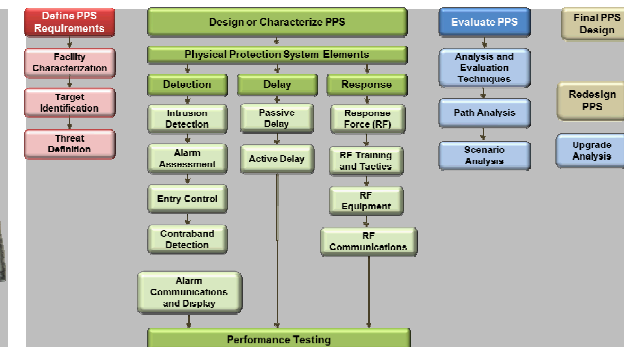


Exceptional service in the national interest



Physical Protection Implementation in the United States

Felicia A. Durán, Ph.D.
Security Systems Analysis

Korea Hydro Nuclear Power/Central Research Institute
Daejon, South Korea – November 18-22, 2013

Presentation Outline

- U.S. Nuclear Regulatory Commission
 - Mission
 - Security Regulations for Power Reactors
- Security Baseline Inspections
- Security Functions
- Examples of Security Measures
- Force-on-Force Exercises
- Conclusion

U.S. Nuclear Regulatory Commission

- U.S. Nuclear Regulatory Commission (U.S. NRC) Mission
 - To license and regulate the nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety, promote the common defense and security, and protect the environment.
- How the U.S. NRC Regulates
 - Regulations and Guidance
 - Licensing, Decommissioning and Certification
 - Oversight
 - Operational Experience

- Security Goals and Objectives
 - Ensure adequate protection in the secure use and management of radioactive material
- Nuclear Security
 - Physical security of nuclear facilities and materials from sabotage or attacks
- Security Program Regulations
 - For Power Reactors – U.S. Code of Federal Regulations (CFR) Chapter 10 (USNRC), Part 73 (10 CFR 73)
 - 10 CFR 73 – Physical Protection of Plants and Materials
 - 10 CFR 73.55 – Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors Against Radiological Sabotage

10 CFR 73.1 – Design Basis Threat

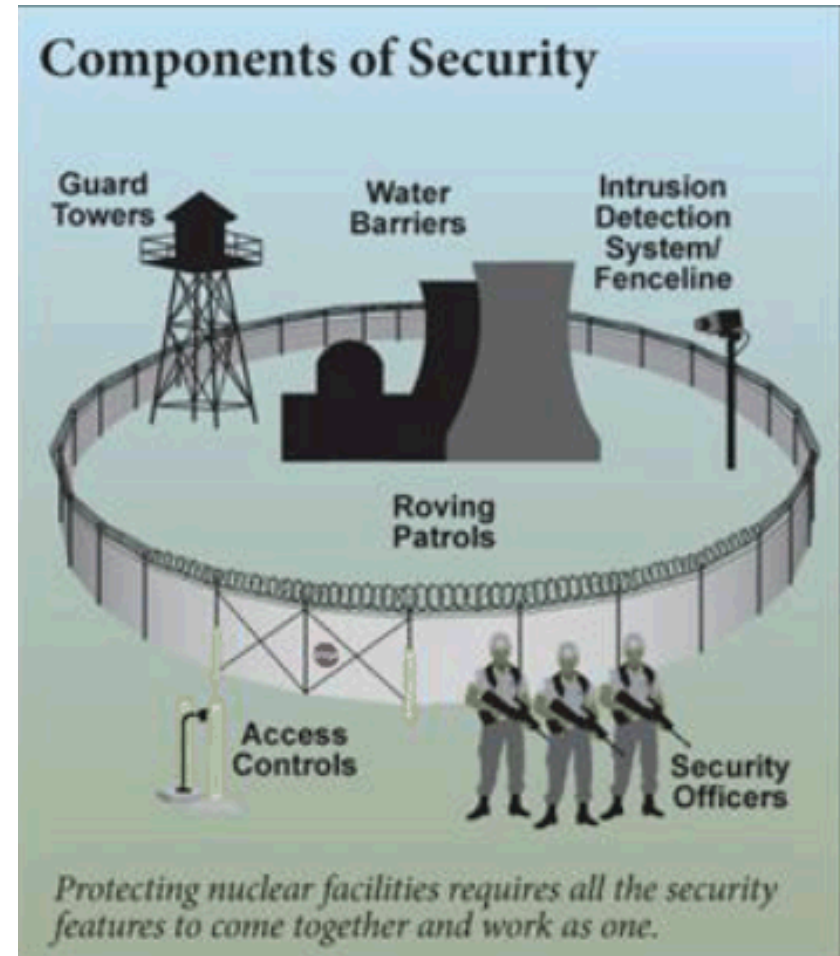
- Radiological Sabotage – Power Reactors
 - Determined violent external assault
 - Using stealth or diversion
 - Operating in a single, multiple, or combination of groups
 - Well-trained and dedicated (sufficient knowledge to identify equipment and plan a successful attack)
 - Active or passive insider
 - Suitable weapons
 - Hand-carried equipment
 - Land and Water vehicles
 - Cyber attack

