as the moth is. Everything else around us becomes invisible.

Yet the most danger may lie in these other areas. Firefighters who charge headstrong into the front door

of a building may be unaware of the cornice ready to collapse or the electric wires underfoot. A size-up by each member helps to alleviate this phenomenon of heading straight to the flames. To reduce firefighter injuries and deaths during the extinguishment phase, you must maintain a heightened state of "situational awareness"-being aware of everything around you. Know what is going on. Be attuned to the actions of your fellow firefighters and where they are operating.

When I was a young lieutenant, I remember a fire in which a collapse had occurred, trapping firefighters. The radio reported only the collapse of a section of the building. One of my team yelled to me to get to the cellar immediately. He had heard moments before the squad company radio report that they were moving a line into the basement. Our company rushed to the area; one trapped firefighter was immediately removed. Our team's collective situational awareness made this tragic incident have a positive and happy resolution. Although I have mentioned situational awareness during the extinguishment phase, I would be neglectful if I didn't mention that situational awareness and safety need to be practiced at all times, from routine station duties to the most complex operations.

**Thomas Dunne, deputy chief,
Fire Department of New York**

Response: Search is the most dangerous activity a firefighter performs, particularly when operating on a floor above the fire. However, a number of factors can reduce the danger to which he is exposed.

First, officers must ensure that a charged hoseline is in position to confine the fire and provide a means of egress. In addition, they must exercise control and accountability of personnel doing the searches.

Individual firefighters should maintain a sense of their location in the building and communicate with supervisors as they search. Effective air management is vital to avoid overextending work time or distance from clean air. In addition, large occupancies absolutely call for the use of search ropes.

Firefighters searching areas above the fire area are in an especially precarious position and should ensure that they have an alternate means of egress or an area of refuge. This means placing ladders effectively and forcing entry into safe areas of the building before there is a dire need to do so. Also, personnel operating on the fire floor must always be aware that their actions (such as maintaining control of the door to the fire occupancy) can radically affect the safety of firefighters working above them.

Teamwork and communication can create a safer search environment, but it is equally important to know when a search is inappropriate. A firefighter may have to make the difficult decision not to search a building based on his experience, observations, and gut instinct. On occasion, the risks of an aggressive search can outweigh the prospects of a life hazard.

**Bobby Shelton, firefighter,
Cincinnati (OH) Fire Department**

Response: I have spent the greater portion of my career on truck companies. Search and rescue are the most arduous and most dangerous fireground activities.

When advancing a hoseline, you need not only protection from the fire but also a lifeline to lead you out should there be any disorientation issues. Truckies, armed with a tool-i.e., an ax, a hook, a halligan, and maybe a thermal imaging camera, nothing else-go in slightly ahead of the line to perform a task in a completely hostile environment.

To make this activity safer, we need to really look at what we are trying to save. If the structure is obviously vacant, is interior firefighting really necessary? We only risk a lot if we are going to gain a lot. On arrival, do we size up the structure from as many sides as possible, looking for a secondary means of egress before entry? The tools we have at our disposal are incredible; do we use them to their full potential? In our training and drills, are we stressing the basics of firefighting and not solely relying on the technology? Are departments providing their members with equipment that can assist in rapid bailout? Are rapid assistance teams in place? The questions go on and on.

The bottom line is that firefighting is inherently dangerous. All fireground activities are dangerous, but if we take all of the necessary precautions and apply ourselves to training in the basics, we can enhance the safety of our interior crews.

**Mike Mason, lieutenant,
Downers Grove (IL) Fire Department**

Response: Fireground search for reported civilians within structures being consumed by fire and smoke is one of the most dangerous events, along with advancing the first line into an enclosed structure when you don't know the structure's layout. Even though firefighters train on building construction types and materials and the most common layouts of ranches, row houses, bungalows, brownstones, and other structures, the inherent dangers behind those doors and windows are countless. You will be putting your lives on the line especially if you are not training on the environments in which you are conducting aggressive primary searches. The key word here is "aggressive." To be aggressive, you need to be sure of your knowledge and training in fireground search.

