DLE 2083: INTRODUCTION TO SECURITY MANAGEMENT

CHAPTER 12

PHYSICAL SECURITY

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Chapter 12: Learning Outcomes

- At the end of the topic, students should be able to:
  - Defines physical security.
  - Explain the objectives of physical security.
  - Identify the threats to physical security.
  - Understand other important controls in physical security.

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Physical Security

- Physical security includes:
  - Layered defense model
  - Crime Prevention Through Environmental Design (CPTED)
  - Facility and infrastructure criteria

Physical Security

- Primary goal
  - **Life safety** is the **main goal** in physical security.
  - In emergencies, organization must ensure safety of personnel before safety of the facility or equipment.

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Objectives of Physical Security

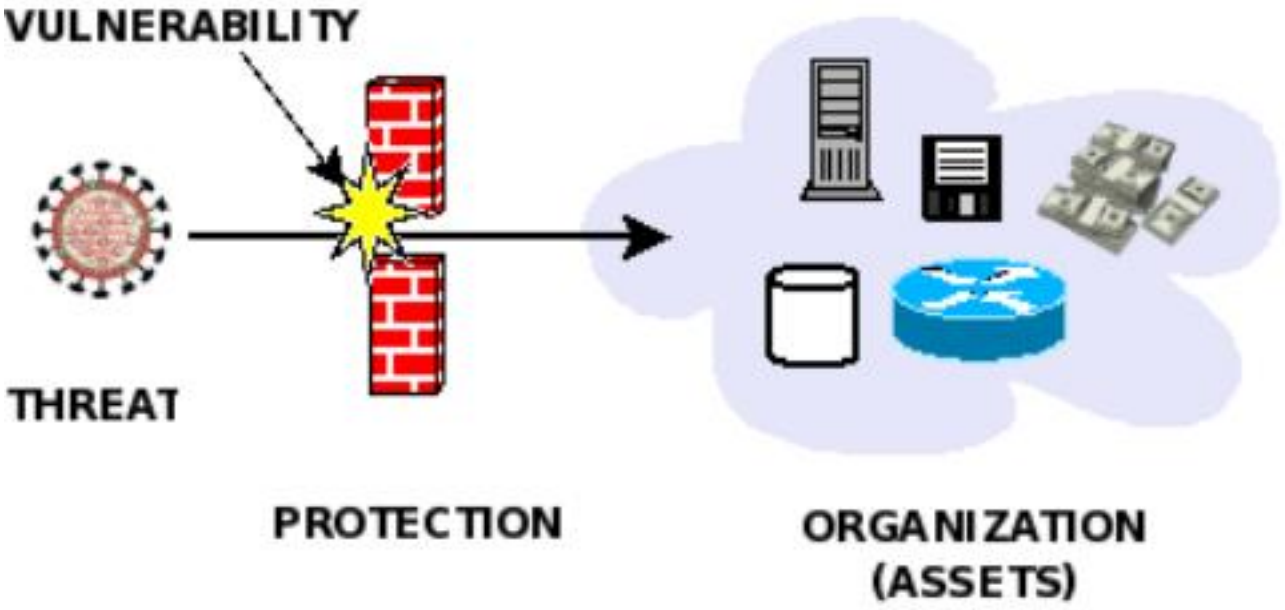
- Deterrence for crime and disruption
  - Convince threat agent not to attack
  - E.g. fence, security guards, etc.
- Delay to reduce damage
  - If attacked, delay long enough to detect and respond.
  - Layers of defense, barriers, etc.

Objectives of Physical Security

- Detection of crime or disruption
  - Develop capability to detect attacks that cannot be delayed forever.
  - For example install smoke detectors, CCTV, etc.
- Assessment
  - Once detected, assess the method of attack, the target, and remediation.
- Respond procedures
  - Take appropriate actions without overreacting (fire suppression, emergency response, etc.)

Site Risk: Threats to Physical Security

- Natural and environmental
- Utility systems
- Human-made or politics events



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Site Risk: Threats to Physical Security

- Malicious threat sources and countermeasure.
  - Theft
    - Countermeasure: strong access controls, IDS, locked doors, etc.
  - Espionage
    - Countermeasure: good hiring process, background checks, etc.
  - Dumpster diving
    - Countermeasure: proper disposal policy and procedure, etc.

