

Commercial BUILDING PRODUCTS

SERVING ARCHITECTS, CONTRACTORS, AND OWNERS IN COMMERCIAL CONSTRUCTION

**MASS Notification
and the Latest Codes
by Cooper Notification**

Decoding Mass Notification Codes

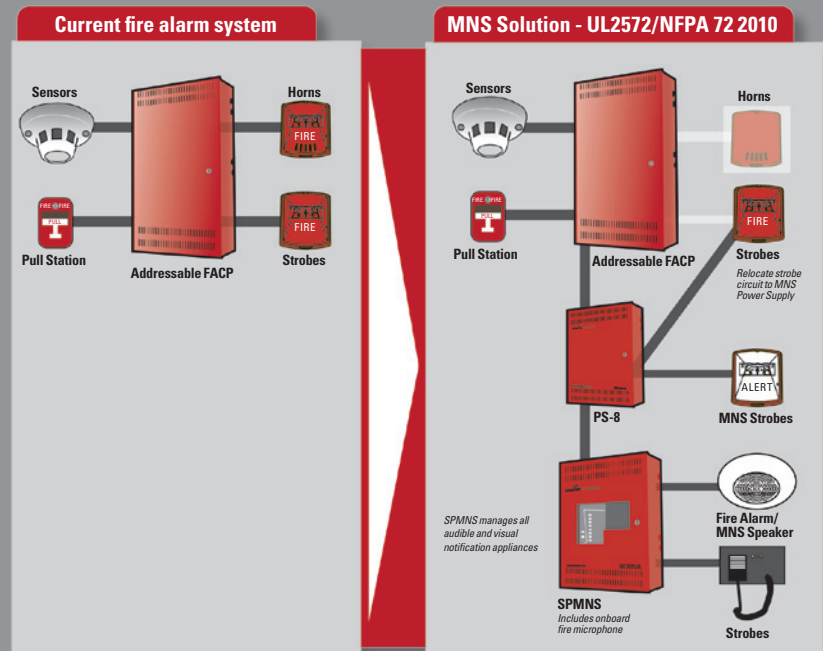
Fire codes apply to more than fire situations. A new chapter takes up mass notification systems for the private sector.

**Ted Milburn,
Cooper Notification**



Mass notification systems need intelligible voice commands to guide building occupants to a safe exit.

MNS Retrofit



Building owners can leverage existing infrastructure, systems, and equipment with minimal upgrades and modifications. Illustration: Cooper Notification

Today's facility managers are not only concerned with protecting their facilities, personnel, and community from sophisticated and complex threats, but also understanding and complying with the industry's latest codes and requirements. A new chapter on mass notification systems is included in the 2010 edition of the National Fire Protection Association's (NFPA), Quincy, MA, 72 *National Fire Alarm and Signaling Code*.

The Dept. of Defense (DOD), Washington, defines mass notification as a means to "provide real-time information and instructions to people in a building, area, site, or installation using intelligible voice communications, along with visible signals, text, and graphics, and possibly including tactile or other communication methods." (See box on last page for a history of mass notification systems.) The DOD further states that mass notification systems (MNS) "protect life by indicating the existence of an emergency situation and instructing people of the necessary and appropriate response and action."

In the 2010 code edition, Annex E became "Chapter 24 Emergency Communications Systems," the first mass notification code for the private sector. Underwriters Laboratories has also moved toward establishing a new standard for mass notification—UL 2572. It will measure how a MNS performs against the NFPA emergency communication systems' (ECS) codes.

