

Fire Alarm Control Unit

- Discuss the requirements of the fire alarm system
- Describe the functions of the fire alarm control unit
- Determine the meaning of indicators on the fire alarm control unit and the required documentation



Standards

- NFPA 70 National Electrical Code
 - How devices are connected and communicate
- NFPA 72 National Fire Alarm and Signaling Code
 - What the devices do
- Local ordinance amendments



Selecting a System

- Determine the goal of the protection
 - Is it just about occupant notification?
 - Is it about property protection?
 - Is it about business continuity?
 - No interruption to facility processes. Maintain the ability to produce product
 - Define why the system is being provided?
 - Is it about simple code compliance or something more?



System Types

- Protected Premises System (aka “Local”)
 - Only alerts occupants that are present
 - Pre-signal alarm system
 - Typically in places like hospitals –coded message to those who can assist in evacuation without sending facility wide alarm
 - Conventional alarm system
 - Cannot identify which device triggered the alarm
 - Zoned conventional alarm system
 - Fire Alarm Control Unit (FACU) identifies a zone that activated the alarm
 - Can be activated manually



System Types

- Central Station

- Signal sent to offsite alarm company
 - System oversight
 - Monitoring of signals
 - Retransmission of alarm signals
 - Recordkeeping
- 24/365

- Proprietary

- Onsite, owned and operated by the building owner
- Signal sent to owner
- Designated onsite personnel investigate the alarm



System Types

- Remote
 - Alarm signal sent directly to fire department
- Auxiliary
 - Coded signal sent directly to public fire reporting system
 - No community public fire reporting system = no auxiliary system



Minimum Documentation

- 7.2
 - For all systems
 - 16 items
- Remainder of chapter 7
 - Where applicable
- 7.8
 - Required forms
 - 12 figures



Fire Alarm Control Unit

- Alarm panel
 - Interprets signals
 - Initiates responses
 - Extensive programming
- Previously hardwired
 - Wireless and remote options now available



Location

- Main entrance
- Firefighter Command Center
 - Related panels



Signal Transmission

- Link between the detector and the control panel
- Hard-wired
 - Analog or digital
 - Normally Open(NO) contact on detectors
 - Conventional
 - Detectors in parallel
 - EOL resistor for integrity monitoring
 - 2-wire or 4-wire
- Optical Fiber
 - Similar to hard-wired
 - More information at higher speeds
 - Connections more difficult
- Wireless
 - Radio frequency



Interface

- Positive indication
- Alarm
- System must monitor and detect faults in devices, appliances, wiring, etc.
 - Trouble
 - Supervisory
- Graphical Interface
 - Descriptive



Automatic Sprinkler System Supervision

- Required for critical operating features such as:
- The position of sprinkler water shut off valves
 - Normally only valves that are 2 ½ inches or larger
- The air pressure in a dry pipe system or pre-action system
 - Supervisory signal whenever the air pressure climbs above or drops below a designated set point
- Low temperature in a building equipped with a wet pipe system, closets protecting dry pipe, pre-action or deluge valves from freezing, or supply water storage tank
 - Supervisory signal whenever the temperature drops below a designated set point





Automatic Sprinkler System Supervision

- Storage tank water level
 - Supervisory signal whenever water level rises above or drops below a designated set point
- Operation and integrity of a fire pump
 - Distinct supervisory signal sent when
 - Pump runs
 - Power to the motor is interrupted
 - Main switch is placed in position other than automatic start
 - Battery charger fails
 - Engine experiences abnormal condition or fails to start
 - Controller fails





Supervisory Circuits

- NFPA 72
 - Supervisory devices cannot be on the same circuit as alarm initiating devices
 - A common wiring configuration has been to install waterflow alarm devices on the same circuit as supervisory initiating devices
 - Problem is that alarm will not differentiate between a closed valve or a broken connection
 - If wiring configuration and panel configuration provides signal differentiation as required by NFPA 72, the devices can be wired on the same electrical circuit



Signals

- Latching
- Silence
- Reset



System Response

- Detection
- Notification
- Auxiliary functions



Records

- Must know history
- Printer

