Threat and Hazard Identification and Risk Assessment

Background/Overview and Process Briefing
Homeland Security Preparedness Technical Assistance Program

May 2012
PPD-8 Background

- A linking together of the national efforts, organized around key elements:
  - Ends we wish to achieve (National Preparedness Goal)
  - Means to achieve (National Preparedness System)
  - Reporting progress (Annual National Preparedness Report)
  - Sustained engagement, building and sustaining preparedness (Whole Community Initiative)
National Preparedness System Description - Components

The National Preparedness System description is comprised of six major components:

- Identifying and Assessing Risk
- Estimating Capability Requirements
- Building and Sustaining Capabilities
- Planning to Deliver Capabilities
- Validating Capabilities
- Reviewing and Updating
(1) Identify the Threats and Hazards of Concern
- Uses background research, probability models, subject matter experts, online resources, 2011 SPR, existing HIRAs, etc.
- Eliminates some threats/hazards from consideration

(2) Give Context to the Threats and Hazards
- Add as much jurisdictional-specific context as necessary to identify impacts and define capability targets
- Time, season, location, and community factors
- Include the threat and hazard context that presents the greatest risk

(3) Examine the Core Capabilities Using the Threats and Hazards
- For each core capability, describe the desired outcome – what you want to achieve
- For each threat/hazard, estimate and document the impact to the community through the lens of the core capabilities

(4) Set Capability Targets
- For each core capability, couple the greatest impact with the desired outcome.
- This becomes an all-hazards target

(5) Apply the Results
- How the results (gaps) are used throughout the rest of the NPS
- Formally outside of the THIRA/SPR
- Documentation: State Homeland Security Strategies, IJs, etc.

THIRA Toolkit Table 1
- Threat and Hazard List
- Uploaded to the SPR tool

THIRA Toolkit Tables 2 and 3
- Desired Outcomes
- Matrix of Estimated Impacts
- Uploaded to the SPR tool

THIRA Toolkit Table 4
- Capability Targets
- Entered directly in the SPR tool

Assess Current Capability
- Indicate the relative priority (high, medium, or low) of each capability
- For each core capability, assess proximity to the THIRA target
- Provide narrative description of any capability gap
- As appropriate, assess the impact of mutual aid
# Core Capabilities List

<table>
<thead>
<tr>
<th>PREVENT</th>
<th>PROTECT</th>
<th>MITIGATE</th>
<th>RESPOND</th>
<th>RECOVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>Planning</td>
<td>Planning</td>
<td>Planning</td>
<td>Planning</td>
</tr>
<tr>
<td>Public Information and Warning</td>
<td>Public Information and Warning</td>
<td>Public Information and Warning</td>
<td>Public Information and Warning</td>
<td>Public Information and Warning</td>
</tr>
<tr>
<td>Operational Coordination</td>
<td>Operational Coordination</td>
<td>Operational Coordination</td>
<td>Operational Coordination</td>
<td>Operational Coordination</td>
</tr>
<tr>
<td>Forensics and Attribution</td>
<td>Access Control and Identity Verification</td>
<td>Community Resilience</td>
<td>Critical Transportation</td>
<td>Economic Recovery</td>
</tr>
<tr>
<td>Intelligence and Information Sharing</td>
<td>Cybersecurity</td>
<td>Long-Term Vulnerability Reduction</td>
<td>Environmental Response / Health and Safety</td>
<td>Health and Social Services</td>
</tr>
<tr>
<td>Interdiction and Disruption</td>
<td>Intelligence and Information Sharing</td>
<td>Risk and Disaster Resilience Assessment</td>
<td>Fatality Management Services</td>
<td>Housing</td>
</tr>
<tr>
<td>Screening, Search, and Detection</td>
<td>Interdiction and Disruption</td>
<td>Threats and Hazard Identification</td>
<td>Infrastructure Systems</td>
<td>Infrastructure Systems</td>
</tr>
<tr>
<td>Physical Protective Measures</td>
<td></td>
<td></td>
<td>Mass Care Services</td>
<td>Natural and Cultural Resources</td>
</tr>
<tr>
<td>Risk Management for Protection Programs and Activities</td>
<td></td>
<td></td>
<td>Mass Search and Rescue Operations</td>
<td></td>
</tr>
<tr>
<td>Screening, Search, and Detection</td>
<td></td>
<td></td>
<td>On-Scene Security and Protection</td>
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</tr>
<tr>
<td>Supply Chain Integrity and Security</td>
<td></td>
<td></td>
<td>Operational Communications</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Public and Private Services and Resources</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Public Health and Medical Services</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Situational Assessment</td>
<td></td>
</tr>
</tbody>
</table>

