GUIDELINE F.09 – Communication Paths for Fire Alarm Systems

F.09.1 PURPOSE

The purpose of this guideline is to provide information and requirements for the communication paths of supervising station fire alarm systems per Section 907 of the California Fire Code (CFC) and NFPA 72.

F.09.2 SCOPE

This guideline shall apply to all buildings where fire alarm systems are installed per Section 907 of the CFC, NFPA 72, and other applicable codes, ordinances, and standards.

F.09.3 PROCEDURE

A fire alarm permit is required for the installation, alteration, or repair of a fire alarm system. Plans shall be submitted to the fire department for approval before any work is commenced.

F.09.4 ALTERNATE METHODS

Nothing in Chapter 26 shall be interpreted as prohibiting the use of listed equipment using alternate communications methods that provide a level of reliability and supervision consistent with the requirements of these Guidelines and Standards, NFPA 72, and the intended level of protection. (NFPA 72 Section 26.6.2.2)

F.09.5 DEFINITIONS

Digital Alarm Communicator Receiver (DACR). A system component that accepts and displays signals from digital alarm communicator transmitters (DACTS) sent over the public switched telephone network.

Digital Alarm Communicator System (DACS). A system in which signals are transmitted from a digital alarm communicator transmitter (DACT) located at the protected premises through the public-switched telephone network to a digital alarm communicator receiver (DACR).

Digital Alarm Communicator Transmitter (DACT). A system component at the protected premises to which initiating devices or groups of devices are connected. The DACT seizes the connected telephone line, dials a preselected number to connect to a DACR, and transmits signals indicating a status change of the initiating device.

Digital Alarm Radio System (DARS). A system in which signals are transmitted from a digital alarm radio transmitter (DART) located at the protected premises through a radio channel to a digital radio receiver (DARR).

Path (Pathways). Any circuit, conductor, optic fiber, radio carrier, or other means connecting two or more locations.

Performance-Based Technology. Communications methods operating on principles different from the specific methods of NFPA 72.

Wired Transmission. The communication between devices via cables.

Wireless Transmission. The communication between devices using means other than cables.

F.09.6 EQUIPMENT

All equipment shall be UL listed for its intended use and installed in compliance with NFPA, FCC, UL, and all other applicable regulations.

F.09.7 COMMUNICATION PATHS (Section 26.6.3.1.6)

Single communication paths shall meet the following requirements:

1. The path shall be supervised at an interval of not more than 60 minutes. (The supervising station must receive a signal from the alarm communicator monitoring the condition of the fire alarm system at an interval of 60 minutes or less).

2. A failure of the path shall be annunciated at the supervising station within not more than 60 minutes. (The supervising station shall receive an audible and visual alarm at an interval of 60 minutes or less indicating that the signal path from the protected premises to the supervising station has failed).

3. The failure to complete a signal transmission shall be annunciated at the protected premises in accordance with Section 10.15 (The protected premises annunciator shall indicate a trouble signal should the signal transmission fail.).

4. The secondary power supply for all equipment necessary for the transmission and reception of signals to the central station (internet gateway, router, etc.) shall provide power for a minimum of 60 hours.

Multiple communication paths shall meet the following requirements:

1. Each path shall be supervised at an interval of not more than 6 hours.

2. The failure of any path shall be annunciated at the supervising station within not more than 6 hours.

3. The failure to complete a signal transmission shall be annunciated at the protected premises in accordance with Section 10.15. (trouble signal).

4. The secondary power supply shall provide power for all equipment necessary for the transmission and reception of signals to the central station for a minimum of 24 hours.

F.09.8 DACT (Section 26.6.3.2)

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

1. One-way private radio alarm system (complying with Section 26.6.3.3.2).

2. Two-way Radio Frequency (RF) multiplex system (complying with Section 26.6.3.3.1).

3. Performance-based technology (complying with Section 26.6.3.1).

   Exception: Where access to two technologies in the proceeding list is not available at the protected premises, with approval of the authority having jurisdiction, a telephone line (number) shall be permitted to be used as the second transmission means.

F.09.9 PERFORMANCE-BASED TECHNOLOGY (Section 26.6.3.1)

Performance-based technologies are permitted to be installed if they conform to the performance requirements of Section 26.6.3.1 and other applicable requirements of NFPA 72.

This includes the following:

1. Transmitters using IP (Internet Protocol).

2. IP transmission over the public open Internet or over private IP facilities maintained by an organization for its own use.

3. Transmitters using various (non-dialup) digital cellular technology.

Wired IP Transmission. There are two types of wired IP transmission devices. One where the IP network is connected directly to the fire alarm control unit (integrated IP or native IP). The second uses an intermediary module that can include the following:

1. IP dialer capture module.

2. IP data capture module (such as RS-232, keypad bus, RS-485).

3. Relay contact monitoring module.

See NFPA 72 A.26.6.3.1 for more information on cellular and IP technology requirements.

PERFORMANCE-BASED TECHNOLOGY PLAN REVIEW FOR SINGLE PATHS

In addition to the requirements of CFC Section 907 and NFPA 72, all of the following information shall be included on the plans for performance-based technology and single path communication plan review:

1. Provide proof that the technology provides a level of reliability and supervision consistent with the requirements and intended level of protection per NFPA 72.

2. Note on plans that if the central station will be employing new technology or equipment beyond the scope of its current certificate, a new UL certificate will be required showing that it is listed for the new technology.

3. List the type of data transmission technology used and clearly identify each step in how the alarm information travels from the protected premises to the central station and back.

4. Identify which portions of the system are proprietary, leased, or part of an established public or major private telephone, cable, internet service, etc.

5. Note potential deficiencies or weakness in the system and how the technology safeguards against them.

6. Specify the method of ensuring signal and data integrity.

7. Provide UL/FM and CSFM listing sheets showing that the communicator and all other related equipment is approved for its intended use.

8. Specify if prioritization features such as data or bandwidth throttling are enabled. The communicator shall not have inhibited transmission signals from the alarm system beyond the maximum delay of 90 seconds. If the network or system has this feature, either provide documentation from the manufacturer that the feature can be disabled or that the maximum possible delay for any type of signal is less than what is permitted by NFPA 72.

9. Radio repeater and receiving stations shall have documentation demonstrating compliance with all applicable requirements of NFPA 72.

10. State on plans how each of the performance requirements will be tested, and proof of compliance demonstrated to the fire official at the time of final inspection and acceptance. (how will signal strength be verified?, how will data integrity be measured? etc.).