Overview of NRC Physical Security

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With thanks to the
NRC's Office of Nuclear Security and Incident Response

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Design Basis Threat (DBT)

Title 10 of the Code of Federal Regulations (10 CFR) 73.1 prescribes the requirements for the establishment and maintenance of physical protection systems which will have the capabilities for the protection of power reactors and special nuclear material (SNM) at fixed sites, in transit, and of plants in which SNM is used.

Two DBTs:

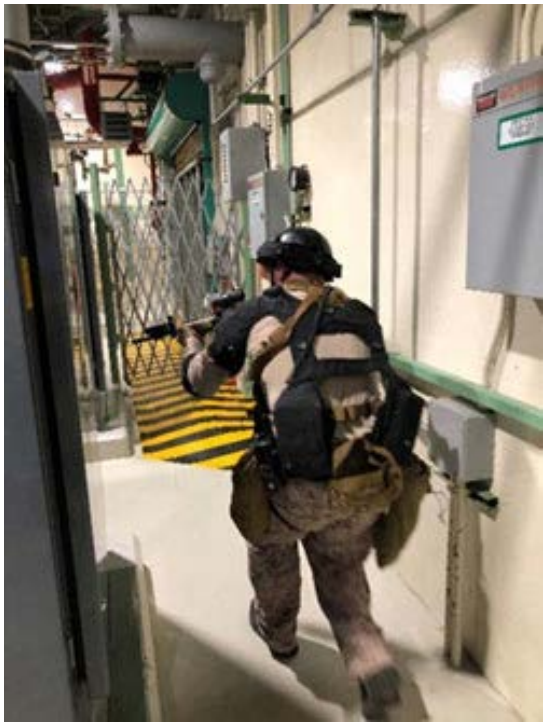
Radiological Sabotage
(applied to nuclear power plants and Category 1 fuel cycle facilities):
Safeguards model for protecting critical systems from acts of radiological sabotage.

Theft or Diversion of formula quantities of strategic special nuclear material
(applied to Category 1 fuel cycle facilities):
Safeguards model for protecting critical systems from the acts of theft or diversion.

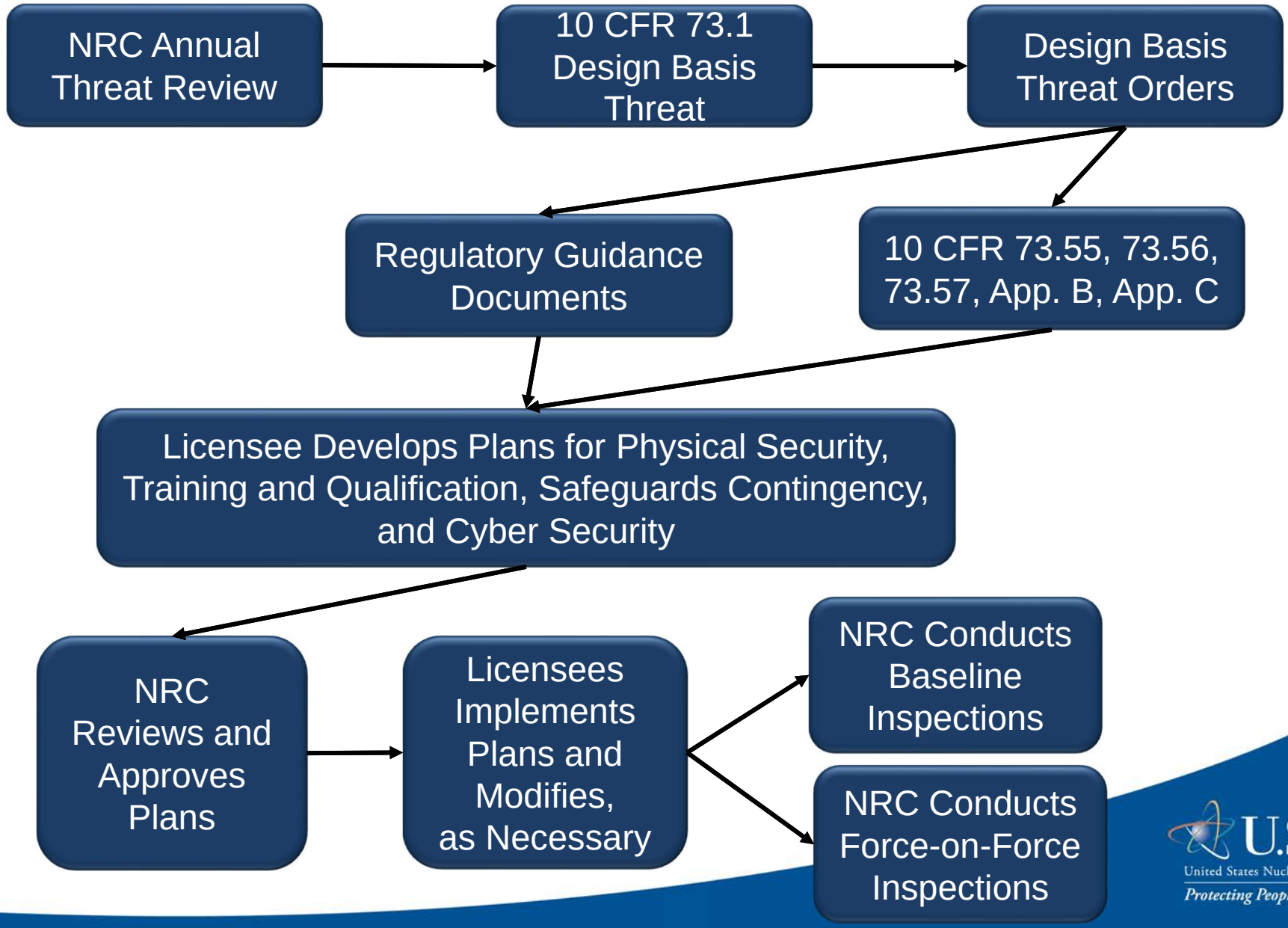
Design Basis Threat (DBT)