Power Reactor Security

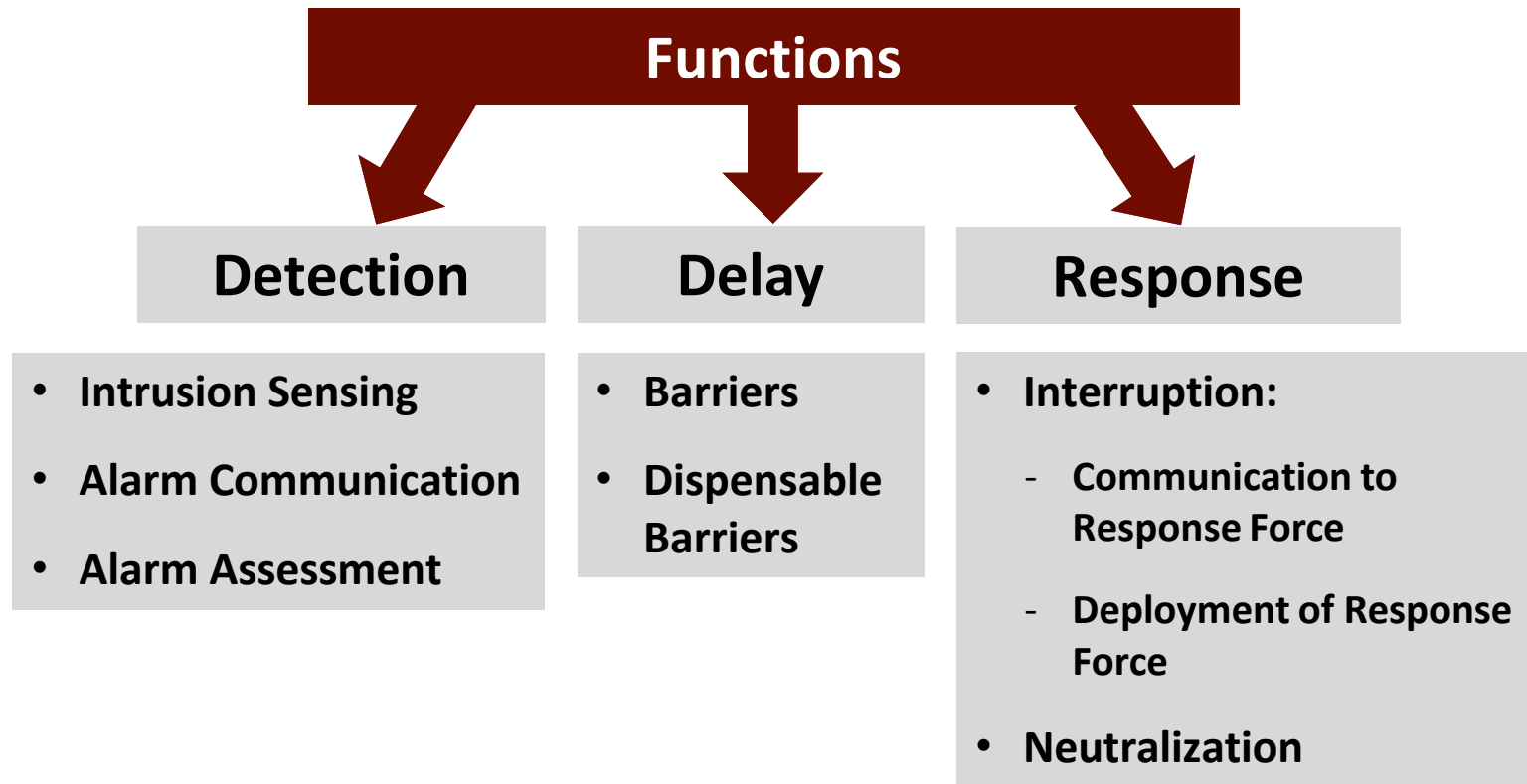
- 10 CFR 73.55 (b) Requires each licensee to establish and maintain a physical protection program, to include a security organization, which will have as its objective to provide high assurance that activities involving special nuclear materials are not inimical to the common defense and security and do not constitute an unreasonable risk to public health and safety.
- Physical protection programs must:
 - Protect against the design basis threat (DBT)
 - Prevent significant core damage and spent fuel sabotage
 - Maintain at all times the ability to detect, assess, interdict, and neutralize threats
 - Provide defense-in-depth through the integration of systems, technologies, programs, equipment, processes and procedures

