



Alarm Systems Using Wireless or Other Transmission Technology as a Single Path of Communication

The NYS Division of Code Enforcement Technical Bulletin permits the reference of Annex A.3.3.141 of NFPA 72 - 2010 Edition, pertaining to acceptable fire alarm signal transmission paths. Additionally, the signal transmission paths must utilize an approved method which is listed and tested in accordance with UL 864 for fire alarm signal transmissions.

Purpose

To clarify the requirements where the NFPA 72 - 2007 Edition, Section 8.5.4 currently requires the common DACT, which traditionally utilizes two hard-wired phone lines (POTS lines) for signal transmission; whereas, NFPA 72 - 2010 Edition permits the use of other technology for communication between alarm panels and central station facilities and in some cases allows a single path of communication instead of a dual phone line configuration.

References

NFPA 72 2010 National Fire Alarm and Signaling Code
NFPA 72 2007 National Fire Alarm Code 72 - 6.16.2.7, 72. - 8.6.3.2.1.1,
Fire Code of New York State 2010 Sections 907.15, 903.4.1

Description of Code Reference

IP monitoring doesn't have its own section heading in the 2007 edition of NFPA 72; instead, it is generically addressed in Section 8.6.4, "Other Transmission Technologies." This section stipulates that the AHJ (Authority Having Jurisdiction) must allow IP monitoring when it is in "conformance" with this section: "8.6.4.1 Conformance.

NFPA 72 - 2007 Edition - Section 8.6.4, Other Transmission Technologies, provides guidance as to the requirements with which IP Communicators must comply.

NFPA 72 – 2007 Edition – Section 8.6.4.1 Conformance. Other transmission technologies shall include those transmission technologies that operate on principles different from specific transmission technologies covered by this chapter and shall be permitted to be installed if they conform to the requirements of this subsection and to all other applicable requirements of this Code.

Other transmission technologies shall include those transmission technologies that operate on principles different from specific transmission technologies covered by this chapter and shall be permitted to be installed if they conform to the requirements of this subsection and to all other applicable requirements of this Code." Conformance simply entails mounting, wiring and programming the equipment in strict accordance with the manufacturer's printed instructions packed with the equipment.

NFPA 72 - 2010 Edition - Chapter 26 provides further clarification with respect to this emerging technology and more specifically speaks to the reliability of the transmission methods and power supplies.

Communication Methods

Supervising station systems shall have communication methods that are approved. The 2010 edition of NFPA 72 provides general requirements for transmission methods used by supervising station systems.

In general, all transmission methods shall meet the requirements of Sections 26.6.3.1.1 through 26.6.3.1.13, in addition to these requirements digital alarm communicator (DACT) systems and radio systems shall meet the requirements of 26.6.3.2 and 26.6.3.3 respectively.

Digital Alarm Communicator Transmitters (DACT) shall continue to be installed according to their listing with an approved phone line and approved secondary means of communication in accordance with NFPA 72 - 2007 Edition - Section 8.6.3.2.1.4.

Other Transmission Channels or alternative means proven to meet the exception given for a dedicated derived channel are acceptable.

Besides the common DACT, which traditionally utilizes two hard-wired phone lines for signal transmission, 2010 Edition - NFPA 72 permits the use of other technology for communication between alarm panels and central station facilities and in some cases allows a single path of communication instead of a dual phone line configuration.

Unless prohibited by the enforcing authority, governing laws, codes, or standards, a single transmission path shall be permitted, and the path shall be supervised at an interval of not more than 60 minutes.

A failure of the path shall be annunciated at the supervising station within not more than 60 minutes. The failure to complete a signal transmission shall be annunciated at the protected premises in accordance with 10.12.

NFPA 72 - 2010 Edition - Section 26.6.3.1.5 Single Communications Path.

NFPA 72 - 2010 Edition - Section 26.6.3.2.1.4 Transmission Channels.

(A) A system employing a DACT shall employ one telephone line (number). In addition, one of the following transmission means shall be employed:

- (1) A second telephone line (number)
- (2) A cellular telephone connection
- (3) A one-way radio system
- (4) A one-way private radio alarm system
- (5) A private microwave radio system
- (6) A two-way RF multiplex system
- (7) A transmission means complying with new technologies section**

This policy is not an adoption of the 2010 Edition of NFPA 72 in its entirety, any other use of NFPA 72 - 2010 edition that is an alternative to accepted methods in the 2007 Edition - NFPA 72, other than the monitoring options, shall be subject to an appeal or variance.

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The NFPA does not play the role of certifying specific products for use in NFPA 72-compliant systems. Instead that task has been assigned to Underwriters Laboratories, which conducts tests to confirm that products meet specified performance requirements and that the products include instructions that clearly specify requirements for installation in a manner compliant with NFPA 72.

