Performance Testing Nuclear Security

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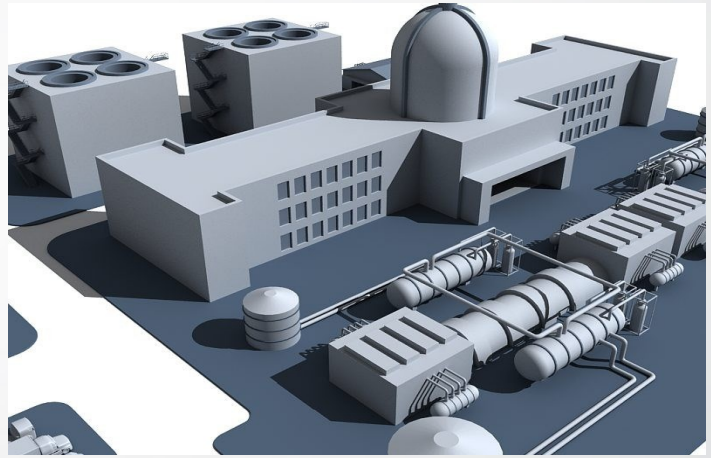
Overview

- General guidelines for protection of nuclear facilities and materials are established in State and international documents
- Requirements are set forth in State regulatory documents
- Compliance inspections are baseline reviews
- Only performance tests can measure the readiness to repel a terrorist attack on a facility

- Combination of compliance inspections and performance tests required
- Various methods for conducting performance tests

Outline

- Compliance v. Performance
- Objectives of Performance Testing
- Testing Methodologies
  - Paper Review
  - Tabletop Drills
  - Computer Simulations
  - Limited Scope Performance Testing
  - Force-on-Force Exercises
- Assessment of Findings



Compliance v. Performance

Compliance = planning

Performance = battle

Compliance v. Performance

"No battle plan survives contact with the enemy."

Helmuth von Moltke, German military strategist

Compliance v. Performance

"No battle plan survives contact with the enemy."

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"In preparing for battle I have always found that plans are useless, but planning is indispensable."

Dwight D. Eisenhower, American general and president

Compliance v. Performance

- Compliance
  - Design Basis Threat
  - State regulatory requirements
  - "Baseline" inspections – appropriate systems, appropriately implemented

Compliance v. Performance

- Compliance
  - Design Basis Threat
  - State regulatory requirements
  - "Baseline" inspections – appropriate systems, appropriately implemented
- Performance
  - Activation of all systems
  - Mobilization of forces
  - Engagement and results

