PHYSICAL PROTECTION PRINCIPLES

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WHAT IS PHYSICAL PROTECTION SYSTEM?

It is the integration of people, procedures, and equipment for the physical protection of assets or facilities.

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WHY PHYSICAL PROTECTION SYSTEM?

To prevent, protect and response against theft, sabotage, malicious activities or other malevolent human attacks

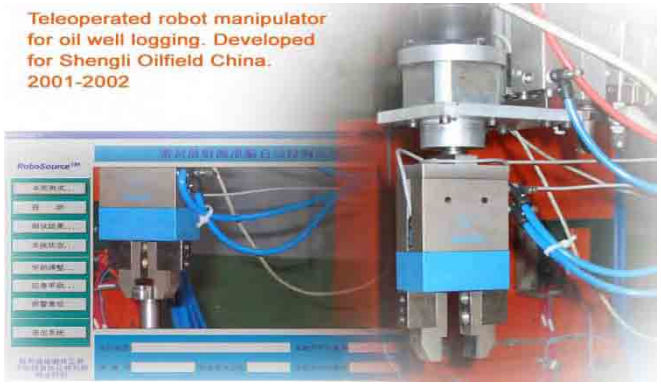
Malicious Activities

Theft

Sabotage

What is to be Protected ?

- Facility
- Process
- Material



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PHYSICAL PROTECTION SYSTEM

What is the principle of Physical Protection System?

4 **D**s of PPS

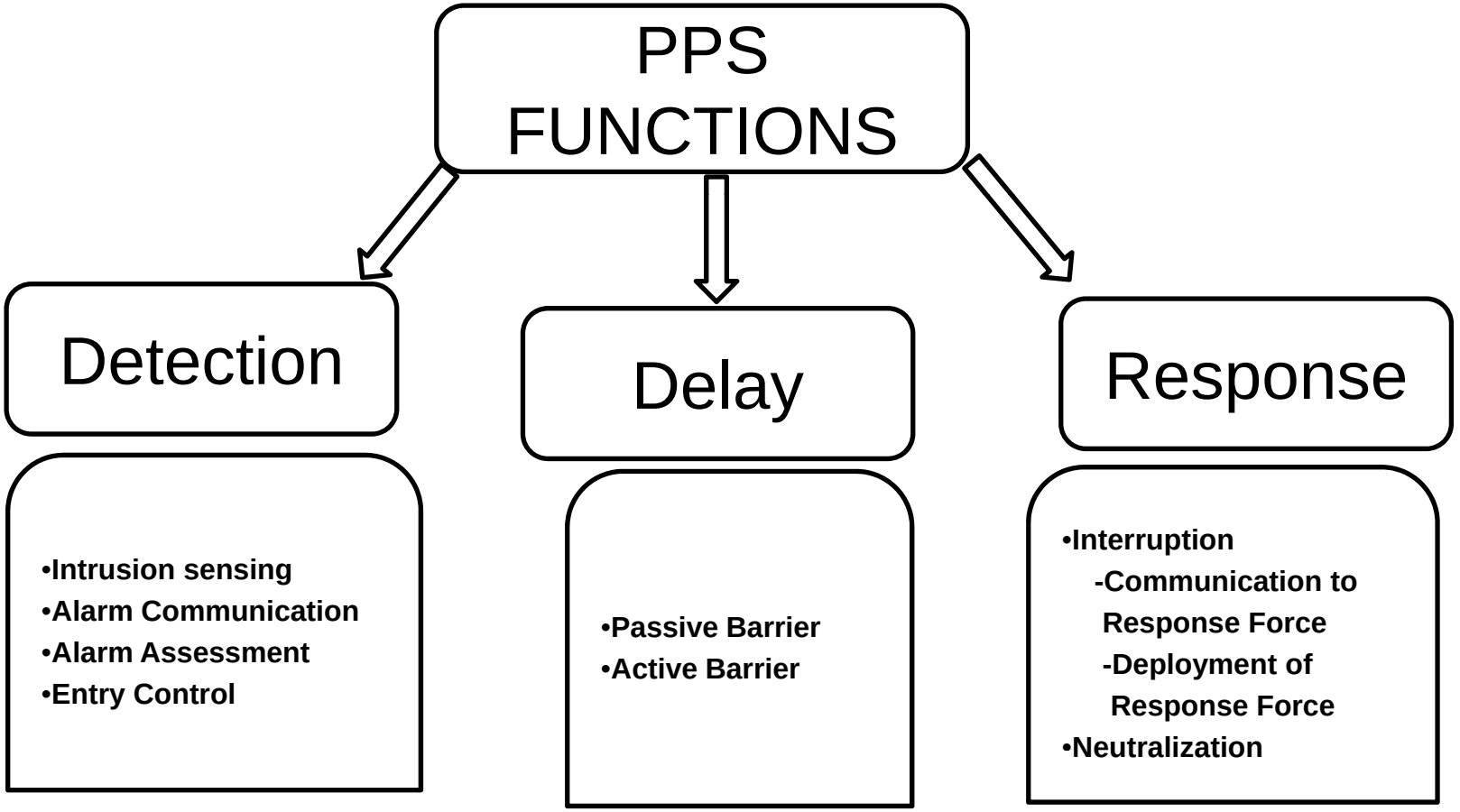
Deter

Detect

Delay

Defeat

WHAT IS THE MAIN FUNCTIONS OF PPS?