**FEMA**
THIRA Process

- Step 1 – Identify the Threats and Hazards of Concern
- Step 2 – Give Threats and Hazards Context
- Step 3 – Examine the Core Capabilities Using the Threats and Hazards
- Step 4 – Set Capability Targets
- Step 5 – Apply the Results
THIRA Toolkit Overview

The toolkit includes:
- Bibliography
- Threat/Hazard Description Statements Template
- Desired Outcomes Template
- Estimated Impacts Template
- Core Capability Targets Template
Toolkit Bibliography

- The bibliography is broken down into the following categories:
  - FEMA documents
  - Presidential documents
  - Federal statutes and regulations
  - Human-caused incidents
  - Technological incidents
  - Data sources
THIRA Steps

1. Identify threats and hazards of concern
2. Give the threats and hazards context
3. Examine the core capabilities using the threats and hazards
4. Set capability targets
5. Apply the results
Step 1: Threat and Hazard Types

Three types of threats/hazards:

1. Natural: Acts of nature, such as hurricanes, tornados, earthquakes, and disease outbreaks and epidemics

2. Technological: Hazards resulting from accidents or failures of systems and structures, such as hazardous materials spills or dam failures

3. Threats or human-caused: Intentional actions of an adversary, such as a threatened or actual chemical or biological attack or cyber event
### Step 1: Example Threats and Hazards of Concern

<table>
<thead>
<tr>
<th>Natural</th>
<th>Technological</th>
<th>Human-caused</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resulting from acts of nature</td>
<td>Involves accidents or the failures of systems and structures</td>
<td>Caused by the intentional actions of an adversary</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avalanche</td>
<td>Airplane crash</td>
<td>Civil disturbance</td>
</tr>
<tr>
<td>Disease outbreak</td>
<td>Dam/levee failure</td>
<td>Cyber incidents</td>
</tr>
<tr>
<td>Drought</td>
<td>Hazardous materials release</td>
<td>Sabotage</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Power failure</td>
<td>School violence</td>
</tr>
<tr>
<td>Epidemic</td>
<td>Radiological release</td>
<td>Terrorist acts</td>
</tr>
<tr>
<td>Flood</td>
<td>Train derailment</td>
<td></td>
</tr>
<tr>
<td>Hurricane</td>
<td>Urban conflagration</td>
<td></td>
</tr>
<tr>
<td>Landslide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tornado</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tsunami</td>
<td></td>
<td></td>
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<tr>
<td>Volcanic eruption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildfire</td>
<td></td>
<td></td>
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<tr>
<td>Winter storm</td>
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<td></td>
</tr>
</tbody>
</table>
Step 1: Identify Potential Threats and Hazards

Information on potential hazards and threats can come from:

- Existing threat and hazard assessments (Hazard Identification and Risk Assessment)
- Previous incidents
- Review other current plans, policies and procedures (e.g., Catastrophic Planning Initiative, Emergency Operations Plans and annexes)
- Local, regional and neighboring jurisdictions’ THIRAs
- Analysis of critical infrastructure and key resources
- Online data sources from the U.S. Geological Survey (USGS), National Oceanic and Atmospheric Administration (NOAA), and the Department of Homeland Security (DHS)
Step 1: Identify Potential Threats and Hazards

Gathering data on threats/hazards requires research from:

- Hazard Mitigation Plans / HIRA
- After-action reports from previous incidents
- Subject matter experts in various threat/hazard types
  - Local universities who do hazard analysis
  - Federal agencies such as NOAA, USGS and DHS
  - Law enforcement agencies and fusion centers
  - Local historical societies
  - Other jurisdictions of similar size and composition facing the same hazard
THIRA Steps

