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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