



CHIEF'S FILE CABINET

Ronny J. Coleman

LOOK UP, DRILL DOWN

From a code adoption perspective we require technology in buildings because we need it. Not just because it is available. One of the first questions that must be asked and answered is: Will it work when we want it to during an emergency? The more expensive a technology is that is going to be placed into a building, the more we need to be able to prove that it will work when it is required. The first line of defense to assure this is fairly straight forward. We expect all of our installations to meet standards when they are put in. When they are inspected and approved, they are supposed to be as ready to go as they ever will be. What I am talking about of course are all those risk mitigation requirements that we are requiring by fire and building codes. Annually there are billions of dollars being spent on installing devices that we have to be able to rely on when a fire occurs. The second line of defense is the maintenance of these facilities to assure that graceful degradation has not occurred and the technology stands ready to react. Now to the big question of the day, what is our third line of defense?

If you answered that it is ongoing and comprehensive training and education of the people who must use this technology, you can move to the head of the class. Simply stated, the failure to train on technology that has been properly installed and maintained has resulted in failures during fire episodes. It is not the sort of thing that you want to have to explain on the 6 o'clock news. The idea of actually training on technology is not as well accepted as it could or should be.

Before elaborating on this training need, we should stop to remind ourselves that the risk assessment model has four quadrants to it. You should be more than familiar with those four but for the sake of this article let me remind you that they are low consequence, low frequency; high frequency, low consequence; high frequency, high consequence; and low frequency, high consequence. It is unfortunate that many people disconnect the idea of risk mitigation from the model by failing to realize that the high consequence low frequency event is probably the one that you are putting risk mitigation technology in place for in the first place. But we often fail to train our personnel using this same line of logic. Having spent a few hours on the drill ground, I personally believe that the vast majority of our training is based on a high frequency of events with relatively low consequence overall. This does not mean that I am ignoring the other four quadrants but much of the technology that we put in place is supposed to be there when everything goes wrong.

Recently, I had a chance to read a document entitled "Revisiting the Swiss Cheese Model of Accidents". The document comes from Euro Control Experimental Center in France. What it states is that accidents in complex systems occur through the accumulation of multiple factors and failures. Author J. Reason has proposed a model for what happens when this occurs that is based on the metaphor of Swiss cheese. His model suggests that multiple contributors (the holes in the cheese slices) must be aligned



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for any adverse event to occur. Barriers in the system (the slices themselves), are intended to prevent errors that result in adverse events. This is a perfect metaphor for examining what fire departments should be doing in high risk domains.

But don't let me talk anymore about theory. Let's talk practical application. I was given an invitation to attend a drill conducted by the Portland Fire and Rescue. The two organizers of this drill were Lieutenants Ryan Rossing and Chris Barney. These two officers had an interesting philosophy about proving that built-in installations actually work by conducting an on-site exercise. One might say that they are good examples of someone "thinking outside the box". This is because they actually went out and conducted a major high-rise drill on a 27 story building to see if the combination standpipe system will perform exactly as projected.

This is a department that is well prepared to fight fires in high-rise buildings. I reviewed their alarm assignment for high-rise buildings and found it consistent with what I would have expected for a metropolitan fire department. But their focus was not on how many people it is going to take to perform the job. Their focus was on whether or not the technology would do everything that it had been installed to do.

I will not go into a lot of detail about the drill because I am anticipating that they will be presenting their case in a publication that will be written by them. What I wanted to do was to focus on the spirit and intent of why they were doing it in the first place.

Have you ever heard of Murphy's Law? I have often interpreted Murphy's Law as being the first ground rule for combating fires. If anything is going to go wrong, it will go wrong while a building is burning or falling down. These two fire Lieutenants developed a standpipe drill that tested every aspect of the buildings standpipe installation. Working cooperatively with the owner of the building, they didn't just look at the standpipe, they pumped into it. They didn't just look at the fire pump in the basement, they ran it. Their methodology was that of an optimist as opposed to a pessimist. They looked for the things that were going to go right but had a strong sense of what could possible go wrong.

They were rewarded for their diligence by discovering a little bit of both. Fortunately nothing was catastrophic and the majority of the testing and research went exactly as scheduled. They went through extensive efforts to document each piece of evidence to support both their good and bad findings. I will leave it to them to explain what both of these mean in the context of their article.

Where I would like to finish this column is characterized by a conversation that I have often found myself having with property owners. When discussing cost of installation regarding the very low frequency, high consequence scenario, many building owners and developers will attack you with one simple question: If an event happens that infrequently, is the cost really worth the benefit? If you have not faced that question, you are in the minority, and if you have faced that question and only have one answer (because it is in the code) then this drill should resonate with you. Here is where some of the



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answers come from. If we continue to require risk mitigation in buildings we need to know more about its performance than anyone. We need to train on it. We need to evaluate it. We need to have the specifics about what it takes to make it work correctly under those high risk scenarios. Lastly, we should be able to look our constituency in the eye when we say that we not only need these provisions, but can be rendered ineffective if they have been denied.

My helmet is off in deference to the members of the Portland Fire and Rescue that went to the lengths of conducting the Fox Tower Standpipe Drill. Many of us would benefit from doing similar exercises in our high-risk occupancies.

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