Introduction to Vulnerability Assessments

Module 4: Threat Definition

National Nuclear Security Administration

Module Objectives

After completing this module, you will be able to:

- Distinguish between a Threat Assessment and a Design Basis Threat (DBT)
- Describe process for developing a DBT
- Identify capabilities for outsider and insider threats

Definitions

- **Threat Assessment**
  - An analysis that documents the credible motivations, intentions, and capabilities of potential adversaries that could cause undesirable consequences to nuclear materials and nuclear facilities
    - One of the major inputs for the Design Basis Threat (DBT)
- **DBT**
  - The attributes and characteristics of potential insider and/or outsider adversaries who might attempt unauthorized removal of nuclear material or sabotage, against which a PPS is designed and evaluated
    - Based on results of threat assessments as well as other policy considerations

Purpose of DBT

- Provides consistent policy within a country
- Provides a rational basis for
  - Evaluating the adequacy of a PPS
  - Testing and exercising
  - Supporting countermeasure modifications
  - Making and justifying decisions
- An integral input for design
- Serves as a resource management tool
  - Places reasonable bounds on effort required to protect nuclear materials

Roles and Responsibilities

- Overall responsibility for development, implementation, and maintenance of DBT rests with state government or agencies
- DBT process may involve several different organizations
  - Regulatory authorities (such as DOE, NRC)
  - Intelligence organizations
  - Facility operators
- Good communication and coordination among these organizations is essential

Performing Threat Assessment

Threat assessment process has three parts:

1. Input

- Review of existing actual threat data

2. Analysis

- Determination of threats considered applicable to nuclear facilities
- Assessment of postulated threat characteristics and capabilities

3. Output

- Documented threat assessment listing postulated credible threats to the agency's nuclear facilities

Threat Assessment Input

- Includes
  - All reliable sources of information
  - All potential adversaries
  - Local, national, regional, and international
- Considers
  - Potential adversaries' motivations, intentions, and capabilities
  - Adversaries for other high-value, high-consequences assets
  - Historical malicious acts, planned events, and training activities
  - Level of confidence for information

Threat Assessment Analysis

- Assess and document in detail each potential adversary considered applicable to the nuclear facilities

