

Sounding The Alarm

In the engineering community, one small miscalculation or overlooked detail could prove to be disastrous. That's particularly true of fire and life safety systems, which sit dormant and unnoticed but must perform flawlessly once triggered by a fire event. The sheer number of fire protection systems, and the need for them to work in concert, is why building owners should care about commissioning and integrated testing—practices that ensure that technical experts are involved in all phases. The commissioning process is becoming more common in commercial construction, and in many jurisdictions, now required. But in all cases, it's just smart.



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One of the biggest factors that is driving jurisdictional requirements for commissioning and integrated testing is the International Energy Conservation Code. Beginning with its 2015 edition, building commissioning requirements were expanded to include almost all commercial structures. While fire protection and life safety systems are generally not directly governed by IECC the requirement to test all system-to-system interfaces with systems governed by IECC means that in most commercial buildings, integrated testing during commissioning will include fire and life safety systems.

Commissioning, for those who are unclear on details, is a complete process that guides the design, installation and testing of building systems and components. Integrated testing assesses whether they interface properly. A test of a fire alarm system as a stand-alone system, by comparison, is an example of acceptance testing.

So why is traditional acceptance testing not enough? If all individual systems successfully pass acceptance testing, then they should be fine, correct?

Not necessarily. Any built environment in today's world will contain myriad complex fire and life safety features. These include the things you see, such as fire alarm systems, fire sprinklers, other fire suppression systems and exit signs. But they also include things you don't see, such as smoke evacuation systems, stairwell pressurization systems, fire doors and fire walls.

Holistic System

These systems frequently interface with other building systems to perform essential life safety tasks such as recalling elevators during a fire or shutting down air handlers that are contaminated with smoke. Acceptance testing only confirms that individual systems send the right signals to other building systems, but integrated testing as part of the commissioning process ensures that these signals actually trigger the intended system output in these interconnected systems to function holistically.

In 2012, the National Fire Protection Association published NFPA 3, Recommended Practice for Commissioning and Integrated Testing of Fire Protection and Life Safety Systems—the first nation-

ally recognized document outlining an approach to those processes. In the 2018 version of NFPA 3, commissioning and integrated testing was elevated to a standard from just being a recommended practice.

Under NFPA 3, the bulk of commissioning services are performed during the construction stage by a Fire Protection and Life Safety Systems Commissioning Team, which is led by a Fire Commissioning Agent (FCxA). For new construction projects, the commissioning process includes what to do in planning, design, construction and occupancy.

NFPA 4 now provides guidelines for integrated testing of new systems and existing systems. At a minimum, there is an Integrated Testing Agent and the necessary testing personnel for each integrated system. The team may also include contractors, installers, insurance representatives, and representatives of the Authority Having Jurisdiction. When integrated fire protection systems are included, the FCxA must further define the overall performance objectives.

To ensure that the result is a robust fire and life safety envelope, it is critical to consult with professionals who understand fire and life safety systems before equipment is purchased or planned, and also throughout the entire design and installation process. Commissioning and integrated systems testing are essential, value-adding strategies that aid in mitigating risk. ■

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