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Course



Firefighter Casualties: When “Old-School Firefighting” Doesn’t Work

BY ANTHONY AVILLO

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Firefighter Casualties:

When “Old-School Firefighting” Doesn’t Work

Educational Objectives

On completion of this course, students will

1. Describe the occupancies and conditions where it is dangerous to undertake an aggressive interior attack.
2. Describe the “wood-frame private dwelling” mentality and how it causes needless firefighter casualties.
3. Discuss the consequences of having to call a “time-out” on the fireground because of an error in initial operations.
4. Identify the scope of responsibility of an officer with regard to his subordinates.

BY ANTHONY AVILLO

FROM TIME TO TIME, YOU HEAR THE PHRASE “OLD-School Firefighting” and the need to return to our roots—i.e., hard-nosed, get-down-and-dirty, get-in-there-at-all-costs firefighting. Although many times this approach is warranted, failing to recognize when it is not warranted can and has cost firefighter lives. A cavalier approach to structural firefighting all the time, every time, displays a gross misunderstanding of risk management and usually results in more casualties than are acceptable (and *none* are acceptable!). No firefighter is tougher than a fire, a collapsing building, misbehaving electricity, or a moving vehicle. Your job as an officer is to keep your subordinates from testing that theory.

Unfortunately, the biggest theory testers are often company officers who arrive first (the initial incident commanders) and operate without looking at the big picture, often getting themselves and their crews into more danger than they bargained for. It is then up to those arriving thereafter to hopefully restore some sanity to the operation and rein in nonthinking, overaggressive personnel before they get in over their heads.

Statistically, firefighter death and injury rates per 1,000 fires at vacant building and commercial structure fires are almost four times those at occupied residential structure fires. We will examine why this is so; take issue with the “damn the torpedoes, full speed ahead” approach toward lightweight construction; and discuss the sometimes tragic consequences of the “that’s the way we always do it” approach.

We simply cannot employ the old wood-frame, private-



(1) What do we know about this building? How safely can we operate in a potentially unsafe building without sufficient ventilation or additional means of egress? Slow things down until you can make the building behave a little. Don’t forget about the occupied exposure issues here. (Photos by author unless otherwise noted.)

dwelling strategy we have used for so many years; that tactical approach does not match today’s buildings, their construction, or the fire conditions the structures and their contents generate. Our private-dwelling (also called “2½-story frame”) mentality is killing us. In many cases, we need to choose caution over aggression until we better understand what we are confronting.

VACANT STRUCTURES

Vacant building fires are often at top of the list for line-of-duty deaths (LODDs) per 1,000 fires; LODDs at such fires have been as high as 18 per 1,000 but are now



(2) How will your department operate here? Do you know how to remove these metal enclosures quickly and efficiently? Will your troops pile into this building before you get that accomplished? Can you stop the insanity and get control of the situation before tragedy strikes?

lower at approximately 12 per 1,000. This is still too high. Bringing up this statistic, I ask students why it is so high. Remember, fire service statistics exist for one reason: so you don't become one! The answers I get vary, from the building deterioration to poorly enforced codes to illegal vagrants to delayed discovery of fire. We are blaming everyone else on the planet (including the building) but not ourselves. The problem lies with our own attitude, which is often complacent. We rush headlong into these dangerous structures without thinking about the potential dangers. Why? Because we always do that, whether the building is occupied or not.

In vacant structures especially, we may need to consider holding the horses at the barn door until we have made some proper attempts at making the building behave. Overzealous, overexcited personnel must be controlled. That is the responsibility of the initial incident commander, usually the first-arriving company officer. If this member is also overzealous and overexcited, we are in trouble. These first decisions can make or break the operation, ensuring safety or inviting tragedy.

Consider the boarded-up vacant building (photo 1). How many times have we seen firefighters (including those overzealous, overexcited members) pry off the front door, after which a dozen or so personnel parade into a smoke-choked structure to look for a fire that is nearly impossible to find because of the lack of available ventilation? The possibility of holes in the floor or missing stairs is not even as critical as the fact that the secondary and additional means of egress have not been established.

What if a Mayday or a rapid fire condition occurs? Firefighters trapped behind openings that are boarded up or secured with HUD- or VPS-type metal enclosures have little chance of escape when conditions deteriorate. Open up the building before entering. If it lights up, so be it. Allowing firefighters to operate without sufficient ventilation and means of egress is irresponsible and asking for trouble (photo 2).