Site Risk: Threats to Physical Security

- Malicious threat sources and countermeasure
  - Social engineering and shoulder surfing
    - Countermeasure: employee awareness program, etc.
  - HVAC access (Heat, Ventilation and Aircond)
    - Countermeasure: section lock downs to control access, smoke sensor, etc.

Perimeter and Security Engineering

- Security through multiple layered controls:
- E.g. perimeter, grounds, building entrances, etc.

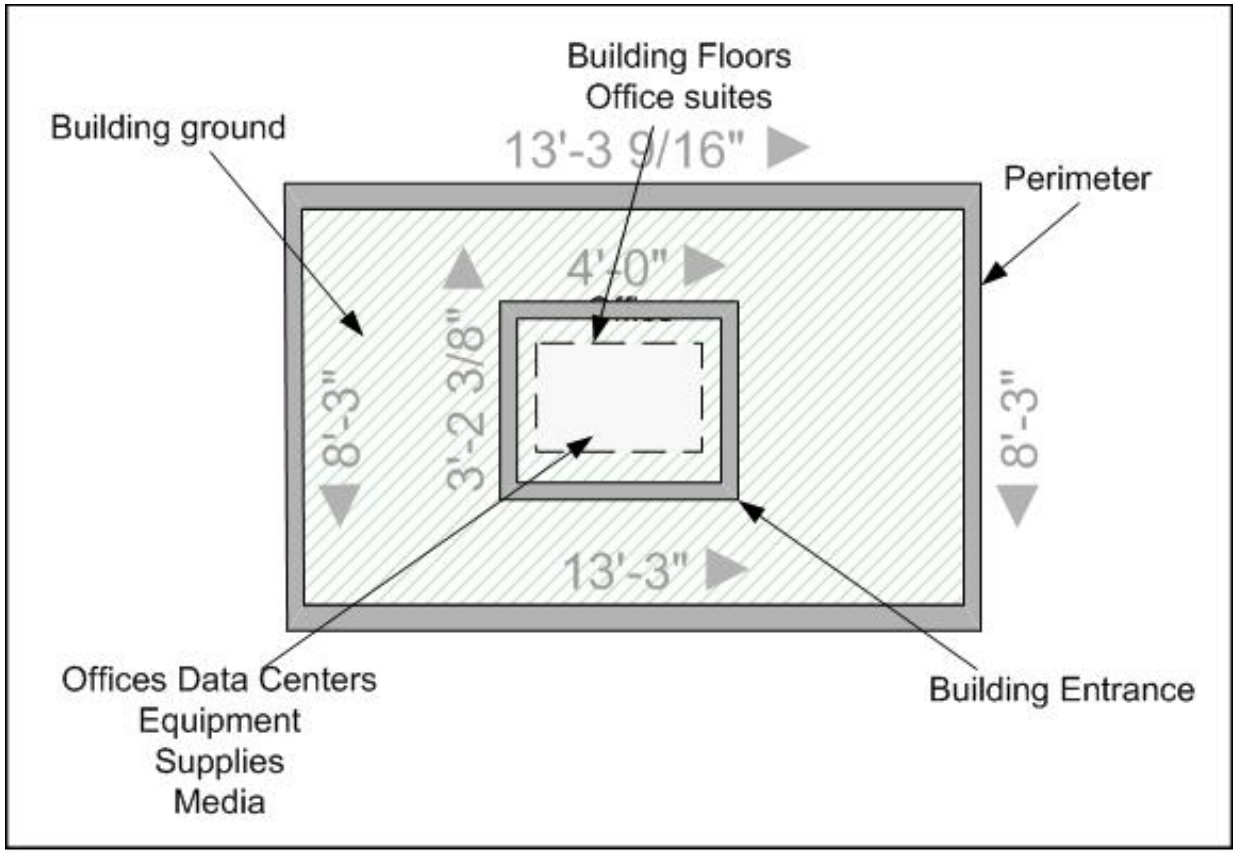

Figure 1

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Perimeter and Security Engineering

- **Perimeter security controls: First line of defense**
- Protective barriers either natural or structural
  - Offer natural barriers, such as terrain.
  - Structural barriers: fences, gates, bollards, and facility walls.
- Landscaping
  - Ponds, hedges can provide a barrier or entry point.
  - Spiny shrubs make it harder for an intruder to enter.

Perimeter and Security Engineering

- Fences
  - Enclose security areas and designate property boundaries.
  - Meet gauge and fabric specifications, etc.
- No parking near fences.
- Gates – minimum number needed.

