## Types of Threats

* Natural, or man made
* Fire and smoke, water
* Storms
* Sabotage, vandalism
* Utility loss (power, HVAC, water)
* Equipment failure
* Personnel loss (strikes, illness, access, transport)

## Motion Detectors

* **Infrared**: changes to infrared lighting patterns
* **Heat-based**: changes in heat levels in monitored area
* **Wave pattern**: transmits a consistent low **ultrasonic** or high **microwave** frequency pattern and monitors for disturbances
* **Capacitance**: changes to the electrical or magnetic field near a protected object
* **Photoelectric**: changes in light levels (use in dark room)
* **Passive audio**: listens for abnormal sounds
* Local alarm – broadcast audible alarm signal heard up to 400 ft
* Centralized alarm – notifies a central monitoring system, may not have local alarm
* Auxiliary alarm – notifies local emergency services

## Problem with Power

Fault - momentary loss of power

Blackout - complete loss of power

Sag - Momentary low voltage

Brownout - Prolong low voltage

Spike - Momentary high voltage

Surge - prolonged high voltage

Noise - steady interfering power disturbance or fluctuation

Transient - short duration of line noise disturbance

Clean - nonfluctuating pure power

Inrush - initial power surge usually associated with connecting to a power source, whether primary or alternate/secondary

**Fire extinguisher types**

|  |  |  |  |
| --- | --- | --- | --- |
| **Stage** | | **Description** | |
| 1 | Incipient | Air ionization, no smoke | |
| 2 | Smoke | Visible smoke at point of ignition | |
| 3 | Flame | Flame can be seen by naked eye | |
| 4 | Heat | Everything in the area burns | |
| **Class** | **Type** | **Examples** | **Suppression** |
| A | All combust-ibles | Paper, wood | Water, soda acid |
| B | Burnable liquids | Gas, oil | CO2, Halon, soda acid |
| C | Computers and electrical | Computer equipment | CO2, Halon |
| D | ‘Da rest  (Metal) |  | Dry powder |
| K | Kitchen | Grease |  |

**The trouble with Halon:**

* Toxic gas
* Not environmentally friendly
* Montreal Protocol – contact Halon recycling facility instead of contacting a vendor
* There are EPA-approved replacements for Halon:

FM-200(HFC-227ea), CEA-410 or CEA 308, NAF-S-III (HCFC Blend A), FE-13 (HCFC-23), Argon (IG55) or Argonite (IG01), Inergen (IG541)

**Fire suppression systems**

|  |  |  |
| --- | --- | --- |
| **Wet pipe** | Always full of water | Immediate |
| **Dry pipe** | Compressed air, air escapes opening a valve, pipes fill and discharge water | Air escapes first |
| Deluge: dry pipe system which uses larger pipes and more water |
| **Preaction system** | Combination dry pipe / wet pipe system  Dry pipe until early stages of fire when pipe fills with water  Wet pipe triggered when sprinkler head is triggered by heat | Delayed, can be turned off in time to prevent damage to computers |

* Ideal temperature for computer room: 60 – 75F, 15 – 23C
* Ideal humidity: 40 – 60%
* Static electricity:
* 40V destruction of circuits
* 1,000V scramble monitor
* 1,400V destroy data on a hard drive
* 2,000V system shutdown
* Fences are perimeter-defining devices
* 1 – 2 ft marks the flower garden
* 3 – 4ft deter casual trespasser
* 6 – 7ft too hard to climb easily
* 8ft+ with barbed wire, deter determined intruder
* None stop a determined intruder

- Behavioral-based systems are also known as Profile-based system

- Common-mode noise is electromagnetic interference (EMI) that is noise from the radiation generated by the difference between the hot and ground wires

- Halon suppresses combustion through a chemical reaction that kills the fire

- Crime prevention through Environmental design (CPTED) is discipline that Outlines how the proper design of a physical environment can reduce crime by directly affecting human behaviour.

- Soda Acid suppresses the fuel supply of the fire.

- Dry pipe sprinkler system minimizes chances of accidental discharge of water.