National Nuclear Security Administration

United States
Department of Energy
National Nuclear Security Administration

International Nuclear Security

M5-C: PPS Design – Delay

Research Reactor Sabotage Protection Workshop

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INS International Nuclear Security
Reducing Risk of Nuclear Terrorism

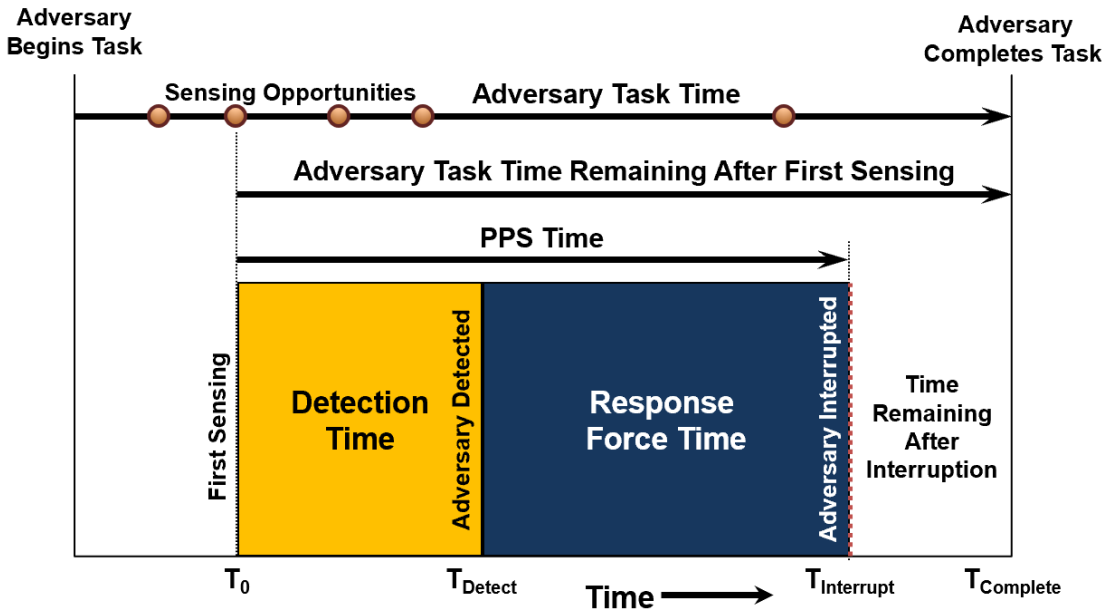
Learning Objectives

Objectives:

- Understand considerations for the implementation of vehicle and personnel barrier systems
- Discuss approach for delay time estimation

Delay as an Element of PPS

- Detect – **Delay** – Respond
- Goal
  - Prevent adversary vehicle access
  - Force adversary to use predictable routes
  - Delay adversary's progress and facilitate neutralization
- Principles
  - Delay after detection
  - Balanced delay
  - Integration with the response protective strategy
  - Designed to ensure safety of personnel and facility operations



Vehicle Barrier Systems

- Vehicle barriers are recommended for HRC facilities to
  - Keep stand-off threats away from target areas
  - Prevent direct vehicle access to the building structure
  - Force adversaries to travel on foot
  - Make the removal of theft target material more difficult

- Passive vehicle barriers
  - Natural terrain
  - Engineering features

- Active vehicle barriers

Personnel Barriers

- Fences
  - Prevent casual access
  - Are not significant barriers but can help to channelize adversaries
- Structural barriers
  - Nuclear-grade building structures are robust due to safety reasons
  - Doors and windows present a natural pathway
- Specialized barriers (shark cages, etc.)
  - Can provide significant delay against common threats

Breaching Tools

- Delay must be designed and evaluated against the postulated threat capabilities

How to Estimate Delay Time

- Understand DBT attributes and assumptions
  - Adversary tools
  - Credible barrier defeat methods and their constraints and limitations
  - Defeat timelines
- Use manufacturer's data as they apply to DBT scenarios
- Engage with SMEs in the military and law enforcement communities
- Conduct scenario-based time-motion studies and barrier testing

What Does Delay Do

- MTRF attack movie vignettes
  - No VBS
  - VBS
  - VBS and shark cage

In Conclusion

- Delay is a critical element of the PPS
- Delay systems include vehicle barriers and personnel barriers
- There are fundamental principles in designing and implementing delay systems
- Delay times are estimated based on DBT scenario information and with information from all available sources

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Questions, Comments, Concerns?

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