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Photo by: Bryan Kearon

FIRE SEARCH AND RESCUE ABOVE A FIRE

One of the most dangerous assignments a firefighter can take is to go above a fire. Firefighters operating above a raging fire have been forced to jump for their lives out of second-floor windows. They have been burned to death by blasts of flame as the room flashed over, their bodies discovered after the fire, hanging out of open windows or crumpled up just below the sill. The deadly products of combustion rise upward and kill firefighters trapped above a fire. Heat and flame may block their escape back down a stairway they had just climbed, or flames may quickly spread up the outside of the building from window to window. The smoke, heat, and toxic gases may seep through the cracks between the floor boards, concealed spaces, and poke-through holes; a trapped firefighter may be asphyxiated by these products if his air supply runs out, or these products may react explosively in a fireball.

When a firefighter is killed above a fire, the cause of death may appear to be collapse, carbon monoxide, or flash-over. However, a careful analysis may reveal a deadly chain of events as the cause, not a single mishap. First, the firefighter becomes disoriented. Then the firefighter is lost in smoke, entangled in some object, or confused by the sudden heat or flame increase of the growing fire. Next, the firefighter is unable to return to the door or window just entered and is unable to find an alternate escape. Then either the firefighter is overcome by smoke or toxic gases after the breathing apparatus runs out of air, or burned to death by flashover, or the firefighter falls victim to hyperthermia, in which case his body absorbs the rising heat faster than it can be evaporated.

Flame and heat cause 25 percent of the firefighter deaths in this country each year. Some of these victims are those trapped above a fire. If operating above a fire is so dangerous, we must ask ourselves: why do it? The answer is threefold: to search for trapped occupants of a burning building; to search for vertical fire spread; and to protect people trapped on a top floor during a shaft fire.

SEARCHING ABOVE FOR VICTIMS

Firefighters must go above a fire to search for unconscious or trapped people as soon as possible during a fire. In multistory buildings, the most arduous location besides the immediate fire area itself is the room or apartment is the rooms directly above a fire. Of the six exposed sides of a fire (the four sides and top and bottom), the most deadly side is the one above the fire. A firefighter ordered to conduct a primary search of the fire structure will go above the fire as soon as possible after searching the point of origin. Deadly carbon monoxide is generated by the incomplete combustion of the typical fire load in a burning house. It is lighter than air and quickly rises to the floor above.

SEARCHING ABOVE FOR FIRE EXTENSION

Immediately after a fire is darkened down by an attack hose team; the chief in charge wants to know about conditions on the floor above. The chief wants to know if the fire spread upstairs. A firefighter is ordered to go above to check for fire spread. This firefighter goes to the room or apartment directly above the fire and feels the floor and base-boards there. If it is too hot to touch with the bare hand, or if smoke is pushing out around the cracks in the baseboard or flooring, then the area is opened up and examined for hidden fire. Statistics reveal that when a second hose line is stretched into a burning building, it is most often operated above the fire.

OPERATING ABOVE DURING A SHAFT FIRE

When a fire originating in a cellar or lower floor enters a shaft way that is enclosed or restricted at the top (such as a stairway, elevator, dumbwaiter shaft, or garbage chute), the flames quickly rise in the shaft, and the most rapid fire and smoke spread in the building will occur at the top floor. Here, the flames, heat, and deadly smoke, trapped by the top of the shaft way enclosure, will quickly mush-room out and spread to the top floor or attic.

People located at this point will be in great danger during the shaft fire. The chief in charge must order that the top of the shaft be vented to release the smoke and flame; at the same time, a hose line must be placed to extinguish the spreading fire, thereby protecting the top floor occupants. To accomplish this, firefighters have to operate at least one or more floors above the fire.

If the fire breaks out of the shaft way enclosure on a lower floor, the fire-fighters could be trapped above. When ordering firefighters to operate above a fire during a shaft fire, the chief must also provide the means of escape, such as an aerial ladder. Actually, some type of above-the-fire operation is carried out during every building fire. It becomes routine. When any procedure is done over and over again there is a danger of underestimating its seriousness. At every fire in which you are required to go above, a careful size-up should be carried out before you act.

SIZE UP THE FIRE

Most firefighters are trapped on a floor above a fire because they failed to size up the fire below them. The condition on the fire floor should be analyzed before going above. If not, a potentially deadly mistake is made. The firefighter should attempt to determine the approximate location of the fire. To check the hot spot above, the firefighter should know the hot spot below. Next, the size and intensity of the fire should be observed. (In most instances, only the flame and smoke coming out of the doorway to the burning room or apartment can be observed.) This information should be used by the firefighter to determine if the fire can be extinguished by the hose attack team. If the fire appears beyond control of the firefighters operating the hose line, do not go above. Notify the chief there will be a delay getting to the floor above. Seek another safer avenue to get above or as soon as conditions permit go above and complete the assignment.