Motivation

Political, ideological, financial, personal

Willingness to die

Intention

Nuclear related

- Theft
- Sabotage

Other: stop operations, social disruption, political instability, economic harm

Capabilities

Numbers

Weapons, equipment

Explosives

Knowledge, skills, and training

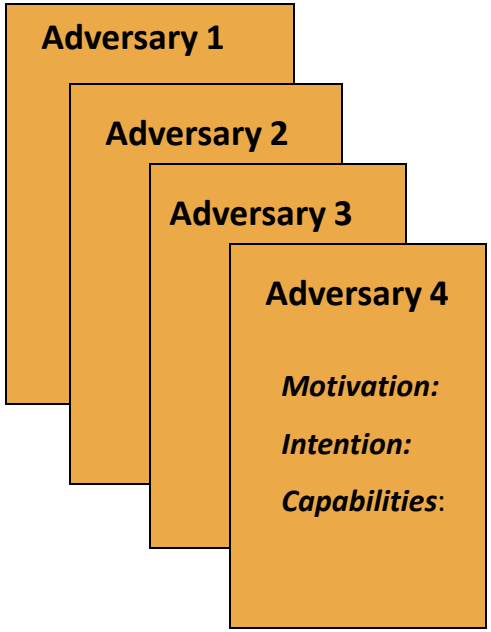
Insider assistance

Transportation methods

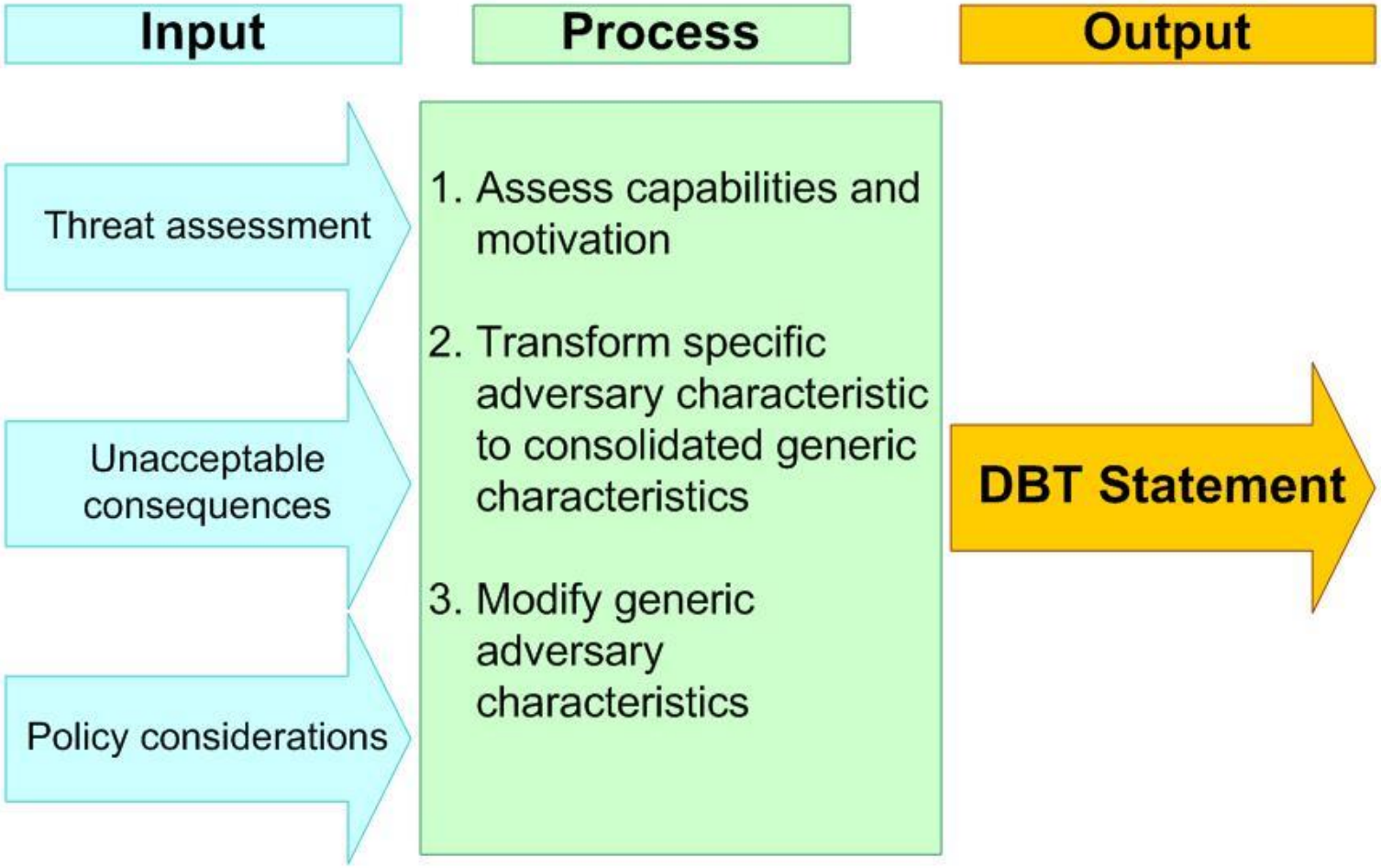
Tactics

Threat Assessment Output

- Threat assessment document
- Contains postulated threat data to nuclear facilities under the auspices of the government agency
  - All known, credible threats applicable to nuclear facilities
  - Detailed description
  - Credibility of information



