Where's the Fire?

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Fire safety on construction sites is at a crossroads. It's time for an approach based on collaboration, education, and training - and powered by wireless digital solutions.

In my two decades as a certified fire investigator, I have seen firsthand how fire can cause devastation to livelihoods and site assets, costing millions of dollars in damage and causing significant hits to project timelines and brand reputations. I also understand the full lifecycle of a fire emergency, from code and standard development to education, inspection, enforcement, emergency response, investigation, and failure analysis.

My experience has taught me that in today's modern environment, there is no standard method of detecting a fire emergency on construction sites.

Many sites are in fact under prepared when it comes to fire prevention, fire-alarm initiation, or detection devices and procedures, as well as alerting fire departments to help save lives and site assets.

Contractors are under a great deal of pressure to deliver on time and under budget; as a result, corners are cut, and it is hard to overcome the standard thought process of "it won't happen to me." As a result, I believe we are at major crossroads in our fire-prevention efforts, with new collaborative and digital-led solutions needed. In my view, this involves a three-prong approach: enforcement, education, and partnership.

AN EVER-PRESENT DANGER

In May 2023, two construction workers died in a five-alarm fire

on a construction site in Charlotte, North Carolina. The incident only reinforced the view that fire is still a very real and present problem for the construction industry, even in today's modern age. According to the National Fire Protection Association, from 2017 to 2021, local fire departments in North America responded to an average of 4,440 fires in structures under construction every year.

Fire can escalate quickly if it's not mitigated promptly - and plans and preparation for an organized evacuation of a site are still a real problem for most contractors. There is an underlying feeling that construction workers are used to working in an unstable and dynamic environment that has a higher level of danger associated than the average office job. As a result, they're more inclined to investigate the source of the initial problem and then attempt to mitigate it themselves using portable fire extinguishers or alternative methods.

This only adds to delays, as it takes time for individuals to notice smoke or other early signs of a fire emergency and determine it as a problem and not simply hot work, for example, or a piece of heavy equipment starting up.

A COLLABORATIVE APPROACH

To overcome this, we must first put our faith in education and training. This applies not only to contractors but also to code inspectors, standards departments, and fire departments or fire-marshal offices. Each party must be educated in the latest regulations, codes, standards, and best practices to implement an efficient fire-prevention management plan. From a collaborative point of view, each group brings different resources and an ability to help solve this problem.

One of the major parts of this is codes and standards. For more than 125 years, NFPA has been at the forefront of this with NFPA 241: Standard for Safeguarding Construction, Alteration and Demolition Operations. This gives the AHJ - the authority having jurisdiction - the ability to produce a compliant, documented fire-safety plan for a construction project.

While the process is robust, it does have its shortcomings. Even the most recently developed codes and standards are years behind the actual date on which they were published. This has a knock-on effect, with local jurisdictions being even further behind their code cycle.

For example, the most recent NFPA 241 edition is 2022, but that's based on work that was started several years prior. Many jurisdictions might be one or two cycles behind, but if an AHJ is two cycles behind on what they're utilizing, that means a constructed building might be drawn up and approved with a code that precedes it by several years, which can lead to significant gaps in modern fire-safety knowledge.

Furthermore, there's no modern mandate for construction sites to implement wireless-led technologies to safeguard sites in construction - something I believe is imperative if the industry is to truly embrace all the possibilities that come with modern safety efforts.

GOING WIRELESS

A full-wired fire-, medical-, and emergency-alert system onsite during the construction phase is not a possibility; its temporary nature means it would have limited power access and supply.

In North America and in many countries around the world, we are short-sighted when it comes to this phase of projects.

However, wireless systems are primed to address the current problem. Many of these technologies are portable and come with long battery lifespans. As temporary systems, they can also be reused and redeployed from one jobsite to the next, which is particularly advantageous for contractors with multiple projects in one area or large sites.

As an industry, it has become normalized that projects have designated building methods and materials, a required number of protected exits, a fully monitored fire-alarm system and sprinkler system, and other safety measures, all prior to receiving a certificate of occupancy. However, during the construction phase, the very same project has far fewer requirements - and, in actual practice, minimal controls in place.

While technology offers new possibilities, it is an attitude shift that is needed. A wireless fire-alert system eliminates many of the problems and dangers on jobsites when it comes to speed responsiveness and human error. The system acts as a 24/7 smoke- and heat-detection system, with mobile-alert integration for fire-program managers. Where manual methods are not enough, we must put our faith in technology, and we must treat the construction phase of a project with the same level of fire-safety importance as the finished product.

FUTUREPROOFING FIRE SAFETY

The major issue for the construction industry is the perceived notion that for something to be done correctly and safely, it can't be cost- or time-effective. But this simply isn't the case anymore. It's time for all stakeholders involved in fire safety during the construction process to collaborate, educate, and train on best practices and possibilities afforded by wireless safety technology.

Contractors may need to spend a little more to improve their fire-prevention efforts, but that's nothing compared to the scale of these projects, which can be measured in years and tens of millions of dollars, alongside the huge costs associated with fire loss onsite - beginning with the human ones. That is something for which no value can be assigned.

About the Author

John Heinen is the principal fire investigator at Compass Fire Investigations and Consulting. John has over 20 years of direct related experience and a B.S. in Fire Science along with a M.S. in Occupational Health and Safety. His extensive career experience includes fire investigation, fire safety, fire code consulting, other aspects of general safety, and OSHA compliance.

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