Best Practices on Methodologies & Techniques to Assess the Effectiveness of Physical Protection Measures & Systems

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PANTEX PLANT | Y-12 NATIONAL SECURITY COMPLEX

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Vulnerability Assessment Overview

- Analytical basis for a performance-based protection strategy
- Evaluates security system designs to determine the protection system effectiveness of specified targets against defined threats
- System effectiveness is dependent on the probability of detection, probability of interruption, and the probability of neutralization
- Methodology contingent on an in-depth understanding of facility characterization and its protection systems

Facility and Protection Systems

- Analyst must have in-depth understanding of the state of security systems
- Performance expectations and assumptions are initially derived from standards or default values
- True operational performance is heavily dependent on reliable performance testing data of security systems
    - Access controls
    - Intrusion detection systems
    - Assessment systems
    - Delay systems
- Validate or invalidate assumptions derived from standards or default values
- Effective program provides both the reliability and assurance of the security system.

Ensuring Credible Data

- Collaboration between VA and PTG
- Determine testing criteria and frequency
  - Protection Element Importance
- Understand standards/capabilities of security systems
- Clearly communicate expectations/assumptions
- Ensure testing parameters are communicated
  - Begin/End criteria
  - Objectives

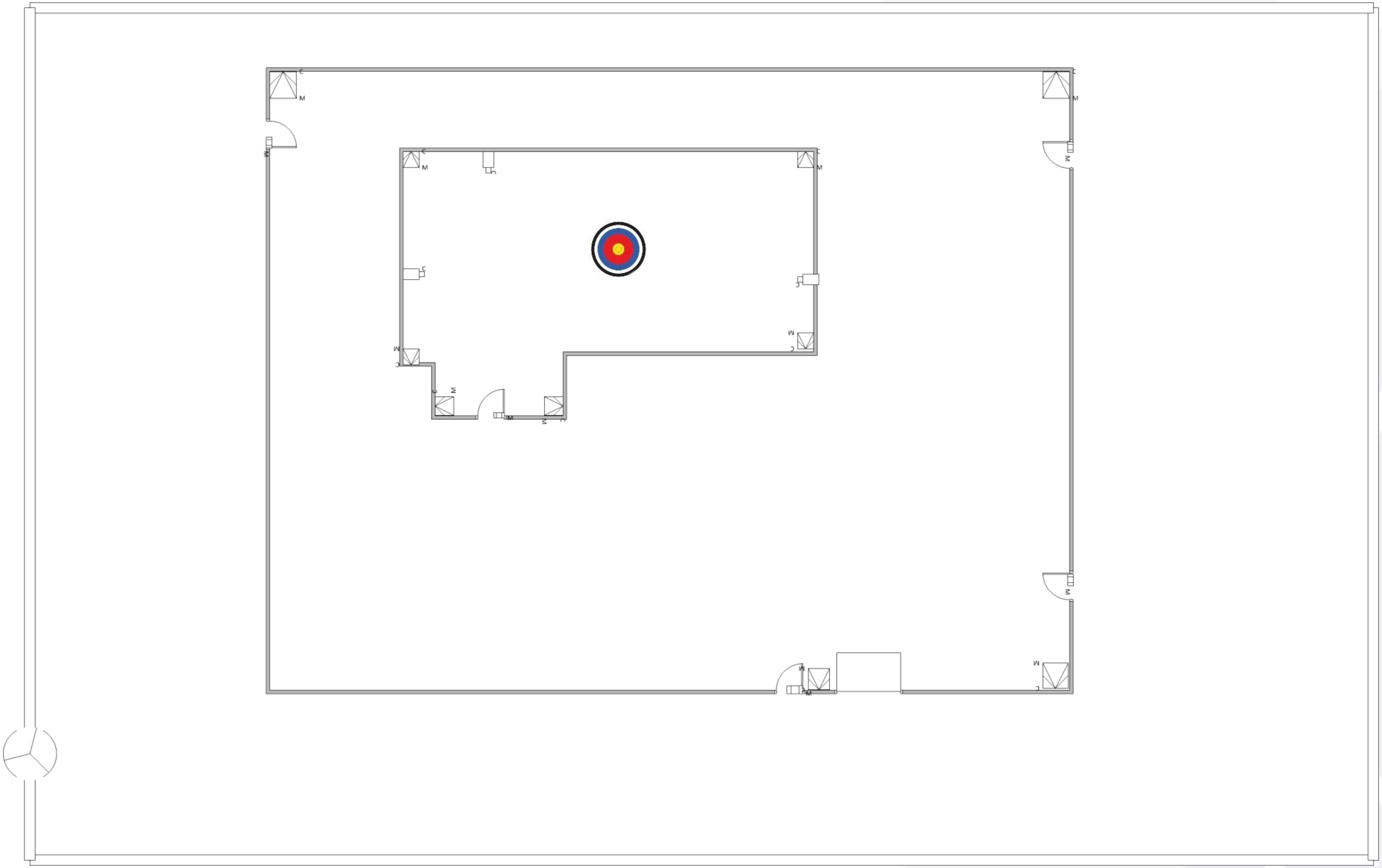
Test Plan Development

- Purpose and Objectives
  - Collaboratively derived criteria developed between the VA Group and the PTG.
- Evaluation Criteria
  - Expected performance outcome of the system being tested
- Testing Methodologies
  - Various methods of testing systems
- Parameters
  - Criterion imposed to maintain the integrity of the test and minimize safety and security risks
    - Support Personnel-Trusted Agents
    - Equipment
    - Compensatory Measures
    - Safety Assessments
- Data Collection
  - Results should be collected and documented in a standardized report to incorporate back to VA

Testing Methodologies

- Operability
  - Verifies system working as designed
- Effectiveness
  - Utilizes defeat methods to determine system effectiveness
- Adversarial
  - Uses adversary objectives and criteria in an attempt to defeat the system
- Black-Hat
  - Test designed to stress the system beyond established limitations

Example

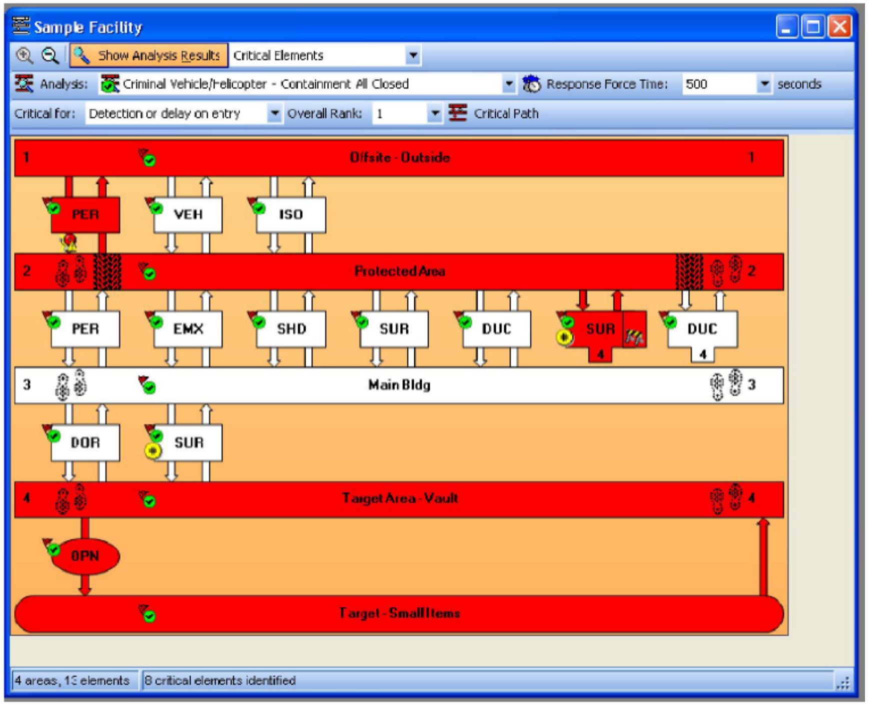


Results

- Data collection in shared database
  - Calculations include confidence levels
- Determine Figures of Merit for computer simulations and modeling
  - Probability of Sensing
  - Probability of Assessment
  - Probability of Detection
  - Delay times
- Updated data becomes the new performance expectation

Use of Modeling tools

- Credibility of the models and simulations is heavily dependent on FOM accuracy
  - Pathway Analysis
  - Neutralization Tools
- Validation full-scale performance tests to ensure effectiveness of protection strategy