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Perimeter and Security Engineering

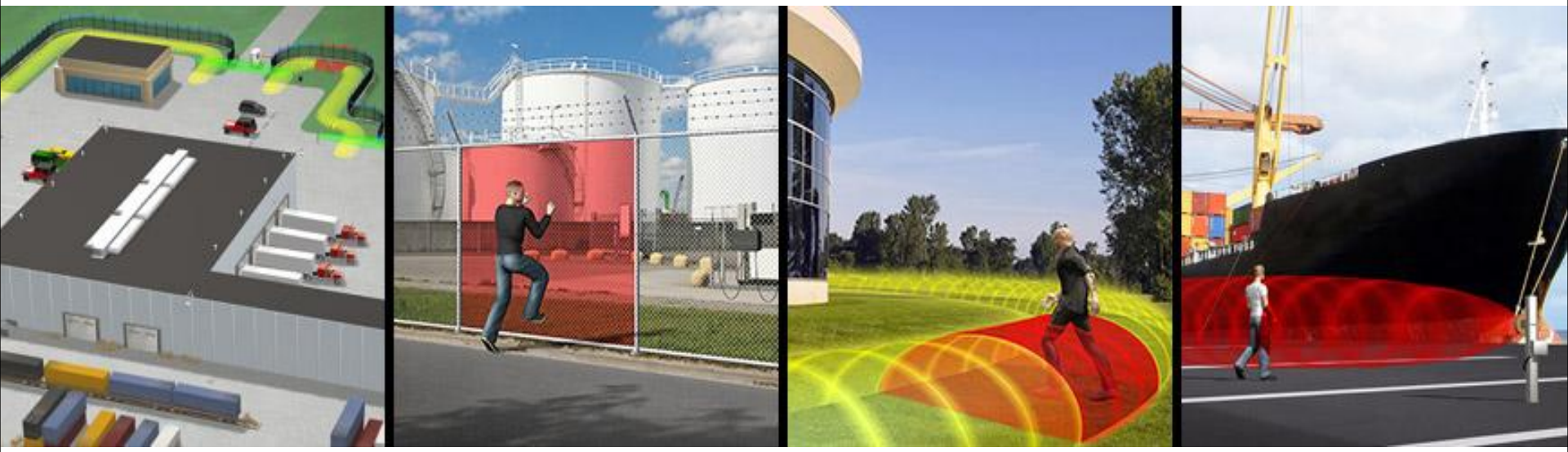
- Bollards
  - Variety of sizes and shapes depending on use.
  - Retractable ones are designed for traffic control.
  - Provide security against vehicles ramming into or stopping near buildings.
  - Lighted bollards can be used for lighting controls along parks, paths and sidewalks.

Perimeter and Security Engineering

- Perimeter – Intrusion Detection Systems (IDS).
- Detects unauthorized access into an area or site.
- Some of the characteristics are:
  - Photoelectric
    - Active infrared beam that triggers an alarm when crossed.
  - Ultrasonic
    - Ultrasound energy bounced off the floors, walls, objects. The receiver detects the foreign signal change caused by the intruder and sounds the alarm.
  - Microwave
    - Receiver diode picks up transmitted and bounced energy waves in an enclosure. Intruder disrupts the waves and activities.

Perimeter and Security Engineering

- Some of the characteristics are:
  - Passive infrared
    - Where objects radiate IR with the heat of their bodies. Detector notes change and triggers an alarm.
  - Pressure sensitive
    - Detects pressure on the sensor or surrounding area.



Surveillance and Counter-Surveillance

- CCTV is an excellent tool for security.
  - Not a simple security device.
  - Blind-spots, motion detection systems, and workplace privacy.
- CCTV capability requirements:
  - Detection
  - Recognition
  - Identification

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Surveillance and Counter-Surveillance

- Mixing capabilities
  - Provide joint capabilities.
- Virtual CCTV Systems
  - Fake systems (dummy) that are installed as a deterrent.

