



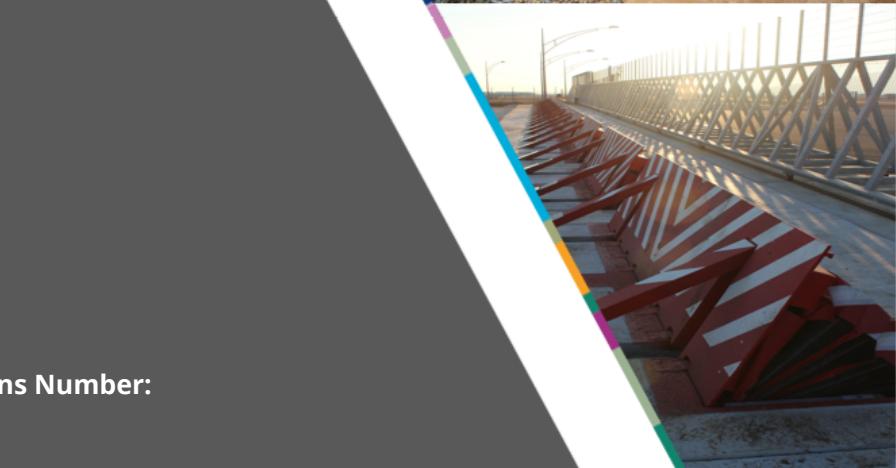
**Sandia
National
Laboratories**

Exceptional service in the national interest

Physical Protection of Critical Infrastructure

Presented by:
Jeremy Cummings

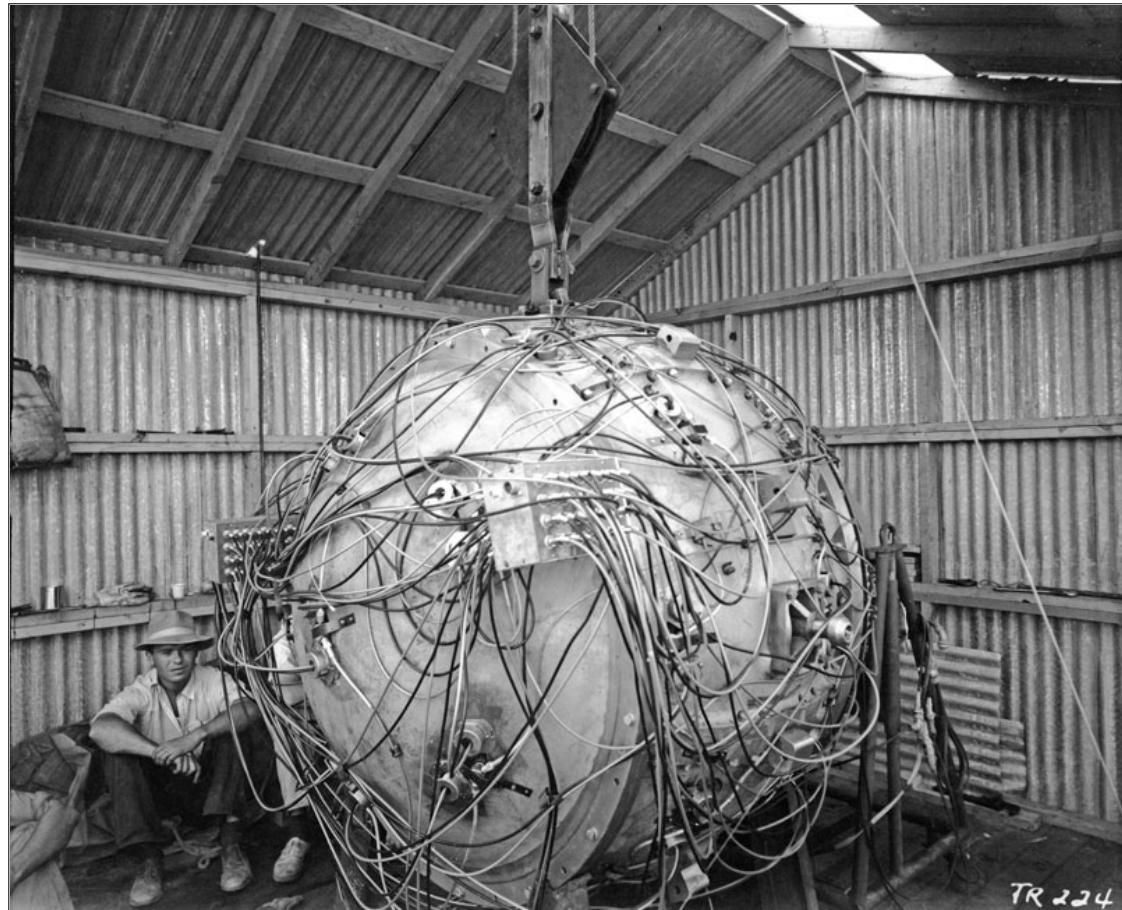
4–5 September 2024



Historical Perspective



Sandia's initial mission: "weaponize" the designs yielded by the Manhattan Project.