1. Identify threats and hazards of concern
2. **Give the threats and hazards context**
3. Examine the core capabilities using the threats and hazards
4. Set capability targets
5. Apply the results
Step 2: Give the Threats and Hazards Context

- Jurisdictions should refine and reduce their list of threats and hazards to those of greatest concern.
- This process can be completed by:
  - Planning efforts (catastrophic planning and hazard mitigation planning)
  - Subject Matter Experts
  - Analysis
  - Policy
  - Historical Data
Step 2: Give the Threats and Hazards

Context

- Focused on hazards and threats of greatest concern
- Continues this idea by showing how a threat or hazard can affect your jurisdiction
  - The following should be considered:
    - When might a threat/hazard occur (time of day/season)?
    - Where might a threat/hazard occur (populated areas, coastal zones, industrial areas, etc.)?
  - What are the conditions that would escalate the level of greatest concern in the jurisdiction?
- Multiple threats or hazards occurring at the same time
- Cascading effects of a threat or hazard
THIRA Steps

1. Identify threats and hazards of concern
2. Give the threats and hazards context
3. Examine the core capabilities using the threats and hazards
4. Set capability targets
5. Apply the results
Step 3: Examine the Core Capabilities Using the Threats and Hazards

- Desired outcomes are established to explain what the jurisdiction wants to achieve for each core capability
- Impacts of the threats and hazards on a community is estimated
  - Impacts are understood through the lens of the core capabilities
Step 3: Determine the Desired Outcomes

- Desired outcomes should be measurable, for example:
  - Response and Recovery mission areas are usually defined by time (e.g., must be accomplished within 24 hours)
  - Prevention, Protection, and Mitigation mission areas may use percentages (e.g., scanning 25 percent of cargo containers)
## Step 3: Desired Outcomes

<table>
<thead>
<tr>
<th>Core Capability</th>
<th>Desired Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening, Search, and Detection</td>
<td>Screen 100% of targeted cargo, conveyances, mail, baggage, and people associated with an imminent terrorist threat or act using technical, non-technical, intrusive, or non-intrusive means</td>
</tr>
<tr>
<td>Access Control and Identity Verification</td>
<td>Ensure 100% verification of identity to authorize, grant, or deny physical and cyber access to specific locations, information, and networks</td>
</tr>
<tr>
<td>Long-term Vulnerability Reduction</td>
<td>Achieve a measurable decrease in the long-term vulnerability of critical infrastructure and systems</td>
</tr>
<tr>
<td>Fatality Management Services</td>
<td>During the first 72 hours of an incident, conduct operations to recover fatalities</td>
</tr>
<tr>
<td>Infrastructure Systems</td>
<td>Within 15 days of an incident, restore and sustain essential services (public and private) to maintain community functionality</td>
</tr>
</tbody>
</table>
Step 3: Estimate Impacts

- For each threat and hazard, determine the impacts on the community through the lens of the core capabilities
  - Some of the core capabilities may not apply for a threat or hazard.
  - For example, the prevention capabilities only apply to terrorism threats
- Consider impacts related to the mission areas
  - For example, in prevention and protection, think about what actions you would take to
Step 3: Estimate Impacts

- These impacts may include:
  - Displaced households
  - Fatalities
  - Injuries/illnesses
  - Direct economic impacts
  - Disruption to infrastructure
  - Intelligence requirements and needs
  - Supply chain disruption

- Coordinate with whole community partners to review and validate impacts
# Step 3: Estimated Impacts Example