The licensees **must design their physical protection systems that are capable of defending against a determined violent external assault, attack by stealth, or deceptive actions**, including diversionary actions by single or multiple groups through single or multiple entry points with the following attributes, assistance, and equipment:

- Well-trained (including military training and skills)
- Insiders - Active or passive or both
- Suitable weapons, including handheld automatic weapons
- Hand-carried equipment, including incapacitating agents and explosives
- Land and water vehicles
- An internal threat
- A land vehicle bomb assault
- A waterborne vehicle bomb assault
- A cyber attack



Role of Design Basis Threat in the Regulatory Process



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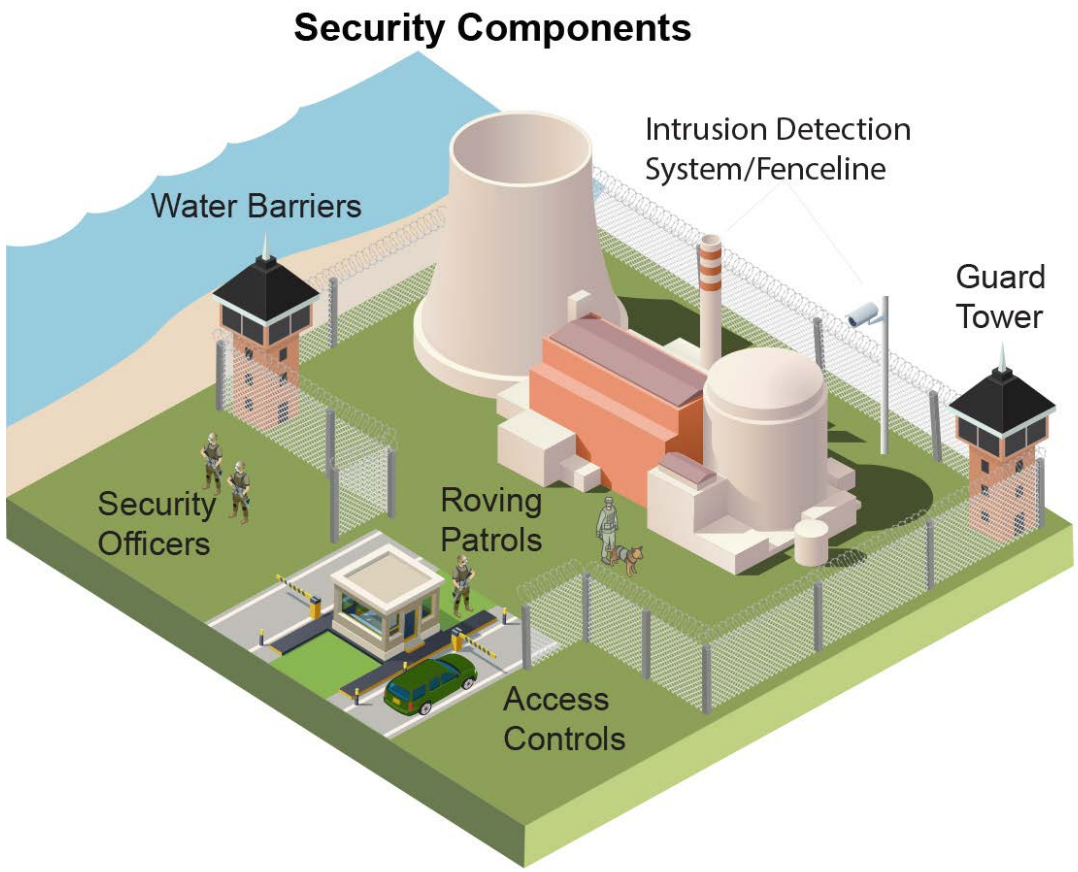
Contents of a License