In addition, show respect for the unexpected when making initial entry on upper floors, since the “keep

out” barriers are often only on first-floor doors and windows, making initial entry through the upper-floor access more attractive. But this might not be such a great idea when there are no other ventilation opportunities. An opening on an upper floor [a normal vent-enter-search (VES) operation] might be just enough to pull fire into stairwells and toward those single openings, trapping firefighters inside who have no other way out. No wonder the statistics for firefighter LODDs are more than four times as high for vacant structure fires as those in occupied residential dwellings: We are fighting these fires as if we were in an occupied residential dwelling with intact stairs and floors, plenty of available ventilation openings, alternative means of egress, and a means to coordinate our attack.

Vacant buildings (and buildings under renovation) must be investigated and all hazards communicated to the operating firefighters. Adopting a building marking system is a good step to alert all firefighters to a hazardous building. Coupled with a dispatch-based notification system during response and a proper preliminary size-up report, identifying the concern (and then actually paying attention to it) will hopefully start the operation off on the right foot.

Remember, in these structures, the items we risk our necks for tonight will probably be tossed into a dump truck and carted away tomorrow morning (photos 3, 4).

COMMERCIAL OCCUPANCIES

The percentage of actual rescues from commercial occupancies on fire is extremely small compared with the LODDs that result when firefighters wander around in a large, smoke-filled area without proper orientation tools or techniques because they did not consider the potential consequences before entering. As of 2009, commercial occupancies account for the most LODDs per 1,000 fires, nearly 14. In addition, commercial occupancy fires have been prone to many multiple firefighter fatality incidents in this and in previous decades.

This is the type of fire where our failure to recognize the inherent dangers usually costs us most dearly. Private-dwelling tactics just do not work in these structures, and it has been proven time and time again. Look at the fatality reports (and the pictures and videos on the Internet and pictures in magazines) and you will see firefighters stretching small-diameter hoselines into large buildings. Why? Because “this is the way we always do it”; “we always stretch the 1¾-inch crosslay, Chief.” Here you will find not only the fire load overwhelming firefighters but also short stretches that further jeopardize the opera-

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(3) The fire department has marked this now-vacant fire building. The "X" in the box denotes a no-entry strategy. Other markings indicate that the roof is open (RO) and the floor is open (FO), good information to know going in. Pay attention to it. (4) Renovations rarely strengthen a building. The second floor of this old braced-frame building is now supported by lightweight wooden I-beams. Once it is covered up, it will not be evident, and we will likely fight this fire as we would one in any old wood-frame building. That could be a deadly mistake. To be aware is to be alive.



quences. Again, someone has to stop the insanity and bring safety to the fireground. Sometimes that requires a little treachery and some "unpopular" action by the officer who sees the bigger picture.

The roof is another dangerous area in commercial structures. Large commercial structures most often employ some type of truss roof assembly. It may be lightweight (discussed in the next section), but often the roof is supported by larger truss assemblies (e.g., a bowstring truss or a parallel-chord timber truss), which have caused multiple LODDs over the years.

One proactive measure would be to mark all such buildings with a

tions, especially searching firefighters.

And when we are pushed out of the building and forced to go defensive, we still use the small-diameter hoselines because they are what we have always used and we have them charged already (and we sometimes ignore collapse zones too!) (photo 5).

Engine company personnel stretching hoselines of insufficient diameter are not the only ones getting into trouble in these occupancies. If you read the LODD reports, you will see that ladder and rescue company personnel have operated inside a large structure without proper equipment [e.g., lifelines and thermal imaging cameras (TICs)] and failed to maintain orientation with their exit point. Firefighters routinely leave lifelines and TICs on the apparatus because it is either not department policy (enforced or otherwise) or personnel are too hurried (or too lazy) to open an extra compartment and grab the lifeline.

What's the real reason? Because we never bring lifelines and search rope bags into the building fires we normally fight, right? Again, this is failure caused by complacency and routine.

Deciding to stretch large-diameter handlines with solid bore nozzles and to operate on a lifeline if you are not on a hoseline indicates a competent officer and a safe fireground. This large building/large hoseline/lifeline philosophy must be reinforced constantly. If it is not done on your arrival and you are now in charge, you must address it. Failing to do so can result in severe conse-



symbol indicating that the structure has a truss roof assembly. But for this system to be effective, it must not be ignored. Unfortunately, we can have all the proactive safety measures in the world in place prior to an incident. But if companies fail to heed the warnings because they operate with the wood-frame, private-dwelling mentality, then they will

stay on the roof too long, ignore the fire conditions and radio reports from the interior, and, sadly, fall through the roof when the assembly fails. This same mentality causes firefighters to ignore (or fail to look for) critical warning signs such as fire traveling above a drop ceiling in a large commercial building, and they end up crushed beneath a failing ceiling and roof.