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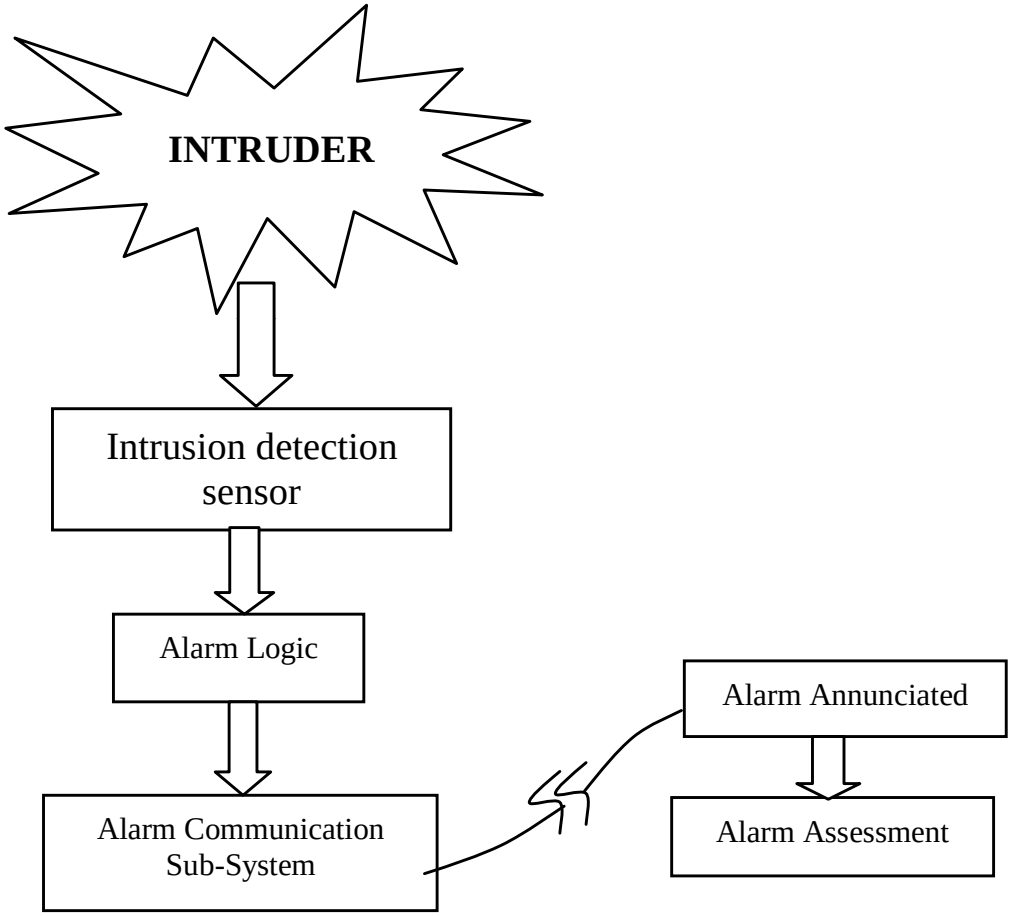
DETER

Deter the Adversary. How?

- Implement a PPS which adversary perceive as too difficult to defeat. Psychological barrier towards sabotage / theft attempt.
- Fence – Gate – Gun, Laws & Regulations, Security Gadgets, Armed Security Personnel.

