United States Nuclear Regulatory Commission

Protecting People and the Environment

The NRC Nuclear Security and Incidence Response

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NRC Responsibilities

- **NRC Strategic Plan Performance Goal:**
  - Ensure the Secure Use and Management of Radioactive Materials
- **Strategic Outcome:**
  - No instances where licensed radioactive materials are used domestically in a manner hostile to the security of the United States.

What do we do in the security arena?

- Security Oversight
  - Security policy development
  - Inspections and enforcement
- Emergency Response
  - Emergency Operations Center
  - Information Assessment Team
  - Safeguards Team
  - Safeguards Advisories
- International Safeguards and Security

NRC works in partnership with other federal agencies (DOE, DOD, etc.), licensees, and the public

NRC Security Program Organization

- The Commission
- Office of Nuclear Security and Incident Response (NSIR)
  - Security Policy
  - Security Operations
  - Emergency Preparedness and Response
    - Emergency Operations Center
- Program Offices (reactors, fuel cycle …)
- Regional Offices
  - Resident inspectors

What do we regulate (security)?

Commercial industry and activities

- Power plants
- Research and test reactors
- Spent fuel storage and transportation
- Fuel fabrication facilities and SNM transportation
- Uranium conversion facility
- Uranium enrichment facilities
- Medical and industrial isotopes and sources
- SNM and technology exports

How do we regulate?

Inputs
- International Standards and Guidelines
- Threat Assessment
- Security Assessments
- Stakeholder input
- Operating experience

NRC advisories

Security policy
- regulations
- Orders

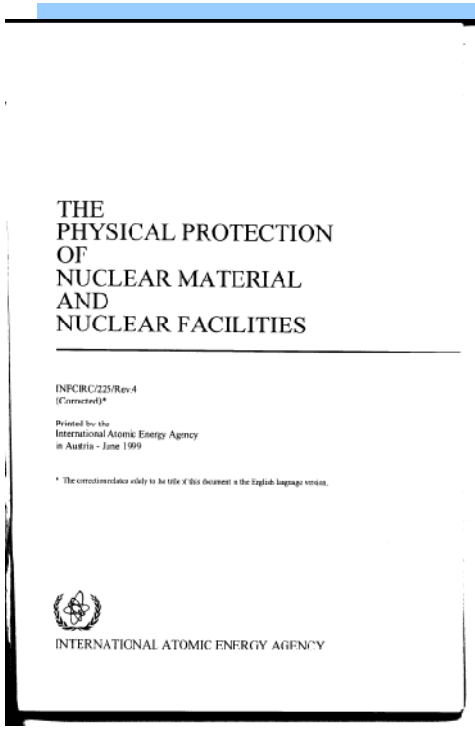
Licensing
- security plans
- commitments

Licensee implementation

Security inspections
- baseline
- performance

Enforcement

International Guidelines and Standards



THE
PHYSICAL PROTECTION
OF
NUCLEAR MATERIAL
AND
NUCLEAR FACILITIES

INFCIRC/225/Rev.4
(Corrected)*

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International Atomic Energy Agency
in Austria - June 1999

* The correction relates solely to the title of this document in the English language version.

INTERNATIONAL ATOMIC ENERGY AGENCY

- Convention on Physical Protection of Nuclear Material
- IAEA INFCIRC 225/REV.4 (June1999) – Guidelines

IAEA INFCIRC 225

- Provides definition of
  - Category I, II, and III special nuclear material
  - self-protecting material

NRC uses a similar categorization approach

- States that material categories are the basis for graded physical protection requirements

  In determining the level of physical protection, account should be taken of the possibility that the unauthorized removal of nuclear material could lead to the construction of a nuclear explosive device by a technically competent group

- Provides general recommendations regarding protective measures

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Categorization of Nuclear Material

Nuclide and % Enrichment Level	Category I	Category II	Category III
Plutonium	≥ 2 kgs	< 2 kgs and > 500 g	≤ 500 g and > 15g
Uranium 235 ≥ 20%	≥ 5 kgs	< 5 kgs and > 1 kg	≤ 1 kg and > 15g
Uranium 235 < 20% and ≥ 10%		≥ 10 kg	< 10 kg and > 1 kg
Uranium 235 < 10%			≥ 10 kg
Uranium 233	≥ 2 kgs	< 2 kgs and > 500 g	≤ 500 g and > 15g