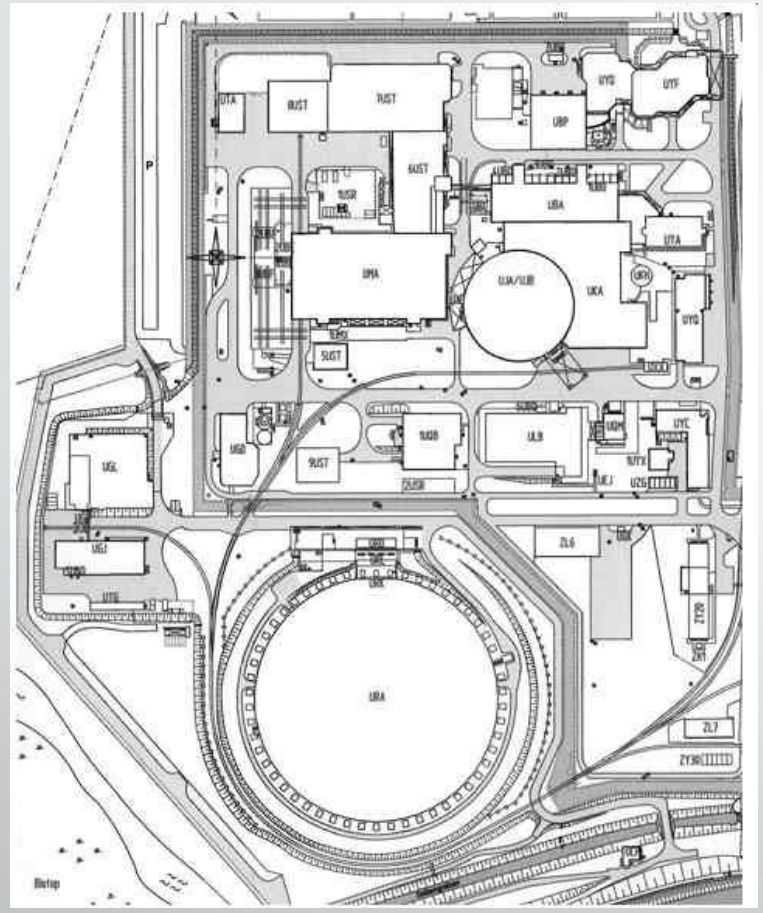
Objectives of Performance Testing

- Final, true test of the protective strategy
- Enhances training techniques
- Provides evidence to regulators
- Validates the planning
- Confirms whether the security force can:
  - perform the right tasks
  - at the right time
  - with sufficient force to counter the adversary attack

Testing Methodologies

- Paper Review – desktop review of commitments and past actions
- Tabletop Drills – uses plant drawings or 3-dimensional mockups of facility to conduct "tactical chess" game for opposing forces
- Computer simulations – allow multiple consecutive tests in short period of time
- Limited Scope Performance Testing – isolated skills tests based on specific posts, timelines, and portions of strategy
- Force-on-Force Exercises – full-field deployment of "shadow" force to repel an adversary attack

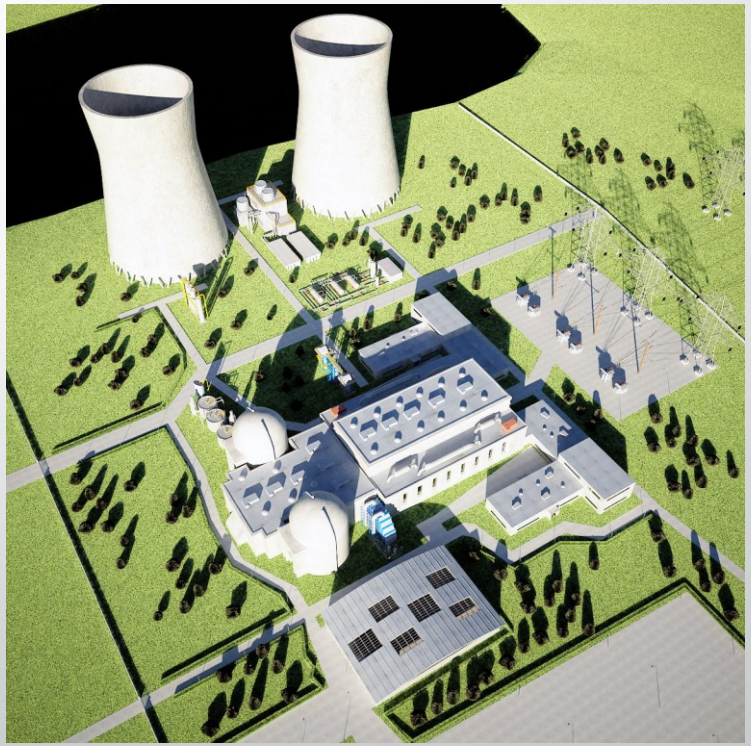
Paper Review



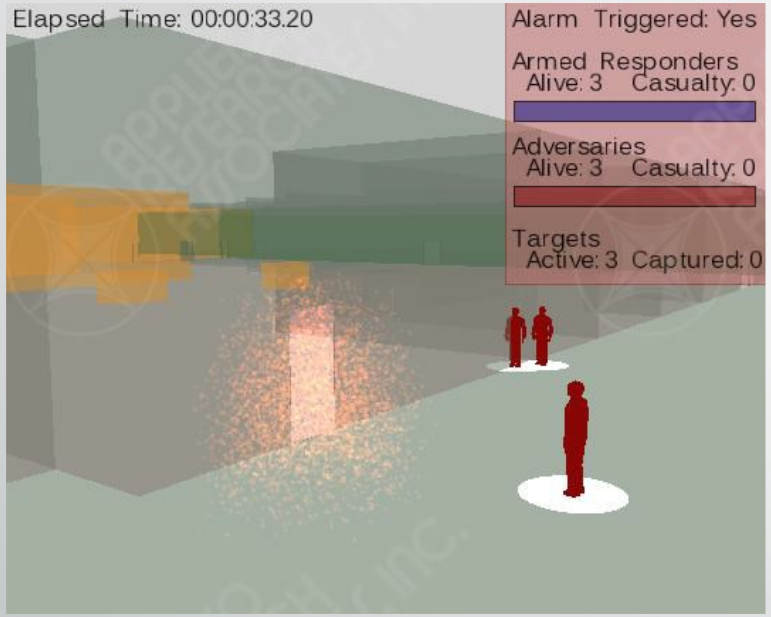
- Review of documents
  - design basis threat statement
  - current physical security plan
  - past results from tabletop drills and force-on-force exercises
- Conceptual testing
- Consideration of protective strategy modifications
- Written evaluation of results