Historical Perspective (Cont)



Sandia New Mexico: First PIDAS, 1949



Fundamental Research



Detection/Assessment: Sensor testing, AC&D human factors



Delay: Time, equipment



Response: Response force timeliness and effectiveness



The Design and Evaluation of
**PHYSICAL
PROTECTION
SYSTEMS**



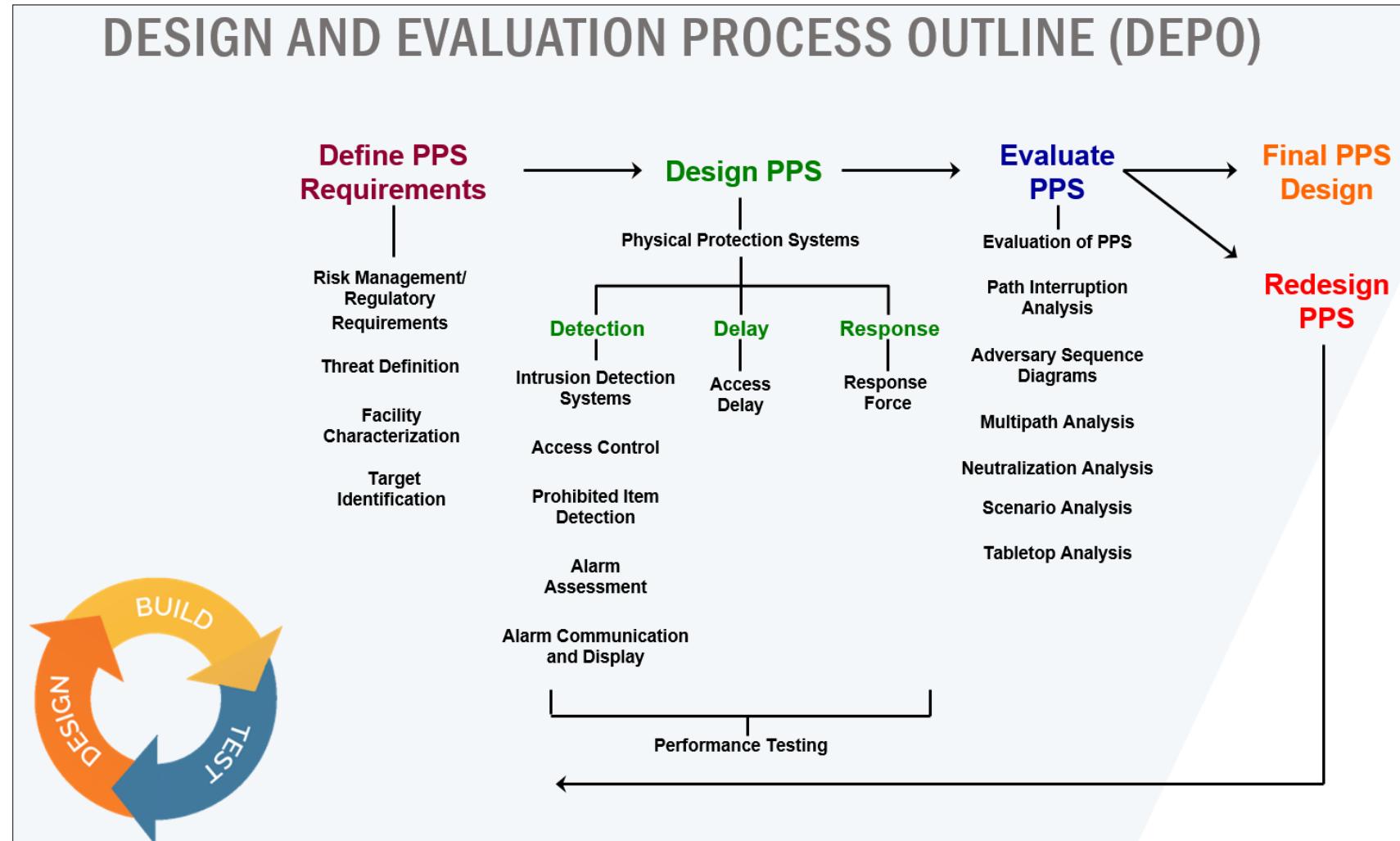
SECOND EDITION

Mary Lynn Garcia

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Process

Threat assessment
 Site survey
 Design/simulation >
 Design finalization >
 Procure/build/test
 Install
 Validate