Security regulations and orders

- Code of Federal Regulations

  Parts 10 CFR 26, 73, 74, 95 …
- Security Orders (mostly post 9/11)
- Reg.Guides describe acceptable approaches

- Regulations and Orders contain both performance-based and prescriptive requirements
- The trend is towards performance-based regulations
- NRC is revising its security regulations

Purpose of NRC Regulated Physical Protection Programs

Physical protection programs and systems are designed to protect against acts of radiological sabotage and to prevent the theft of special nuclear material (SNM).*

*radiological sabotage: "Any deliberate act directed against a plant or transport …. which could directly or indirectly endanger the public health and safety by exposure to radiation" (10 CFR 73.2)

NRC Safeguards Approach

- Graded and risk-informed approach to safeguards
- Defense in depth principle
  - multiple barriers, alarms, communications, response
- Planned response to security events
  - Licensee provides immediate response
  - LLEA, FBI provide reinforcements

NRC Activities and the DBT

High Risk Activities - DBTs Apply

- Power reactors
- High-enriched uranium/MOX fuel production
- Transport and export of strategic quantities of high-enriched uranium or plutonium

Lower Risk Activities - DBTs Do Not Apply

Research reactors

- Low-enriched uranium fuel production
- Transport and export of low-enriched uranium (quantities of low to moderate strategic significance of SNM)
- Spent fuel storage and transport of spent reactor fuel

DBT Statements (10 CFR 73.1)

- **Two DBTs**
  - **Radiological sabotage**
  - **Cat I SNM theft or diversion**

- **General description**
  - External assault
  - Vehicle bomb attack
  - Internal threat
  - Cyber threat

Information about specific adversary characteristics is not available to the public

