Emergency Communication Systems Provide Safer Structures, Save Lives

Jeff Van Keuren, Engineering Leader, Compliance Detection & Alarm, Edwards—A UTC Fire & Security Company

The 2010 edition of NFPA 72 *National Fire Alarm and Signaling Code* received a name change with the addition of the words "and Signaling" to its title. The scope of the code covers the application, installation, location, performance, inspection, testing, and maintenance of fire alarm systems, supervising station alarm systems, public emergency alarm reporting systems, fire warning equipment and emergency communications systems (ECS), and their components[1]. The ECS is new to the code in this edition.

What is so special about ECS and why is it important in the evolution of the life safety systems of a building?

The scope of the 2002 edition of NFPA 72 involved the performance and maintenance of only the fire alarm system. The closest representation of an ECS was an emergency voice/alarm communications system. During a fire emergency, its function was to provide a dedicated fire communication system for the partial or complete evacuation of occupants from large structures, such as high rise buildings, in a safe and orderly manner.

Out of Harm's Way

Today, the code takes into account additional life-threatening events that are considered equivalent to, or more important than, a fire emergency. These events include:

- human-caused events (accidental and intentional) that threaten security
- dangerous situations, such as carbon monoxide poisoning
- accidents, such as toxic spills and radiation leaks
- natural disasters, such as tornados and tsunamis

When identifying the different types of events, consideration must be given to getting occupants out of harm's way. This is all part of an emergency response plan created by analyzing different risks associated with the occupancy. In case of a fire, the goal is to get the occupants out of the building or to an area of refuge, but in the event of a tornado, the occupants should be relocated to an area of the building out of the way of flying debris or structural weakness.

Most emergency response plans should contain when and how to use an ECS. This system is classified into two types—one-way and two-way.

In an emergency, one-way ECSs are intended to broadcast information to people in one or more specified indoor or outdoor areas. According to NFPA 72, emergency messages can be conveyed either by audible, visible, and textual means or any combination thereof.

Two-way ECSs are divided into systems that are anticipated to be used by building occupants, and systems intended to be used by firefighters, police, and other emergency services personnel. They are used to exchange and communicate information, such as instructions, acknowledgement of receipt of messages, condition of local environment, condition of persons, and to provide assurance that help is on the way.

In-Building Fire Emergency Voice/Alarm Communications System, courtesy of UTC Climate, Controls & Security

[1] NFPA 72 *National Fire Alarm and Signaling Code*, National Fire Protection Association, Revised 2010

Example HPSA units, courtesy of UTC Climate, Controls & Security

One Way to Safety

Focusing on one-way communications systems, NFPA 72-2010 subdivides this type of ECS into four categories:

- A distributed recipient mass notification system communicates directly to targeted individuals and groups that might not be in a contiguous area. An example of this is mass text messaging.
- An in-building fire emergency voice/alarm communications system consists of dedicated manual or automatic equipment for originating and distributing voice instructions to the occupants of a building, as well as alert and evacuation signals pertaining to a fire emergency. By adding "in-building" to the definition, it can be used for other emergency conditions.
- An in-building mass notification system is used to provide information and instructions to people in a building or other space using intelligible voice communications and visible signals, text, graphics, tactile, or other communication methods. Examples of these are commercial sound systems, messaging displays, and flat-screen text displays.
- Wide-area mass notification systems are generally installed to provide real-time information to outdoor areas and could have the capability to communicate with other notification systems provided for a campus, military base, municipality, or similar single or multiple contiguous areas. Examples of these are high power speaker arrays that are capable of transmitting sound over one mile.

Technology-Based Flexibility

In buildings, flexibility is the key component of an ECS. The purpose of a one-way system is to inform the occupants of the potential danger and provide instructions on what to do, where to go, and when to re-enter the building.

ECSs are a very significant change in how we think about a building's life safety systems. Proper communications between emergency responders and occupants is a must, so improving communication via new technologies will provide safer structures and save lives.

Mr. Van Keuren has been involved in the fire alarm and signaling business for 27 years. He is responsible for the global product compliance strategies at UTC Climate, Controls & Security's Detection & Alarm business segment.

› Surge Protective Devices—Protecting Systems that Protect

Technology has given us many products that make modern life more convenient, productive, and safe.

Smoke detectors, carbon monoxide detectors, and arc-fault circuit interrupters keep us safer at home. Transportation and air traffic control systems keep planes, trains, and automobiles traveling safely. Numerous other electronic systems enhance our safety on a daily basis.

But what is protecting the systems that protect us?

The Insurance Institute for Business and Home Safety estimates that power surges cost businesses $26 billion annually in lost time and equipment repairs and replacements. When surges affect systems that are designed to enhance safety, more than money and equipment repairs are at stake. The failure of safety systems puts people at risk.

Surge protective devices (SPDs) keep surges at an acceptable level that can be withstood by microprocessor- and electronic-based equipment. SPDs help prevent damage, degradation, and disruption to electrical and electronic systems.

Not only do SPDs help extend the life of equipment and protect investments, they also protect systems that enhance personal safety.

John Miller, Industry Manager | *john.miller@nema.org*