8. Security and Physical Protection
Basic Concepts
A physical protection system is the integration of **people, procedures, and equipment** for the protection of assets or facilities against theft, sabotage, or other malicious human attacks.
Objective: Prevent Theft and Sabotage

- Deter the Adversary
  - Implement a PPS which all adversaries perceive as too difficult to defeat
  - Problem: deterrence is impossible to measure

- Defeat the adversary with PPS
  - PPS functions required: detection, delay, response
  - Actions of response force prevent adversary from accomplishing his goal
Physical Protection System Functions

PPS Functions

Detection
- Intrusion Sensing
- Alarm Communication
- Alarm Assessment
- Entry Control

Delay
- Passive Barriers
- Active Barriers

Response
- Interruption:
  - Communication to Response Force
  - Deployment of Response Force
- Neutralization
Detection

Performance Measures:
- Probability of Sensor Alarm ($P_S$)
- Time for Communication and Assessment ($T_C$)
- Frequency of Nuisance Alarms (NAR)
- Probability of Assessment ($P_A$)
- $P_D = F (P_S, T_C, NAR, P_A)$
Delay

Provide Obstacles to Increase Adversary Task Time

Physical Barriers

Protective Force (Guards)

Performance Measure: Time to Defeat Obstacles
Response

Performance measures

- Probability of communication to response force
- Time to communicate
- Probability of deployment to adversary location
- Time to deploy
- Response force effectiveness

Communicate to Response Force ➔ Deploy Response Force ➔ Neutralize Adversary Attack
The Principle of Timely Detection

Deter Actions

Mitigate Results

Begin Action

Task Complete

Adversary Task Time

Delay

PPS Time Required

Defeat Adversary

First Alarm

Detect

Alarm Assessed

Respond

Adversary Interrupted

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Time
Example Hospital Facility
Neutralization

- Very difficult to measure
- Subject matter experts
- Tabletop exercises
- Force-on-force exercises
- Computer simulation models

- The winning combination:
  - Right people
  - Right equipment
  - Right training