NATIONAL FIRE ALARM AND SIGNALING CODE

INTRODUCTION

National Fire Protection Association (NFPA) documents describe a level of fire protection agreed on by persons representing a variety of interests. The guidance in these documents does not reflect unique conditions or special considerations, such as system performance under adverse conditions. Nor does NFPA guidance reflect the increased system reliability that AXA XL Risk Consulting recommends for high valued properties.

This AXA XL Risk Consulting Guideline takes a position on the provisions of NFPA 72 that AXA XL Risk Consulting believes require clarification or changes. To understand the position, this Property Risk Consulting Guideline must be read with a copy of NFPA 72. The provisions of the NFPA document are not repeated.

POSITION

General

Achieving an acceptable level of surveillance at an AXA XL Risk Consulting surveyed facility may include more than having a fire alarm system that meets the recommendations of this Property Risk Consulting Guideline. PRC.11.0.1 indicates when additional surveillance is recommended at AXA XL Risk Consulting surveyed locations.

Apply the inspection, testing and maintenance requirements of the Code to all fire alarm systems, regardless of the date installed.

In the United States, AXA XL Risk Consulting recommends equipment listed for alarm service by the nationally recognized laboratories in PRC.18.3.1. When applying the Code to an installation outside the United States, use equipment listed by a nationally recognized testing laboratory for the particular country. Contact the AXA XL Risk Consulting local field servicing office for information on recognized laboratories.

When a supervising station fire alarm system uses circuits leased from a communications utility, such as the telephone company, it might also use utility-owned terminal equipment at the protected premises — such as an optical fiber multiplex interface — that must itself have standby power. In most cases, the standby power will not meet the duration recommended in this section. When this is so, either upgrade the standby power supply of the utility-owned terminal equipment to meet this duration or provide an alternate communications pathway.

Locate overrides for fire safety functions inside locked enclosures with keys available only to trained and authorized personnel. Arrange the override to initiate an audible and visible trouble signal upon activation. Include instructions for using the override in impairment handling programs.

Assign the responsibility for testing and maintenance of fire alarm system. This applies for multi-tenants and leased buildings.

Protection of Fire Alarm Control Unit

If the control unit is located in an area protected by automatic sprinklers where water flow is monitored by the fire alarm system, AXA XL Risk Consulting considers this protection adequate for the control unit in lieu of smoke detectors or heat detectors. If the system is UL Certificated, a smoke detector mounted above the control unit is required.

Approval And Acceptance

In addition to the Record of Completion required, submit the following information to the local AXA XL Risk Consulting Local Plan Review Office for review and comment prior to the start of an installation. AXA XL Risk Consulting does not approve systems but reviews the plans and specifications to confirm compliance with applicable codes and comment on deficiencies and concerns. Resolve any deficiencies and concerns prior to the start of installation:

- An exact copy of the contract covering the installation, acceptance testing, periodic testing, periodic preventive maintenance and emergency maintenance of the fire alarm system.
- Product descriptive literature stating the manufacturer's name and model number for each fire alarm system component, and verifying that each component is listed for the specific.
- A list of all functions monitored by the fire alarm system.
- A list of all equipment locations, including the termination points of all circuits connecting the protected premises fire alarm system to a supervising station.
- A general wiring diagram showing the interconnection of all fire alarm system components.
- Standby battery calculations or details of the standby power supply.
- Wire type and size of interconnection wiring and wiring methods to be used.
- A list of points and point addresses.
- A written sequence of events describing all functions of the system.
- A written plan for the acceptance test.
- Where specifically requested by AXA XL Risk Consulting, internal schematic wiring diagrams of individual fire alarm system components.
- Shop drawings and notification appliance circuit voltage drop calculations.

Third Party Verification of Fire Alarm Systems

In meeting the requirements of NFPA 72*,* AXA XL Risk Consulting recommends that a UL Central Station Fire Alarm Certificate be issued for all new installations of fire alarm systems that include connection to a central station, whether such an installation is a completely new installation or a complete retrofit of a system including new head on gear to an existing installation.

If an accurately and thoroughly completed FMRC Placard is in place, AXA XL Risk Consulting will consider the Placard as evidence that at the time the installation was made it complied with the then current edition of whatever NFPA signaling standard was applicable. However, if such a system is modified, then the UL Central Station Fire Alarm Certification should be issued for the modification to the system.

As an extension to the requirements of NFPA 72*,* AXA XL Risk Consulting recommends that the appropriate UL Fire Alarm Certificate for Local, Auxiliary, Remote Station, Proprietary or Emergency Voice/Alarm Communications System be issued for each such installation. In addition to confirming that an alarm installation meets all the provisions of NFPA 72, experience has shown that UL certification results in more prompt repair and restoration of alarm systems when problems are discovered during testing.