Protecting nuclear facilities requires all of the security features to come together and work as one.

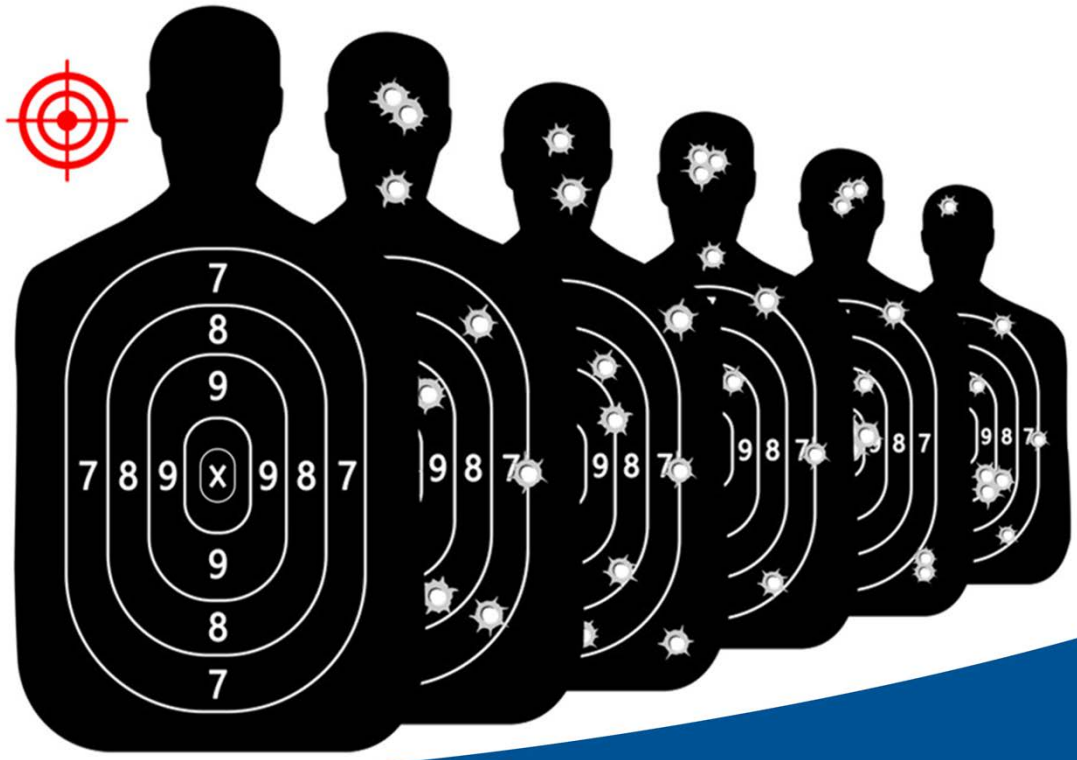
- Physical Security Plan
- Training and Qualification Plan
- Safeguards Contingency Plan
- Cyber Security Plan

Physical Security Plan

Describes the licensee's implementation of the Commissions requirements set forth in 10 CFR 73.55, “Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage.”

Training and Qualification Plan

Describes how the licensee will implement the minimum training and qualification requirements at its site and establishes the site-specific training and qualifications guidelines needed to ensure that each individual is properly suited, trained, equipped, and qualified to effectively perform assigned duties and responsibilities.