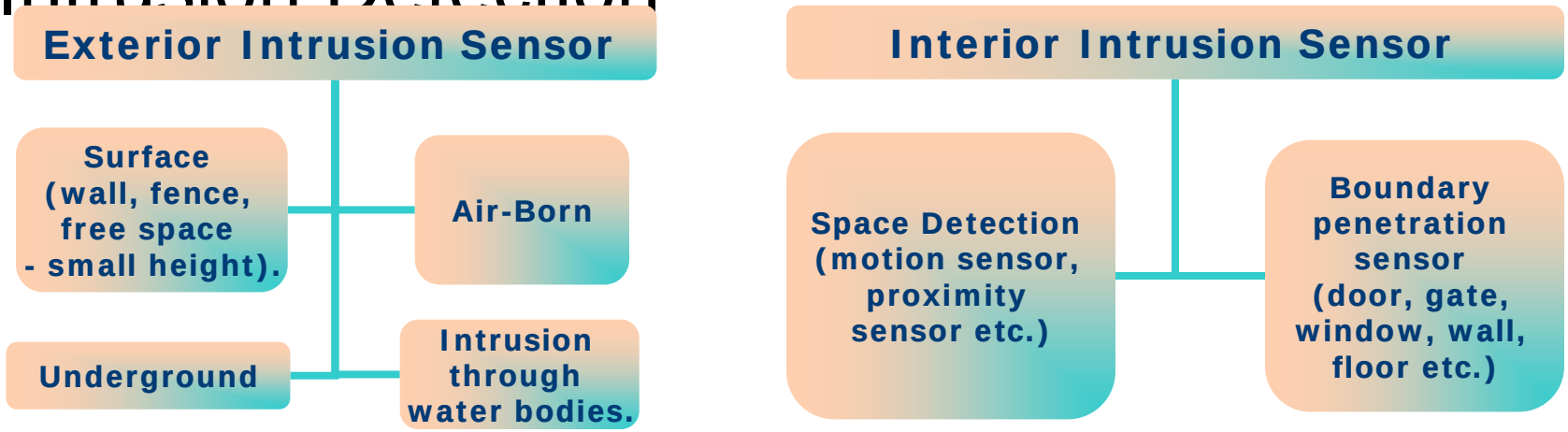
Deterrence is impossible to measure.

DETECTION


INTRUDER
Intrusion detection sensor
Alarm Logic
Alarm Communication Sub-System
Alarm Annunciated
Alarm Assessment
INTRUSSION DETECTION
ALARM REPORTING SYSTEM

DETECTION

Intrusion Detection



DETECTION

Detection Performance Measures

- Probability of Detection (Pd)
  - Probability of Sensor Alarm (Ps)
  - Time for Communication and Assessment (Tc)
  - Nuisance Alarm Rate (NAR)
  - Probability of Assessment (P_A)
  - Pd = F (Ps,Tc, NAR, P_A)
- Ease / Difficulty in Defeating Sensor
- Vulnerability to different weather condition

DELAY

Delay is the slowing down the adversary progress

- Physical barrier walls
- Access control
- Locks
- Multiple delay elements
- PPS Area Zoning
- Guard Forces

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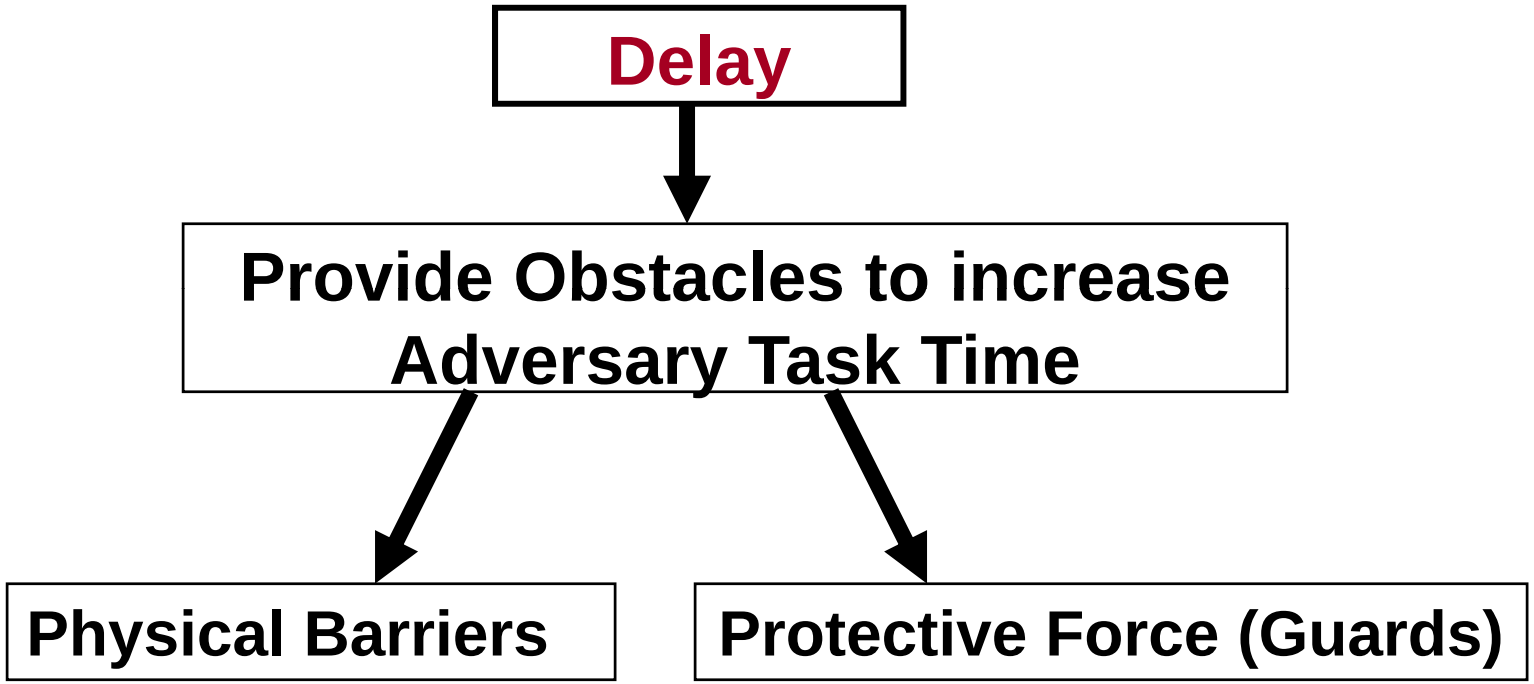
DELAY



