



Introduction to Vulnerability Assessments

Module 4: Threat Definition

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



Module 4:

Threat Definition

Introduction to
Vulnerability Assessment

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

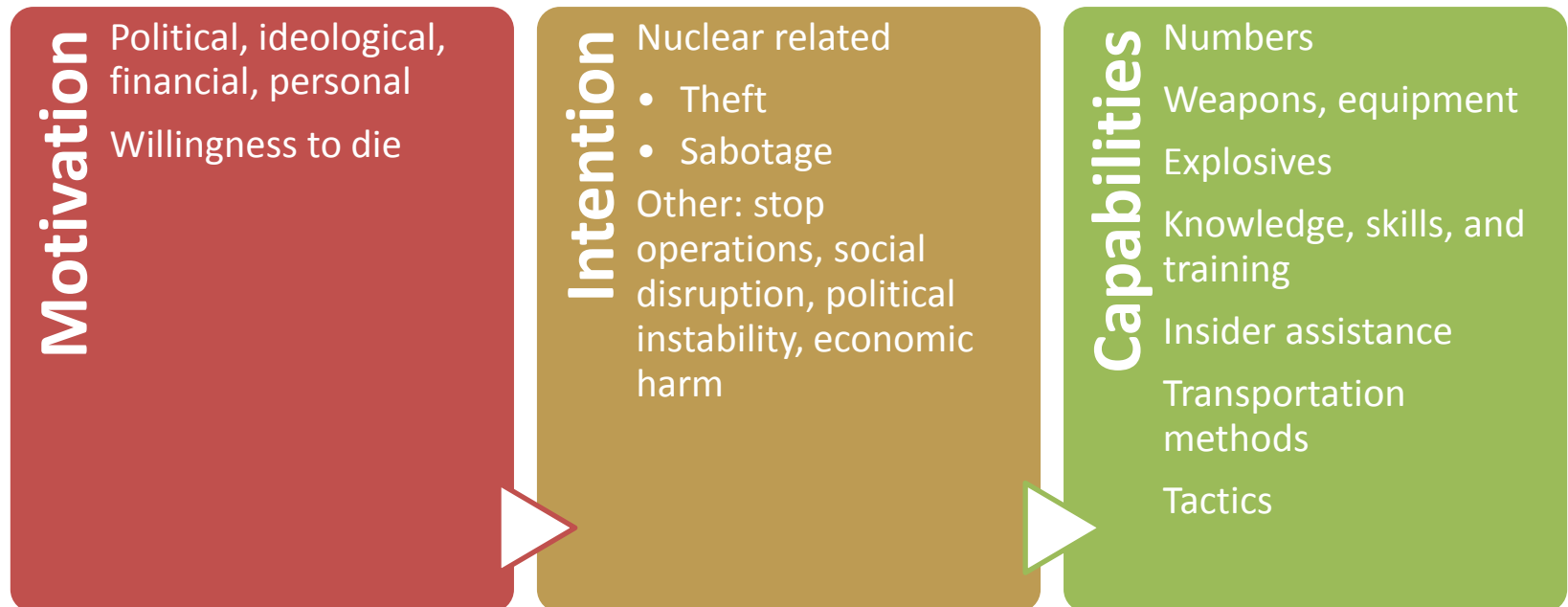
- Documented threat assessment listing postulated credible threats to the agency's nuclear facilities