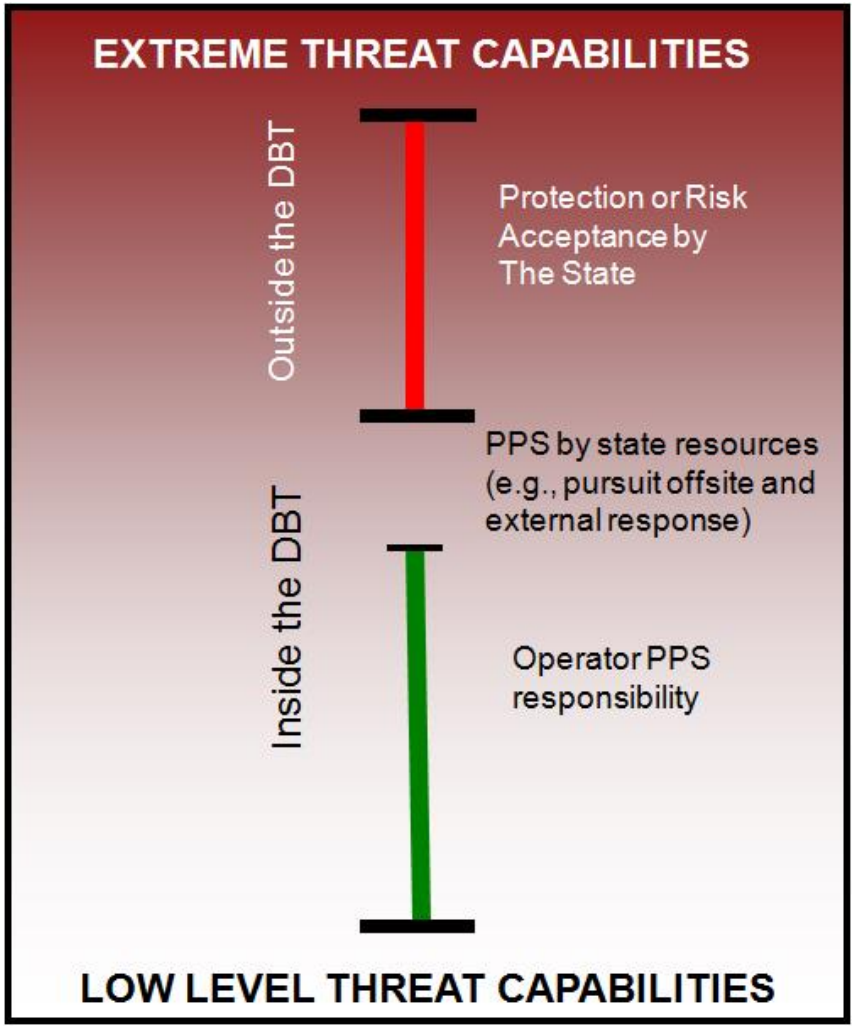
Developing a DBT



Adversary Capabilities

- Types of adversary capabilities addressed in DBT
  - Numbers
  - Weapons
  - Equipment
  - Explosives
  - Knowledge, skills
  - Training and tactics
  - Transportation means
  - Insider assistance

DBT Space


EXTREME THREAT CAPABILITIES
Outside the DBT
Protection or Risk Acceptance by The State
PPS by state resources (e.g., pursuit offsite and external response)
Inside the DBT
Operator PPS responsibility
LOW LEVEL THREAT CAPABILITIES

Categories of Outsider Threats

- Terrorists (high-level threat)
- Criminals (moderate-level threat)
- Protestors (low- to high-level threat)
  - Demonstrators
  - Activists
  - Extremists

Terrorists

- Motivation
  - Commit violent acts to gain political objectives
- Characteristics
  - Expert use of explosives (military, commercial, and homemade/ improvised)
  - Well funded and staffed
  - Core group may have support of a larger group
  - Military weapons (fully automatic weapons, sniper rifles, etc.)
  - Wide range of transportation
  - Highly trained and motivated
  - Willing to kill and/or die

Criminals

- Motivation
  - Economic gain
- Characteristics
  - Small group (1 to 3)
    - Organized crime may be larger group
  - Has conventional weapons
    - Commercially available
  - Has small amounts of commercial or homemade explosives
  - Uses deceit, theft, fraud, coercion, and extortion
  - Not willing to die, but may be violent to prevent capture
  - May cooperate with terrorists

Protestors

- Demonstrators
  - Motivations - Ideologically motivated
    - Looking for media attention for their cause
  - Characteristics
    - Can be a small (10) or large group (~2000)
    - Typically unarmed, nonviolent
    - Conduct acts of civil disobedience
- Activists
  - Motivation - Intent of political effect and attention of media
  - Characteristics
    - Moderate-sized group, well-educated, and trained
    - Expected to target property or police, not public
    - Cause property damage, criminal trespass

