SPEAK UP

We Have Not Been Doing It Wrong!

Veteran fire chiefs defend longstanding firefighting practices

Recent fire service studies have validated information, dispelled some myths and provided valuable data, yet, through misinterpretation, they have inadvertently led to more myths.

Our education and experience repeatedly tell us that when we ventilate a fire building through any opening, it must be coordinated with the engine companies' movement. This concept is not new, but the fire service educational community is revisiting it and stressing the need for our members to take a more analytical approach to when and where we "open up" a fire building, and for good reason.

The terms "legacy" and "modern" homes indicate changes in construction, increased use of plastics and synthetics in furnishings, energy-efficient windows and increased r-values in residential construction. Each is a key contributor to the concern. The diagnosis is not new – the change from legacy to modern homes started in the mid-1970s and has accelerated over the years. What is new is that not all fire service personnel are fully aware of the increased fire growth concerns of modern homes and how they affect the fireground.

The misinformation can start early in the career of a firefighter or fire officer. Training has indirectly played a significant factor in the confusion of fire growth rates and their effect on the fireground.

Thirty years ago, most live-fire training was conducted in acquired structures that let personnel learn, in a more realistic environment, about fire behavior and its effects on the structure. Today, nearly all live-fire training is conducted in concrete or steel burn buildings. While these structures provide a safer environment and are more cost effective, they are limited to Class A fire loads (generally, wood pallets stacked in a corner) or Class B fuel (usually, propane props) in a building that retains heat.

Although Class A burn buildings do allow for some fire-behavior training, it is limited to the fuel load used during the evolution. Class B burn buildings, on the other hand, only let students see fire development and growth to the extent that the control system allows. Fire growth in these structures is actually fuel controlled. These structures do not provide the opportunity to learn how a structure's design and contents contribute to the fire load as in Type III, ordinary; Type IV, heavy-timber; and Type V, wood-frame structures. This could lead to a false sense of security among students. Neither Class A nor Class B-type burn buildings, common throughout the United States, let students see true fire growth through all stages of fire development. Flashover simulators can demonstrate fire growth to the flashover stage, yet are limited to that skill.

While providing safety during live-fire training is undoubtedly important, we must understand that we are limiting the effectiveness of the training. The fire service must develop methods to reduce or eliminate these limitations during the training scenario. To take this concern one step further, actual training techniques may further compound the problem. Numerous training organizations do not let students ventilate a structure, either vertically or horizontally, during training evolutions. Some have ventilation set up only in the event of an emergency. This is done to keep smoke and heat in the building for the next group or rotation. Fire service instructors must understand that eliminating ventilation during training could send the message to students that ventilation is a tactic performed only after the fire is controlled.

Photo 1. Chief and company officers must ensure coordination between engine and ladder companies during fireground operations. *Photo by Steven Woodworth*

The UL report *Impact of Ventilation on Fire Behavior in Legacy and Contemporary Residential Construction* clearly proves that ventilation is an important tactic that must be coordinated with the advance of the attack line. One key element of the report is the need for education and training. Firefighters cannot be expected to perform a coordinated attack when they have not been trained in that manner. The old adage of "fight like you train and train like you fight" has been lost in fire service training.

More than ever before, fire departments are reminded to take a more disciplined approach to where, when and how they ventilate. This awareness is combined with a stronger emphasis on getting water on the fire and limiting building openings. The information gathered and reported about flow path or fire travel is outstanding. It reinforces the fire service's need to