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

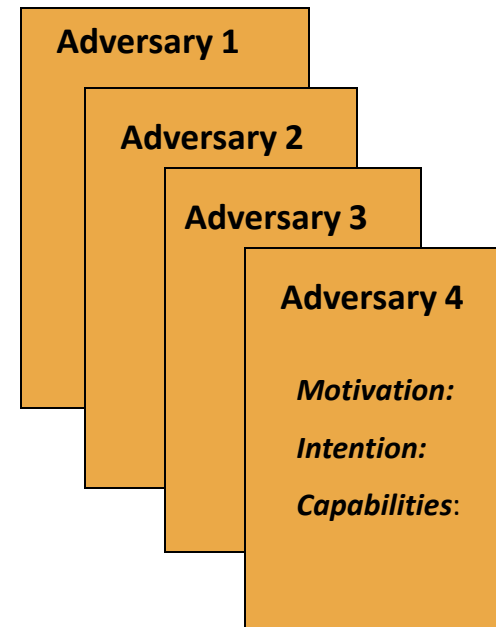
Threat Assessment Analysis

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

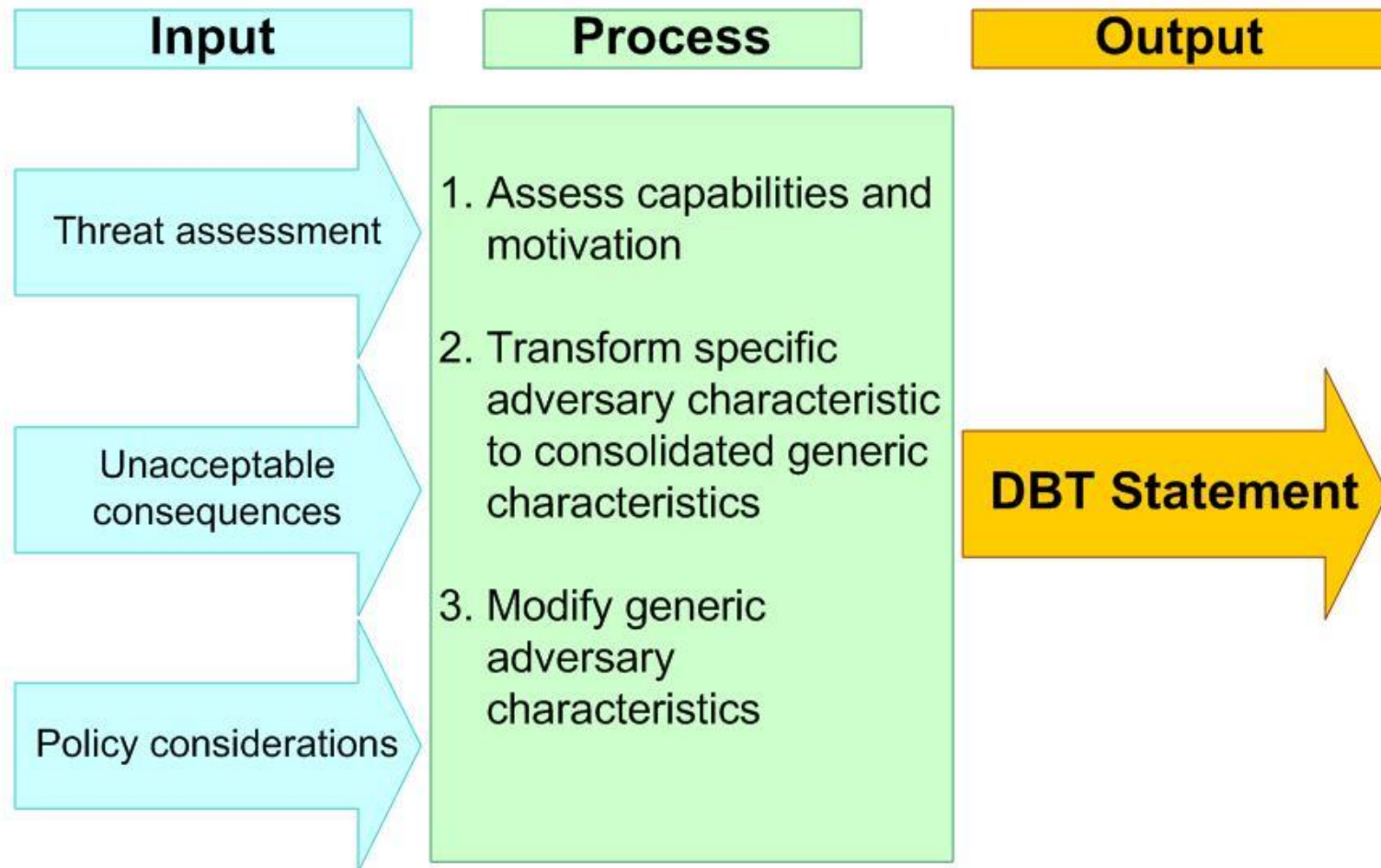


Threat Assessment Output

- 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

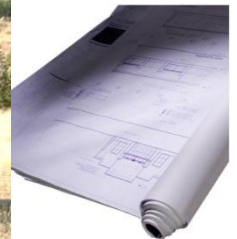


Developing a DBT

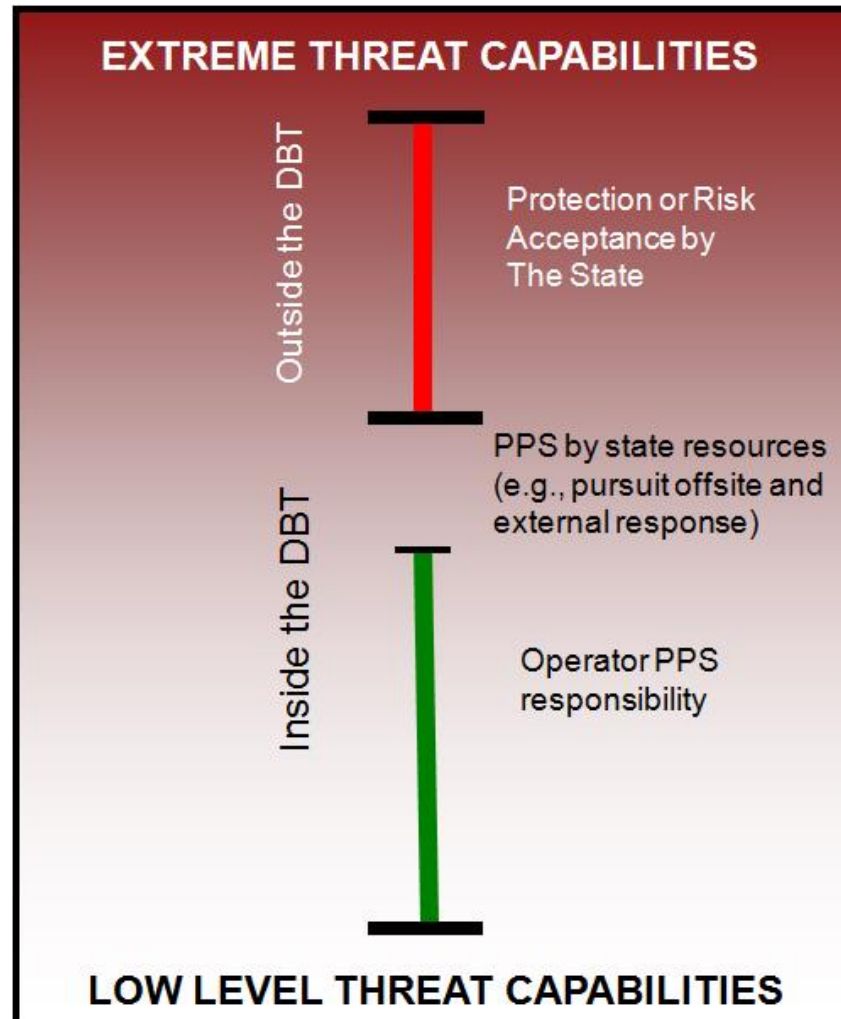


Adversary Capabilities

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