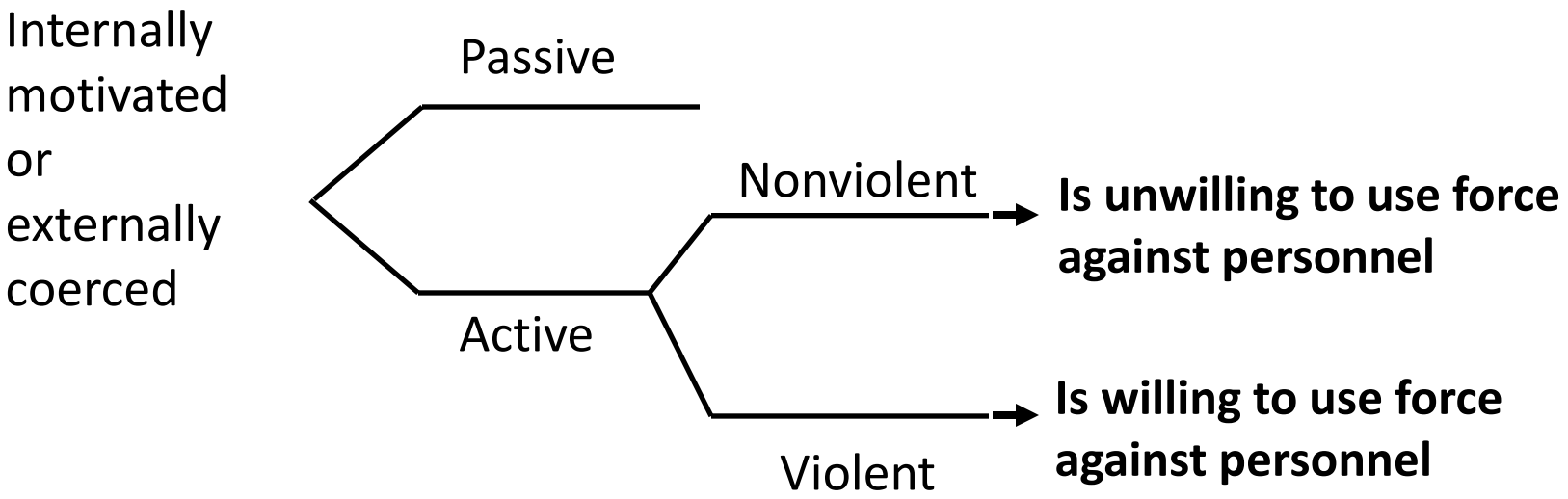
Protestors *(cont'd)*

- Extremists
  - Motivation - Intent on political effect and attention of media
  - Characteristics
    - Small group (10 to 15)
    - May have simple explosives in moderate amounts
    - May have conventional, commercially available firearms
    - Construct and use equipment in clever ways
    - Likely to be more violent than other types of protestors

Insider Definition

- Insider
  - Any individual with authorized access to nuclear facilities or transport who might attempt unauthorized removal or sabotage, or who could aid outsiders to do so
- Insiders might include
  - Management
  - Regular employees
  - Security personnel
  - Service providers
  - Visitors
  - Inspectors
  - Past employees
  - Others?

Insider Categories



All insiders can use stealth and deceit

Insider Motivations

- Ideological – fanatical conviction
- Financial – wants / needs money
- Revenge – disgruntled employee or customer
- Ego – “look what I am smart enough to do”
- Psychotic – mentally unstable but capable
- Coercion – family or self threatened
- Others?

Motivation is an important indicator for both level of malevolence and likelihood of attempt

Factors Affecting Malicious Insider Actions

Access
+
Knowledge
+
Authority

Insider Opportunity

+

Ideological
Financial
Revenge
Ego
Psychological
Coercion

Insider Motivations

~

Insider Attempt

Insider Access

- Authorized work areas
- Special temporary access
- Escorted or unescorted
  - Restrictions on insider during access
- Emergency access (fire, medical, police, etc.)
- Unauthorized access
  - Easy to obtain?
- Duration of target exposure
  - Conditions of target during insider access
- Protection equipment and process tools
- Special site equipment
- Other?

Insider Authority

- Authority over people
  - Designated authority over others
  - Personal influence over others
- Authority over tasks and equipment
  - Assessment of alarms
  - Preparation of sensitive forms
  - Authorization of processes and procedures
- Temporary authority?
- Falsified authority?
- Exemption from procedures?
- Others?

Insider Knowledge

- Targets
  - Locations, characteristics, and details of targets
  - Details of facility layout
- Security systems
  - Security forces capabilities and communications
  - Details of facility and security operations
  - Location and details of safety and security protection systems
- Operations and processes
  - Materials accounting
  - Operational processes
  - Tools and equipment

