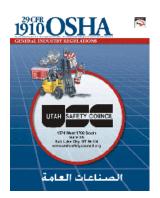


Fire Safety Basics II: Detection & Warning Systems





يتم تدرس هذا الموضوع في دورات أوشا التالية:

☐ OSHA 510: Occupational Safety and Health

Standards for the Construction Industry.

☐ OSHA 511: Occupational Health and Safety

Standards for General Industry.

□OSHA 2015: Hazardous Materials

سبتمبر 2011 جزيرة تاروت، السعودية

دورات الاوشا

إذا أردت دورات الاوشا بصيغة بوربوينت، عليك ترجمة موضوعين للغة العربية من دورات المقدمة في موقع "هندسة الإطفاء والسلامة".

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Fire Safety Basics II: Detection & Warning Systems

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Fire Detection Systems

The detecting part of a fire protection system has two main tasks:

- (1) giving an early warning to enable building occupants to escape and
- (2) starting extinguishing procedures.

 Smoke Detectors: respond to the particles of combustion, both visible and invisible which occur during the second fire phase; conventional operates on a light principle (less or more light trigger); smoke scatters or absorbs light;



- Photoelectric detectors (line powered w/ annunciation - warning - in case of lamp failure); esp. for smoldering fires
 - beam type- obscuration- light directed at a photocell, smoke obscures beam, decreasing transmission

- Photoelectric detectors (line powered w/ annunciation - warning - in case of lamp failure); esp. for smoldering fires
 - reflected beam uses a beam of light in a in a chamber w/ a photocell normally in darkness. Smoke particles enter and scatter light and reflect to the cell

- ionization detectors (sense both visible and invisible products of combustion). System contains a chamber w/ positive and negative plates and a small amount of radioactive material (Am, Ir) that ionizes air in the chamber; the potential btwn the plates causes ions to move across the chamber, setting up a current;

- when aerosols from a fire enter the chamber, they cling to the moving ions, which slows them and increases the voltage necessary to keep the current moving and make contact; hence, an alarm;

Ionization Detectors

- single chamber current flows btwn 2 poles and detects increased voltage from combustion aerosols
- dual chamber 2 identical sources of radiation, one sealed chamber, the other open to the air. The inner chamber monitors ambient conditions and compensates for changes due to BP, temp, and RH.

Ionization Detectors

 low voltage - (24 v) less costly to operate, more costly to install;

Flame detectors:

 Respond to the optical radiant energy of combustion, usually at IR area of spectrum; 5-30 Hz range, can be sensitive to bright sunlight; fast responding; UV types insensitive to sunlight;

Alarm Systems

- Local- building notification
- Auxiliary local with circuitry to a master box
- Remote as defined
- Proprietary supervisory system
- Central station service system

Local Alarm

- A local alarm consists of warning devices right in the building.
- Local alarms are generally used for life protection—, to evacuate everyone
- can be tied in with another system to summon the fire department.
- Inexpensive

Auxiliary

- less expensive than local alarm system
- ties a fire detector to a nearby fire call box
- In effect a relay station triggered by fire detectors inside the building.

Central Alarm

- available in most major cities
- continually monitors a number of establishments
- in case of an alarm, calls a nearby fire station and alerts the building's personnel
- May provide maintenance, inspection and follow up to alarms.

Proprietary Alarm

- feed alarms to the building's own fire watcher or maintenance force
- Optionally to the fire department as well



Signals

- Trouble
- Notification
- Evacuation
- Waterflow
- Voice
- Visual





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