DBT Space



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)*

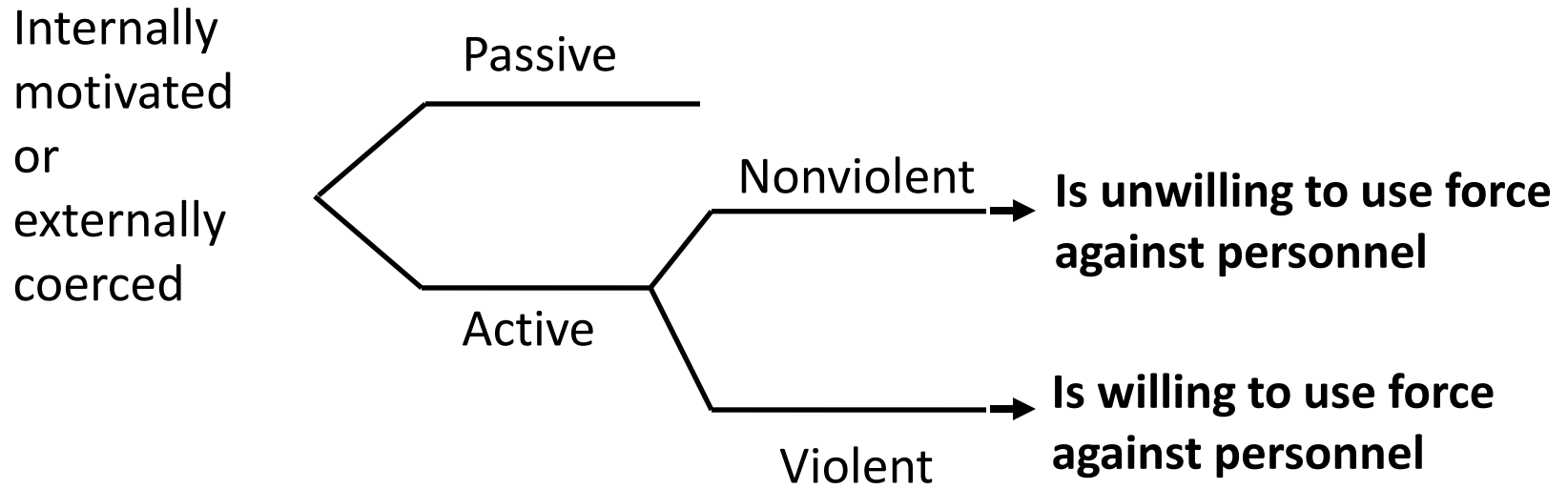
- Extremists
 - Motivation - Intent on political effect and attention of media
 - Characteristics
 - Small group (10 to 15)
 - May have simple explosives in moderate amounts
 - May have conventional, commercially available firearms
 - Construct and use equipment in clever ways
 - Likely to be more violent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



