



FPST 1213 Fire and Safety Hazard Recognition

Fire Detection and Alarm Systems

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Fire and Evacuation Alarms



- Know the differences between alarm system types
- Understand the main components of an alarm system
- Know how different alarms are initiated
- Distinguish between the different types of fire detectors

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Standards



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

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System Types

as known as



- Protected Premises System (aka "Local")
 - Only alerts occupants that are present
 - Conventional alarm system
 - Zoned conventional alarm system
 - Can be activated manually

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System Types



- Central Station
 - Signal sent to offsite alarm company staffed 24/7/365
 - Station personnel take action but do not respond to site
- Proprietary
 - Onsite, owned and operated by a single building owner
 - Signal sent to owner. Designated onsite personnel investigate the alarm
- Remote
 - Alarm signal sent directly to fire department
 - Generally serves properties under various ownerships

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Alarm System Components

p.609

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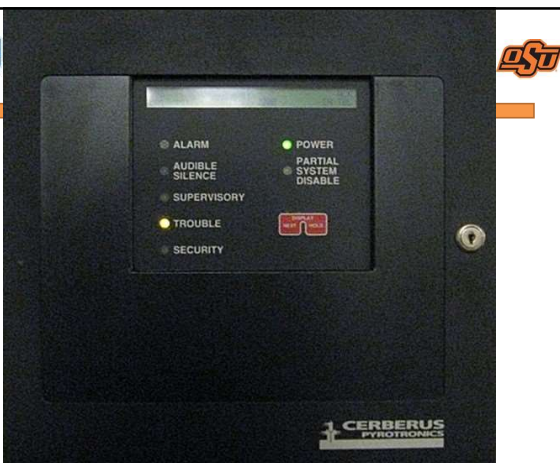
Fire Alarm Control Unit (FACU)

- aka "Alarm panel"
- Interprets incoming signals
 - Alarm
 - Supervisory
 - Trouble
- Initiates appropriate response

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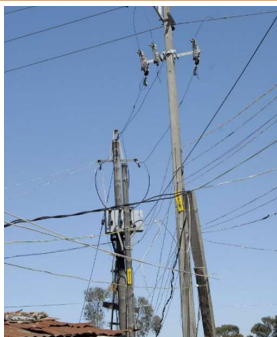
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Power Sources



- Primary
 - Power grid connection
- Secondary
 - Batteries or generator



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Initiating Devices



- Anything that “senses” the fire
 - Manual pull stations
 - Heat detectors
 - Smoke detectors
 - Flame detectors
 - Water flow alarm

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Automatic Fire Detection



- Spot
 - Single location for each detector
 - Classroom
- Linear
 - Any signal across a space
- Non-restorable
 - Sensing element destroyed detecting fire
- Restorable
 - Sensing element used multiple times

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Heat Detectors



- Oldest type of detector
 - Sprinklers
- Lowest false alarm rate
- Typically ceiling mounted in small confined areas
- Fixed temperature or rate-of-rise
 - Spot – p.625, 626
 - Linear – p.627



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Linear Heat Detector



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Heat Detectors



- Rate of rise
 - Spot type
 - Line type
 - 12-15°F per minute

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Smoke Detectors

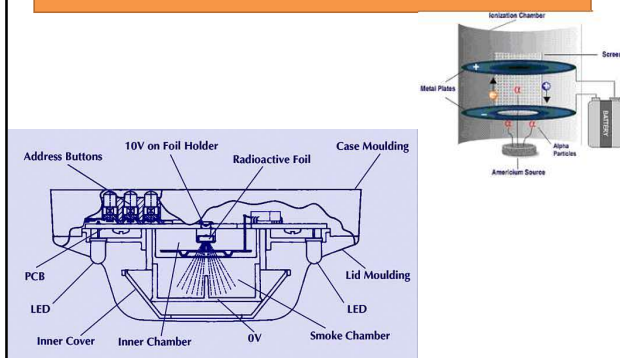


- Detect most fires much more rapidly than a heat detector
- Ionization
- Photoelectric
 - Have superior response to low energy smoldering fires because they respond to smoke density
- They only detect...

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Smoke Detector Function - Ionization



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Smoke Detector Function - Photoelectric




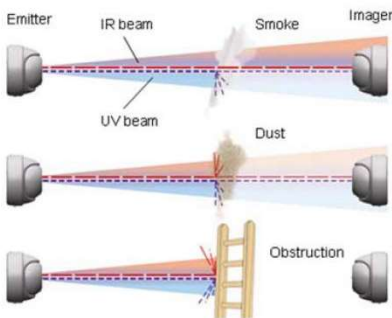
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Linear Smoke Detector








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Flame Detectors




- Ultraviolet
 - UV light contacts the sensor
- Infrared
 - Contain a filter to screen out unwanted light except for IR





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Notification Appliances



- Anything that delivers information
 - Horns
 - Bells
 - Voice communication speakers
 - Strobes
 - Text messages
- Emergency Communication System
 - Mass Notification System
 - Notify occupants and provide information and instructions



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Auxiliary Services



- Designed for special functions
- Shut down heating, ventilation, and air-conditioning (HVAC) system
- Close smoke and/or fire doors
- Stairwell pressurization
- Override control of elevators

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Inspection



- General
 - Accessible
 - No damage
 - No painted



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Sidewall
painted




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Testing




- Restorable
 - Certain devices used to test function and sensitivity
 - Ensure proper action activation
 - Ensure they return to a normal status
- Non-restorable
 - Usually replaced every 15 years
 - 3rd party testing option exists



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