Security Baseline Inspections

- Security Plans
- Security Organization
- Physical Barriers
- Target Sets
- Access Controls
- Search Programs
- Detection and Assessment Systems
- Communications Requirements
- MOX Fuel
- Security Program Reviews
- Testing and Maintenance
- Compensatory Measures
- Records



Security Functions



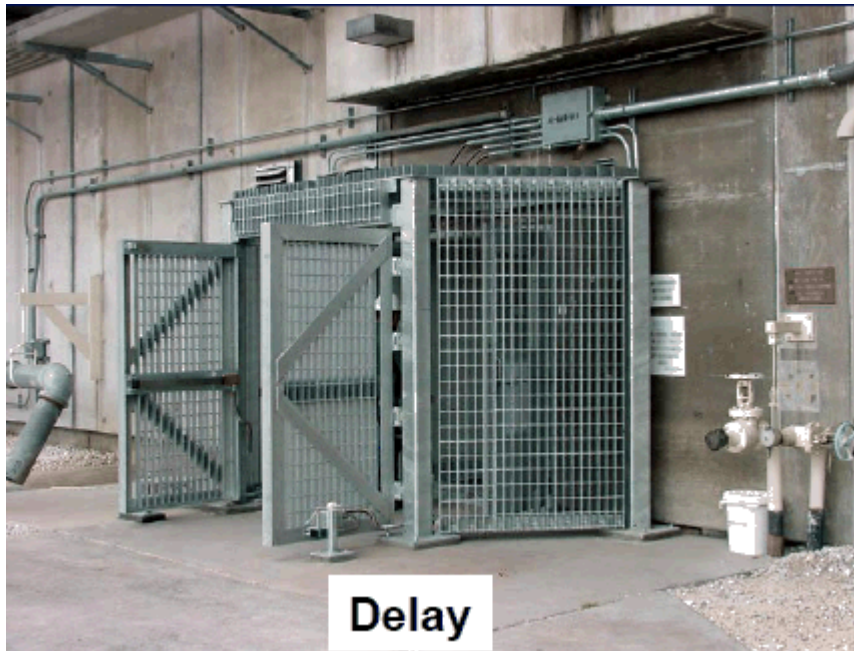
Example of Security Measures



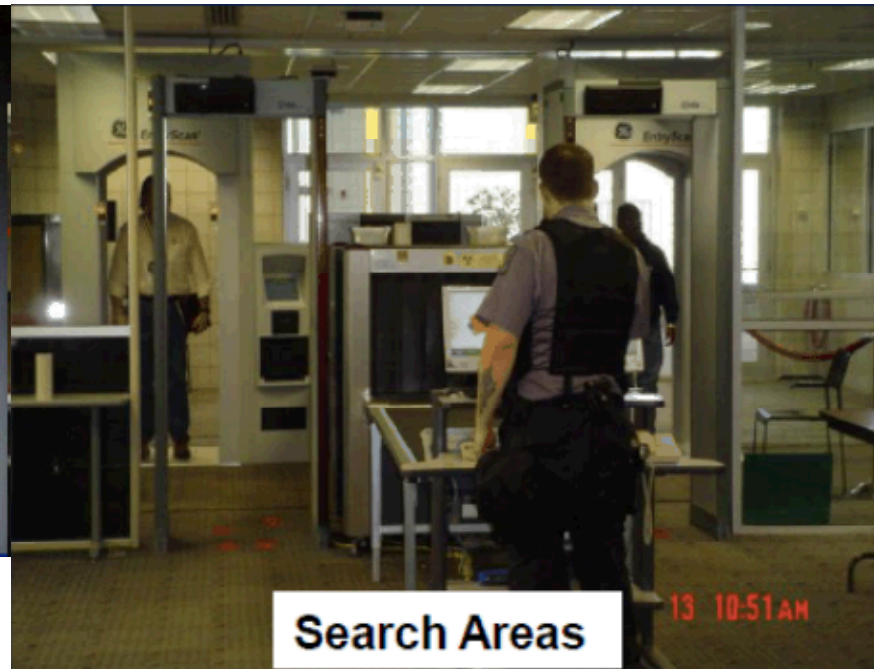
Examples of Security Measures



Examples of Security Measures



Examples of Security Measures



Examples of Security Measures

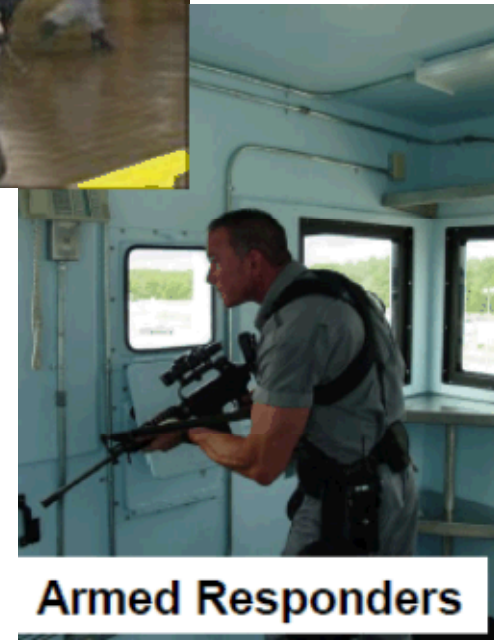
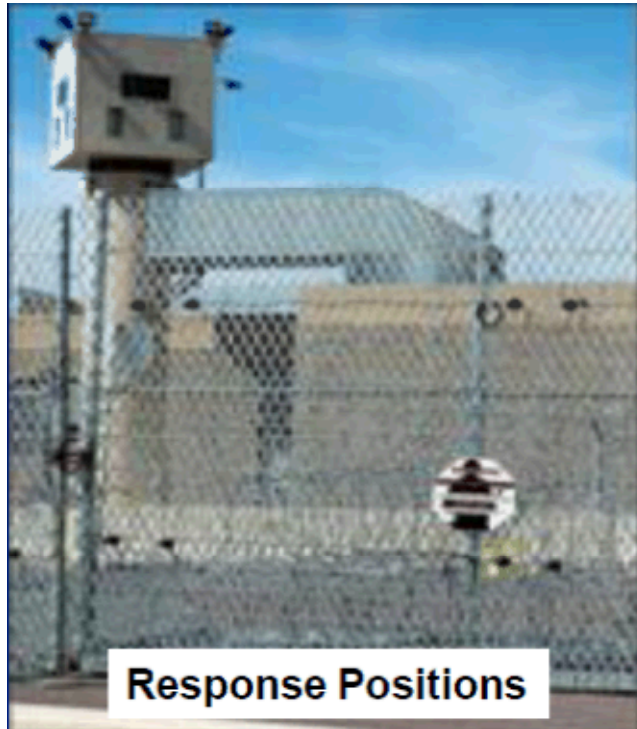