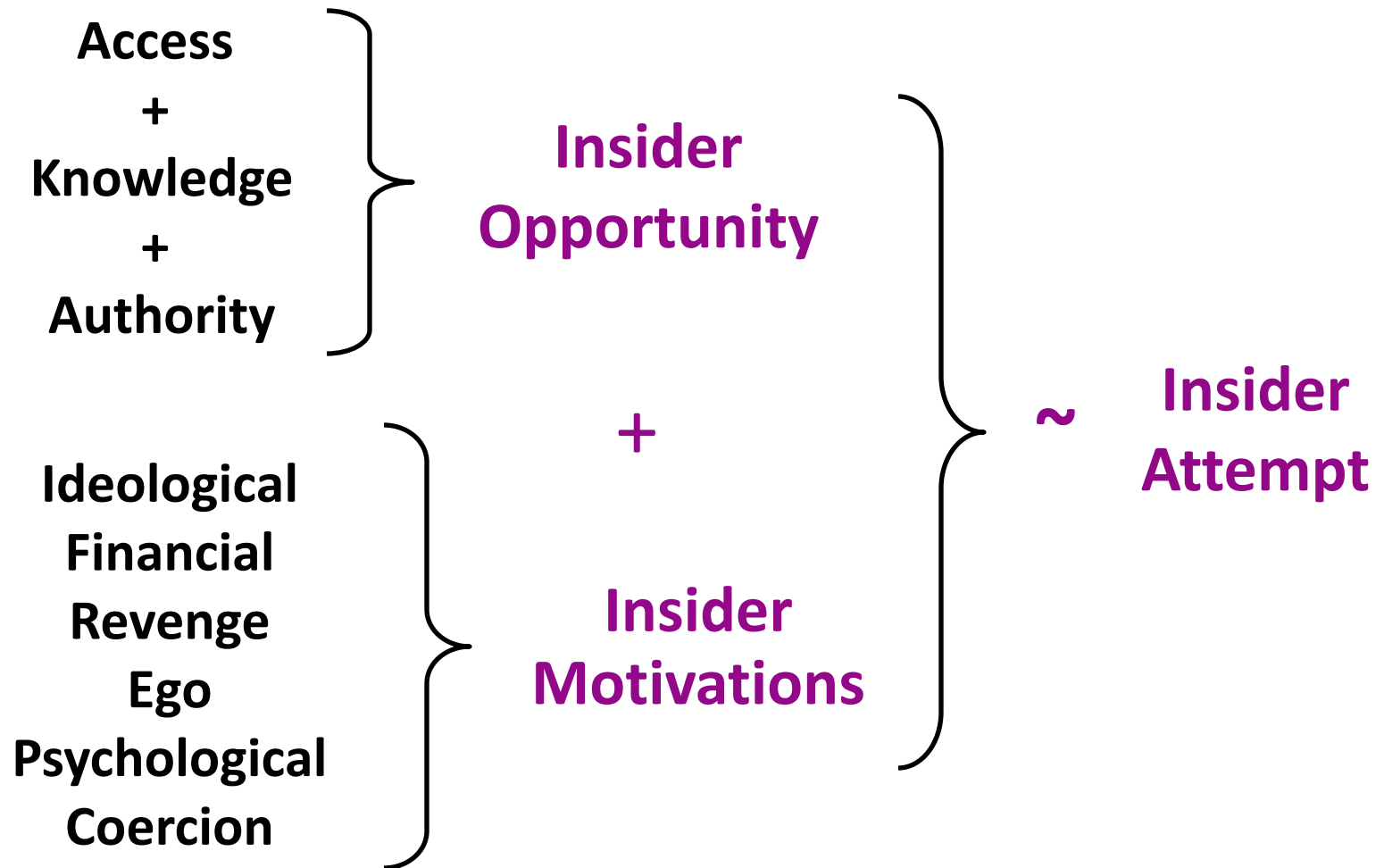
All insiders can use stealth and deceit

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



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