Impairments

The AXA XL Risk Consulting's RSVP* Impairment Handling Program should be followed when the alarm system is impaired.

Qualifications of Service Personnel

Fire alarm systems should be serviced by personnel employed by an organization that has been UL listed for the servicing of fire alarm systems, either under UL designation UUFX or UUJS.

Acceptance Testing

A representative of AXA XL Risk Consulting should witness initial acceptance and any reacceptance testing.

Use hot water to test restorable heat detectors.

If live smoke is chosen as a test method, use a bee smoker to produce the smoke. This device, normally used by a beekeeper to anesthetize bees, can be safely carried through ordinary environments and only releases smoke when the bellows is squeezed.

If a UL listed aerosol test gas is used in place of live smoke, the test gas should be approved by the manufacturer for the specific smoke detector. To prevent contamination of the smoke detector with an excessive amount of aerosol test gas, the user must strictly follow the instructions of the manufacturer of the smoke detector and the manufacturer of the aerosol test gas.

Such instructions may include the use of an extension delivery tube, maintaining the distance between the aerosol test gas container or nozzle and the smoke detector, and limiting the duration of the application of the aerosol.

Maintenance, Inspection And Testing Records

Records of testing must include individual listing of each device tested. Simply indicting the system was tested or indicating the number of devices tested is not acceptable.

Partitions

When partitions require detector spacing to be reduced in accordance with engineering judgment, the designer/installer should submit to the local AXA XL Risk Consulting Local Plan Review Office a narrative clearly describing all factors that were considered in calculating the spacing.

Heat Sensing Fire Detectors

There are two general types of heat detectors. Spot type, which are devices that occupy a specific spot or point and line type, which are linear devices that extend over a distance, sensing temperature along their entire length. Recognize detection is not protection and detection systems should be used as required by other NFPA Codes, selected and applied with consultation of AXA XL Risk Consulting.

Temperature Classification

Select a detector based on temperature classification and stability in the environment of the area where detection is to be installed.

For information about choosing heat-sensing fire detectors to be installed in high temperature environments, see PRC.11.3.1.1.1.

High Ceilings

As the fire plume rises, cooling is a factor and detector spacing must be reduced.

AXA XL Risk Consulting encourages using Annex B to determine spacing of heat detectors for large open areas or for special hazard applications. The designer/installer should submit to the local AXA XL Risk Consulting Local Plan Review Office a narrative clearly describing all factors that were considered in calculating the spacing.

Sprinkler Water Flow Alarm-Initiating Devices

When valve tamper supervision is not provided, AXA XL Risk Consulting suggests that water flow alarms be the drop-in-pressure type. See PRC.11.3.2.2.

Time Limit For Indication of Water Flow Alarms

NFPA 72 allows a maximum of 90 s from initiation of water flow to indication of a water flow alarm at the premises control panel. This time allowance starts when the flow of water at the alarm-initiating device equals or exceeds the flow from a sprinkler head of the smallest orifice in the system and ends when the water flow alarm signal is indicated at the protected premises fire alarm system control unit.

This 90 s time allowance must include any mechanical or electronic time delay — either built into the water flow alarm-initiating device or inserted at any other point in the system. The 90 s time allowance must also include any alarm transmission time inherent in the communications technology used. For example, if an addressable multiplex fire alarm system is installed at the protected premises, NFPA 72 would permit such a system to have a maximum scan time of 90 s when fully loaded.

In addition, a maximum of 90 s from receipt of an alarm at the premises control panel is allowed to the time of receipt of the alarm at the supervising station. In summary, the *Code* allows a maximum of 180 s from initiation of water flow to signal receipt at the supervising station, with neither of the limits addressed exceeding 90 s.

Control Valve Supervisory Signal-Initiating Devices

AXA XL Risk Consulting does not recommend using plug-type valve supervisory devices as they can be reset with the valve actually not fully open, or completely shut. See PRC.11.3.4.1.

Presignal Feature and Positive Alarm Sequence

Because of the unnecessary delay in transmitting fire alarm signals to the supervising station, avoid using Presignal Feature and Positive Alarm Sequence. If specific circumstances warrant the application of these features, review the situation with the AXA XL Risk Consulting Principal Consultant prior to the installation.

Combination Systems

Avoid using combination systems, since overall system reliability is generally enhanced when different types of signaling systems, such as fire, burglary and building management, are separate and distinct. If specific circumstances warrant the application of combination systems, obtain the review and comment of the AXA XL Risk Consulting.

