



*it is about you feeling **SAFE***



Internal Support Systems

Internal Support Systems



■ Power Issues

- A continuous supply of electricity assures the availability of company resources.
- Data centers should be on a different power supply from the rest of the building
- Redundant power supplies: two or more feeds coming from two or more electrical substations

Internal Support Systems



- Power protection:
 - UPS Systems
 - ◆ Online UPS systems
 - ◆ Standby UPS System
 - Power line conditioners
 - Backup Sources

Internal Support Systems



- Other power terms to know:
 - Ground
 - Noise
 - Transient Noise
 - Inrush Current
 - Clean Power
 - EMI
 - RFI

Internal Support Systems



■ Types of Voltage Fluctuations

□ Power Excess

- ◆ Spike
- ◆ Surge

□ Power Loss

- ◆ Fault
- ◆ Blackout

□ Power Degradation

- ◆ Sag/dip
- ◆ Brownout
- ◆ Inrush Current

Internal Support Systems



- Environmental Issues
 - Positive Drains
 - Static Electricity
 - Temperature

Internal Support Systems



- **Environmental Issues: Positive Drains**
 - Contents flow out instead of in
 - Important for water, steam, gas lines

Internal Support Systems



■ Ventilation

- Airborne materials and particle concentration must be monitored for inappropriate levels.
- “Closed Loop”
- “Positive Pressurization”

Internal Support Systems



- Fire prevention, detection, suppression
- **“Fire Prevention:”** Includes training employees on how to react, supplying the right equipment, enabling fire suppression supply, proper storage of combustible elements
- **“Fire Detection:”** Includes alarms, manual detection pull boxes, automatic detection response systems with sensors, etc.
- **“Fire Suppression:”** Is the use of a suppression agent to put out a fire.

Internal Support Systems



- Fire needs oxygen & fuel to continue to grow.
- Ignition sources can include the failure of an electrical device, improper storage of materials, malfunctioning heating devices, arson, etc.
- Special note on “plenum areas:” The space above drop down ceilings, wall cavities, and under raised floors. Plenum areas should have fire detectors and should only use plenum area rated cabling.

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■ Types of Fire:

□ A: Common Combustibles

- ◆ Elements: Wood products, paper, laminates
- ◆ Suppression: Water, foam

□ B: Liquid

- ◆ Elements: Petroleum products and coolants
- ◆ Suppression: Gas, CO2, foam, dry powders

□ C: Electrical

- ◆ Elements: Electrical equipment and wires
- ◆ Suppression: Gas, CO2, dry powders

□ D: Combustible Metals

- ◆ Elements: magnesium, sodium, potassium
- ◆ Suppression: Dry powder

□ K: Commercial Kitchens

- ◆ Elements: Cooking oil fires
- ◆ Suppression: Wet chemicals such as potassium acetate.

Internal Support Systems



■ Types of Fire Detectors

- Smoke Activated
- Heat Activated

- ◆ Know the types and properties of each general category.

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- Different types of suppression agents:
 - Water
 - Halon and halon substitutes
 - Foams
 - Dry Powders
 - CO2
 - Soda Acid
 - Know suppression agent properties and the types of fires that each suppression agent combats
 - Know the types of fire extinguishers (A,B,C, D) that combat different types of fires

Internal Support Systems



■ Types of Sprinklers

- Wet Pipe Systems (aka Closed Head System)
- Dry Pipe Systems
- Precaution Systems
- Deluge Systems

Perimeter Security



■ Lighting

- Know lighting terms and types of lighting to use in different situations (inside v. outside, security posts, access doors, zones of illumination)
- It is important to have the correct lighting when using various types of surveillance equipment.
- Lighting controls and switches should be in protected, locked, and centralized areas.

Perimeter Security



- **“Continuous lighting:”** An array of lights that provide an even amount of illumination across an area.
- **“Controlled lighting:”** An organization should erect lights and use illumination in such a way that does not blind its neighbors or any passing cars, trains, or planes.
- **“Standby Lighting:”** Lighting that can be configured to turn on and off at different times so that potential intruders think that different areas of the facility are populated.
- **“Redundant” or “backup lighting:”** Should be available in case of power failures or emergencies.
- **“Response Area Illumination:”** Takes place when an IDS detects suspicious activities and turns on the lights within the specified area.

Perimeter Security



■ Surveillance Devices

- These devices usually work in conjunction with guards or other monitoring mechanisms to extend their capacity.
- Know the factors in choosing CCTV, focal length, lens types (fixed v. zoom), iris, depth of field, illumination requirements

Perimeter Security



- **“Focal length:”** The focal length of a lens defines its effectiveness in viewing objects from a horizontal and vertical view.
- The sizes of images that will be shown on a monitor along with the area that can be covered by one camera are defined by focal length.
 - Short focal length = wider angle views
 - Long focal length = narrower views

Perimeter Security



- **“Depth of field:”** Refers to the portion of the environment that is in focus
- **“Shallow depth of focus:”** Provides a softer backdrop and leads viewers to the foreground object
- **“Greater depth of focus:”** Not much distinction between objects in the foreground and background.