SIZE UP THE STAIRWAY DESIGN

The type of stairway leading to the floor above must also be evaluated by the firefighter. There are three types of stairs: an open stairs, an enclosed stairs, and a smoke-proof stairs. **An open stairway**, found in most private houses, is the most dangerous stairs a firefighter can climb. All the flame, heat, smoke, and toxic gases generated by the fire will flow up the open stair and quickly becomes a chimney flue during a house fire. There is no protection for a firefighter attempting to gain access to the floor above a fire. In many instances it is safer to go above a fire by way of a portable ladder placed at a second-floor bedroom window as an alternate or simultaneous entry.

An enclosed stairway of an apartment house offers more protection than an open stairs in a private house. An enclosed stairway in a multiple dwelling that has properly operating self-closing doors to each public hallway may be used to go above a fire when the door to the fire floor is closed. When there are two such stairways, the safest way to go to the floor above is by way of the one that's not being used by the attack hose team to extinguish the fire.

When an apartment house has only one enclosed stairway and the door to the burning apartment is open during fire attack, the enclosed stairway will become filled with heat and smoke. Before going above the fire, a firefighter should check to see that the hose line is being advanced into the burning apartment by the attack team and that the door to the burning apartment has not been removed or damaged beyond use by the forcible entry operations. Notify the officer of the attack hose team you are going above a fire if possible. If the attack team retreats due to a burst hose, explosion, or increase in fire intensity, the door must be closed to protect the firefighter above.

Smoke proof stairway Some commercial high-rise buildings are constructed with a smoke-proof tower stairway, in which an open air vestibule exists between the occupancy and the stair enclosure that prevents heat, smoke, and flame from entering the stairway. This is the safest stairway for a search above the fire.

SIZE-UP OF A SECOND EXIT FOR ESCAPE

If the interior stairs used by the firefighter to go above a fire suddenly becomes filled with heat and flame, the firefighter cannot use this path to get back down. He must locate a second exit for his emergency escape or be trapped above. A firefighter must know his options ahead of time should the worst occur. Going above a fire should not be a snap decision made on the spur of the moment inside the burning building. It should have been decided upon at a preplanning session at the start of the tour of duty back in the firehouse. With this knowledge, the firefighter can properly size up the outside of the burning building on arrival. Before entering a burning building to search above, the firefighter should examine the front of the structure. Look for a second exit. A portable ladder already raised to a second-floor bedroom

window, a porch roof, or fire escape may provide an escape if the interior stairs becomes cut off by fire.

BUILDING CONSTRUCTION SIZE-UP

The degree of danger or threat of being trapped above a fire is greatly influenced by the construction of the burning building. Of the five basic types of building construction—fire-resistant; noncombustible; ordinary; heavy-timber; and wood-frame—the greatest threat to a firefighter who must search above a fire is posed by the wood-frame building. Vertical fire spread is more rapid in this type of structure. In addition to the three common avenues of vertical fire spread—the interior stair-way, windows (auto exposure), and concealed spaces, flames can trap a firefighter above by spreading up the combustible exterior of the building. No other construction type has a combustible exterior. In addition, interior walls, halls, and stairs of wood-frame buildings are often covered with combustible wood that rapidly spreads fire upward to the floor above. Firefighters who transfer from a fire district with brick-and-joist buildings to a fire company that responds to fires in wood frame buildings must realize that they have less time to search above a fire before the danger of being trapped becomes great. A building of ordinary (brick-and-joist) construction is the next most dangerous structure for operating above a fire. The vertical fire spread problem in this type of structure is the concealed spaces. Concealed spaces behind walls, ceilings, and floors spread flame and smoke upward to the floor above. Small openings, cracks around radiator pipe risers, and ceiling light fixtures and bathroom fixtures, allow flame and smoke to enter and exit the concealed spaces. Many communities and towns have areas in which buildings of different construction are side-by-side. Fire-fighters must realize that the dangers in operating above a fire depend not only on the size of the fire but on the type of building construction as well.