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Safeguards Contingency Plan

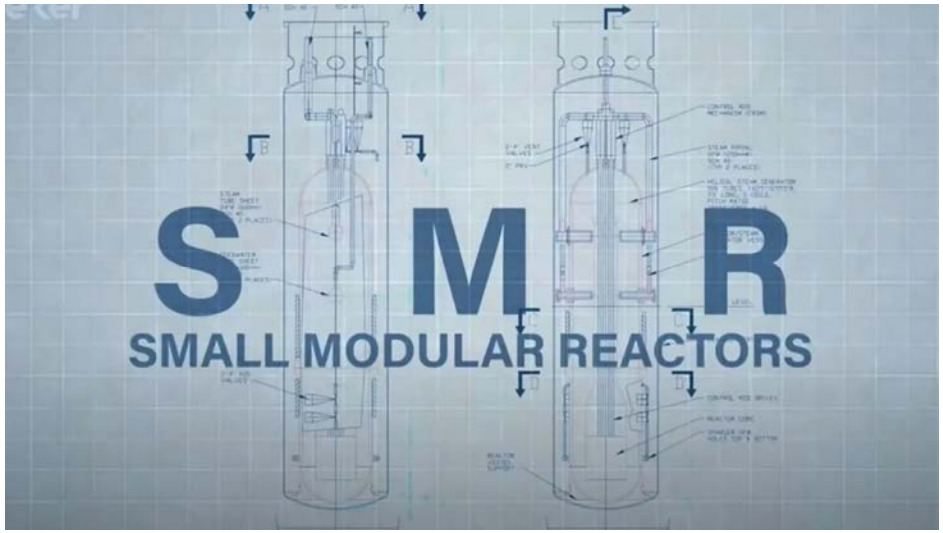
A Safeguards Contingency Plan defines the licensee's objectives in its response to events of threats, thefts, or radiological sabotage.

Cyber Security Plan

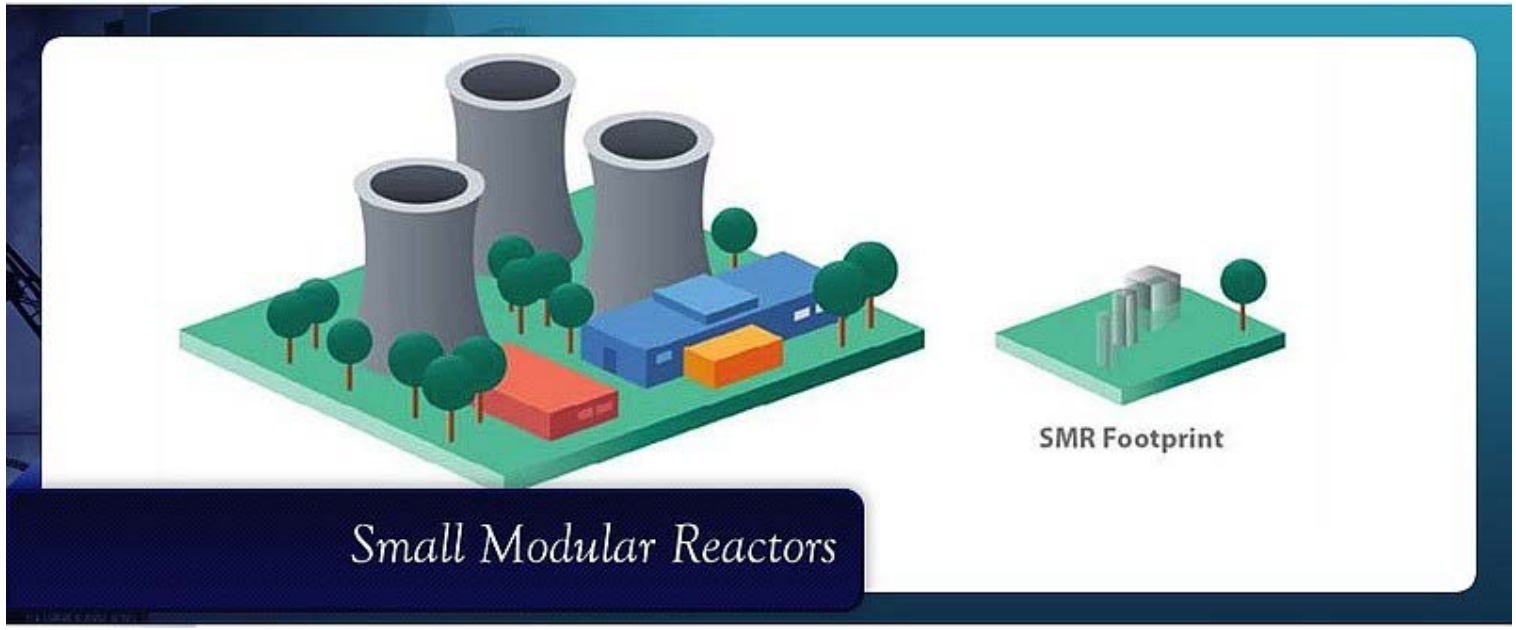
Each licensee must provide with high assurance that digital computer and communication systems and networks are adequately protected against cyber attacks, up to and including the design basis threat as described in § 73.1.