- **Performance measures**
  - **Time to defeat obstacles (T_D)**

ELEMENTS OF DELAY

Barriers

In Place:
Fail Secure

Commercially Available

Weak Against Explosives

Operational: visual Limitations

Protective Force Guards

Flexible

Continuous Operational Cost

Sensitive in Numbers

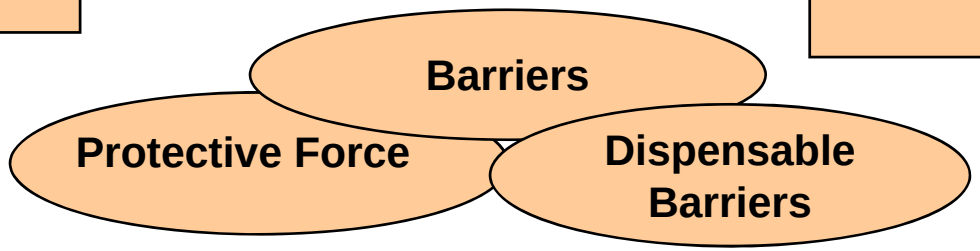
Subject to Compromise

Dispensable Barriers

Compact: Rapidly Deployed

Maximize Target Delay

"Somewhat" Threat Dependent



DELAY

- **Delay should be present 100% of the time.**
- **Balanced Design**
- **Delay in Depth**
- **Vehicle delay is important to limit adversary tools**
- **Explosives can defeat elements but cause collateral damage**
- **Same barrier offer different delay times depending on their location, the attack, tools, adversary skill etc.**

RESPONSE

Response Force is the Last line of the Defense against adversary progress towards the Target.