Conducting primary searches today is challenging and at times outright suicidal if you don't know what you're getting yourself into. We regularly conduct search drills within our department for civilian and distressed firefighters. We conduct this training within many types of structures with limited to no visibility; the objectives are to make this often urgently needed fireground activity safer and to be more accountable by making firefighters and their officers more aware of fire behavior as it relates to time, air management, search methodologies, and good decision making based on probabilities and successful outcomes.

To provide for accountability and the safety of firefighters involved in the precarious activity of primary search, departments should develop guidelines and training that are simple yet aggressive enough to enhance a driven search on the fireground.

**Jeffrey Schwering, lieutenant,
Crestwood (MO) Department of Fire Services**

Response: Overhaul continues to injure and kill firefighters every year. All we need to do is look at the National Institute for Occupational Safety and Health reports to see multiple line-of-duty deaths during overhaul operations in the past several years.

We get complacent during overhaul. We start taking off equipment (masks, gloves, for example). We need all of our personal protective equipment (PPE) more during overhaul. We are looking for hidden pockets of fire that can and will jump out and hurt us with no warning. Smoke is still present, containing all the bad stuff that might not get us now but later in life, when we want to be bouncing our grandchildren on our knee.

The training of our members has to be the key to safe overhaul operations. Departmental guidelines must be in place so every firefighter is on the same page. Make overhaul a larger part of your training

procedures. Company officers need to ensure that all members know why they need to keep their PPE, including their mask, on during overhaul.

All members need to be thinking not only about their safety but also about the safety of the firefighters standing next to them. We all need to pay more attention to the big picture from the start of the fire, through the overhaul phase, and up to our return to the station.

**Russ Chapman, lieutenant,
Milford (CT) Fire Department**

Response: Interior search—more specifically, in the basement or above the fire floor—is the most dangerous. As anyone who reads this magazine knows, there is not a month that goes by that there isn't a report of firefighters getting “jammed up” in either of these two places.

There is no simple answer. All firefighters are taught to search in pairs. All officers and incident commanders (ICs) are taught to make sure that all points of egress are covered. Still, time and time again we read about and see fire departments that do not follow these basic rules. There are countless reasons for this; many can be considered valid for some of the members involved. We do not work in a perfect world—far from it.

A wise firefighter gave me some great advice years ago: All firefighters have to go into a job with the idea that they are their own RIT. They should strive not to get into situations that will get them in trouble. They need to be proficient in building size-up, not only for tactical reasons but also for sizing up how to get out of the building. This will decrease the incidents of injuries and deaths, but not completely stop them.

There is one basic and simple strategy and principle that seems to be lost on many fire officers and firefighters. The next time you run a tactics discussion, ask the group the most important reason for an interior attack hoseline. Most will not get the answer right. They will say the reason for the primary hoseline is to attack the fire. The answer that should be hammered into all firefighters and future fire officers is “to protect the egress—the egress of the occupants and the egress of the firefighters.” If members are searching above the fire floor, get a hoseline in position immediately to cover the egress. The primary reason for a backup hoseline is to cover the egress of the primary. They need not commit right away. If the backup hoseline is committed, then a third hoseline must be put in service to cover the stairs (it should not be brought through the same entrance as the previous two if possible). Right about now, in most departments, ICs are lacking personnel. These three lines and aggressive ventilation are the most important jobs when we put firefighters in harm's way conducting searches. I am glad that in the past few years there has been an emphasis on getting back to the basics. Let's continue this trend.

