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U.S. Design Basis Threat Requirements

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Session Objectives

- Identify the regulatory body responsible for U.S. DBT
- Identify the types of facilities for which DBT is required in the U.S.
- List the adversary characteristics included in the DBT

Regulatory Responsibility

- The Nuclear Regulatory Commission (NRC) is responsible for regulation of all civilian nuclear activities in the U.S.
- Physical Protection requirements are specified in Title 10, Part 73 of the Code of Federal Regulations (10 CFR 73)
- Licensees must establish and maintain physical protection systems which have the capability to protect nuclear material
- Certain facilities must demonstrate capability to protect against a specified design basis threat

Design Basis Threat Definition and Use

- *Design Basis Threat* means a profile of the type, composition, and capabilities of an adversary.
- The NRC and its licensees use the DBT as a basis for designing physical protection systems to protect against acts of radiological sabotage and to prevent the theft of nuclear material.
- The DBT is described in Title 10, Section 73.1(a), of the *Code of Federal Regulations* [10 CFR 73.1(a)].
- Nuclear facility licensees are expected to demonstrate they can defend against the DBT.

Design Basis Threat Applicability

- **NRC specifies a DBT for use in designing and evaluating the performance of physical protection systems to:**
  - Prevent Radiological Sabotage
  - Prevent theft of Category I (formula quantity) nuclear material
- **Radiological Sabotage means any deliberate act directed against a plant or transport which could directly or indirectly endanger the public health and safety by exposure to radiation**
- **Category I material is nuclear material in any combination in a quantity of 5,000 grams or more computed by the formula, grams = (grams contained U-235) + 2.5 (grams U-233 + grams plutonium)**
- **In practice, a DBT is used in the U.S. for:**
  - Nuclear power plants
  - Fuel cycle facilities that use or store Category I material

Design Basis Threat Characteristics (1)

- **Determined violent external assault**
  - Single group attacking through one entry point
  - Multiple groups attacking through multiple entry points
  - Combination of one or more groups and one or more individuals attacking through multiple entry points
  - Individuals attacking through separate entry points
- **Well-trained (including military training and skills) dedicated individuals**
- **Willing to kill or be killed**
- **Sufficient knowledge to identify specific equipment or locations necessary for successful attack**

Design Basis Threat Characteristics (2)

- **Active or passive (or both) inside assistance**
  - Active – facilitate entrance and exit, disable alarms and communications, participate in violent attack
  - Passive – provide information
- **Suitable weapons**
  - Handheld automatic weapons
  - Silencers
  - Effective long range accuracy
- **Hand-carried equipment**
  - Incapacitating agents
  - Explosives
  - Tools

Design Basis Threat Characteristics (3)

- **Land and water vehicles**
- **Internal threat (without external activity)**
- **Vehicle bomb assault**
  - Land or water vehicles
  - May be coordinated with an external assault
- **Cyber attack**

Design Basis Threat Characteristics (4)

- **Detailed DBT characteristics are specified in a separate, classified document transmitted to appropriately cleared licensee personnel**
- **Licensees must submit several plans demonstrating the ability of physical protection systems to protect against the DBT**
  - Security Plan – Physical protection measures in place
  - Safeguards Contingency Plan – Plans for response to security incidents
  - Cyber Security Plan – Measures for protection of digital computer and communication systems and networks

Summary

- **NRC is responsible for specifying the DBT that applies to nuclear facilities in the U.S.**
- **DBT is used for**
  - Nuclear power plants
  - Category I nuclear facilities
- **Adversary characteristics include:**
  - Determined, well-trained external attack
  - Insider assistance/insider attack
  - Weapons, explosives, tools
  - Land and water vehicles
  - Vehicle bomb attacks
  - Cyber attack