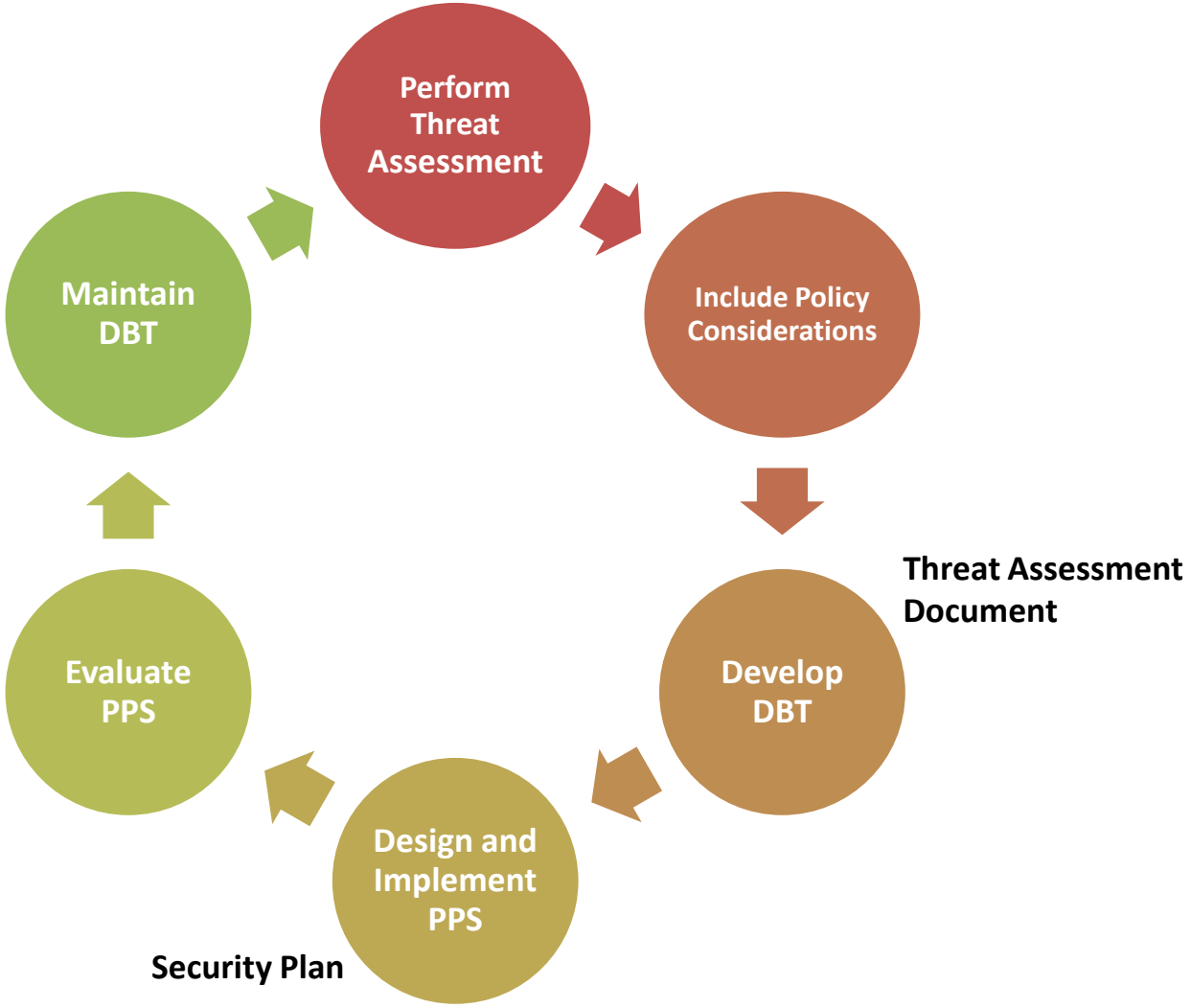
Using DBT to Develop Effective Physical Protection

- DBT used
  - As regulatory tool for physical protection
  - In accordance with agency legal requirements and organizational responsibilities
- Options for implementing DBT
  - Gives DBT to facilities, who use it to define performance requirements
  - Uses DBT to define requirements for facilities
    - Performance
    - Prescriptive
- Due to sensitivity, dissemination of DBT or its elements should be limited to those with need-to-know

Maintaining the DBT

- Indicators for DBT review include
  - Event that indicates unexpected threat
  - Change in government policy
  - Change in nuclear program
  - Request by interested party
  - Periodic review
- Follow same process as for developing DBT
- Review may or may not result in change to DBT

DBT Life Cycle



Summary

- Threat Assessment
  - Government agency-level evaluation of threats to nuclear materials and facilities
  - Includes capabilities of those threats
- Design Basis Threat (DBT)
  - Attributes and characteristics of potential insider and/or external adversaries against which a PPS is designed and evaluated
- Developing DBT is a 3-step process that
  1. Assesses adversary capabilities and motivation per threat assessment
  2. Transforms specific characteristics into generic characteristics
  3. Modifies generic characteristics based on policy considerations

Summary *(cont'd)*

- Types of adversary capabilities for outsider and insider
  - Outsider
    - Numbers
    - Weapons, equipment, explosives
    - Knowledge, skills, training, tactics
    - Transportation means
    - Insider assistance
  - Insider
    - Number
    - Level of violence