**Christopher Fleming, lieutenant,
Portland (ME) Fire Department**

Response: Decision making. Everyone from firefighter to IC makes decisions that affect incident outcome and firefighter safety. The fireground is an extremely high-pressure situation, and psychologists tell us that in these types of situations we rely on successful mental models to guide our decisions. The only problem is that we tend to overlook the discrepancies that don't fit our successful models. What ends up happening is that we pick tactics that worked in one situation and try to make them fit a different situation because we recognize similar prompts (smoke and fire, for example). But, we miss the things we don't readily recognize (different construction, fire load). If our successful models of fire attack are based on single-family dwelling fires, we will use those same tactics at a commercial occupancy. As these tactics fail, the mental stress increases, and we further narrow our focus on things

we recognize and miss the fact that what we're doing isn't working. Unfortunately, this is our natural biological response to stress, and it is hard to overcome. The fire service needs to do a better job of training our members on all levels to be better decision makers. We need to teach how to properly assess situations and pick strategy and tactics based on what's actually happening and on what we can do instead of working backward from the result we want and making decisions based on the incorrect context.

**Randall W. Hanifen, lieutenant,
West Chester (OH) Fire-Rescue**

Response: Search and rescue. This activity is performed many times near the seat of the fire or directly above the fire. Often the crew performing this activity does not have the protection of a hoseline. The crew is often focused on finding and rescuing a victim instead of observing fire conditions. This aggressive task, coupled with the decreased time of flashover in many fires, makes this a very dangerous but necessary task.

This task can be made safer in a few ways. The first is live-fire training in acquired structures. This training, although cumbersome to conduct at times, is second to actually performing the task in an actual situation. By training in these very realistic conditions, fire instructors are able not only to teach search techniques but also to demonstrate the fire progression and behavior in a real building.

The second way to increase firefighter safety is to equip the crew with at least one thermal imaging camera (TIC). This increases the efficiency of their search and can be used to scan the environment to see heat differences. Many of the newer models have a heat gauge built into the display. Teaching the search crew to use the TIC not only for search but also for monitoring the atmospheric conditions is crucial. In terms of other fireground activities, the proper and timely coordination of fire attack and ventilation will decrease the likelihood that the search crew's environment will reach flashover conditions.

The final way to improve the crew's safety is to ensure their gear is NFPA compliant, in good working order, and worn properly. In the case of rapid fire progression, this will protect them to the best of our current equipment's abilities. Search and rescue is likely the most important fireground activity we perform; firefighters and fire officers must train on and remember the safety hazards associated with this function.

**Michael J. Farrell, captain,
Waterbury (CT) Fire Department**

Response: Primary search above the fire floor. Normally (and appropriately) performed without the protection of hoselines simultaneously with initial suppression operations below, it is one of the most dynamic and unpredictable places to be. Timing is critical; expediency is a must for success; and your environment becomes less tenable every second. This is the harsh reality where split-second decision making separates successful rescues and reluctant withdrawals.

How to make it safer is an interesting issue in that so much of the success or failure of primary search above the fire depends on personal experience, mental and physical discipline, and a test of one's mettle. It is one of the tactical functions in a hostile fire that is less dependent on equipment and tactics, making it more difficult to make it safe. It is difficult to neutralize the floor above a good working fire, so we are forced to rely more heavily on our experience, intuition, and a huge dose of faith in our comrades working below us and outside. Starting from the inside and working out, the first thing we can do to minimize the threat of this assignment is to use seasoned, experienced firefighters to perform this

evolution. Know who they are in your department, and go to them when the rubber hits the road.

Next, we can ensure an aggressive hose team is making the seat of the fire with an adequately sized handline and is aware of the search efforts above it. That being established, it is assumed by both crews that the stairwell will remain protected until the fire is controlled or the search is completed or abandoned. To further safeguard this operation, every combat firefighter (or riding position in career departments) should be issued a portable radio. It is unconscionable that fire departments in this day and age continue to put personnel into offensive operations with no direct communications link to those outside responsible for their well-being and rescue.

Two more factors that can improve the safety of this dangerous operation are ladder work and a good RIT program. Have clear, strong, rigid policies on how to make buildings behave from the outside when our personnel are operating inside under working fire conditions. Clearly define OV work; horizontal and vertical ventilation practices and expectations; and vent-enter-search (VES) and ground laddering/aerial practices. Practice them, staff for them, and make them a priority during offensive operations. Last, develop a workable plan accounting for the timely and consistent presence of a well-trained, adequately staffed, aggressive RIT.

