



California Department of Forestry and Fire Protection

CAL FIRE

2009 FOCUS ON SAFETY



Structural Firefighting Awareness

The Fire Analysis and Research Division of the National Fire Protection Association released statistical information for the calendar year 2007 related to structural fires in the United States. These statistics included staggering numberings such as **One** “structure” fire was reported every **59 seconds** in the U.S; **One** residential structure fire was reported every **79 seconds**; **One** civilian fire related injury occurred every **30 minutes**; and **One** civilian fire related fatality occurred every **2 hours and 33 minutes**. All totaled, there were 530,500 reported structural fires in the United States during 2007.

CAL FIRE is most commonly known as a premiere wildland firefighting agency. However, wildland firefighting accounts for less than 5% of our total call volume. In providing emergency services within 35 of the 58 counties in California, CAL FIRE is responding to over 350,000 calls a year for services not related to wildland firefighting. One of the more common responses is that for structural fires, including out buildings, single and multi-family residential, commercial, and industrial.

In recent months, CAL FIRE has experienced “Near Miss” situations relative to structure fire operations in different locations throughout the State. These situations have resulted in the release of CAL FIRE Blue and Green Sheets designed to deliver factual and informative information to all employees for the purposes of awareness, discussion, and prevention of repetitive occurrences. CAL FIRE does not wish to become part of a growing list of fire agencies across the Nation who has suffered the loss of a firefighter or multiple firefighters during structure fire operations.

This component of the 2009 Focus on Safety will share some of the “Watch Out Situations” and “Ten Commandments” of structural firefighting operations. This is by no means a complete list of what to be aware of or look out for while engaged in such operations. It is meant to share some compiled information designed to prompt awareness, discussion, and training to better prevent the potential injury or loss of a firefighter.



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Structure Fire “**Watch Out**” Situations

The following are common “watch out” situations for structure fires. Although a great deal of emphasis has been placed on wildland situations, these apply to one of the other aspects of our job: **STRUCTURE FIRES**. These are not all inclusive; however, they are common trends that when noted, can prevent injury and even death.

•**Ventilation crews are driven off the roof by fire extension before you make entry.**

Verbal coordination between the interior attack crews and the roof crew is vital to effective fire suppression. This will also directly affect tactical decisions, such as “offensive” vs. “defensive”, or the extent of advancement into the fire building. Radio communications are VITAL!

•**You flow water on the seat of the fire and make no progress.**

The BTU/fire load is exceeding the GPM being flowed, or the water is not reaching the true seat of the fire. Reassess line and nozzle selection; add additional attack lines to the suppression operations, or request ventilation.

•**You can hear the sound of vertical ventilation operations being conducted behind you.**

Fire conditions or construction types may limit the ability of ventilation crews to perform their operations directly over the seat of the fire. This is especially common on new multi-story, multi-pitch tract homes. It is important that the interior crews coordinate their progress with the ventilation crews so as not to have ventilation operations pull fire over the top of them.

•**You feel uncomfortable or apprehensive for no apparent reason.**

Trust your instincts, as they are rarely wrong. Look, listen and feel for reasons why your instincts are alerting you. Alter your tactics accordingly, and communicate the situation to the I.C / Operations.

•**Your low-air audible on your S.C.B.A. begins to sound, and you still have not located the fire.**

It is important to keep track of your time inside a working fire. One of the best ways to “time stamp” an incident is to note the amount of time that it typically takes before your low air audible sounds. This is achieved through hands-on training exercises. If you know that it takes 20 minutes to exhaust an S.C.B.A. bottle, and you have progressed in on an interior attack, and have still not located the seat of the fire, you should reassess fire ground tactics and/or hose line selection. Again, good coordination between interior attack crews and ventilation crews can mitigate this problem by shortening knockdown time.

•You can hear the fire burning; however, you cannot see it.

There is nothing like the sound of a building on fire; it makes a very distinctive sound. Lack of vertical or horizontal ventilation will allow the thermal balance to push down on interior crews limiting their visibility and progress. In this situation, interior crews should retreat to a safer location until conditions can be improved by means of ventilation, or by additional lines be put in service.

•You realize that you have made entry under, or are working beneath a mezzanine or façade.

Increasingly, commercial strip malls are incorporating facades onto the front of the buildings for cosmetic reasons. These mezzanines and facades are generally “afterthoughts” and are not incorporated into the structural members of the building, but are instead secured onto the fronts with fasteners. These are a threat to interior attack crews in numerous ways. First, they can contain “hidden fire” that goes undetected by crews until a catastrophic collapse occurs, thereby trapping firefighters or disrupting water flow on hose lines. Second, the façade can collapse during extinguishment / overhaul operations crushing crews beneath. In this situation, keep in mind that generally there are no mezzanines or facades above roll-up doors, as they are used for delivery purposes. These make for good entry points. These also provide a larger entry/egress point, limiting congestion.

•You are in zero visibility, the thermal balance is banking down, and air is being drawn in rapidly behind you.

At this point, the fire is drawing for more oxygen, and temperatures are rising, thereby banking the heat down on top of interior crews. Within minutes, your location will become untenable. At this point, interior crews must retreat and reassess tactics, including ventilation and additional lines.

•You are unable to communicate with the “Incident Commander” or “Operations” on the fire ground.

The I.C. is responsible for both resources and personnel status. If you are unable to communicate with the I.C. or other divisions, you must retreat to a location at which clear communications can be made. Compromised communications can have a direct affect on the success of tactics and crew safety. Good communications are a must!

•You are working with unfamiliar crewmembers.