RESPONSE

RESPONSE

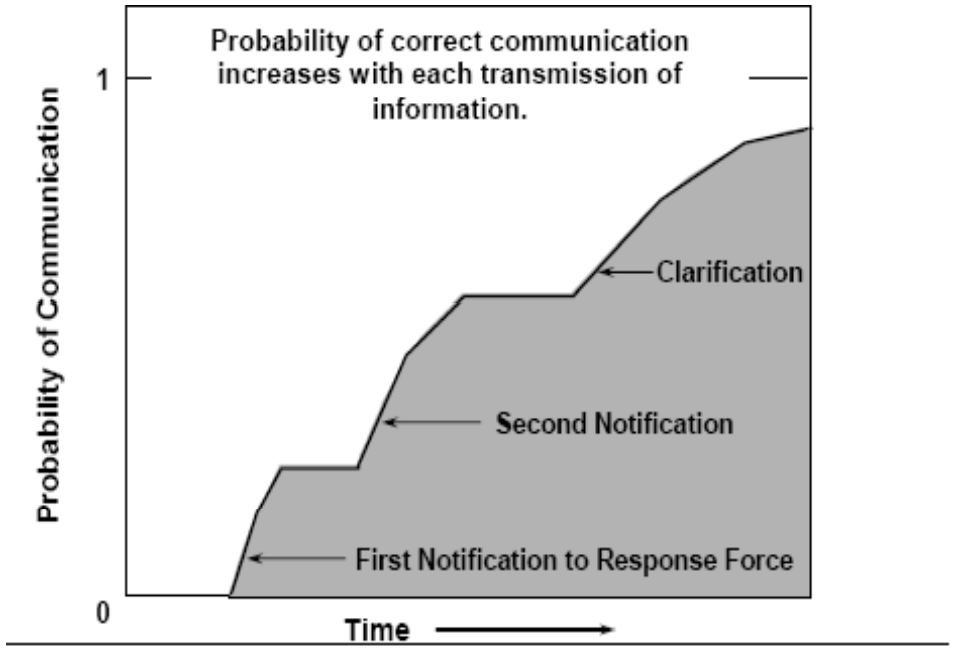
- **ON-SITE** RESPONSE
- **OFF-SITE** RESPONSE

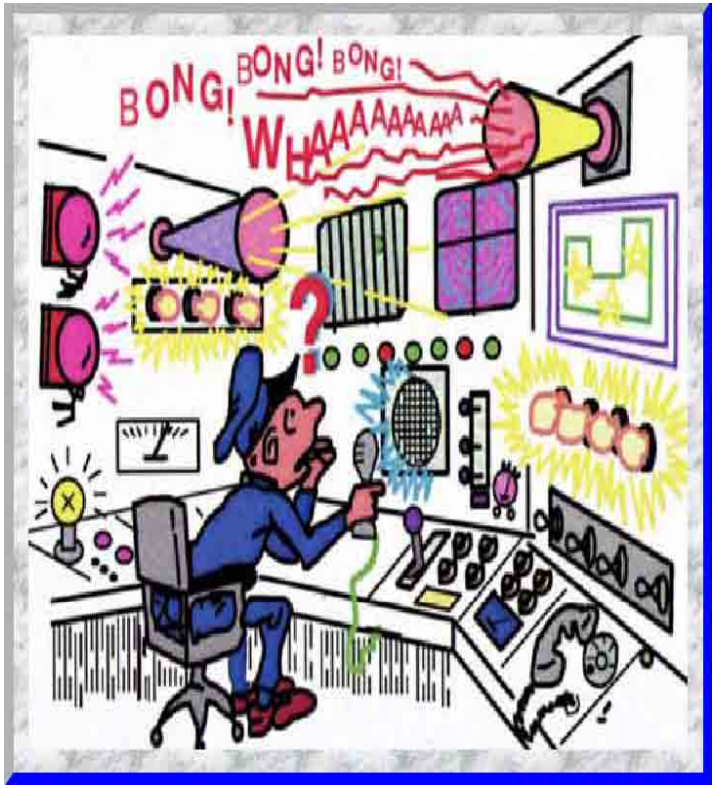
Performance measures

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

RESPONSE

Probability of communication to Response Force





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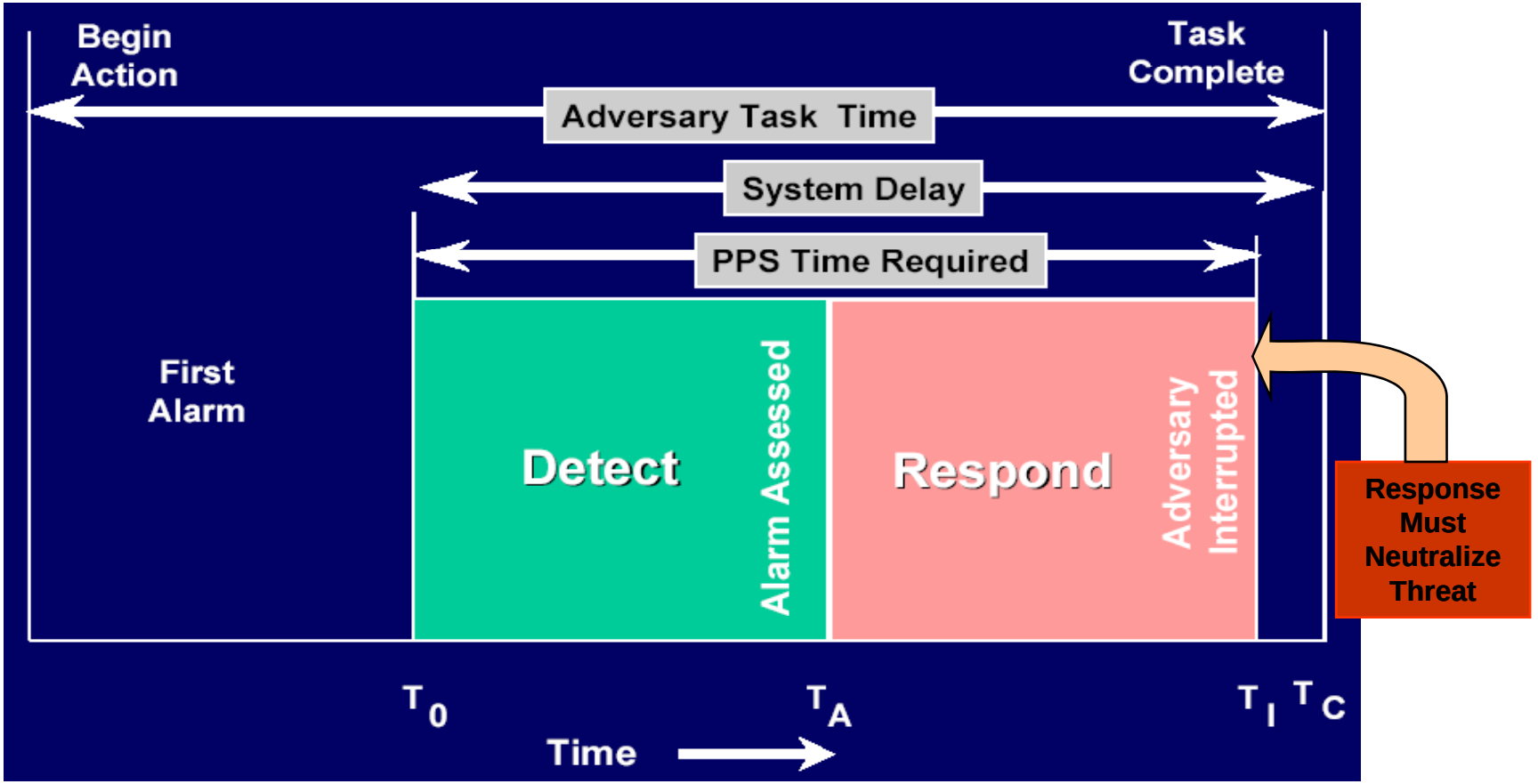
PROBABILITY OF DEPLOYMENT