I saw a video in which firefighters were working on the roof of a one-story commercial structure with an obvious truss roof. In addition to heavy fire and smoke conditions below, the roof had several large HVAC units. The firefighters near the HVAC units continued to cut a roof they should not have been on. In the video, as the HVAC units begin to disappear through the roof, the members jump onto the parapet. Fortunately, they were close enough to the wall, or they would have ended up falling into the inferno below. They were very lucky.

The question must be asked, "Where is the supervision or someone with enough sense to stop the insanity?" This was a multiple-alarm fire and no one recognized (or did anything about) the collapse potential? Who allowed these members to operate on that roof for so long, or at all? And why did those



(5) Not only are personnel using small-diameter hoselines, but they are also operating in the collapse zone. How many supervisors are there at this scene who think there is nothing wrong with this operation? Answer: all of them! (Photo by Glen E. Ellman.)

members on the roof not realize the danger they were in? This was classic tunnel vision at both the roof and command levels. With all the lessons that have been taught (and hopefully learned) by the mistakes of those who came before us when operating in truss buildings, you would think we would know better by now. Not always.

LIGHTWEIGHT CONSTRUCTION

We make our share of costly mistakes in these buildings, too, the obvious consequence of which is rapid collapse. Although this is supposed to be common knowledge across the fire service, time and time again we see firefighters standing on roofs, under roofs, and working on the interior, all while it is obvious that fire is traveling in the voids where the lightweight connections are and where the building is most vulnerable. Why? Because we always



(6) Who is allowing this to happen? Based on the amount of fire and the exposure issues, there must be dozens of officers at this incident. If this guy is wearing a white helmet, that's even worse. The location and extent of this fire clearly show truss involvement. Unfortunately, this is an everyday occurrence. Is it yours? [Photo by Battalion Chief Mike Oriente, North Hudson Regional (NJ) Fire & Rescue.] (7) This floor failure occurred before the arrival of the fire department. Companies quickly knocked this fire down from a doorway. Still, several floor supports failed. Overaggressive tactics can cause us to fall through or be crushed by this failing floor.

go inside and work in the area of the fire. Isn't that the mission? Well, it used to be in older buildings that could maintain their structural integrity for a long time. Not so in the newer buildings of suspect construction. We will examine some of the "private-dwelling" tactics being used here, sometimes causing dire consequences to our players (photo 6).

First and foremost, there is a failure to size up the fire. This also probably accounts for the lion's share of common mistakes in the other occupancies mentioned above. This is having disastrous consequences on the fire service in our response to lightweight structures. We probably kill more firefighters in floor collapses now than in other types of collapse (e.g., wall, roof, ceiling). This has occurred for a number of reasons, not the least being the failure to size up for the fire's location.

At some incidents, firefighters attacked a fire they thought was on the first floor because that floor was heavily charged with smoke on arrival. A quick look at one of the sides and especially the rear before committing a line might avert disaster here. That "first-floor" fire was actually a basement fire. That is not to say that the first line should not go to the first floor to protect the life hazard, but failure to recognize conditions *below* the first floor has resulted in firefighters' falling through the floor just inside the front door, because the fire had compromised the lightweight floor joists beneath the first floor. A heavy tile floor in the foyer only adds to the problem, since it conceals structural damage.

Another issue is that firefighters in these structures are doing what they would normally do in "old school" firefighting—advancing the line right to the seat of the fire to kill the devil where he lives. Again, we are becoming victims of floor and ceiling (depending on where you are in the building) collapses. In these structures and even in the structures mentioned in the preceding paragraphs, a properly charged line, even in an oversized room, can



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usually hit any area in that room from the doorway, where the protection is. “Lightweight construction = caution” working in and directly over the fire area. Knock it down from the protection of a doorway, and then enter for a careful assessment of structural integrity. The fires will still go out, and we will maybe have more healthy (as compared to broken) firefighters out there (photo 7).

Here, as in commercial structures, the rooms may be larger than those of the older private dwelling. Firefighters who are not on hoselines must be on lifelines. That should be policy in any room larger than 15 × 15 feet and be a mandatory assignment when operating in a below grade area, no matter what type of building the fire is in. In addition, don’t forget the TIC. It does you no good if you leave it on the front steps or on the rig.