Like the NFPA, Underwriters Laboratories also updates its requirements from time to time. When a particular UL standard is updated, a date is established for when the new requirements will go into effect. Products manufactured after that date must conform to the requirements of the new version. (Although AHJs have flexibility in determining when and if they want to implement new versions of the NFPA 72 code, manufacturers

do not have the same flexibility in meeting UL requirements. After a certain date, all products manufactured must meet the requirements for the latest version of the standard).

The ANSI/UL 864 standard covers control units and accessories for fire alarm systems. ANSI/UL 864, 9th edition is the version of the standard that fire alarm control panels and communicators manufactured today must obtain for use in systems requiring compliance with NFPA 72, regardless of which version of NFPA 72 an AHJ is using.

Reliability of the communications link

One important goal of NFPA 72 is to help ensure the integrity of the communications link between the fire alarm system installed at the customer premises and the central monitoring station. Older versions of NFPA 72 require a customer to have two dedicated phone lines for commercial fire alarm systems. The idea behind this approach is that if one phone line should fail, the other likely would still be functional. But redundant phone lines are costly, requiring commercial accounts to pay as much as \$700 to \$1200 per year in phone charges for every one of their locations. In addition, redundant phone lines can and sometimes do fail simultaneously.

Fire systems that rely on redundant phone lines for communication are required to send test messages to the central station once every 24 hours to confirm that the system is capable of transmitting an alarm. If the central station does not receive a signal from the system at the expected time, the business is alerted so that the problem can be addressed. The downside of this approach, however, is that if a problem were to occur shortly after a test message, it would not be detected for nearly 24 hours.

Over the last 10 to 20 years, alternative communications technologies using wired or wireless digital data communications have been developed—and increasingly these technologies are being used in security and fire alarm systems. The availability of these alternative communications methods for fire systems caused the NFPA to rethink its requirements for commercial fire systems. One option that the NFPA has allowed in the most recent versions of the NFPA 72 code is to use a combination of two technologies, such as a cellular network and a networked data connection—as long as both connections are verified once every 24 hours. In addition, the most recent versions of NFPA 72 allows a single communications link to the central station to be used if the integrity of the entire communications path is verified more frequently—once every five minutes instead of once every 24 hours.

- The relevant section of the 2007 code is 8.6.4.4.
- The relevant section of the NFPA 72 2010 code is 26.6.3.1.4.1.

When technicians install the system, they establish a connection with the central monitoring station by programming the IP address of the central station receiver and obtaining an account number from the central station, which is also programmed into the system. As part of the programming process, the system prompts technicians to enter the number of minutes for check-in and fail time. Both settings should be programmed for five minutes.

When the initial communication from the system is sent to the central station, the central station receiver records the check-in and fail times for the account number. Those settings trigger the receiver to automatically look for a check-in from the system every five minutes and if the receiver does not receive an check-in message from the communicator, an alert signal is sent to the commercial account through the central station personnel.

The net result is a higher level of system reliability in comparison with traditional systems that rely on redundant phone and the substantially less frequent 24-hour supervision reports associated with that approach.

Today's cellular networks support voice and data communications using digital technology and do not rely on a wired connection to the customer premises that can be damaged or sabotaged. Cellular networks operated by wireless service providers are designed and built to high reliability standards, with proactive monitoring and

redundancy provided by the wireless carrier. Because the cellular connection to the customer premises is fixed, unlike with mobile cellular network connections, no hand-offs are involved, minimizing the occurrence of dropped connections. And because the size of the data messages sent between the cellular communicator and the central station require relatively low bandwidth, the likelihood of communications not going through because of congestion also is minimized.

Ruling

Understanding that the traditional POTS lines are being phased out in favor of other transmission technologies, increased reliability of the internet and the inherent multiple pathways to the Central Station Monitoring Center, the Office of the Fire Marshal will permit the use of a IP Communication method under the following conditions.

1. The secondary power supply for all equipment necessary for the transmission and reception of signals to the central station (internet gateway, router, etc.) shall meet the same battery backup requirements as the fire alarm system, either 24 hours or 60 hours.
2. If the central station will be employing new technology or equipment beyond the scope of its current certificate, provide a new UL certificate showing that it is listed for the new technology.
3. The IP communication device shall have the capability to transmit all signals in full addressability. (i.e Point ID / Contact ID Format)
4. All IP communication devices shall be UL 864 OT listed.
5. All other requirement of the 2010 Fire Code of New York State, 2007 Edition of NFPA 72 and Town of Brighton - Office of the Fire Marshal requirements shall be met.

Systems listed for other than phone line transmission shall be installed and tested in accordance with all requirements of the listing and NFPA 72 National Fire Alarm and Signaling Code, 2010 Edition and their current listing.