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By Tim Knisely

May 2014

False or Unwanted Alarms – Part 2:

Smoke Detectors and Sequence of Operation

We all have heard the old adage that "more is better." That may be true in some products or services that relate to safety, but this is not always the case for fire protection systems.

Building codes are a minimum standard so it is often times refreshing to see a designer exceed these minimums, or try to get a grade better than a "C". This is also where it can create a dilemma for the AHJ. My colleagues and I often debate if it is the plans examiners duty to inform a design professional that their proposed design exceeds the code. More times than not, the examiner is noting deficiencies in the plan and where it needs to be improved. Typically, the examiner will not offer advice about this enhancement because it is meets the minimum code and standard, plus the owner may have requested this change.

However, this can create problems in the fire protection arena. All codes and standards include the "shall" and "should" considerations in just about every application. In many fire protection systems the standards are pretty clear in where, or where not to install a particular product. The standards even have rules on not placing products too close together, such as sprinklers. Often times there aren't enough "shalls" to prevent some of the excess that we see in other systems, such as fire alarms with smoke detectors in particular. Let's take a look at how more can be worse.

Smoke Detectors:

The first indication that there are too many or improperly installed smoke detectors is when the fire department responds to a property frequently for unnecessary or unwanted alarms. It's too bad that we couldn't have caught these installations at the design stage or the approval stage to prevent this. But, not all fire protection systems go through an approval process depending on where you are located in the country. It you find yourself in this situation it can be challenging to correct.

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Smoke detectors are the most common culprit because these are often the device of choice in detecting a fire and protecting a building. Smoke detectors may be found in the most unusual places, such as the commercial kitchen where smoke and steam are prevalent. Inside the janitor's closet where we may also find steam you are likely to find a smoke detector. Other areas with steam or damp locations include the areas immediately outside the bathrooms and in dish rooms, laundry rooms, furnace rooms and attics.

The smoke detector installed in the restaurant dish room that generated numerous unwanted alarms.

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If you need to provide alternative detection here a heat detector is probably your best option. If the building is protected with sprinklers, the sprinkler can be considered the heat detector in most codes and standards if the sprinkler causes the alarm to sound upon activation.

A smoke detector was installed in this kitchen. At the final inspection it was replaced to prevent unwanted alarms.

Sequencing of Alarms:

While not related to the proper installation of the devices alarms we really need to look at the sequencing of alarm signals, and what happens in a building when an alarm sounds.

In some buildings it may be wise for all of the occupants to be alerted to a fire alarm signal immediately, but not always. This is especially true in a residential building (apartment or a residence hall) where microwave cooking is present. In some settings, the dwelling rooms or sleeping rooms are protected with 110-volt or battery operated smoke alarms. If these alarms sound from smoke or steam, it only sounds within these areas. The building alarm will not sound until the smoke reaches the common area / corridor smoke detector that is part of the fire alarm system. In newer or more modern installations the dwelling/sleeping unit smoke detection can be provided by a smoke detector with a sounder base or horn that is part of the building alarm system. This is a great option to consider in new or renovated buildings, but be careful. When the detectors in the

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dwelling/sleeping unit sound the alarm processes or sequence of operation does not need to be different than110-voltbsystem. Instead, we're finding that these alarms are programmed to sound the entire building upon activation of one smoke detector in a living space, as well as notify the fire department. So, if someone burns popcorn in the microwave within their kitchen or room (kitchenette) the smoke detector/sounder base in this room sounds and so does the notification appliances for the entire building. Maybe all four, six or eight floors are now in alarm alerting every occupant in the building because someone burnt popcorn and the fire department is on the way.

This doesn't need to occur – the best arrangement in these situations is for the detector and sounder base to activate and alert the occupants of the dwelling. The fire alarm system can notify the supervising station or campus security of the alarm activation and the appropriate staff is notified to respond.

Depending on the jurisdiction this may be the fire department or it may be the on-call maintenance staff. However, if additional or different devices activate then the building alarm must be activated and the fire department needs to be notified.

Special Considerations:

Fire alarm systems, combined with sprinklers and fire rated features in the building help to provide early warning of a fire, prevent the fire from spreading and help to contain the smoke and heat. These systems work well together as long as they are properly designed, installed and maintained. The building staff and tenants need to be educated about the systems, what they do, how they work and what they sound like.

Another consideration is for your choice of fire protection contractor. Fire protection systems are specialized systems and the installers need specialized training. Sprinkler systems are not plumbing systems and fire alarm systems are not electrical systems. If you specify fire protection systems for your campus, or if you approve these installations in your

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community make sure you make the extra effort to make sure that the installation contractor is qualified to do this work in accordance with the code or standard.

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