Implementing MNS, step by step

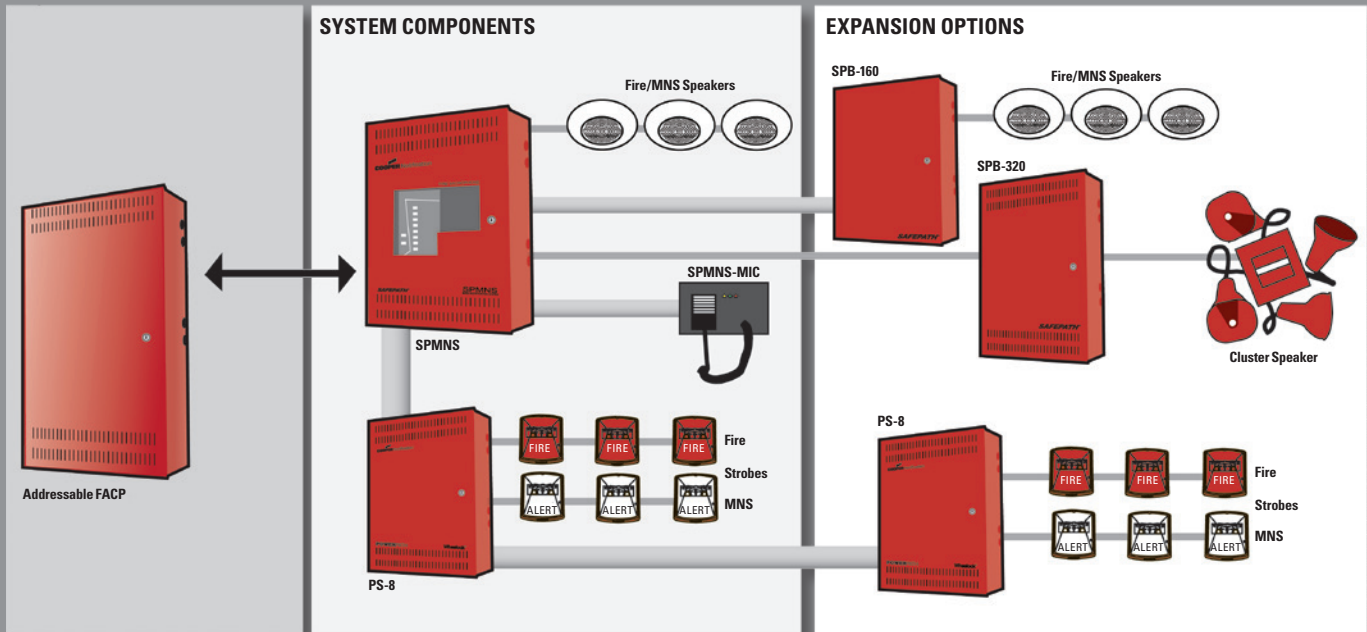
While building owners may be overwhelmed by the new codes, they should understand that they can leverage their existing life-safety systems with minimal upgrades and modifications. Ensuring success doesn't have to be a difficult endeavor and can be accomplished by starting with these steps:

1. Begin with a vulnerability and risk assessment.
2. Develop a master plan that integrates protection systems, mass notification systems, and emergency-action plans.
3. Implement changes on a phased basis.
4. Leverage existing systems and equipment.

Completing a vulnerability and risk assessment provides building owners a scope of their current situation and allows them to develop a master plan to address the needs of the facility. It is highly recommended that these master plans integrate protection systems, MNS, and emergency-action plans.

Chapter 24 of NFPA 72 2010 is a complete set of requirements for indoor and outdoor emergency-communications systems that consists of two classifications of systems: one-way and two-way. One-way communication systems include in-building fire-emergency voice/alarm communications systems, in-building MNS, wide-area MNS, and distributed-recipient MNS (text messages, voice calls, emails, pagers, and desktop notification). For two-way communication systems, the code recognizes two types: two-

Fire Alarm/MNS Solution



A mass notification system can manage all audible and visual notifications. Some systems feature a modular design that meets the functional requirements of emergency-response plans. Illustration: Cooper Notification

way telephones and two-way in-building radio communications.

An emergency-communications system (ECS) must be installed where required by the Authority Having Jurisdiction (AHJ) or other applicable governing laws, codes, or standards. Regardless of whether an ECS is required by the AHJ or voluntary, installing a code-compliant system ensures the facility owner that the communications system has achieved a level of performance tested to the rigorous standards of the latest codes.