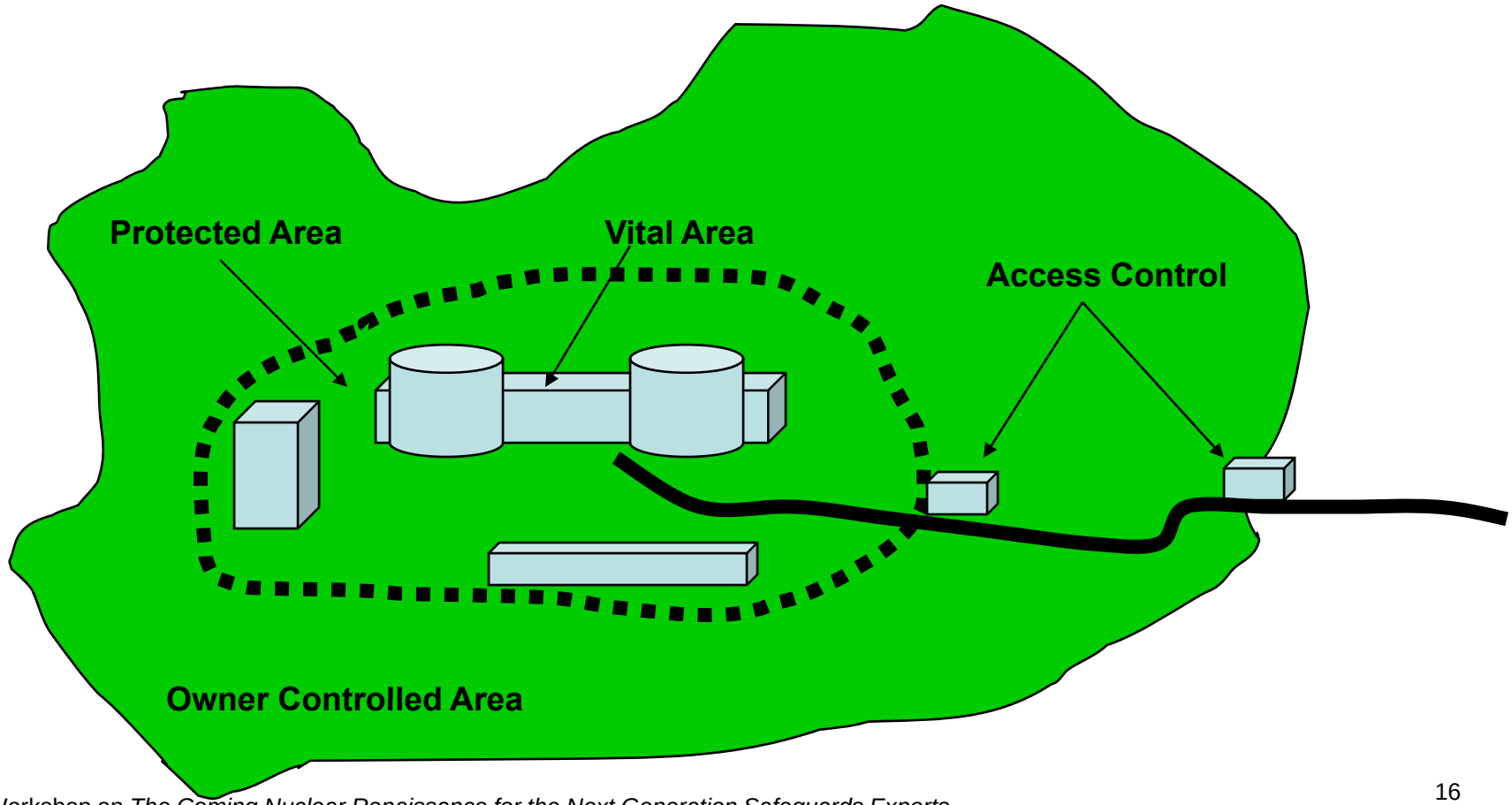
Security posture

- NRC Cat I and power reactor licensees employ a combination of security measures
  - MC&A programs
  - Insider mitigation measures
  - Access control measures
  - Detection and surveillance security systems
  - Robust barriers
  - Armed response

- Security fundamentals apply

  Detect-Assess-Communicate-Delay-Respond

Security at NRC sites



Security at NRC sites

Baseline security inspections program

- Conducted by regional inspectors
- Compliance oriented
  - inspections against regulations and security plans
- Focused on several key areas
  - Access authorization
  - Access control
  - Security plan changes
  - Equipment performance
  - Training programs
  - Protective strategy and contingency response
  - Information security
  - Fitness for Duty

Force-on-Force inspection program

- Performance-based evaluations
  - demonstration of the licensee's ability to defend their sites against a DBT-type threat
- Critical element of security oversight effort
- Conducted by NRC HQ teams

FOF inspection program (Continued)

- Section 170D of the Atomic Energy Act of 1954, as amended
  - security evaluations shall include FOF exercises
  - FOF exercises shall, to the maximum extent practicable, simulate DBT security threats
  - NRC shall mitigate any potential conflict of interest
  - NRC shall ensure that material defects corrected
- NRC FOF inspections are 2-week evolutions conducted, at a minimum, every 3 years at each site
- Mock adversary assaults are at the center of FOF inspections

FOF exercises using “MILES” gear

Multiple Integrated Laser Engagement System

FOF inspection program (Continued)

- Fundamental questions
  - Does the licensee know what they need to protect?
  - Do they have an effective protective strategy?
  - Can they successfully implement the protective strategy?
  - Can they conduct a safe and realistic FOF tactical exercise?
- Priorities
  - Challenging and realistic exercises/ unambiguous results
  - Personnel and facility safety, security, and regulatory compliance
- Identified security deficiencies are promptly corrected

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Looking ahead

- The regulatory process will apply
  - licensing reviews
  - inspections
- NRC is working with its partners to ensure that security and safeguards features are part of the facility design process
- Strong international standards and guidelines are also important

Summary

- NRC regulates security at commercial facilities in the United States
- Physical protection encompasses measures for the protection of nuclear and radioactive materials or facilities from theft and diversion or sabotage
- NRC regulations are risk informed and require a graded approach to physical protection
- NRC develops security requirements and verifies their implementation through baseline inspections and performance evaluations
- The design basis threat (DBT) does not apply to all NRC licensees, only those representing the highest risk
- NRC is ready to regulate future reactor and fuel cycle facilities