Primary search above a working fire is a punishing and dangerous task. However, it is where we find the most imperiled and marginally savable citizens. It is here where our organizational policies, training, equipment, and personal discipline are put to the ultimate test.

**Jim Mason, lieutenant,
Chicago (IL) Fire Department**

Response: The rescue of life. Rescue can be for civilians and firefighters. The problems are numerous. The situation can be complicated by many factors such as the fire's continuous destruction of the building, the likely location of victims, and the point in time when there are enough responders on the scene to adequately search. Often rescue is done without the benefit of hoseline protection. Assessing the rescue scene is usually done quickly, under pressure to act, because time is a primary consideration and fire extension is a critical factor in this dangerous operation.

Rescue can be made safer a number of ways. Prior to an incident, company drills focusing on the size-up of buildings in the response district will bring out ways in which the fire attack and search can be coordinated to get the best results. What are the locations inside where victims are unlikely to escape the fire on their own? They would be sleeping areas like bedrooms and couch areas along with the path of egress. The drill should be something like this: If we arrive at this residence at 123 Main St. and get a legitimate civilian report of persons trapped inside, where would we place the first hoseline if the fire is showing behind the window on the second-floor front, second-floor rear, or first-floor rear? Where would we enter and search?

Along with this type of preplanning, all should understand that their actions affect everyone on the fireground. This means no matter what the assignment is, the size-up must first focus on protection of life. Sometimes the first hoseline can protect only the stairway for the search team. The second engine must put out the fire. When a rescue is needed, communications between companies and the IC are critically important for coordination.

Bruce Peacock, coordinator, County of Brant Emergency Planning/Fire Training, Paris, Ontario

Response: Any operations that take place on the roof of new homes. They are made from the composite type of wood with glue. The roof, from the sheeting through to the beams and support structure, is now

made of lightweight construction. You walk across a new roof, and it's springy, not like the roofs of 10 years ago. In my area, we get heavy snow, and I am sure that in a couple of years, we will see these roofs fail. A firefighter in full gear on a roof will go through the roof.

Roof ladders may prevent some of that, but have you been on a roof ladder punching a hole in a roof for vent operations? You cannot always be sure your feet will stay on the ladder.

We need to have the builder put better wood products in the roof for longer wear and better support, not just for the firefighter but also for the homeowner.

Also, another problem with this type of roof is that once the ceiling below the roof is opened and flame is allowed into the attic area, the house is gone in next to no time-high heat flame, then collapse with almost no way of stopping it.

I have seen a roof with no sign of fire be completely involved in fire in less than two and a half minutes, not much time if you are not paying attention. It could cost the lives of those in the building and those on the roof.

It is scary. We do not seem to have any control. It is something the Building Department needs to address.

**Skip Heflin, captain/training officer,
Hall County (GA) Fire Services**

Response: Interior search and rescue. When firefighters hear the report of persons trapped in a structure, they have a tendency to step things up a notch. When you're searching in the average structure fire, you don't know someone is inside; but when a report of someone's being trapped is received, things change. This is when firefighters skip steps and take chances they would never take under normal conditions. The skipping of steps and shortcuts is the first link in the chain of events that leads to firefighter fatalities. This is when you have many near misses and fireground injuries.

Lack of experience and training contribute to this. Another problem is the lack of proper risk/benefit analysis. Modern firefighters must take into account the benefit to be gained from their actions and the chances of success. If a preflashover fire is reported in an enclosed (enclosed as in a structure that cannot be evacuated by firefighters in a hurried fashion) structure and someone is trapped inside, what are the chances of firefighters going inside emotionally charged and finding and removing a viable human? Our tactics have to change based on the information with which we are presented. Training provides an experience base firefighters can use when faced with similar circumstances; it helps make up for a lack of experience. Consistently performing risk benefit analysis on each and every fire helps you to pick your battles.

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