

White paper:

# 10 Things to Know About Emergency Voice/Alarm Communication in K-12 Schools



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## Introduction

The International Building Code (IBC) and National Fire Protection Association (NFPA) have recently redefined their requirements to reflect evolving life safety needs in buildings across the United States. The IBC is updated every three years whereas new NFPA standards can vary every three to five years.

As we've seen before, these wide-ranging changes can seem overwhelming in the broad sense, but when narrowed down to specific industries, these updates are much more digestible. This white paper will touch on some of the latest IBC and NFPA updates as they relate to emergency voice/alarm communication systems in Group E occupancy, otherwise known as K-12 schools.

### Horn-strobes may not be enough

Historically, horn-based strobe fire alerts were sufficient practice in school settings of over 50 occupants, but these somewhat one-dimensional solutions have their communication limitations.

Where a horn-strobe alarm may not always work the most efficiently in K-12 emergency procedures. What about other emergencies that aren't fire-related? What if there was an intruder or a hurricane, for example?

In these scenarios, schools would also want to communicate shelter, evacuation or lockdown instructions in real time, leading to the need for more thorough and prescriptive communication.

Audio communication allows a principal, for example, to go to the school's fire alarm control unit, grab a microphone, flip a switch, and let everyone know what to do. And schools with a theater or gymnasium (known as "assembly occupancy") have been required for decades to have fire alarm systems that can be voiced. But today, those standards only apply to schools with 100 or more occupants.

NFPA 101, 2024 edition states the following:

*The occupant notification required by 14.3.4.3.1.1 shall utilize an emergency voice/ alarm communication system in accordance with 9.6.3 where the building has an occupant load of more than 100.*

The IBC code (907.2.3 Group E) is similar:

*A manual fire alarm system that initiates the occupant notification signal utilizing an emergency voice/ alarm communication system meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall be installed in Group E occupancies. Where automatic sprinkler systems or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.*

(The only IBC exception is given to those schools with less than 100 occupants.)

## What is considered an emergency voice/alarm communication system?

In the simplest terms, these appliances need to serve the primary purpose of quickly alerting occupants of potential threats or emergencies with approved information and directions for evacuation. In that straightforward definition (from the US Department of Defense), an emergency voice/alarm communication system or voice evacuation system comprises a microphone and annunciator placed in an area approved by the local AHJ.

## 5 benefits of a voice fire alarm system

### 1. Pre-recorded messages

Compared to traditional horn systems, emergency voice/alarm communication systems offer pre-recorded messages that direct occupants in different emergencies. These messages can be tailored to reflect a K-12 school's life safety procedures, adding more specific instructions related to building layouts and exits.

### 2. Public address capabilities

As a school's public address system, emergency voice/alarm communication systems can be used for morning announcements, paging, weather reports and even background music. These alternative uses are all allowed under the Life Safety Code, NFPA 101 (and even encouraged):

In accordance with 9.6.3.11.2 the emergency voice/alarm communication system shall be permitted to be used for other emergency signaling or for class changes.

### 3. Inclusive communication

To reach more students with various abilities and special needs, today's emergency voice/alarm communication systems offer bi-lingual capabilities and even Restricted Audible Mode Operation. Also known as RAMO, this method delivers lower audible levels and was designed for early-education areas and occupants on the autism spectrum who might be sensitive to loud noises.

### 4. Audio system simplification

With building-wide audio capabilities, an emergency voice/alarm communication system can offset the need for schools to have separate paging systems, saving costs. Technology enhancements and improved engineering have also led to many systems being more accessible – and even more affordable.

### 5. CO detection distinction

K-12 schools with fuel-burning appliances, such as a water heater or boiler, must have carbon monoxide detectors. Those alerts are distinctive from fire alarm alerts. Whereas fire alarms provide a temporal three pattern, carbon monoxide alarms beep four times. But in an emergency, things can get chaotic and confusing fast. An emergency voice/alarm communication system can explicitly state what the emergency is and even where it is taking place instead of trying to guess the number of emergency beeps.

## 5 more things to consider

### 1. Multiple microphone locations

In small schools with a compact layout, a single microphone may be sufficient but in larger schools, it may be beneficial to have multiple microphone locations. A microphone in the main or principal's office combined with one on the other side of campus helps ensure a timely response to emergencies. A school or specifier should consider asking their local fire department or AHJ for recommendations if they are unsure.

### 2. Customizable messaging

Because no two schools are the same, built-in emergency messaging with emergency voice/alarm communication systems may not completely address the building's safety needs. Schools should review any pre-loaded emergency response messaging and determine if more strategic messaging is needed to reflect the building's layout and student needs.

### 3. Cost considerations

The implication that the added feature of audio capabilities immediately prices itself out of school budgets isn't necessarily true anymore. System costs have decreased from what they were just ten years ago, making this technology accessible to more and more schools. It should also be noted that the multiple features of a single emergency voice/alarm communication system often negate the need for separate sounders or fire safety peripherals, saving on equipment, materials and labor.

Furthermore, schools can sometimes take advantage of various state and federal grant initiatives available by investing in fire safety and prevention as part of their comprehensive school safety strategies. These grants are intended not just for the safety of school occupants but also for the safety of the public and first responders.

### 4. Future updates

While immediate compliance isn't required, any schools updating their emergency systems to current safety standards should take note of NFPA's 101, Chapter 15 "Existing Educational Occupancies." Section 15.3.4.3.1.2 reads:

When an existing fire alarm control unit or system in a building is replaced, the occupant notification required by 15.3.4.3.1.1 shall use an emergency voice/alarm communication system in accordance with 9.6.3 where the building has an occupant load of more than 100.



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### 5. Proven technology

The Johnson Controls complete, integrated solution provides clear fire and non-alarm audio communication in small to mid-size buildings and can support up to 250 points. Constructed for reliability in any situation, the 4017ES is well-suited for K-12 schools looking to improve their life safety, featuring:

- Flexible audio options for multiple needs
- Targeted messaging for enhanced response times
- A compact design to save wall space
- Pre-assembly for fast commissioning
- Easy integration with existing infrastructure
- Compliance with various building and life safety codes





## Conclusion

Once considered a luxury, emergency voice/alarm communication systems are proving to be vitally important for K-12 schools to stay up to code and to enhance their overall emergency safety protocols. Safety institutions like the NFPA and IBC can be expected to continue to update their standards to help prevent injuries and improve response to emergencies, and the fire and life safety experts at Johnson Controls will be here to guide you every step of the way. Remember, always consult your local fire responders and Authority Having Jurisdiction, local first responders, your life safety committee, or other life safety professionals for guidance specific to your situation.

**For more information or to learn more about the 4017ES, contact your Johnson Controls representative today.**

*This document is not intended, and shall not be construed as legal advice. Please consult your legal counsel if you have questions about local fire codes and related laws and regulations.*

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