The Descent into the Maelstrom

By

Ronny J. Coleman

Many years ago, I read a short story about a physical phenomenon called The Maelstrom.[1] This is a location on a body of water that is extremely tumultuous and dangerous to be near. It is a whirlpool that sucks everything into it and sends it to the bottom of a body of water. The image of the Maelstrom came into my memory just a few weeks ago when observing another physical phenomenon on a science show about black holes in the universe. Both are physical phenomena that create devastating conditions that, once initiated, are hard to reverse. These two images remind me of a set of conditions in the fire service. I am referring to large-scale fire suppression operations. By large scale, I am focusing on multiple alarm emergencies that last for extended periods of time. These are resource drains on the community.

It is standard practice in the fire service to accept the fact that there are certain buildings that create a huge demand when they are on fire. We often call these "target hazards" or "low frequency, high consequence" events. Rapid acceleration of multiple alarm resources accompanied by complex and intensive resource management requirements is sometimes chaotic. Granted, these conditions can be reduced by strong incident command. However, they can be diminished by making modifications to the building through the code enforcement process during construction. The best way to understand this relationship is by looking at how much fire and building codes have done to reduce our fire problem to a more manageable level.

This observation should lead you to at least one basic policy question that every fire department should be prepared to address: What should the fire service do when it discovers that there is a potential for intense and complicated resource management needs based on an occupancy that can consume large amounts of personnel just to deal with logistics? If you read critiques of major fires, they clearly demonstrate the Maelstrom effect. No matter what resources you had as part of your first alarm assignment, the need to increase staffing on the fire ground to handle logistics will accelerate as more resources are requested. This requires that when large fires occur, the utilization and consumption of resources from the remainder of the community are a factor. What this means is that some of these events consume more staffing in support than they do in actual fire ground operations.

When a fire uses up to five or six alarms, the Maelstrom effect is underway. You are pulling resources from the remainder of your community, and sometimes neighboring

---

[1] Poe, Edgar Allan, Descent into the Maelstrom, Short Story

communities, to deal with one specific risk. If you have indentified such a target hazard in your community, there is a radius around that risk that will be drawn down quickly unless alternatives are provided within the building. When you start pulling resources from close proximity to the risk, you have to start reaching out into other portions of the community to populate the multiple alarm event. During the timeframe of an event where resources are being consumed, the remainder of the community is giving up some of its baseline level of protection to meet the needs of just that one risk.

The contemporary theory on planning for fire protection is based on the concept of risk management. If you have a definable risk, then you should be using technology to reduce that risk to a manageable level. Risk reduction is at the foundation of effective and efficient fire protection. This discussion is very relevant to any building that consumes large amounts of resources when a fire occurs. Because when they do suffer an event, they are creating a whirlpool in the system.

This places a huge amount of importance on increasing resources in a building when it is *under construction*. It is for this reason that fire codes have become more and more aggressive in trying to reduce the risk. That is why we put in sprinkler systems, compartmentalization, fire alarms and other technology before the building is occupied. This allows the building to contribute to its own protection and does not reduce the level of service to the remainder of the community.

Therefore, one of the more important considerations in risk management is that if a building creates a problem, it should try to help solve it.

There are two things that a firefighter must take into a building if he or she intends to combat any fire. The first is water. The second is breathable air. We have solved the water problem with standpipes and sprinklers. We have not universally solved the air problem yet.

One solution that should be considered for occupancies that are likely to create large air demands is called “The Firefighter Air Replenishment System” or FARS. FARS technology is currently located as Appendix L of the 2015 ICC International Fire Code. Operations personnel should review this technology to see what it can do to reduce the impact of the need for massive numbers of air bottles during events. Fire code personnel should view the Appendix as part of the tool kit for overall risk management.

FARS is to air what standpipes are to water. If it is built into the structure, it is part of the risk management for that building.

FARS is no different than any other form of built-in fire protection. It is a technology that improves the effectiveness and efficiency, not to mention the health and safety, of responding fire forces. It doesn’t minimize the need for fire suppression resources but significantly impacts the amount of staffing that will be needed to be put into air replacement during a serious fire event.

Summary

The first line of defense for any community is the code enforcement process. Given all that we know about fire and fire behavior, it makes sense that we should use technology to minimize the impact on the community from extraordinary risks. The time to do that is during the code enforcement process. The tool kit for managing complex structures will not be complete without it.

For a list of resource materials on FARS, please visit: rescueair.com/education-and-training

Ronny J. Coleman is a 50-year veteran of the fire service. He is the Past President of the International Association of Fire Chiefs and the Fire & Emergency Television Network, which features career development and succession planning in its Command Transfer series. He served as the Fire Chief in Fullerton and San Clemente, CA, and was the Fire Marshal of the State of California from 1992 to 1999. He is a certified fire chief and a master instructor in the California Fire Service Training and Education System. A Companion Fellow of the Institution of Fire Engineers, he has an associate's degree in fire science, a bachelor's degree in political science and a master's degree in vocational education. In 2014, Chief Coleman received the Tom Brennan Lifetime Achievement award from Fire Engineering. In 2015 he was awarded the International Public Safety Leadership & Ethics Institute Honors Award.