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Ronny J. Coleman

The Double Edged Sword; Code Requirements and Utilization by Suppression

The field of built-in fire protection is turning into a veritable kaleidoscope of technology. Whereas we once had one or two ways of achieving fire protection control, we now have a vast array of tools and techniques emerging as part of our code requirements. Some of them have evolved from the space race. When compared with just a few decades ago new technology is coming to use from research and development labs at an incredible rate.

Granted, some of us may regard the four to five year research and development phase of some concepts as being relatively slow, but in the overall perspective that's almost an instantaneous change. Much of the new technology is being incorporated into codes and standards as soon as it has been clearly established that it can perform at certain levels of fail-safe.

But, like the proverbial double-edged sword, all of this new technology does have a down side. It is one thing for us to go about the business of embracing technology and codes and standards, and even requiring its installation. It is quite another for us to perform adequate follow-up inspections and to use that technology under fire ground conditions. There simply is no correlation between the requirement for the installation and the capability of the organization to adequately fulfill its potential when an emergency occurs.

It is interesting to note that in most fire service organizational settings, fire prevention and fire suppression are usually treated as separate divisions and, in fact, have almost totally different cultures. It is not unknown in many departments for the fire marshal and the fire suppression personnel to speak a different language and, for all intents and purposes, to be totally unaware of what the other one is doing. When much of our built-in technology was basically passive this did not create much of a problem.

For example, if a fire department required an exit width or an exit to be in a certain location, combat personnel weren't really too concerned about it because they simply would find that condition upon arrival at the emergency and they would utilize it according to whatever tactics were required. As technology has become more active, there is often a requirement for an interface between combat personnel and the technology at the time of an emergency. Avoiding the interface or ignoring it, in some cases, not only will have a negative effect on the effectiveness of the equipment but, in fact, could actually alter the outcome of the emergency in an adverse way. It could even increase the liability for the fire service.

What we are referring to is the fact that there is a real distinction between the adoption of technology on the code side and the utilization of technology on the suppression side. No organization can afford to have any gap in the knowledge base by its suppression personnel that are required to make new technology work under stress conditions. To narrow down the discussion, I would like to focus on how this relationship works in the area of sprinkler systems, alarm systems, and packaged combination



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systems for specific risks. Each one of these areas of technology are going to require a more closely knit relationship between code requirement and operational capability in the future.

One reason for this need is also based upon the condition that in many fire departments the responsibility for doing on-going inspection work for fire safety systems often falls on the shoulders of the fire companies. While the fire prevention specialist often makes the initial inspection, the annual inspection of the occupancy shifts to suppression personnel. Over the last couple of decades there has been a tremendous increase in the number of fire departments that are utilizing suppression personnel as their eyes and ears in the field for looking at occupancies after they have received their Certificate of Occupancy.

Yet, it is not uncommon for the training of fire inspectors and especially plan checkers to vastly outstrip the amount of training that is being given to the combat personnel. While the suppression person may have to cope with the very things that are being required by the plan checkers and fire inspectors they often lack the background to do so. A review of the average curriculum for in-service training for most fire departments indicates that the fire prevention topics, especially with regard to specific technology, is usually a very low priority in the hierarchy of training priorities.

A few years ago in a discussion with one of the community colleges regarding recruit firefighter training, it was strongly suggested that fire academies add more time in the curriculum to train personnel on such things as fire alarm systems and sprinklers. The suggestion was not received favorably. The point of view expressed by the review team was that an entry-level firefighter was not responsible for such types of equipment and, therefore, did not fall into their basic competency list.

However, in reviewing training curriculums for fire academies at some of the more progressive fire service agencies around the country and specifically those in the United Kingdom, it was noted that the fire prevention function has a very high priority. The real question is just when we should start with the training of firefighters on this most important aspect of our profession.

Let's start with the basics. We should readily admit that combat personnel don't have the time or the inclination to learn a lot about the design of a sprinkler system or alarm system. However, they must be more than conversant with how it functions when an emergency is in progress. I am not talking simply about their ability to turn it off so that the bell will stop ringing or that the noise level will be reduced. In order to deal with this level of competency, firefighters must have an appropriate vocabulary and a reoccurring experience with the technology so that they have as much comfort with built-in fire protection equipment as they do with the technology that is carried on their fire apparatus.