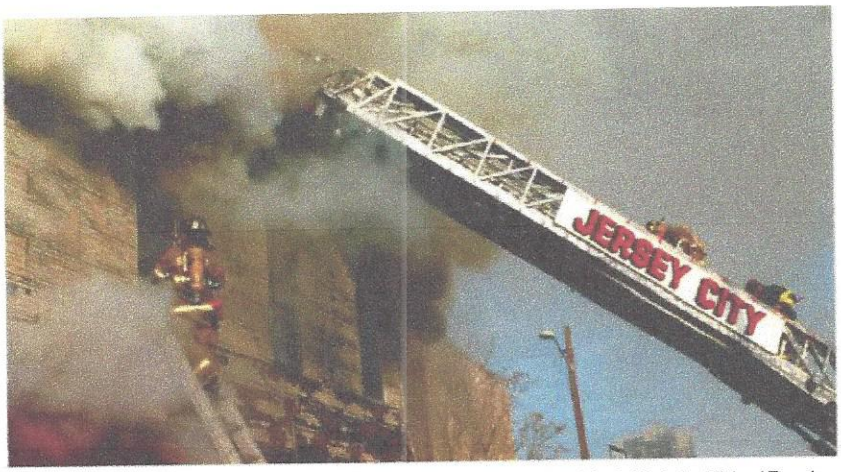

Photo 2. Coordination between the ladder and engine companies is critical. *Photo by Michael Terpak*

conduct a more disciplined approach to locating the fire, communicating its location, assessing the wind, floor and room layouts and then coordinating the vent opposite and above the movement of your hoseline. Many have been preaching and practicing this concept for years. (See photo 1.)

But what has become new in the education of our firefighters is the attempt by some to eliminate or criticize those who attempt to stretch a hoseline in the front door to extinguish a fire within the building as compared to those who are educated to "hit it hard from the yard." This concept is referred to as a "transitional attack," but it is not new. The fire service used to refer to this as "darken it down" or a "blitz attack" with the same objective as the new teachings – to reduce energy and slow the fire's growth rate. This has been, and continues to be, a viable option for the fire officer. Its use, as with many others on the fireground, is determined by a number of factors. But to teach or state that the fire service has been doing it wrong is not valid, and is in fact shortsighted.

Any and all credible research and teachings should be viewed and shared as a means to increase the survivability of our members. There is no doubt that the findings from UL and National Institute of Standards and Technology (NIST) studies do that. But to remove other options for fire attack that have been successful and refined for years is unacceptable. What we should be taking away from this research is the need for all to become better at what we do, to become more analytical in our operations and to give us more tools or options to utilize on the fireground; not to eliminate them.

There is no doubt the fire environment has changed. More energy is released in a room-and-contents fire today than 20 or 30 years ago. It is also important to note that there was a tremendous amount of work years ago that let senior members see first-hand how fire moves when channeled, as well as where and how to apply water to extinguish it.

Revisiting the aggressive interior attack under the current fire-growth concerns has validity, but it can't be eliminated, as some suggest. When conducted properly, the aggressive push of a hoseline into the front door saves occupants from losing their lives in a building fire. What this report identifies is the need for those who choose to make an offensive push to become more coordinated, to be more aware, to refine their tactics and become more efficient with the tools and options available.

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The UL report states on page 289 that "fire attack should be coordinated." The report continues, "If air is added to the fire and water is not applied in the appropriate time frame, the fire gets larger and the hazards to firefighters increase." Instead of eliminating options, we need to add to or refine our available options.

When developing a plan of action, the following items should be considered:

1. Stress the need for multi-sided, 360-degree views from your walk-around, reports from the roof and images from thermal imaging cameras outside and inside the building. You need to know where the fire is so you can anticipate where it may spread.
2. What is the height, construction and occupancy type?

- Length times width will give you the square footage of a building. These will affect the hoseline selection and stretch. Long and difficult hose stretches with minimal staffing may warrant an outside stream initially (now referred to as the transitional attack) until more members arrive to stretch to the interior. Height times length times width will give you the cubic feet of the structure. This information can be used to determine the minimal fire flow of the structure.
- Construction will help identify fire and smoke spread, the ability of the structure to add to the fire load as well as the building's collapse potential. Fires involving lightweight structural members such as those found in a basement will require an outside stream to not only slow the fires progression (the transitional attack), but to eliminate members from being involved in a floor collapse.

- Occupancy will not only identify the building's life hazard; occupancy will also identify the building's contents; specifically the fire load from the contents, hazardous materials, etc.

