

FPST 1373 FACU Outline

- I. Fire alarm system design
 - a. Codes and standards
 - i. NFPA 70
 - 1. Historically all components wired together
 - ii. NFPA 72
 - 1. How to effectively design and maintain a fire alarm system
 - 2. System documentation
 - a. 7.2 gives list of 16 items required for all systems
 - i. Will cover all in this class
 - ii. Expected to use all of these items on assignments in class
 - b. Rest of Chapter 7 is used when applicable to given system
 - c. 7.8 gives forms that must be used
 - iii. Local amendments
 - 1. Jurisdictions can change requirements
 - b. System goals
 - i. Code is a minimum, not a maximum
 - ii. Occupant notification
 - 1. Who needs to know what is happening
 - 2. When do they need to know
 - iii. Property protection
 - 1. Activation of other fire protection systems
 - 2. Notification of fire service
 - iv. Business continuity
 - 1. For some companies, there is a maximum time that they can be shut down
 - a. Design system to limit fire size and/or fire spread
- II. Types of fire alarm signaling systems
 - a. Protected premises
 - i. Only alert occupants present
 - 1. Pre-signal allows someone to investigate before notifying occupants
 - 2. Conventional alarm allows to know which circuit alarm is on
 - 3. Zoned allows to know where fire is occurring
 - ii. Activation
 - 1. Automatic
 - 2. Manual
 - b. Central station
 - i. Commonly used
 - 1. They are the alarm company that is notified when doing ITM
 - ii. Alarm sent to independent company that monitors system
 - 1. Monitoring system at all times
 - iii. Will send out technicians for problems
 - 1. Keeps records
 - iv. Will notify fire department

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- c. Proprietary
 - i. Essentially the same as the central station
 - 1. Operated by building owner
 - d. Remote
 - i. Alarm sent directly to fire department
 - ii. Only respond to alarms, not system problems
 - e. Auxiliary
 - i. Coded signal sent to public system
 - ii. Community must have one in order for this to be a choice
- III. Fire Alarm Control Unit (FACU)
 - a. Brain of the system
 - i. Interprets signals
 - 1. From initiating devices
 - 2. Must have only one type of information on a given circuit type
 - ii. Initiates response
 - 1. Follows alarm matrix to give correct responses for each input
 - iii. Extensive programming
 - 1. Can be many inputs with different outputs
 - 2. Can be cause of error
 - b. Historically all systems hardwired
 - i. Analog and digital systems
 - ii. Detectors normally open
 - iii. Conventional system with end of line resistor to monitor integrity
 - iv. Two-wire (not fault tolerant) or four-wire (fault tolerant)
 - v. Optical fiber now used in some systems to increase speed and data quantity
 - vi. Wireless and remote options now allowed by the codes
 - c. Located so that fire department can have easy access
 - i. Main entrance
 - ii. Firefighter Command Center
 - 1. Will have other panels there as well
 - iii. Other place approved by AHJ
 - d. Signals
 - i. Latching: Signals that come in and stay indicated on the panel until the problem has been solved and the system reset
 - 1. Initiated response stays in effect
 - ii. Non-latching
 - 1. When condition clears, indicating light and response stops
 - e. Records
 - i. Must have printed record
- IV. Indicating lights on FACU
 - a. System operating
 - i. Green light
 - ii. Indicates that panel is receiving power
 - b. Alarm
 - i. Red light

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- ii. Indicates that a detector indicates a fire
 - c. Trouble
 - i. Yellow light
 - ii. Indicates that the fire alarm system might not work properly if there is a fire
 - iii. Must be fixed in a timely manner
 - d. Supervisory
 - i. Yellow light
 - ii. Indicates that a fire protection system other than the alarm system might not work properly if there is a fire
 - iii. Must be fixed in a timely manner
 - e. Silence
 - i. Audible notification has been turned off
 - 1. Panel still indicates alarm
 - 2. Visual notification still active
 - f. Graphical interface
 - i. Gives the user an indication of where the signal is coming from
 - 1. The circuit that initiated the signal
 - 2. The device or appliance that initiated the signal
- V. Sprinkler system supervision
 - a. Valves that, when in the incorrect position, will prevent the system from operating
 - b. Air pressure in the system
 - i. Pressure too high, takes too long for system to respond
 - ii. Pressure too low, system could accidentally activate
 - c. Low temperature warning
 - d. Water level in storage tank
 - i. Level too high, could damage equipment
 - ii. Level too low, might not have enough water to control fire
 - e. Pump
 - i. Anything that might mean that the pump will not respond as it is supposed to