



National Fire Fighter Near-Miss Reporting System

May-Search Operations

Prepared by Battalion Chief G. O. Lyon (Ret.),
Arlington County Fire Department (VA)

Part 1: Introduction

Conducting a primary search is one of the most dangerous operations that firefighters perform. This rapid search for life is often conducted under highly stressful and deteriorating conditions. It is carried out daily at almost every building fire unless the area where the victims are located is deemed as unsurvivable or the danger to firefighters outweighs the risk. Some of the dangers faced by firefighters performing a primary search are listed below:

- The Search Team operates above the fire under high heat and dense smoke conditions.
- The search must be conducted rapidly in order to save lives.
- In most cases the Search Team will not have a hose line since it slows their search effort.
- The layout of the area being searched is unfamiliar.
- The situation is highly stressful due to the fact that the fire is most often not yet under control and the survivability of the victims is rapidly diminishing.

Listed below are some of the safety precautions that need to be taken to offset these inherent dangers:

- The Search Team should consist of at least 2 firefighters and each member must be properly equipped.
 - Full PPE
 - SCBA
 - PASS device (activated).
 - Hand light
 - Forcible entry tool
 - Portable radio
 - One member should carry a Thermal Imaging Camera if available
- The Company Officer and each firefighter must conduct a personal safety size-up of the building, the specific objective being the completion of a safe and efficient Primary Search. This quick size-up should consider the following:
 - The occupancy will often give clues as to the life hazard, floor layout, and construction.
 - The location of the fire now and where it is likely to extend.
 - The likely location of the occupants and their level of danger relative to the fire location.

- Best access into the building and to the occupants.
- Primary and secondary means of escape for Search Team if things go bad. Are there ladders in place and if so where?
- Is there a hoseline in place and if not, how soon will one be?
- Communicate
 - Knowing where you are allows the IC to coordinate hose lines and ventilation to support your effort
 - The IC and other units can provide critical information, i.e. the victims last known location, changing fire conditions, etc.
 - Notify the IC if you find a victim(s) and request assistance for victim removal so the primary search can be completed.
 - Notify the IC of fire conditions in your area and when you move from one area to another (accountability).
- Have a plan
 - Your size-up should lead to a basic systematic search plan
 - Share the plan with your team members and the engine that is protecting your means of egress.
 - Make mental picture of the building (size, height, and means of egress) before you enter.
 - Familiarize yourself with the buildings in your area, they usually have many construction and floor plan similarities that will prove helpful.
 - In multi-story buildings study the floor below before going to the fire floor and above.
- Develop a survivability profile for the occupants
 - What was their last reported location
 - Where are occupants normally found in this type occupancy
 - What is the potential for savable victims in specific areas of the building based on the current fire conditions?
- Monitor the fire conditions
 - The Company Officer and the entire Search Team must constantly observe their environment.
 - Listen to the radio for reports of changing conditions and action by other units that may affect you.
- Stay calm, oriented, focused, and safe
 - With the stress of deteriorating fire conditions, the awesome responsibility of locating occupants and the adrenaline pumping even an experienced firefighter can get excited, lose the big picture and get tunnel vision.
 - Stay in contact with a wall, control the doors, pay attention to your surroundings, and note secondary means of egress as you search.

- You are the occupants best chance for survival, don't become a victim yourself.

The near-miss case study that follows had a good outcome and disaster was averted because some of the following good practices were employed:

- A 360 "circle" size-up was conducted.
- The four person crew assigned Primary Search divided into two 2 person teams.
- There was a hose line in place and operating on the fire in the basement and the Search Team was aware of it.
- There was a search plan, starting at the last known location of the victim and then moving to other areas.
- The 2 teams communicated with each other and divided the area to be searched.
- The team on the 2nd floor became separated when their primary means of egress was blocked by fire. They both remained calm and oriented, one used the Thermal Imaging Camera to locate a window and the other used the sound of breaking glass to guide him to his partner.
- Even though ladders had not been raised to the 2nd floor, during their size-up the Search Team had made a mental note of the porch which provided a safe refuge from the front windows until ladders could be raised.
- The IC was continually evaluating the rapidly changing conditions and made the decision to evacuate all personnel.
- An emergency evacuation SOG was in place and activated.

Part 2: Case Study 06-0000218

I was a Lieutenant riding fourth on the Heavy Rescue and a Master Firefighter was riding the OIC position due to the fact I had just returned to the station from a promotional exam. We were dispatched for a house fire in our company's second due area. We arrived on the scene and found a working fire in the basement area that had been started by a plumber replacing the hot water heater. The first look at the home had nothing showing from Side A. On the circle check, I was met by the plumber in the front yard who stated that he was bumping the system and started the fire. He did shut off the gas at the propane cylinder and thought his partner went back into the home. I proceeded around to the rear and double checked the cylinder valve to make sure it was in the off position. At this point I had a moderate amount of smoke coming from the basement door and began to prepare for entry along with my Firefighter. We both made entry to start the search and found moderate heat. We searched the C&D quadrant at which point the hoseline was attacking the fire. We thought we had completed the search of the basement so we re-directed to start the search of the upper floor. We came out of the basement and met up with the MFF/OIC and the driver of the Rescue on the front side of the house. We split into two groups, one to search the first floor and the other the second. My team went upstairs and began a left handed search. Halfway through the first room the evacuation signal was given and I led us toward what I thought was the steps. It was into the hall closet. We backed out and headed for the steps. We found the steps fully involved in fire so the FF, aided by the thermal imaging unit, found another bedroom and began to break out the windows for self-evacuation. He and I had separated, but the sound of breaking glass led me to his location. We both exited the home onto a porch roof and sat on the roof while we waited for a ladder. At this point no ladders had been put up to the building. After we had cleared the building, in less than a minute, the rooms/windows that we vented and exited from were fully involved with fire. In less than ten minutes the home collapsed. After the fire was out we found out that the fire had been burning for some time due to the delay of 911 call and distance the FD had to travel to the scene. During this incident we had several injuries. All were minor but we very easily could have lost at least two personnel.