Alarm Signal Initiation – Detection Devices

Alarm verification should not be used to compensate for a poor design and inappropriate detectors or improper location of detectors. The Record of Completion must show whether alarm verification is enabled and should be utilized only after agreement with the AXA XL Risk Consulting Principal Consultant. Alarm verification should not be installed/programmed in a system experiencing false alarms without considering the specific cause(s) of the false alarms.

Cross Zoning

AXA XL Risk Consulting recognizes AND-gate detection designs using smoke detectors or flame detectors when they activate extinguishing systems, but not when they are used for alarms only. AXA XL Risk Consulting does not recommend AND-gate designs of other types of initiating devices.

Manufacturers have developed many AND-gate detection designs, each with its own trade name. Trade names for some common AND-gate designs include counting zone, cross zoning, detector matching, priority matrix, sequential verification, verification zone, and verified detection.

When using AND-gate designs, space detectors in accordance with NFPA 72 sections and PRC.13.0.1. With this spacing, the area covered by the two detectors required to actuate the extinguishing system is

the same as the area that would be covered by one detector in a system without AND-gate design. This decreases chances of false alarms while maintaining the same effective detector spacing.

Elements Of Central Station Service

This section also specifies three methods for providing the required elements under contract to a listed central station. UL lists central stations under designation UUFX, which includes categories for full service central stations, fire alarm service – local companies, and monitoring companies. AXA XL Risk Consulting recommends that subscribers have one contract with a company in one of the first two categories, and that the alarm service be UL certificated by the contracting company. Note that the contracting company can subcontract services, but must still be responsible for upholding the contract with the subscriber.

Retransmission Of Signals

The central station should be able to retransmit fire alarm signals to the public fire service communications center serving the protected premises over two direct outgoing telephone circuits connected to at least two telephone instruments that can reach the specific public fire service communications center by two telephone numbers, or by other means allowed by code. The central station should also record retransmission conversations, retain them for at least one year, and make them available for examination by AXA XL Risk Consulting representatives.

Accessibility Of Records

AXA XL Risk Consulting reserves the right to examine all records of signals received from a protected premise in which we have a contractual obligation to provide loss prevention services.

Retransmission of Signals

The proprietary supervising station should be able to retransmit fire alarm signals to the public fire service communications center serving the protected premises over two direct outgoing telephone circuits connected to at least two telephone instruments that can reach the specific public fire service communications center by at least two telephone numbers. The supervising station should also record retransmission conversations retain and them for at least one year.

When the remote supervising station is not located within the public fire service communications center, the supervising station should be able to retransmit fire alarm signals to the public fire service communications center serving the protected premises over two direct outgoing telephone circuits connected to at least two telephone instruments that can reach the specific public fire service communications center by at least two telephone numbers or other method accepted by the Authority Having Jurisdiction. The supervising station should record retransmission conversations, should retain them for at least one year, and should make them available for examination by AXA XL Risk Consulting representatives.

Single And Multiple Station Alarms And Household Fire Alarm Stations

In addition to homes, this chapter applies to hotels, dormitories and apartment buildings. A smoke detector is part of a system utilizing a control panel, while a smoke alarm is a unit that includes detection and warning components all in one unit. As an extension to the requirements of NFPA 72, AXA XL Risk Consulting recommends that a UL Fire Alarm Certificate for an Emergency Voice/Alarm Communications System be issued for each installation.

UL FIRE ALARM CERTIFICATE PROGRAM

In response to requests from AXA XL Risk Consulting and other property insurers, on January 1, 1984, UL began a Central Station Fire Alarm Certificate program. On June 1, 1985, UL began a Fire Alarm Certificate program for Local, Auxiliary, Remote Station, Proprietary and Emergency Voice/Alarm Communication Fire Alarm Systems.

These programs require the installer/maintainer of the particular fire alarm system to state that the installation complies with the requirements of UL and NFPA standards. In accordance with the requirements of NFPA 72, AXA XL Risk Consulting requires each central station fire alarm system to have a UL Central Station Fire Alarm Certificate.

Every year, UL inspects a random sampling of all certificated installations by each installer/maintainer. This random inspection provides quality assurance feedback on the accuracy of the certificate program.

The certificate contains two parts. The first part is the certificate itself. The second part is a description of the fire alarm system.

As of 2020, UL charges $90 a year to issue a certificate. Alarm companies charging more than this could be attempting to subsidize their fixed costs for providing certificate service over a small number of clients. They could also be charging for items that were not part of the original fire alarm system but should have been provided. When a fire alarm company quotes an unreasonably high estimate for issuing a UL certificate, the company should be asked for an itemized list of the charges.

For more information on the certificate program, see http://www.ul.com/alarmsystems/.