Regarding the roof, no one belongs on (or under or in the area of) a lightweight roof that has fire or potential fire beneath it without independent support. Cut roofs in these structures only from the protection of an aerial device or, if on a flat lightweight roof, a roof ladder spanning several joists. Even this last option may not be enough. Years ago, wood-joint buildings were built with a redundancy so if a structural member such as roof or floor joist burned through, adjacent members assumed the load and did not collapse (usually).

Today, lightweight building components have no such redundancy. The collapse of one member can lead to a domino-style collapse. Monitor conditions below carefully and pessimistically. Also, take a TIC to the roof; it will immediately show you where the heat concentrations on the roof are, which will be the first area to assess. A report from the roof indicating fire involvement will alter your strategy. Don’t wait. If you are the IC, get everyone out of the fire area beneath that roof and everyone off that roof. You may be able to pinch the fire off with a properly coordinated and monitored pincer action from the exposures of large structures such as townhouse complexes, but the firefight in the fire area is lost. Don’t take it personally.

Use these same tactics in hybrid buildings, which are constructed from “whatever material is cheapest today.” Consider these also lightweight buildings and require the same cautious assessment as in any lightweight structure. This was covered in depth in my article “Fireground Strategies: The New Millennium Multiple Dwelling” (*Fire Engineering*, October 2005) and in my textbook *Fireground Strategies, Second Edition* (Fire Engineering, 2008).

REMEDIES

All the issues discussed here should be no surprise to anyone, especially officers. As an observer and a participant, I see that the fire service must change its attitude. We are not invincible. As stated before, no firefighters are tougher than fire, uncontrolled electricity, buildings that fall down, or moving vehicles. The awareness philosophy (or the change from a broken and unsafe philosophy) must start with the department administration, funneling down

the chain of command from chief officers to the extremely pivotal company officer position and then to the firefighter. If the people at the top think this is important, they will set a better example, and the department will become safer. Unsafe people must be in the minority and must be made to feel that way.

A major obstacle to safety often arises when the first-due companies begin the operation for the given situation incorrectly. Often, even though many on the fireground realize that the approach should be different, few take the initiative to change it. Such a situation requires someone with some guts to basically call a time-out and *stop the insanity!*

Unfortunately, the fireground doesn’t like time-outs. The fire will keep doing what it’s doing to the building and ignore the time-out, which often makes the situation more dangerous and delays proper operations. But it may be the only action that ultimately can stop firefighters performing unsafe or incorrect actions from getting themselves or others killed.

Regarding corrective action, you may have no other choice, so be prepared when the time comes, thinking ahead to what you want accomplished and how and countermanding those actions that were ordered before your arrival (basically changing the scope of the operation, if warranted). For many officers, this is tough to do, but it’s your job as an officer. Those collar pins on your uniform, whether they are bars, horns, or eagles, stand for two things: conflict and controversy. If you are not prepared to deal with those issues and take action that no else will take, whether on or off the fireground, you will be a poor officer and get run over by your subordinates, often at the most inappropriate time—when it can cost their lives.

Whether it’s someone not following department protocols, wearing gear improperly, operating unsafely, or conducting operations inconsistent with or seemingly out of sync with the dangers the building or situation presents, the right thing to do and the hardest thing to do are often the same thing. That’s your job, like it or not.

Remember, all you chiefs and subordinate officers who stand idly by as companies take incorrect or unsafe action, that your department position is not based on popularity. If you are in command, whether it’s a company or an incident (or both), anything that happens, good or bad, is ultimately your responsibility—you will be held accountable. You are responsible to work safely and consistently in the given conditions at all times. If those actions are going to upset your subordinates, so what? Remember also that your support of your subordinates is an all-the-time thing, whether they like it or not. If your decisions are unpopular, they might just be the correct decisions. If you take correct action, no matter how unpopular, your subordinates may be enjoying that next meal because of your actions.

Remember, you are also responsible for your assigned personnel all the time. You can never ignore any violation,