- **Response Force Location**
- **Transport**
- **Training and tactics**
- **Adversary tactics:**
  - ✓ **Ambush**
  - ✓ **Diversion**
  - ✓ **Vehicle bomb**

RESPONSE FORCE EFFECTIVENESS

- **Effectiveness measure: probability of neutralization**
- **Ability of the response force to neutralize the adversary:**
  - **Kill**
  - **Capture**
  - **Cause to flee**

PPS TIMELINE



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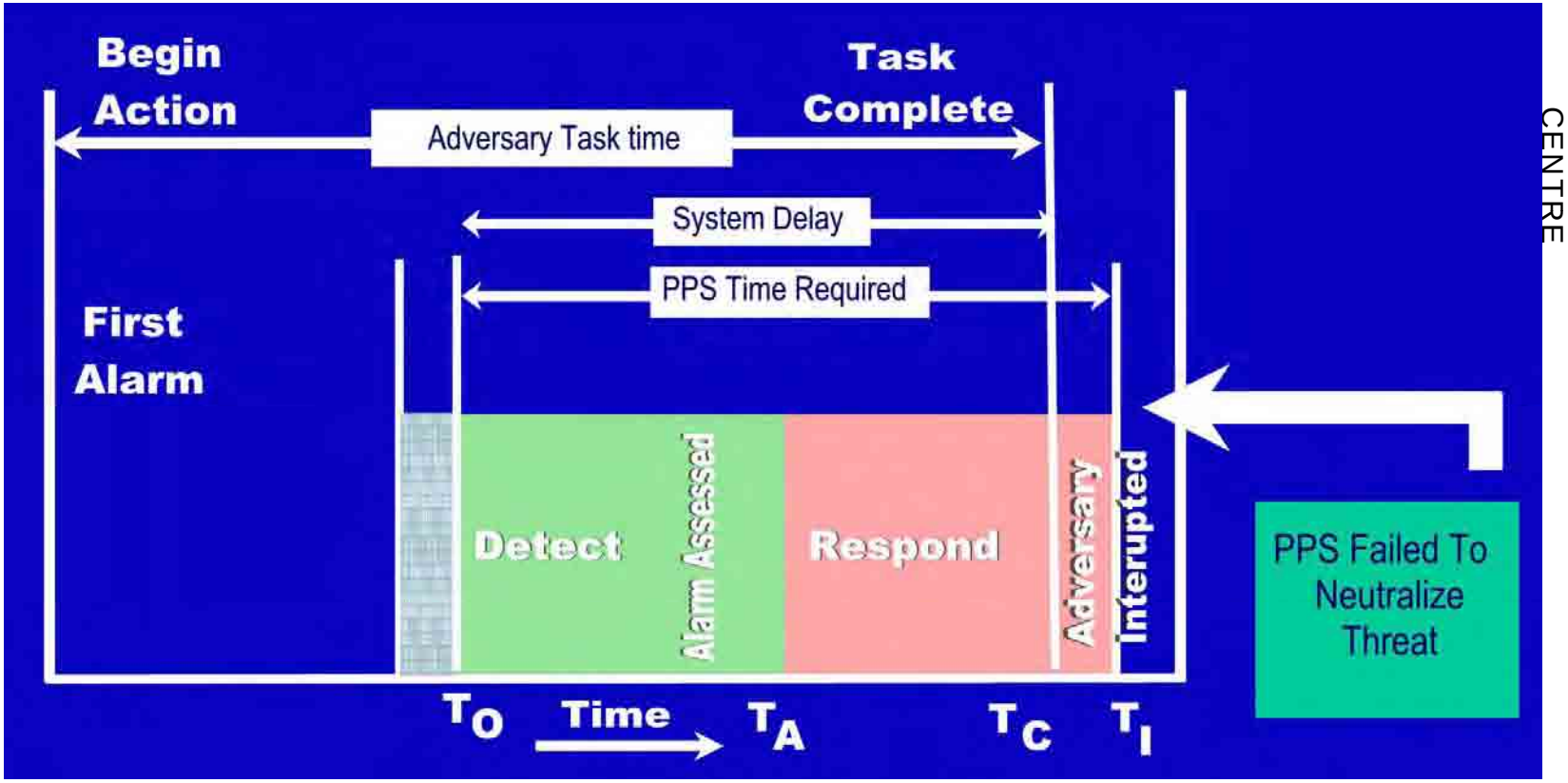
PPS TIMELINE