In-building MNS

In-building mass-notification systems are installed in buildings or structures for the purpose of notifying and instructing occupants of an emergency. An in-building MNS provides information and instructions using intelligible voice communications and visible signals, text, graphics, tactile, or other communications methods.

Combining or integrating in-building fire-emergency voice/alarm communications systems with other communication systems such as mass notification, public address, and paging, is now allowed and encouraged by code. Using one system that meets code is financially beneficial to the owner since it reduces design, installation, and on-going life-cycle costs. Fire-alarm or priority mass-notification messages (as determined by a risk analysis) must take precedence over any other announcement, such as paging or public address.

In-building MNS components include:

- primary control unit for the MNS, which monitors and controls notification appliances
- dedicated microphone for live emergency-communication messages that can be distinguished from a fire microphone
- notification appliance circuit
- interface to a fire alarm system
- audible and visual notification devices.

The emergency response plan

Creating an emergency-response plan requires a detailed risk analysis. When designing a mass-notification system, consider the anticipated risks of each facility, probability and frequency of occurrence, and projected loss. How a facility disseminates information and specific “take-action” instructions needed for different types of emergencies is an important element of risk mitigation.

A facility’s emergency-response plan (ERP) should be developed based on the risk analysis and in accordance with NFPA 1600, *Standard on Disaster/Emergency Management and Business Continuity Programs*, and NFPA 1620, *Recommended Practice for Pre-Incident Planning*. Plan elements include:

- team structure
- procedures for building system, human, terrorism, and weather emergencies
- equipment and operation
- notification (message content, approval, and initiation processes)

- training and drills.

An MNS provides live voice and pre-recorded localized messaging within a protected individual building, areas surrounding the building, and other outdoor designated areas. The notification zones are based on the risk analysis. Each separate building should be provided with a separate in-building MNS, which must be designed with intelligible voice in accordance with NFPA 72–2010 Chapter 18, “Notification Appliances.”

An effective in-building MNS manages all audio and visual notification appliances and reports trouble and supervisory signals through the fire-alarm system. Determined by the ERP, the MNS control unit can override the fire alarm with live voice from a microphone or manual activation of a high-priority message. After the in-building mass-notification system relinquishes control, the fire-alarm system will automatically restore to normal operation (without an active fire-alarm signal) or operate based on the emergency-response plan with an active fire-alarm signal.

The priority level of recorded messages is determined by the emergency-response plan and based on an evaluation of:

- occupancy impact on individual security
- danger to life
- danger to community
- danger and impact on the nation.

Only recorded messages determined by the ERP to be of higher priority than fire-

The Evolution Of Mass Notification

In 1996, terrorists attacked Khobar Towers, a U.S. Air Force housing complex in Dhahran, Saudi Arabia, killing 19 U.S. servicemen and wounding hundreds of others. Secretary of Defense William Cohen issued a post-incident report of the attack that concluded there was no effective notification system with which to warn personnel. The principal means for sounding an alarm at Khobar Towers consisted of having personnel go door-to-door throughout the eight-story dormitory, alerting residents of the danger.

This primitive approach prompted the U.S. military to develop force-protection standards. Thus, in 1999, the U.S. Air Force developed the Antiterrorism Force Protection Standards. To add to the standards, in 2002, the Dept. of Defense, Washington, created the Unified Facilities Criteria (UFC) 4-010-01 Minimum Antiterrorism Standards for Buildings, where mass notification was first defined.

Two years later, the Defense Department published UFC 04-021-01 Design and O&M: Mass Notification Systems, which required the installation of intelligible voice notification systems in and around new "inhabited buildings."