SIZE-UP OF THE FIRE FLOOR OPERATIONS

A firefighter above a fire must be able to size up accurately the hose attack team operation taking place on the fire floor. Before going above, check to see that the hose line is charged and all is in place for commencing the initial attack operation. The firefighters about to advance the

attack hose line must be wearing full protective clothing and self-contained breathing equipment. The hose attack team should be just about to enter the fire doorway or already be inside the fire area, with the charged hose line being advanced in with them. The scene should not indicate a disorganized defensive operation in which water is shooting into a smoke-filled doorway, but, rather, an aggressive, well-planned interior attack on the origin of the fire with fully protected firefighters. If the attack team is about to advance, the officer in command of the hose line should be informed by the firefighter responsible for the above-fire operations that he is going above. This communication should make the attack hose line officer realize that more is at stake than simply fire extinguishment. It also makes the officer responsible to notify the chief in command of the fire, in the event that the hose line advance is not successful. Firefighters have been trapped above a fire even after conducting a proper size-up of the fire floor operation. Unexpected events often happen at fires: A pumper may suddenly break down and stop pumping water to the attack hose-line; a hose length may burst and delay the hose line attack advance; a window in the burning room may break, allowing a strong wind to blow fire against the advancing hose team, forcing them back out of the burning apartment; an explosion may seriously injure the fire-fighters operating the attack line. Therefore, firefighters must realize that operating above a fire is always a high-risk operation.

SAFETY PRECAUTIONS

After the decision is made to go above a fire, there are several safety precautions a firefighter can take to reduce the risks of being trapped. One is have a charged hose line with you. If not:

1. Notify your officer when you go above a fire. Even if your assignment has been preplanned, inform him by portable radio. This is a form of fire ground control that increases firefighter safety. A company officer should know where all of his assigned firefighters are operating during a fire.
2. When the officer in charge of the attack hose line is crouched down in the hallway, about to advance the hose line into the burning room, a tap on his shoulder and a finger pointed upstairs can convey your assignment to him.

3. When searching in pairs, leave a firefighter at the foot of the stairs to warn you of deteriorating conditions on the fire floor.
4. If manpower permits, one or two firefighters should be assigned to assist an undermanned or inexperienced attack hose team on the fire floor.
5. When there is a danger of flashover in the hallway above a serious fire and a difficult forcible entry operation is required to gain access to the apartment directly over that fire, locate an open door or force open a door to an apartment that's not directly over the fire. If conditions suddenly get worse in the hallway, the open apartment not over the fire may be your area of refuge.
6. When the apartment or office floor over the fire in a fire-resistive building is opened and the area is clear of smoke and heat, and the hall is charged and about to flash over, it may be feasible to close the door to the apartment partly after you enter to search so flame or smoke does not spread inside and trap you. However, in many older residence buildings, the smoke and heat will be worse inside the apartment directly over the fire apartment. It seeps upward through concealed spaces and poke-through holes. Do not close the door behind you when searching this type of smoke and heat charged area above a fire.
7. Be equipped with a portable radio and full protective fire gear. If you become trapped above, notify the officer in command of your condition and your location.
8. If you enter a smoke- and heat-filled room, hallway, or apartment above a fire and you suspect flashover conditions, first locate a second exit such as a window leading to a fire escape or portable ladder, and then start to search.
9. When you climb or descend a stairway between the fire floor and floor above, stay close to and face the wall. Heat, smoke, and flame flowing up a stairway will be rising vertically near the stairwell or around the banister.
10. All firefighters assigned to search above a fire should understand the firefighting priorities of risk taking. The only justification for risking a fire-fighter's life is when there is a real chance to save another person's life. If a person's cries for help can be heard, or if a victim is seen lying

on the floor, a firefighter may take any chance in an effort to save that person, including sacrificing his own life. However, a firefighter should not risk his life on the report of a missing person or even the high probability of a person trapped above a fire. We have all witnessed the person shouting about "my baby" being trapped-and the baby turns out to be a cat or the hallucination of a hysterical person. When such a vague plea for help is heard, the veteran firefighter stays cool and does not get carried away with the emotional scene, making every effort humanly possible to search the area short of becoming trapped and killed by the fire.

QUIZ FOR NEWSLETTER:

1. Which one is not a reason why firefighters operate above a fire?
 - A. Search for trapped victims
 - B. Search for vertical fire spread
 - C. Stretching hose lines during a shaft fire
 - D. To coordinate hose attack advance

Answer _____

2. What room, on the floor above, should a firefighter search when looking for vertical fire extension?
 - A. Front room
 - B. Rear room
 - C. Middle room
 - D. Room directly above the fire

Answer _____

3. What type stair presents the greatest chance of firefighter entrapment when searching above a fire?
- A. Open stair
 - B. Enclosed stair
 - C. Smoke proof stair
 - D. Horizontal exit

Answer _____

4. What construction type presents the greatest chance of firefighter entrapment when searching above a fire?
- A. Fire resistive
 - B. Ordinary
 - C. Wood frame
 - D. Heavy timber

Answer _____

5. True or False

When a vague plea for help is heard, the veteran firefighter stays cool and does not get carried away with the emotional scene, making every effort humanly possible to search the area short of becoming trapped and killed by the fire.

Answer _____

Answers: 1.D;2.D;3.A;4.C;5.True