Physical Security System Features: There Are Three



Detection - A sensor detects something

Assessment - An AC&D operator sees alarm, assesses video, determines if a threat exists

Delay - Time required for adversary to complete objective

Response - Interrupt adversary and neutralize

Detection & Assessment



Sensors cue the AC&D operator to assess an area; no assessment = no detection

Sensor trips alarm → alarm and video is displayed on console → operator assesses

Response forces are mobilized

NAR/FAR: Nuisance Alarm Rate/False Alarm Rate

AC&D: The human interface



Delay



The clock starts at detection, T_0 . Response force time to target, T_G , must be less than the delay remaining along the path to target, T_R .

- Vehicle barriers
- Distance
- Walls (facility constraints)
- Doors
- Windows; utility ports; roofs; floors
- Delay, not barriers
- There is no delay without detection



More Delay



Obscurants/irritants



Foams



Response

Initial (onsite) response, followed by secondary response

T_G must be kept to a minimum

Considerations:

- Equipment
- Communications
- Training (tactics, classroom, and application)
- Escalation of force
- Physical fitness
- Performance testing
- External coordination



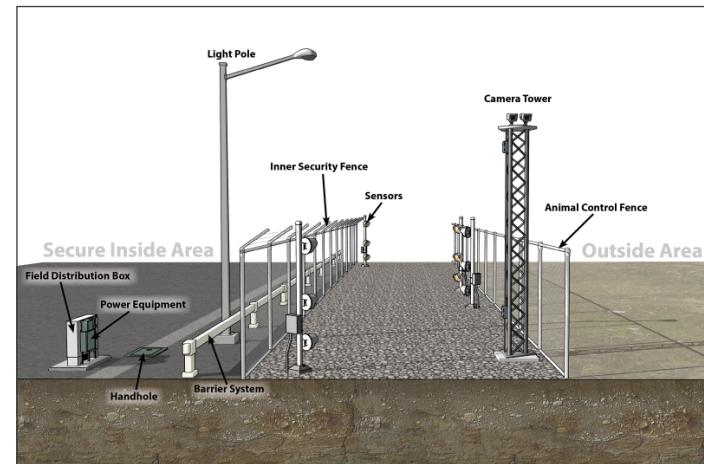
Dangerous toys: ROWS

Deterrence



Goal is to implement a physical protection system that the adversary perceives as too difficult to defeat.

Infosec: Design details are not available in the public domain.



But Wait - There's MORE!



Cyber Security

Network Security

Information Security

Access Control/ID and credential verification

Interior Sensors

Environmental Factors

Lighting

Camera Selection

Design for Human Factors (AC&D)

Video Callup

Communications and COMSEC

Secondary AC&D Stations

Uninterruptible Power

Contraband Detection

Risk Assessment/Target ID

UAS/CUAS

Questions and Answers

Bonus: Access Control

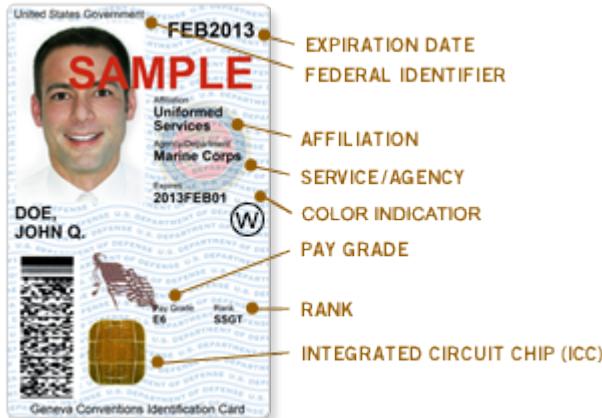


AC&D located in secure area

Must ensure unhindered access to authorized personnel

Three-factor verification:

Something you **have**



Something you **know**



Something you **are**

