

# High Rise Fire Alarm and Life Safety Systems

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All information contained in this document is based on practical experience and training. Always refer to authority having jurisdiction and applicable codes when making any fire alarm/life safety decision.

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# High-Rise Fire Alarm and life Safety Systems

## Identify and Locate Alarm Source

Identifying the source: Fire Alarm Systems have two means of identifying the location of an alarm or system activity.

L.E.D. - light emitting diodes, can be used to bring attention to a label or a location on a Graphic Annunciator.

The L.E.D and label system is least effective but the more information that is on the label the better.

Also the more division of a building into zones represented by the L.E.D.'s the less time it will take to locate the area.

Graphic Annunciators are very useful for locating a device or area in buildings that have many non-typical floors.

Addressable Fire Alarm Systems also use a pulsing L.E.D. on most devices to indicate the device is being polled by the fire alarm system for it's status. If the device is in alarm the L.E.D. will be on in a solid state.

Fire Alarm Systems also use L.E.D.'s on the front panel and within the panel to indicate general system activity such as Fire Alarm, Trouble, Supervisory, or Fireman phone activity.

L.C.D. - liquid crystal display, can be used to give text information to locate an area(zone), single device or any system activity(all future reference will be to addressable type systems).

L.C.D. displays come in different sizes, the more characters used to identify a location the better.

Information should include:

Type of device - smoke detector, heat detector, pull station, sprinkler flow switch, duct detector, etc..

Floor of the alarm - Fire Alarm L.C.D. should match signage in the stairs and elevator indicators.

Location on floor - if the device is in a room on the north end of a floor the text should indicate this as well as reflect the signage on the door.

Device Address - all alarm devices should be labeled with it's address to help with further identification. This address is used to identify a device on the SLC (signaling line circuit).

## Trouble\Faults

**Identifying and repairing the source of non-alarm indications ASAP will reduce false alarms**

With the use of the F.A.C.P.(Fire Alarm Control Panel) identify the source of the trouble\fault. There are trouble\fault conditions related to internal F.A.C.P. problems and those related to devices connected to the F.A.C.P.

The first defense against a trouble\fault condition accelerating into a false alarm condition is to address the condition when it occurs. If the fault was caused by a known condition such as water or dust correct the condition immediately. Most Fire Alarm Systems today have features that allow for early stage identification of faults such as dirty detector warnings, ground fault detection, etc. Waiting to research the problem will almost always result in a false alarm condition. If your Fire Alarm Company has direct connect to the technician on duty calling them at first sign of a trouble\fault is your first defense against a trouble\fault turning into a false alarm. The technician will be able to help with actions that can be taken to reduce chances of a false alarm while a technician is in route to your location.

Information on 24\7 service and placing the Fire Alarm System on disregard should be posted clearly in the Fire Control Room.

Most Fire Alarm Companies will supply training on their brand to customers and Fire Department Personnel at no charge. Having an understanding of a facilities Life Safety System is a must when responding to activity in a Fire Alarm System.

The Fire Alarm System's log is very useful in identifying potential problems. Whenever service personnel respond to a service call the log should be viewed to identify problems that may be associated with the current trouble\fault.

# Supervisory Conditions

## Sprinkler System

Supervisory conditions on the F.A.C.P. must be responded to in order to identify the source. As with any F.A.C.P. activity not responding to and correcting a supervisory event could accelerate into a false alarm or vital Life Safety System component failure.

The Sprinkler System component of a Life Safety System is the first defense against a fire spreading and the F.A.C.P. monitors and controls building systems in accordance with the activity received from the Fire Pump Controller, shut off valve tamper switches and flow monitor switches.

The Fire Pump Room is usually in a remote location in the building and should be on a daily walk through list. (See check list)

If a tamper switch is left in supervisory condition that area may be left unprotected.

The Fire Pump A\C and Fire Pump Run is also monitored by the F.A.C.P.

Dry Sprinkler Systems pose their own set of problems. If supervisory low pressure events are not corrected a trip of the Water Flow pressure switch will cause a false alarm. This may indicate a problem with the compressor that holds air pressure in the dry system pipes or a leak.

When temperatures will be near freezing make sure all dry system pipes are drained of any water to prevent bursting and thus a false alarm. (Requires Sprinkler Company Training)

A Sprinkler System Company should be involved in reviewing a sites Sprinkler System operation with all maintenance personnel.

# Elevators and F.A.C.P. Control

Elevator control is another element of a Life Safety System.

The F.A.C.P. controls the elevators in certain fire alarm situations.

Detectors that are used for elevator recall will recall the elevators to the primary or alternate floors. If a recall detector is in alarm on any floors above the ground floor the F.A.C.P. will activate a relay to recall elevators to the ground floor (primary). If a recall detector is in alarm on the ground floor the F.A.C.P. will activate a relay to recall elevators to the second level (alternate). Also Smoke detectors in the equipment room will recall elevators to primary floor. These detectors will also turn a indicator lamp on in the elevator cab. Heat detectors in the equipment room will shunt all power to the elevators except cab lights and emergency phone.

Facility Personnel should have reset keys to restore elevators to normal operation after F.A.C.P. is reset. Personnel should know location of shunt trip and elevator breakers to restore power if shunt heat detectors have been activated after fire alarm is reset.

Elevator codes have changed and facilities may have different elevator devices and reset procedures, personnel should be familiar with their reset procedure. The elevator manufacturer can supply keys and reset procedure information.

## Generators

The emergency generator may activate under certain conditions and may transferred power. After an alarm has been reset and all Life Safety Systems components are restored to normal check to verify main power is back on the building. The generator annunciator in the Fire Command Room will indicate generator status.

# FALSE ALARMS

## PREVENT AND CORRECT

### Limiting False alarms is second only to Life Safety

False alarm prevention starts with the systems design. Consideration must be taken when deciding location and type of detection devices.

Trash and linen chutes have long been a source of false alarms. Open corridor smoke detection is also a source of false alarms.

NFPA 72 allows for other than smoke detectors to be used if AHJ agrees ambient conditions are incompatible with automatic smoke detection.

Pull station covers should be included in the original design of a fire alarm system especially for any open air areas. Covers not only reduce environmental effects to devices that may cause false alarms but have been proven to reduce false alarms due to unintended and vandal activation.

Buildings along the ocean front require many consideration due to high concentrations of moist salt air and the accumulation of high levels of condensation on all exposed area devices during temperature divergent times of the year. Although the only real solution to these problems is enclosed corridor buildings, there are steps that can be taken to minimize their effect.

Maintenance personnel must take into account the effect on Life Safety Systems that cleaning, painting, pressure washing, etc. will have. Taking precautions to protect devices prior to work will prevent false alarms and damage that can eventually cause false alarms. Always place system on test before any such work begins.

With Intelligent systems that have staged alert design built into the system one of the easiest steps to take in false alarm prevention is to respond to warning alerts before they become false alarms.

## **Identify and correct**

After identifying the cause of a false alarm, steps must be taken to correct what effected the device. If the cause was ambient conditions work with building management to correct the conditions. If ambient conditions cannot be effectively improved the next step is to work with AHJ to change detection type. Dust and moisture problems should be addressed in this manner.

A thorough investigation of the F.A.C.P. log should be useful in determining whether the False alarm was the result of a onetime cause, a reoccurring cause and also if the false alarm was caused by ignoring the F.A.C.P. warning alerts prior to the false alarm.

Something as simple as keeping an area clean and dry can reduce false alarms.