3. What is the anticipated floor and room layout? Is this a railroad flat room apartment vs. a split-level private dwelling? This information helps identify fire growth and movement. Your knowledge of the building or area may provide you with that information.
4. Upon arrival, where is the fire located? A fire on the lower floor of an occupied multiple dwelling is different than the same fire on the top floor. Give further consideration to the fire's location as it relates to interior stairs. If wooden interior stairs and wainscoting line the walls of a stairwell, as in many older frame and brick multiple dwellings, get water into that space as quickly as possible.
5. Where are trapped occupants? Whether their location is viewed, reported or anticipated, hoselines need to protect any trapped occupants as well as those searching for them. Place a hoseline between the fire and any endangered occupants as quickly as possible.
6. Limit or control door openings, from gaining control of the door to the fire room or apartment by your ladder company members to actually giving consideration to limiting the opening via the front door of the fire building until water is ready to move.
7. Delay removing any glass and vertical openings until you:

A. Assess wind speed and direction.
B. Identify and obtain information on the fire's location.
C. Confirm there is charged hoseline in the building.
D. Communicate what you are going to do before you do it. This is critical to coordination.

8. Stress the need for effective communications between the engine and ladder company. Use short descriptive radio transmissions such as, "We have water in the hallway," "We have control of the door" or "We are going to take the glass from the second floor rear." (See photo 2.)
9. Assess speed and maneuverability with your hoseline(s) based on the fire's location and extent. Is it best to attempt to "soften the target" and hit it from the outside for 15-20 seconds or use the same 15-20 seconds to move the hoseline to the interior and attempt to "kill the target"?
10. Once the location of the fire is determined and there is water to the nozzle, create/increase the flow path opposite the push of the hoseline.
11. Stress the need for quicker and bigger water in your buildings. Consider re-educating your members with more efficient hose stretches to increasing the size of your interior hoselines.
12. Presently, it is being taught and written that a hoseline cannot push fire. While this is true and has been tested and documented by NIST studies, it must be understood that an improper stream pattern moved in and "around" a window opening will upset the thermal balance. Anyone who has ever been in a room where this has happened can testify to this, often quite emphatically. Even a straight or solid stream moved "around" the opening will shut down that window. Simply, if you shut down the flow path/fire travel out the window, that energy will go someplace else. Upsetting the thermal balance has a detrimental impact on firefighters, who are encapsulated in turnout gear and self-contained breathing apparatus (SCBA). This has a severe impact on trapped occupants who are not protected.

Now, consider a lower-floor fire in an occupied multiple dwelling with a wood-lined interior stair and occupants trapped on upper floors. If you move water around a window opening in that scenario for 15-20 seconds, you can create a bigger problem than you had when you first arrived.

As interesting and promising as the scientific results are, in our opinion, there are some tactics that should never change or be eliminated. Effective company officers and chief officers must develop and implement the appropriate strategy and tactics for the situation. A plan of action

must be developed for the situation rather than attempting to make the situation fit a pre-conceived plan.

The following elements should be considered to accurately assess a situation and ensure that the plan is developing to fit the situation:

A. Time and coordinate your ventilation with the engine companies' movement.
B. Consider any and all factors that could negatively affect the fire's growth.
C. Protect the building's primary means of egress, its interior stair.
D. Place a hoseline between the fire and any endangered occupants.
E. Protect members searching for trapped occupants.
F. Speed and maneuverability with a well-supplied hoseline puts out fire.
G. Locate, confine and extinguish the fire.
H. If you put the fire out, all of your other problems will go away.

Perhaps one of the most prominent statements of the UL report is on page 284, where it clearly states, "These tactical considerations are not meant to be rules, but to be concepts to think about, and if they pertain to you, by all means adapt them to your operation." Strategies and tactics for fires must be applied based upon the needs of the situation.

The fire service has devoted a great deal of effort toward training that focuses on the safety and survival of its members. While training is critical, the fire service must come to the realization that the most effective way to increase firefighter safety is through the coordinated efforts of good and well-thought-out engine and truck company functions.

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