Critical Elements

Analysis: Criminal Vehicle/helicopter - Containment All Closed

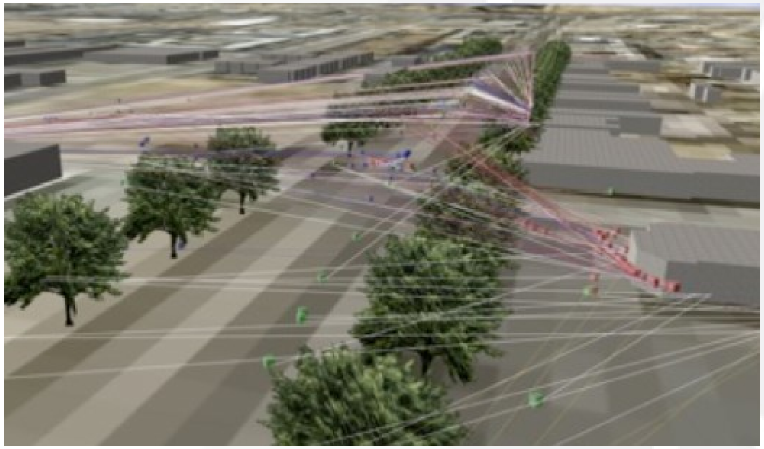
Response Force Time: 500 seconds

Critical for: Detection or delay on entry

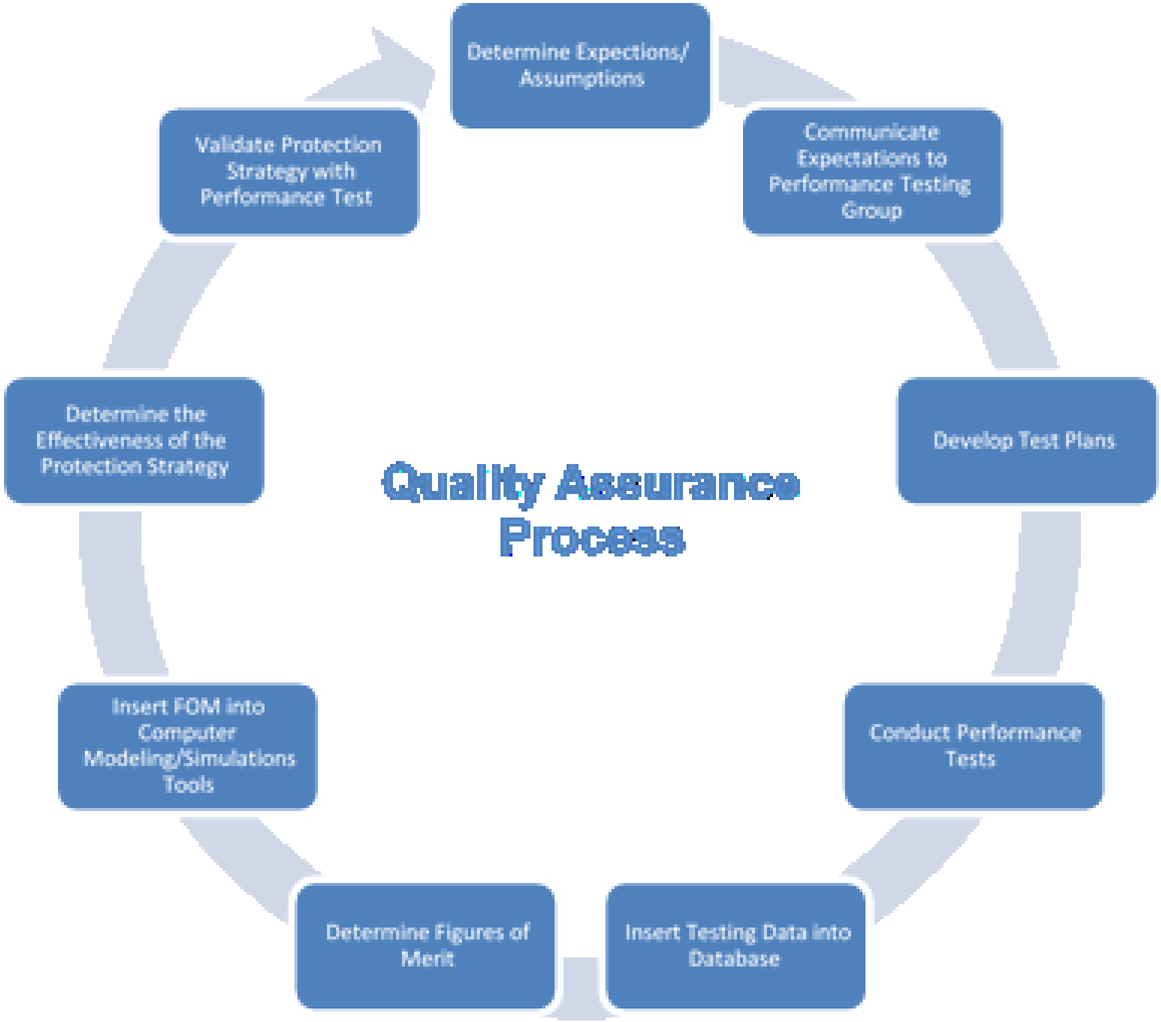
Overall Rank: 1

4 areas, 13 elements

8 critical elements identified



Quality Assurance



Quality Assurance Process

Determine Expections/ Assumptions

Communicate Expectations to Performance Testing Group

Develop Test Plans

Conduct Performance Tests

Insert Testing Data into Database

Determine Figures of Merit

Insert FOM into Computer Modeling/Simulations Tools

Determine the Effectiveness of the Protection Strategy

Validate Protection Strategy with Performance Test

Discussion