As authorities having jurisdiction, fire departments have a real good reason for being concerned about this level of competency; their own liability. It follows that if an organization requires that a piece of equipment be installed for a specific fire protection function, in the event it does not perform adequately or is placed out of service inadvertently due to improper utilization the fire agency could find themselves facing liability. Several years some agencies in the western part of the United States were shocked to find that an individual contractor had actually installed fraudulent sprinkler systems that could not function in an emergency.



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What is more interesting is the question of how many more systems out there will not function because they have not been inspected by an individual who knows what to look for? For example, recently one of my fire inspectors came into my office and gave me a sprinkler head that he had found during an inspection of a warehouse. The sprinkler head was so badly bent that the deflector was almost at a 90-degree angle from what its original position was suppose to be. In this particular case, the head failed to activate, but if it had it would simply not have operated correctly.

When I questioned the fire inspector as to how he found it, he responded with, "It's because I was looking for it." His rationale was this happened to be a building that has quite a turnover in occupancy and that they utilize a lot of forklifts and moving heavy equipment within the structure. He anticipated that there would be head damage. This type of experienced observation is not necessarily commonplace. What happens when those potential problems are being looked for by a person who is only accustomed to examining the valves and perhaps the trim of a sprinkler system?

The second reason why we should be interested in this issue is firefighter safety. It is not uncommon for fire organizations to "trade off" certain building design features anticipating that built-in fire protection is going to give you the necessary edge to restrict and control a fire. In a previous column, I wrote about the New Zealand experience and their quality control impact on the effectiveness of sprinkler systems. Failing to provide a high level of maintenance means that the common barriers that have been traded off may, in fact, endanger the lives of the firefighters.

One of our reasons for this increasing emphasis is literally public relations. Whenever a fire department has an event in which there is a loss of life and property there is often a backlash caused by the public's perception that something could or should have happened differently. It is especially true when there are complex sets of circumstances that the fire department has to explain after the emergency is over. High rise structures, extra hazardous occupancies, life safety situations, such as nursing homes and schools, and other occupancies that have high media value cannot be allowed to have malfunctioning built-in systems.

There are several different approaches to resolving this problem. First and foremost, place a proper amount of interest in the recruit academies for entry-level personnel. A cursory overview of the basic manipulative components of a sprinkler system, are simply not enough, even for a recruit firefighter. They should be adequately trained on the basic hydraulics of a system and given an understanding of the effects of fire behavior on sprinkler head performance and the subsequent results of failure of a sprinkler head to perform its job.

Most recruit academies give only a cursory examination of the components and expect the individual to achieve a level of identifying the various parts but not necessarily knowing a great deal about their performance. In the future, this should be given a more thorough examination by departmental training officers.

The second level of modification should be in the training of fire inspectors. Granted, earlier in this article I mentioned the fact that a lot of fire departments have spent a lot of money on the training of



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their inspectors. A recent study performed in Southern California revealed that the rapid turnover in fire inspector positions has resulted in the net amount of experience for the average being relatively limited.

In one study group, the individuals responsible for conducting fire inspection on built-in systems had less than three years experience in the field. In many cases, they had never received specialized training. Some departments are attempting to overcome this particular problem by the creation of reserve fire inspector programs wherein candidates receive an extensive amount of specific inspection training before they start on a full-time basis.

The third level is in the departmental training curriculum. There should be a reoccurring training module each year in the suppression schedule that deals with built-in fire protection systems. This module should build a bridge between the utilization of systems in a suppression scenario and a proper inspection of the systems during routine company inspections. Those departments that have extensive pre-fire planning programs should place even a stronger emphasis on a thorough job of inspection being done by suppression personnel.

Summary

In conclusion, sprinkler systems are an awful lot like flashbulbs. Whenever a person buys a flashbulb to use in their camera, they anticipate a flash when they push the trigger on the camera. In many cases, there have been ruined birthday photos and other ceremonial occasions merely because the flashbulb was all right but the batteries were dead or the camera had otherwise been damaged to prevent the flashbulb from functioning correctly. The same thing might be said about sprinkler systems.

The design, manufacture, and listing of sprinkler heads are a comprehensive, intense process that results in a fantastic product. Yet, there is absolutely no guarantee that the sprinkler head will be allowed to do its job if it is put in an environment in which all the cards are stacked against it. The authority having jurisdiction that requires a sprinkler head to be installed should place as much emphasis on the maintenance and periodic protection of that sprinkler head as they do the emphasis on getting them installed in the first place.