It is imperative that all members of an engine or truck company maintain crew continuity and communication. If there is an overtime crewmember working, they may not be familiar with tactics and strategies of your company, or may simply lack the experience necessary to successfully complete tasks assigned to them. It is the company officer’s responsibility to insure that any crew members not assigned to their company are made familiar with standard operating guidelines, specialized equipment (chainsaws, rotary saws, recip. saws, jaws), and special hazards that pertain to their particular company and first-in area.

•You arrive at scene with smoke and flames showing from the roof and initiate an interior attack.

Time of day, area of involvement and rescue support an aggressive interior attack; however, be aware that with fire venting through the roof, the fire has progressed enough to compromise the structural integrity of the roof and other structural members. With most modern construction being “light weight”, sustainable burn time is shortened, and roof collapse is likely. Progress your interior lines methodically, and keep the I.C. informed of

your progression. Continually reevaluate the fire behavior, effectiveness of the interior attack, and the “risk vs. gain” factor. Do not forget to use all of your senses.

●**You make an interior attack on a working structure fire, and must rely on vertical ventilation to progress to the seat of the fire.**

Progression of interior attack lines can be hampered by thermal balance, visibility, heat, and structural layout. If you are unable to progress interior lines without the benefit of vertical ventilation due to excessive smoke and heat conditions, limit your exposure and reassess your tactics. Communicate the behavior to the I.C. and initiate other means of making the interior environment more tenable, such as horizontal ventilation, taking the windows of the fire room from the exterior, or P.P.V.

●**You arrive at the scene to find a working fire; however, your entry will be delayed.**

This can occur for numerous reasons, such as water supply, long hose pulls, access problems, staffing needs/shortages (NFPA 2-in/2-out), or forcible entry challenges. Initiate your actions based on current and expected fire conditions. Remember that with most fire loading in buildings being petroleum-based byproducts (plastics, synthetics, and foams), fire intensity and growth is increased.

●**Multiple companies (engine and truck) are making entry through a single entry point.**

Single door entry/egress points are designed for just that, a single person to pass through in a “non-emergency” situation. Keep in mind that should the need arise, such as in a flashover situation, the impact of evacuating multiple companies through one door could prove to be fatal. Care should also be taken to secure doors, so as not to prevent egress/ingress, or allow for fire extension.

TEN COMMANDMENTS OF INTERIOR STRUCTURE FIREFIGHTING

Courtesy of Battalion Chief DON STUKEY, L.A.F.D. (retired)

Aggressive interior firefighting is the trade mark of many fire departments. The following TEN COMMANDMENTS of INTERIOR STRUCTURE FIREFIGHTING are presented in a chronological sequence to point out some of the many factors needed to carry out a safe effective operation.

1. "TRAIN AS IF YOUR LIFE DEPENDS ON IT...BECAUSE IT DOES"

- Training is 90% attitude, make sure you have a positive one
 - * establish SOP's
 - * training...be able to do it in the dark
 - * morning checks...take them seriously
 - * know your crew

2. "DRILLING + DISCIPLINE = SAFETY"

- Officers set the example
- Routinely used SOP's
- Mental self discipline

3. "WHILE RESPONDING, THINK ABOUT THE BATTLE"

- 1st alarm assignment
- Weather
- Captain get the map out
- Response route
- Water supply
- Occupancies in the area
- Radio traffic
- Smoke (loom-up)

4. "COMMUNICATIONS AND COORDINATION WILL MAKE OR BREAK YOU"

- Within your crew
- Between companies
- Between the I.C. and all resources

5. "ALWAYS SPOT FOR THE BIG ONE"

- Front seat relationship
- 1st in companies are the most important
- Consider radiant heat, collapse, and hazmat hazards
- Apparatus placement should be based on your strategy and tactics
- Don't be a road hog, leave room for additional resources

6. "LOOK AT THE SMOKE, THAT'S THE FIRE TALKING TO YOU"

- Smoke...look at the differences
 - * location
 - * volume
 - * color
 - * pressure
 - * what will you have in 10, 20, 30 minutes
- This will effect the following:
 - * size up...mental and verbal
 - * rescue problems
 - * potential for flashover or backdraft situations
 - * fire load...what's burning

*** IF YOU THINK YOU NEED HELP...YOU PROBABLY DO**

7. "THE CONSTRUCTION TYPE WILL DETERMINE HOW MUCH TIME YOU HAVE TO MAKE AN EFFECTIVE DIFFERENCE"

- Age of the structure
- Light weight construction
- Ordinary construction
- Heavy construction
- Roof construction MAY BE the most important construction feature

8. "LINE AND NOZZLE SELECTION...PICK THE RIGHT TOOL FOR THE JOB"

- GPM needed
- Personnel available
- Mobility
- Hand lines or heavy streams
- Nozzle...straight or spray

9. "THE BEST PIECE OF SAFETY EQUIPMENT WE HAVE IS BETWEEN OUR EARS"

- Knowledge and experience should keep us from getting into situations where our protective equipment is needed to save our life
- Proper wearing and use of full protective equipment
- Make sure your smarter than your equipment
- Think about when it's TIME TO GET OUT...recognize the factors
- Use all your experience and senses to fight fire smart
 - * sight
 - * hearing
 - * heat
 - * possible smell
 - * COMMON SENSE
- When everything goes wrong...know how to help save yourself

10. "PULL CEILINGS BEFORE IT'S TOO LATE"

- For your safety
- To extinguish the fire
- Establish an anchor point
- Possibly prevent a flashover
- BOTTOM LINE...NEVER LET THE FIRE GET BETWEEN YOU AND YOUR ESCAPE ROUTE

REMEMBER, MENTAL MISTAKES ON THE FIRE GROUND CAN BE DEADLY. FIGHT FIRE SMART!!