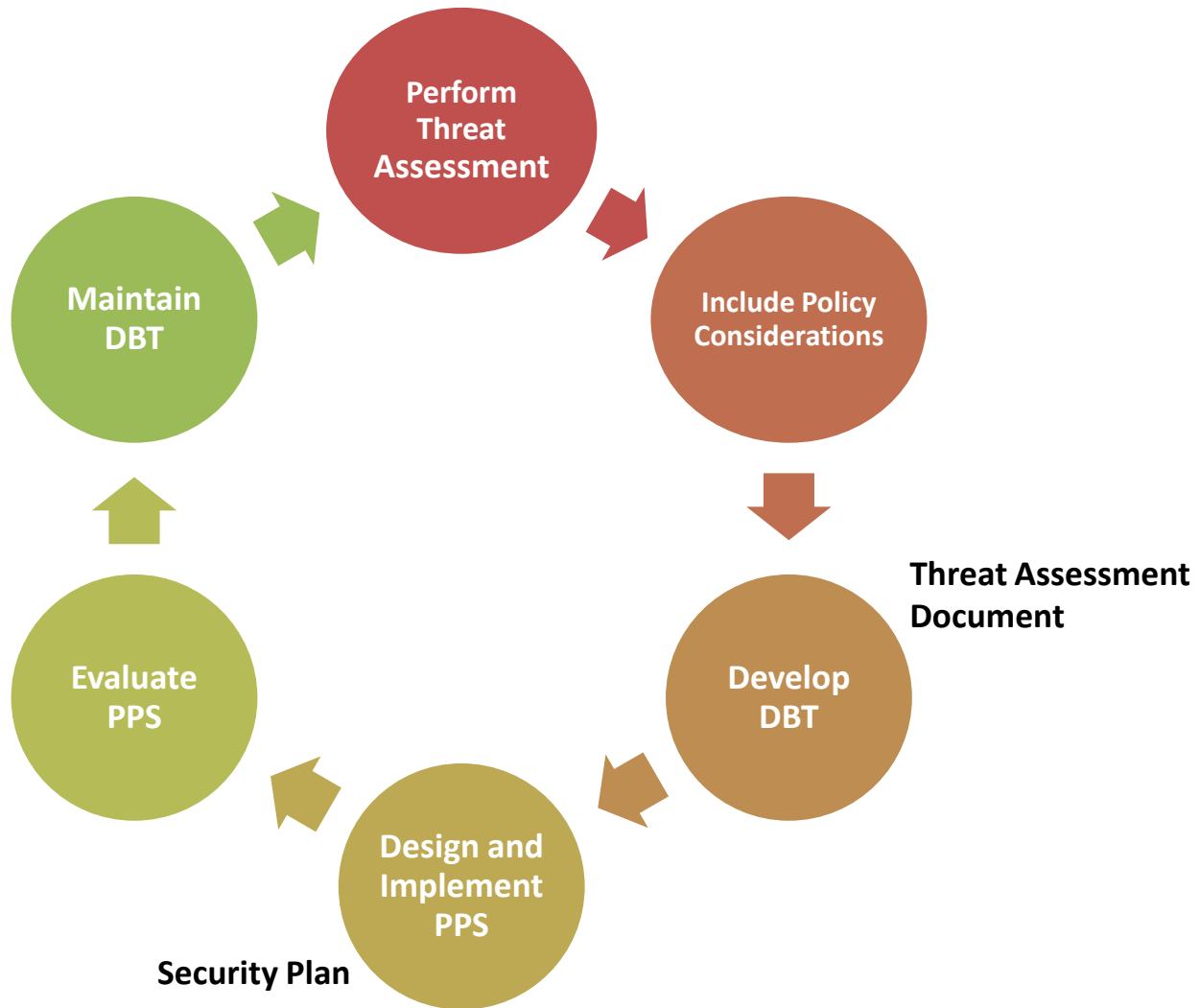
Using DBT to Develop Effective Physical Protection

- 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