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Surveillance and Counter-Surveillance

- CCTV have three main components:
  - Camera lens
    - Fixed
    - Zoom
    - Automatic iris
  - Transmission media
    - Wired or Wireless
  - Display monitor
    - National television System Committee (NTSC)
    - Phase Alternative Line (PAL)

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Additional CCTV System Equipment

- Pan and tilt units
- Panning device
- Mountings
- Switchers/multiplexers
- Remote camera controls
- Infrared illuminators
- Time/date generators
- Videotape or digital recorders
- Motion detectors
- Computer controls

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CCTV Concerns

- Total surveillance
- Size in terms of depth, height, and width
- Lighting
- Contrast

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Security Lighting

- Use with other controls
- Support crime prevention
- Types of lighting:
  - Continuous
    - A series of fixed lights arranged to flood a given area during hours of limited visibility.
  - Trip
    - Activated by sensor that detects activity such as movement or heat.
  - Standby
    - Like continues lighting but lights not always on but are turned on either automatically or manually when suspicious activity suspected.
  - Emergency
    - Is used for power failures or other emergencies that render normal system inoperative.

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Building Entry Point Protection

- Locks
  - Considered as delay devices mechanism to unauthorized to entry.
- Lock components
  - Lock body
  - Strike and strike plate
  - Key
  - Cylinder
- Types of locks
  - Combination
  - Deadbolt
  - Keyless
  - Smart

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Other Important Controls

- Guards and guard stations
  - Provide a deterrent
- Electronic physical controls
  - Card access
  - Biometric methods
- Compartmentalized areas
  - Extremely sensitive location and most stringent security controls
  - Multi-layered physical access controls

Other Important Controls

- Data center and server room security
  - Wall solid with fire-proof material and permanent part of floor and ceiling.
  - Multi-factor access controls
- Computer equipment protections
  - Laptop and portable device security
    - Docking stations, tracing software, etc.
  - Computer equipment security
    - Protecting the device, data, etc.
  - Objects placed inside security containers
    - Safes, vaults, etc.

Site Location and Security Services

- Site security
  - Location of building?
  - Where to build?
  - Surroundings
    - Highway
    - Airport
    - Military base, etc.
  - CPTED should be part of the process.

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Site Location and Security Services

- Facility security
  - Entry points
    - Primary and secondary entrances
    - Windows, etc.
  - Doors
    - Fire proof door vs. security door
    - Isolation of critical areas
    - Lighting of doorways, etc.
  - Windows
    - Standard plate glass
    - Tempered glass, etc.

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Infrastructure Security

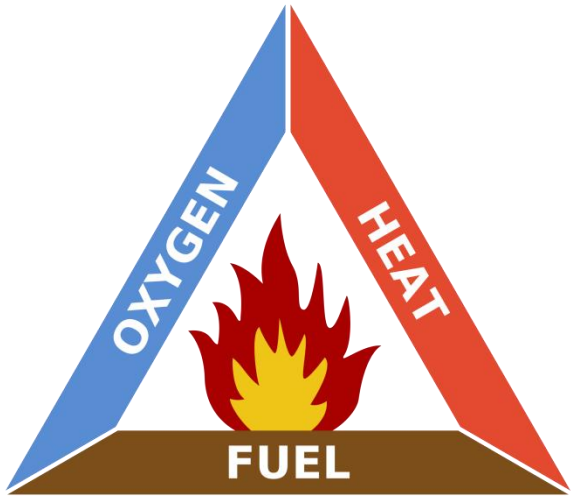
- Infrastructure support systems
  - Electrical power
  - Water/plumbing
  - Network lines, etc
- Key threats to support the system
  - Fire: damage and destruction of facilities
  - Water: flooding or dripping
  - Power loss: disruption or stop operations
  - Gas leakage: explosion
  - HVAC failure: overheating or overcooling, etc.

Electrical Power Faults (SPOF)

- Complete loss of power
  - Blackout
  - Fault
- Power degradation
  - Brownout (under-voltage)
  - Sag (under-voltage)
  - Surge (over-voltage)
  - Spikes (over-voltage)
- Interference (noise)
  - Electromagnetic Interference (EMI)
  - Radio Frequency Interference (RFI)

Fire

- Concerns:
  - Abiding by fire codes
  - Fire containment system
  - Fire extinguishing system
  - Fire prevention training and drills
- Protection:
  - Fire prevention
  - Fire detection
  - Fire suppression



Fire Types and Suppression

- Common combustion (fuel + oxygen + heat)
  - Suppression: water, foam, dry chemicals
- Liquid
  - Suppression: gas, CO_2, foam, dry chemicals
- Electrical
  - Gas, CO_2, dry chemicals
- Combustible metals
  - Dry powders
- Cooking Media
  - Wet chemicals