Security for SMRs

- The integration of safety/security in designs should provide an inherently more secured reactor and facility. (Security by Design)
- May have reduced numbers essential equipment that may need to be protected to prevent radiological sabotage and additional security features may be incorporated into the initial design.
- Security licensing regulations provide for flexibility in how performance and prescriptive requirements are met (e.g., increased reliance on engineered systems, less reliance on operational programs such as staffing, use of offsite responders and offsite monitoring, etc.)



Security Initiatives



- Developing adaptive and risk-informed regulations
- Amending the prescriptive nature of the existing security framework while maintaining a commensurate level of protection for public health and safety, the common defense and security, and the environment

Security Rulemaking

Limited-Scope Rulemaking

Radiological consequence-based criteria to consider implementation of alternatives to certain existing prescriptive requirements, including the following:

- Minimum number of onsite armed responders
- Reliance on law enforcement or other offsite armed responders to fulfill interdiction and neutralization functions
- Use of means other than physical barriers to accomplish delay and access control functions
- Location of the secondary alarm station
- Designation of vital areas for the secondary alarm station and its secondary power supply

Security Rulemaking

10 CFR Part 53 Rulemaking

Performance-based regulation alternative for increased flexibility and the use of practicable approaches for the protection of a variety of advanced reactor technologies.

- Security and safeguards programs addressed by 10 CFR Part 53—
  - information security
  - physical security
  - cybersecurity
  - access authorization
  - material control and accounting

Security Framework Summary

Current Security Framework

- Developed for current operating fleet (Security not integral to initial designs)
- 10 CFR 73.55 contains performance-based and prescriptive security requirements
- Functions – Detect, Assess, Interdict, and Neutralize
- Design Basis Threat (DBT) of Radiological Sabotage
- 73.55(k)(9): Memorandum of understanding with law enforcement
  - Proposed limited-scope rule would allow licensees to rely on law enforcement

Security Framework Summary *(cont.)*

Technology Inclusive Framework *(Small Modular Reactors / Advanced Reactors)*

- Commission's policy statement
  - Opportunity for security issues (e.g., newly identified threats of terrorist attacks) to be effectively resolved through facility design and engineered security features, and formulation of mitigation measures, with reduced reliance on human actions
- Performance vice prescriptive requirements where practicable
- Options to implement prescribed alternatives for SMR/Advanced Reactors under existing framework
- Consequence-based physical security framework
- Law enforcement can be primary response (same as with limited-scope rule)

Contact & References

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Nuclear Security

Background

NRC security requirements for nuclear power plants and other facilities support the agency's efforts to promote the common defense and security in the regulation of the nation's civilian use of radioactive materials. Today, commercial nuclear power plants are considered among the most secure of the nation's critical infrastructure.

Robust security is achieved in layers, with multiple approaches at work concurrently – just as safety in nuclear power plants is accomplished through duplicate back-up systems. Nuclear power plants are inherently secure, robust structures. They are built to withstand hurricanes, tornadoes and earthquakes. Licensees are required to maintain well-trained and armed security officers, physical barriers, and intrusion detection and surveillance systems to defend against possible threats.

Federal and state agencies work together to communicate threat information and coordinate response activities. The NRC works closely with the Department of Homeland Security, FBI, intelligence agencies, the Defense and Energy departments, as well as state and local law enforcement agencies. These relationships ensure the NRC can act quickly on any threats to its licensed facilities.

https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/security-enhancements.html

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Force-on-Force Security Inspections

The Nuclear Regulatory Commission has carried out force-on-force inspections regularly at commercial operating nuclear power plants since 1991 as part of its comprehensive security program. These inspections are an important way to evaluate and improve the effectiveness of plant security programs under NRC regulations (10 CFR Part 73) to prevent radiological sabotage.

FOF inspections assess a nuclear plant's physical protection measures to defend against the "design basis threat," or DBT. The DBT describes an adversary that plant owners must protect against with physical protection systems and response strategies. The NRC periodically reassesses the DBT and makes revisions as necessary.

The Modern Force-on-Force Program

https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/force-on-force-bg.html

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