Lessons Learned

The lessons learned were the Truck did not prepare the building for attack by placing ladders and ventilating. Crews did not understand the amount of fire they had from the beginning.

Discussion Questions

After reviewing this case study consider the following as they apply to you, your crew and your Department.

1. Does your search team always consist of at least 2 firefighters?
2. What is the minimum equipment you take with you?
3. Does your Department routinely provide at least 2 escape routes?

4. Does your Department have a specific SOP/SOG that deals with laddering upper stories?
5. Does your Department train firefighters to conduct a personal size-up of the building?
6. Does your Department train firefighters responsible for Primary Search to conduct a survivability profile for occupants? What critical size up information would you need to feed into your risk/benefit analysis in order to determine if the risk to firefighters outweighs the potential of finding savable victims?
7. Do you communicate with the IC when moving from one area of the building to another (accountability)?
8. Does your Department have a specific SOP/SOG that deals with emergency evacuation? If so, are all companies, including mutual aid companies, well trained and familiar with it? Does it include more than one means of notification?
9. Would you immediately follow the orders to evacuate an area prior to completing your assignment without questioning the decision or contacting the IC?
10. What role did the elements of Crew Resource Management (Communications, Situational Awareness, Decision Making, Teamwork, Task Allocation, and Debrief) play this incident?
11. What specific elements of CRM would you apply to a similar incident within your role (firefighter, Company Officer, Incident Commander) in your Department? What, if any, external (physical) or internal (prejudice, opinions, attitudes, stress) barriers exist that inhibit the use of CRM in your Department?
12. What did you learn from this case study that will help you to avoid a similar near miss?

Part 3: Crew Resource Management Discussion

- **Communication** – interruptions in the communication flow result in messages and orders being misinterpreted, not properly conveyed, completely missed or not carried out
 - It is unclear if the information gained from the plumber concerning the cause and location of the fire and the possible victim was communicated to the IC and other units.
 - The 2 teams from the Rescue had a plan and communicated about searching the first and second floors. It is unclear if this was communicated to the IC.
 - The evacuation signal was clearly received by the search team and the order was followed without question or hesitation.
 - When their escape route was blocked by fire and the team became separated no Mayday call was given.

- **Situational Awareness** – firefighters must be alert and attentive, situational awareness must be updated constantly through observation and communication
 - A 360-degree evaluation of the structure was made by at least one of the search teams and information was obtained from the plumber prior to beginning the primary search.
 - The search team was aware that a hose line was in place and operating on the fire in the basement.
 - It is unclear if anyone was aware of the construction (possibly balloon construction) and the effect it likely had on the rapid spread of fire to the upper floors.
 - The Search Team was unaware that the fire had extended from the basement to the floors above.
 - The IC continued to assess the changing fire conditions from outside the building.
 - When their escape route was blocked and they became separated one search team member had presence of mind to use the thermal imager to find a window for escape and the other used the sound of breaking glass to guide him back to his partner.
 - The search team had made note of the porch before entering and was able to use it for emergency refuge.

- **Decision Making (Risk-Benefit Analysis)** – depends on four factors: information, experience, knowledge, and urgency
 - In this situation it appears that the IC's Risk-Benefit Analysis took into account the rapidly spreading fire and ordered an evacuation.

- The search team responded to the evacuation signal without hesitation or question even though they had not completed their assignment.
- When the evacuation signal was given and the search team's escape route was blocked by fire they did not give a Mayday call. In this case they were able to find a secondary means of escape, but had they not the IC may not have know they were in trouble until it was too late.
- **Teamwork** – to accomplish a common goal a group must work together and cooperate, and have a leader and followers
 - The four person Rescue crew split into 2 two person teams.
 - The two search teams worked together with a plan and a common goal.
 - Each team had a leader and stayed together.
 - When the members of the second floor team became separated they were able to rejoin and escape together.
- **Task Allocation** – knowing the strengths and weakness of team members, assigning tasks accordingly and dividing labor so no team members are overworked
 - The 2 teams developed a plan with one team searching the first floor and the other searching the second floor.
 - It appears that the teams were given assignments commensurate with their equipment and training and carried out their assignments.
 - The second floor was not laddered and windows were not vented. It is unclear if adequate resources were on the scene to cover all critical tasks including RIT.
- **Debrief** – critiquing team and individual actions in a productive manner to reinforce good practices, correct bad practices to avoid mistakes in the future, and share experience
 - There is no mention of a debrief (critique) being done following this incident.
 - Every incident presents an opportunity to learn. Critiques should be conducted after every "working" incident, especially the near-miss situations
 - It is important that this be done in a non threatening atmosphere so that members feel comfortable relating such information.
 - The information gained through critiques is critical in educating other firefighters, reinforcing good practices and identifying the need for new practices or changes.
 - Lesson learned and shared from critiques and near-misses may save another firefighters life.
 - When done properly written critiques are an excellent way to share vital information. They should be written in a positive manner, reinforcing what went right and providing out lessons learned, not pointing fingers or embarrassing specific people or units.

Note: The questions posed are designed to generate discussion and thought in the name of promoting firefighter safety. They are not intended to pass judgment on the actions and performance of individuals in the reports.

Firefighternearmiss.com is funded by a grant from the U.S. Department of Homeland Security's Assistance to Firefighters Grant program. Founding dollars were also provided by [Fireman's Fund Insurance Company](#). The project is supported by [FireFighterCloseCalls.com](#) in mutual dedication to firefighter safety and survival.