In creating the UFC, the Defense Department discovered that most fire-alarm systems were unable to communicate with people in non-fire emergencies such as severe weather. The Air Force petitioned NFPA to develop MNS requirements. As a result, the NFPA added Annex E Mass Notification Systems as recommended guidelines for MNS in the National Fire Alarm Code 2007 edition. This was the first time in the history of the code that a non-fire-alarm system could take precedence over a fire-alarm system. —*Ted Milburn*

alarm activation are permitted to override the fire-alarm notification and initiate the mass notification priority message. Activation of any other recorded message must not interfere with the operation of the fire-alarm system.

Signal priority is:

- discharge (fire suppression)
- MNS
- fire
- local microphone (higher priority than preprogrammed responses).

Using strobes for visible notification

Where there is audible notification, the in-building MNS must also provide visible notification in high-noise areas and to serve the hearing impaired. Typically, visible notification is accomplished using clear strobes for fire alarm and amber strobes for MNS. In addition to the strobes, textual, graphic, or video displays can also be used. Transmission of visible notification and messages must be simultaneous to audible notification and messages.

The wide-area MNS broadcasts real-time intelligible voice messages, tones, and sirens covering large outdoor areas. Wide-area MNS can be used for applications such as campus or facility giant-voice systems, public-warning systems, and military base outdoor-notification systems. System components include the central control station and the high-power speaker array (HPSA). The wide-area MNS must be designed so that each notification zone can be individually controlled by the central control station. Intelligibility is in accordance with the code, and minimum mounting heights are based on the output of the speaker array to prevent hearing damage. The HPSA must have the capability to operate for a minimum of seven days in standby, followed by 60 minutes of operation at full load.

Although distributed-recipient, mass notification systems (DRMNS) cannot be used in place of the required audible and visible alerting systems, DRMNS can be added and integrated with these systems whenever possible for a multi-tiered communications system.

The DRMNS must be able to communicate to hundreds or thousands of individuals through multiple delivery methods, including mass-dialing systems, emails, SMS/text messages, paging, and desktop pop-up notifications. These Web-based communication systems must be installed behind appropriate Internet firewalls to protect the network and be designed with a backup configuration to facilitate distribution of messages.

Code-compliant MNS solutions

It is important for building owners and facility managers to not become inundated with these codes. They need to understand how they can use

solutions that enable them to leverage existing infrastructure, systems, and equipment with minimal upgrades and modifications and still meet codes.

Cooper Notification, Long Branch, NJ, designed the Safepath MNS to integrate with a facility's addressable fire-alarm system for a complete MNS solution that performs fire-alarm and emergency-communications functions. Compliant with UL 2572 and NFPA 72 2010 codes, the system provides personnel and building occupants with intelligible live and pre-recorded voice messages that communicate what to do in response to an emergency. The system manages all audible and visual notification and features a modular and flexible design to meet the functional requirements of emergency-response plans, as well as the complexities of the new codes.

A system-of-systems approach

With a variety of MNS solutions available, security professionals are recognizing the need for a system-of-systems approach to emergency communications. Instead of relying on just one technology to do the job, multiple communication systems ensure that information will successfully reach the affected audience.

The system-of-systems approach to MNS includes sending text messages and emails, distributing automated voice calls, broadcasting alerts over indoor or outdoor mass notification systems, and using display signs, desktop alerts, and social media. However, businesses are realizing that launching alerts from multiple communication systems can greatly increase the time it takes to send and receive messages.

With limited staff and multiple communication systems to employ, businesses need an integrated emergency-notification system with a simplified, single interface to launch all of the different applications. This allows facility managers and emergency-response personnel to focus on the emergency at hand without being slowed down, trying to activate multiple systems.

Today's fire codes apply to more than fire situations and affect a range of departments in an organization. The key is looking for a solution provider that has already decoded the latest mass-notification codes and can help a building owner put an effective building-communications plan in place. ☐

Ted Milburn is vice president of marketing for Cooper Notification, Long Branch, NJ.

The logo for Cooper Notification features a red diagonal bar above the word "COOPER" in a bold, sans-serif font, followed by "Notification" in a smaller, regular font.

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