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COURSE EXAMINATION

- At vacant and commercial structure fires, how do the firefighter injury and death rates per 1,000 fires compare with the rate for residential fires?
 - About the same.
 - Double.
 - Nearly triple.
 - Almost quadruple.
- Why are firefighter casualties so high in vacant buildings?
 - Structural deterioration makes buildings susceptible to collapse.
 - Poorly enforced building codes allow hazards to accumulate.
 - Firefighter attitudes toward these buildings are often complacent.
 - Delayed discovery of fire results in advanced fire conditions on arrival.
- You are about to enter a vacant structure that has been boarded up. What is the best reason for delaying the attack, given these conditions?
 - The lack of ventilation will prevent firefighters from finding the seat of the fire.
 - The potential for backdraft behind closed window panels.
 - The additional means of egress have not been established.
 - The potential for hostile vagrants.
- You respond to a two-story vacant structure fire where metal window closures cover all first-floor windows. You are ordered to conduct vent-enter-search of the second floor. The smoke condition is heavy, and there are no coverings on those windows. How would you evaluate this action?
 - Poor practice. Vacant buildings on fire should never be entered for any reason.
 - Good practice. The ventilation will clear the first floor quickly, allowing members to enter.
 - Good practice. Victims in the building will be easier to remove via the second-floor windows.
 - Poor practice. The fire may light up and cut off egress back to the windows.
- From the list below, select two as proper methods for alerting firefighters to hazardous buildings.
 - A building marking system
 - Continuing progress reports
 - Dispatch-based notification
 - Preplanning manuals
 - 1 and 3
 - 1 and 4
 - 2 and 3
 - 3 and 4
- You respond to a vacant building and see a box with an "X" in the center spray-painted on the structure near the front door. What does this mean?
 - This is the safest door to enter.
 - There is to be no entry to this building.
 - The roof is open.
 - Vagrants have been inside this building.
- Fill in the blank: Renovations will usually _____ a building.
 - Reinforce.
 - Collapse.
 - Weaken.
 - Bond.
- Which type of occupancy has accounted for the most firefighter line of duty deaths per 1,000 fires?
 - Commercial.
 - Residential.
 - Vacant.
 - Industrial.
- The percentage of rescues from commercial occupancies is _____ when compared with the firefighter LODDs suffered in these occupancies
 - About equal
 - Extremely small
 - Is difficult to determine
 - Significantly large

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10. Arriving at the scene of a fire in a large commercial building, you observe that the smoke condition is not too severe. An employee tells you there is a small fire in a record room in the rear. You see the first-arriving engine company stretching a small-diameter line off the crosslay. As incident commander, what action should you take?
- Order the second engine to start a stretch with a 2½-inch backup line.
 - Let them continue the stretch as you wait for the first report, then take action as necessary.
 - Order them to stop and stretch a larger line.
 - Hold them at the door until the ladder company locates the fire and gives a report.
11. At the same fire, you observe the ladder company entering for a search. What is the most significant piece of equipment you would order them to carry in with them?
- A set of irons.
 - A spare SCBA.
 - A thermal imaging camera.
 - A lifeline.
12. You are operating at a large commercial structure. What type of roof assembly would you expect here?
- Sawn joist.
 - Truss.
 - Modified inverted.
 - Chamfered joist.
13. You are operating on the roof of a large, one-story commercial structure with several enormous HVAC units on the roof. The smoke condition is severe and pushing out from all areas. What is your most critical concern?
- Fire spread via the HVAC ductwork.
 - Collapse of the walls.
 - Collapse of the roof.
 - Flashover of the first floor.
14. Which type of collapse probably causes more firefighter LODDs than any other type of collapse?
- Floor collapse.
 - Roof collapse.
 - Wall collapse.
 - Parapet collapse.
15. You arrive at a fire in a residential dwelling constructed of lightweight wood frame. There is heavy smoke on the first floor. What is the best action in this situation?
- Stretch a line to the first floor to protect the life hazard.
 - Recon for the location of the fire before committing.
 - Stretch a line to the basement for extinguishment.
 - Set up for a defensive operation.
16. When confronted with lightweight wood structures, what is the safety concern with advancing a hoseline directly to the seat of the fire?
- It is difficult to penetrate the heat conditions created by these structural components.
 - The structural integrity of lightweight components in the area of the fire may have been compromised.
 - Double- and triple-pane windows are creating early backdraft conditions.
 - Direct stretches require too many firefighters to accomplish.
17. In the structures addressed in the previous two questions, where is the best place from which to apply water to the fire?
- From the exterior.
 - From the roof.
 - From the interior as close to the fire as possible.
 - From a doorway.
18. In a lightweight structure, when fire is suspected in the roof area, which is the best practice?
- Cut the roof from an independent support.
 - Use a roof ladder hooked over the peak to cut the roof.
 - Do not cut the roof—pull the ceiling from below.
 - Do not cut the roof. Allow the fire to burn through and self-vent.
19. In a lightweight structure, a negative report from which area will alter strategy?
- The interior.
 - The basement.
 - The roof.
 - The rear.
20. Awareness of unsafe actions resulting from failure to recognize inherent dangers of a given fireground condition must start with whom?
- The firefighter.
 - The company officer.
 - The chief officers.
 - The fire department administration.

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