System detection and response time must be less than adversary task time (the system delay time after detection).

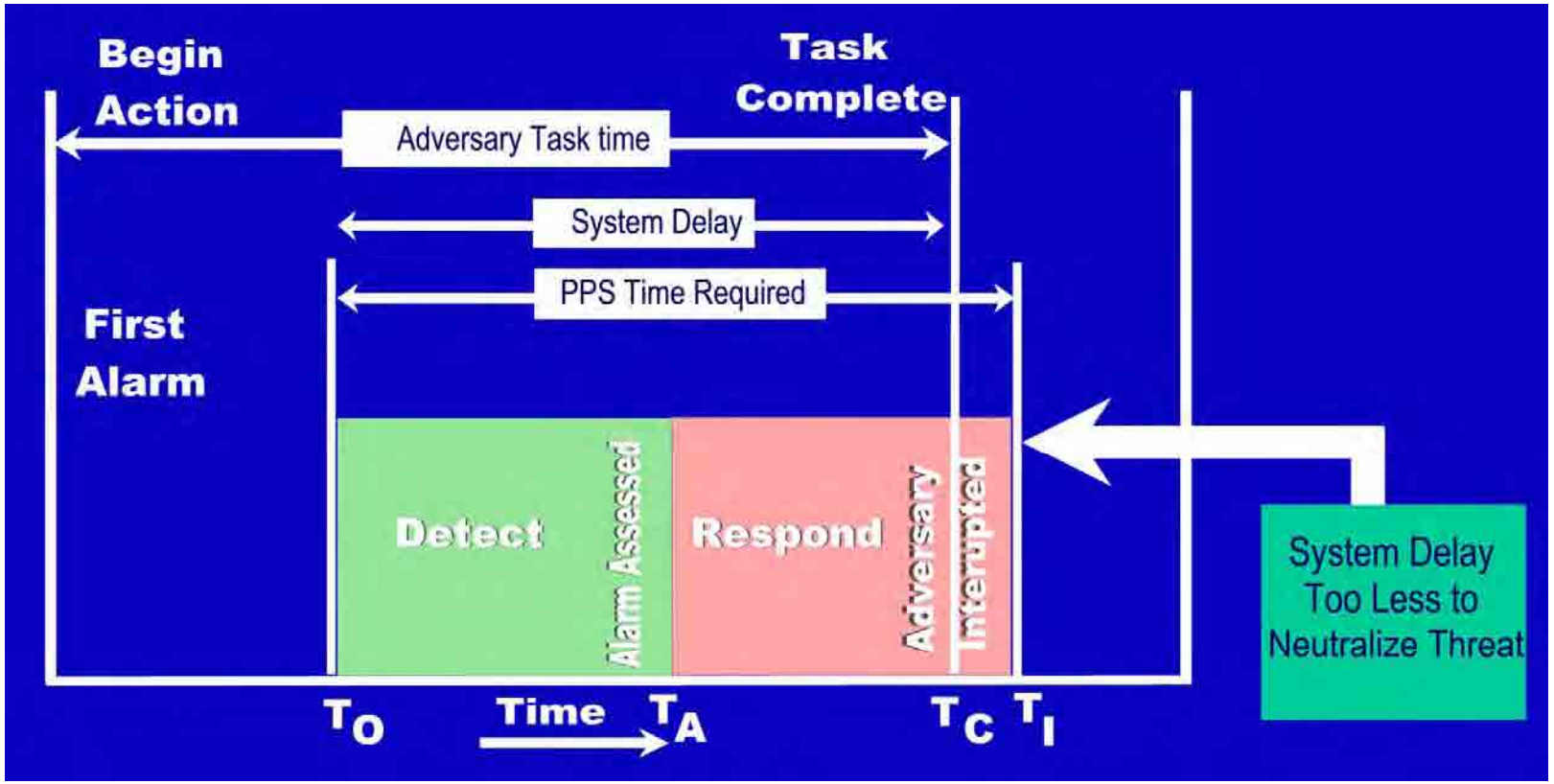
How to achieve

- **Detect adversary attempt early**
- **Reduce assessment time**
- **Reduce response time**
- **Increase Delay time (adversary task time)**

