



CAMPUS FIRE SAFETY CODE TALK

Campus Fire Safety e-NewZone

Integrated System Testing – It's Not Already Done?

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Many people assume that when they enter a building, all the fire protection and life safety systems installed in a facility have been tested. Individually, this is true. Every fire protection and life safety system that is installed in a building is required to pass an acceptance test in order for the owner to receive a certificate of occupancy. Acceptance tests verifies a system's components for an individual system was installed and is operational in conformance with the applicable standards and the Authority Having Jurisdiction (AHJ). Most fire protection and life safety systems in today's world are integrated with each other and designed to work together. The common misconception is that these integrated systems have been tested to confirm they will function with one another in the event of a fire. Until 2015, no single NFPA code or standard mandated integrated fire protection and life safety system testing.

NFPA codes and standards have been around for over one hundred years. When fire protection systems were first installed, they were designed to function independently. Early fire sprinkler systems used water flow bells (i.e. water gongs) to create an audible alarm signal. However, as buildings became more complex and technology advanced, a platform was created for these systems to be able to integrate with one another. What did not evolve however, was the language in a code or standard to require these interconnections to be tested.

For example, think of a student center that contains a fire alarm system, fire sprinkler system, and a central station monitoring of the fire alarm system. In a sprinkler system with a fire alarm panel, a water flow device initiates a signal through the fire alarm panel to then activate the notification appliances. An acceptance test



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in NFPA 13, *Standard for the Installation of Sprinkler Systems*, addresses the activation of the water flow device and tests if a signal is sent to the relay of the fire alarm control panel for the system. An acceptance test for NFPA 72, *National Fire Alarm and Signaling Code*, confirms that when the signal is received by the relay, the notification appliances functions are initiated according to the fire alarm signaling system. These acceptance tests confirm that each system functions individually according to applicable standard, however the acceptance tests do not verify that the systems function together and do not confirm they are properly integrated. An integrated system test would initiate the sprinkler water flow via the test connection to verify the receipt of the sprinkler waterflow alarm at the alarm control unit, confirm the activation of the fire alarm system notification appliances in the building, and verify the supervising station notified the alarm. This test scenario confirms properly installed system integration between the three systems.

Although this concept of conducting integrated system testing might have been applied intermittently in the past by informed facility managers, there was no single code or standard that required integrated system testing to be completed. The Technical Committee on Commissioning and Integrated Testing closed this gap by developing NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing*, first published in 2015.

NFPA 4 provides a testing protocol that will verify that integrated fire protection and life safety systems perform as intended. The standard does not provide specific test scenarios that are required for a particular building or system, rather it provides the minimum requirements that should be analyzed for testing of integrated fire protection and life safety systems. NFPA 4 helps the user document the process and determine who should be on the integrated testing team, recognize the team member responsibilities, identify the criteria to develop test scenarios, conduct the tests, and



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establish testing frequencies. Having the information on the integration of the fire protection and life safety systems in your building and how they function is the best instrument to have in your toolbox.



The Center for Campus Fire Safety



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