Examples of Security Measures



Water Barriers

Examples of Security Measures



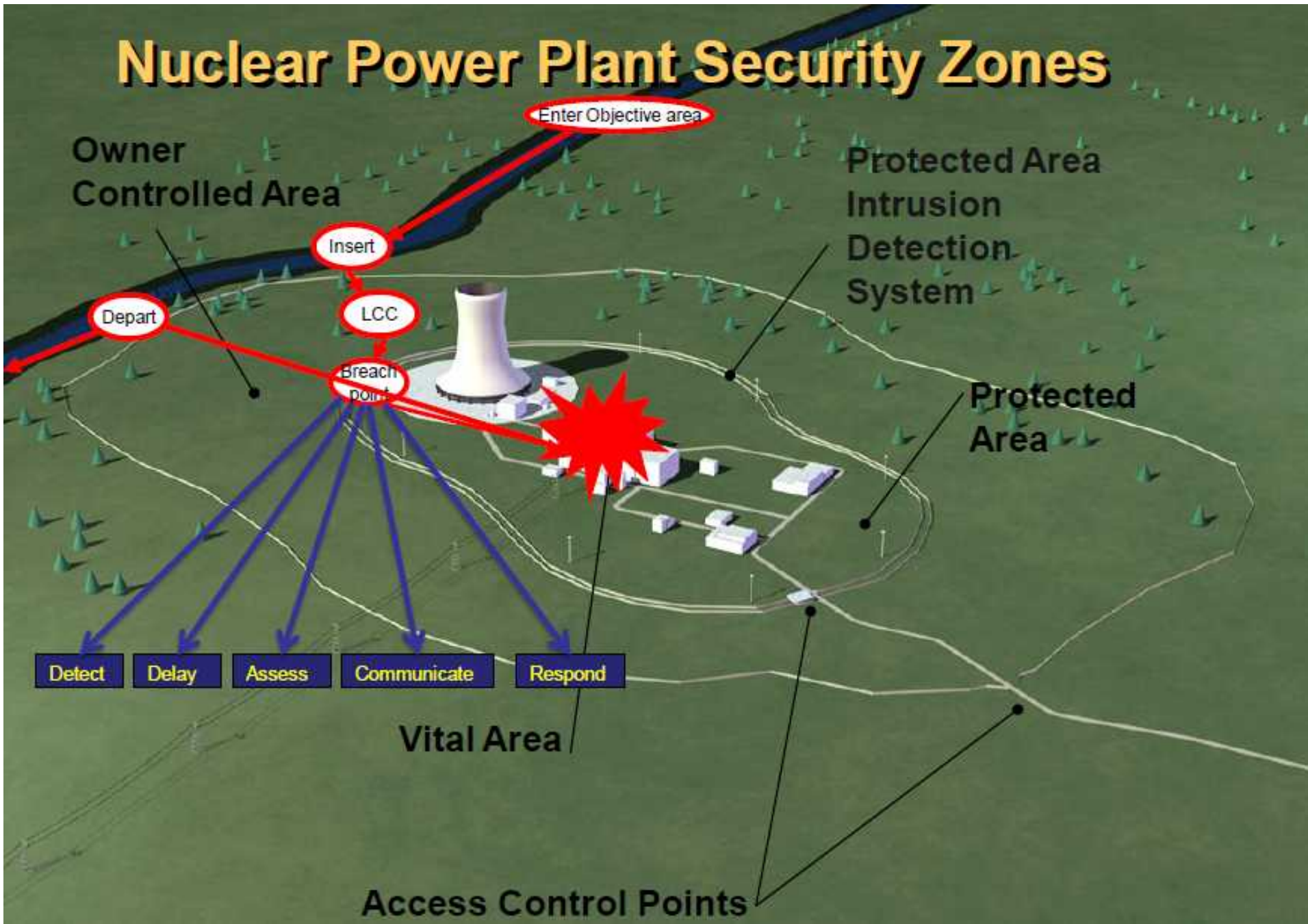
Force-on-Force (FOF) Exercises

- U.S. NRC-evaluated exercises every three years
- Report to the U.S. Congress annually
- Licensees are required to perform quarterly and annual FOF exercises
- Performance-based exercises using a well-trained “mock” adversary force who is attempting to cause damage to the reactor core or spent fuel

FOF Inspection Process

- Target set inspection
 - Does the licensee know what to protect?
- Planning week inspection
 - Does the licensee have a strategy to protect against the DBT?
- Exercise week inspection
 - Can the licensee implement their strategy?

Nuclear Power Plant Security Zones



Conclusion

- Protecting U.S. Nuclear Industry is a Top Priority
- Implementation includes layers of defense
- Inspection process strives for continuous improvement