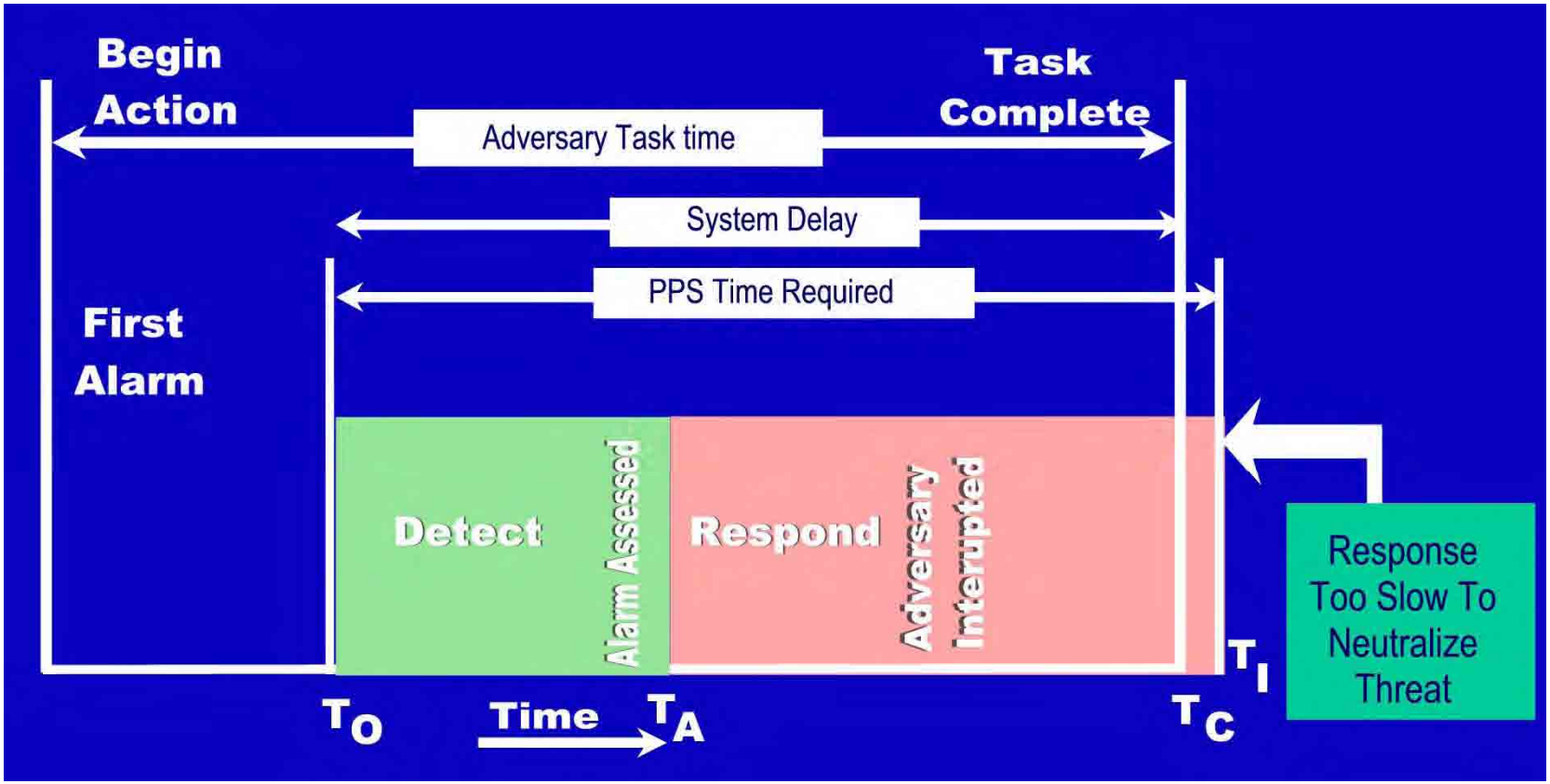
EFFECT OF LATE DETECTION



EFFECT OF INSUFFICIENT DELAY



EFFECT OF DELAYED RESPONSE



PHYSICAL PROTECTION SYSTEM- Summary

Effective Physical Protection System will provides adequate protection against all threats along all paths (over, under, around, through) but yet still facilitate the need for beneficial use of the source/facility.

Thanks You

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