Tabletop Drills

- Plant drawings or 3-dimensional mockup of plant
- Design basis threat
- Players to represent "shadow" force and mock adversary
- List of adversary "tool kit" – weapons, tools, tactics
- Clock management
- Written evaluation of results
- Computer simulations



Computer Simulations



- Advantages
  - multiple computer tests of same strategy
  - more accurate documentation of results
  - allows rapid modifications of assets and re-test
  - avoids human error in observations
- Disadvantages
  - requires modeling of plant and security assets
  - requires onsite knowledge of program and process

Limited Scope Performance Testing

- Plant drawings or 3-dimensional mockup of plant
  - at least the portion being tested
- Design basis threat
  - as represented by adversary force at point of engagement
- Players to represent "shadow" force and mock adversary
  - for the portion that will be tested
- List of adversary "tool kit" – weapons, tools, and tactics
- Clock management
- Written evaluation of results

Force-on-Force Exercises

- Identification of Teams
- Collection of Information
- Identification / Elimination of Artificialities
- Preparation for the Exercise
- Conduct of the FOF Exercise
- Time Management
- Documenting Observations

FOF – Identification of Teams

- Mock adversary team
- “Shadow” security force
- Controllers and event judges
- Record-keepers and exercise managers

FOF – Collection of Information

- All participants cleared for sensitive information
- Information includes:
  - physical security plan, procedures, and post orders
  - contingency plan(s)
  - past results of FOF tests
- Exercise event sheets and records
- Comments/observations from participants
- Time records and neutralization patterns

FOF – Identification of Artificialities

- Stopwatch
- Use of smoke or small explosives
- Climbing
- Engagement systems
- Explosive breaching of physical barriers
- Radio frequency jamming equipment

FOF – Preparation for the Exercise

- Training – controllers, judges, timekeepers, participants
- Proper forms and paperwork to record events
- Placement of assets in best positions
- Safety training
- Steps to avoid confusion between real force and shadow force
- Communication equipment and protocol
- Time management

FOF – Conduct of the Exercise

- Proper placement of participants
- Pre-exercise warning – "This is a drill" – repeated as necessary
- Recording of actions and engagements – with time stamps
- Flagging neutralized participants
- Leave equipment at spot of neutralization
- Clock stoppages clearly announced

FOF – Time Management

- Clock stoppages clearly announced
- Eliminate actions during clock stoppages
- Record time “in” and “out”
- Note all actions according to time stamp

FOF – Documenting Observations

- Collection of documents
  - Time sheets
  - Controller forms
  - Notes and comments from participants
- Organization of notes
- Post-exercise out-briefings with all participants

FOF - Assessment of Findings

- Brief intermission to allow exercise managers to collect and organize time sheets, controller forms, etc.
- Prompt post-brief to allow specific memory to contribute to findings
- Discussion can focus on:
  - results of exercise
  - appropriateness of exercise game plan
  - effectiveness of the protective strategy

Additional Information from NUSAM

NUSAM – Nuclear Security Assessment Methodologies

- Main objective of testing program is:
  - risk-informed, performance-based methodological framework
  - systematic, structured, comprehensive, and transparent
- Secondary objective of testing program is:
  - sharing knowledge and experience
  - providing guidance
  - illustrating best practices

Contact Information

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