<table>
<thead>
<tr>
<th>Prevention</th>
<th>Protection</th>
<th>Mitigation</th>
<th>Response</th>
<th>Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IED Attack</strong>: A lone actor deploys an improvised explosive device (IED) in an indoor concourse of a stadium during a sporting event</td>
<td><strong>Accidental Chemical Material Release</strong>: A nighttime accident in the rail yard results in the release of a toxic inhalation hazard (TIH) in a densely populated residential area</td>
<td><strong>Earthquake</strong>: A magnitude 7.2 earthquake centered near an urban area occurs during mid-afternoon in March</td>
<td><strong>Fatality Management Services</strong></td>
<td><strong>Public Health and Medical Services</strong></td>
</tr>
<tr>
<td>Screening, Search, and Detection</td>
<td>Access Control and Identity Verification</td>
<td>Long-term Vulnerability Reduction</td>
<td>52 fatalities</td>
<td>350 casualties</td>
</tr>
<tr>
<td>67,500 spectators 2,500 vendors and employees</td>
<td>2,500 vendors and employees</td>
<td>Reinforce 500 concrete support columns in stadium concourse</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reroute 100% of rail carrying TIH around densely populated areas</strong></td>
<td></td>
<td></td>
<td>4 fatalities</td>
<td>75 casualties</td>
</tr>
<tr>
<td>N/A</td>
<td>350 rail yard employees and first responders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>Undertake seismic retrofit measures at all public stadiums</td>
<td>375 fatalities</td>
<td>8,400 casualties</td>
</tr>
</tbody>
</table>
THIRA Steps

1. Identify threats and hazards of concern
2. Give the threats and hazards context
3. Examine the core capabilities using the threats and hazards
4. **Set capability targets**
5. Apply the results
Step 4: Set Capability Targets

- Capability targets are based on the greatest estimated impact coupled with the desired outcomes
  - For example, if a train derailment kills 100 people and the desired outcome is to have all remains recovered within 72 hours, then the target capability is to recover 100 remains within 72 hours
- The output of this step is have a target for each of the Core Capabilities
- Jurisdictions may have more than one capability target for each Core Capability
- These targets will serve as the basis for the State Preparedness Report capability assessment
## Step 4: Set Capability Targets

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<thead>
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<th>Core Capability</th>
<th>Desired Outcome</th>
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<td>Screen 100% of targeted cargo, conveyances, mail, baggage, and people associated with an imminent terrorist threat or act using technical, non-technical, intrusive, or non-intrusive means</td>
</tr>
<tr>
<td><strong>Capability Target:</strong></td>
<td>Screen 67,500 people associated with an imminent terrorist threat or act using technical, non-technical, intrusive, or non-intrusive means</td>
</tr>
<tr>
<td>Access Control and Identity Verification</td>
<td>Ensure 100% verification of identity to authorize, grant, or deny physical and cyber access to specific locations, information, and networks</td>
</tr>
<tr>
<td><strong>Capability Target:</strong></td>
<td>Verify 2,500 identities to authorize, grant, or deny physical and cyber access</td>
</tr>
<tr>
<td>Long-term Vulnerability Reduction</td>
<td>Achieve a measurable decrease in the long-term vulnerability of critical infrastructure and systems</td>
</tr>
<tr>
<td><strong>Capability Target:</strong></td>
<td>Achieve a measurable decrease in the long-term vulnerability by rerouting 100% of rail containing toxic inhalation chemicals around densely populated areas</td>
</tr>
<tr>
<td>Fatality Management Services</td>
<td>During the first 72 hours of an incident, conduct operations to recover fatalities</td>
</tr>
<tr>
<td><strong>Capability Target:</strong></td>
<td>During the first 72 hours of an incident, conduct operations to recover 375 fatalities</td>
</tr>
<tr>
<td>Infrastructure Systems</td>
<td>Within 15 days of an incident, restore and sustain essential services (public and private) to maintain community functionality</td>
</tr>
<tr>
<td><strong>Capability Target:</strong></td>
<td>Within 15 days of an incident, restore power to 350,000 customers</td>
</tr>
</tbody>
</table>
THIRA Steps

1. Identify threats and hazards of concern
2. Give the threats and hazards context
3. Examine the core capabilities using the threats and hazards
4. Set capability targets
5. Apply the results
Step 5: Apply THIRA Results

- After THIRA is completed, apply results to the community’s risk management efforts
  - One of the ways to apply the results is to use the Capability Targets as part of an assessment; for example, in the development of the SPR

- A jurisdiction may find it simply needs to sustain existing capabilities, or it may identify a resource shortfall or capability gap
Step 5: Apply THIRA Results

- Preparedness efforts that can also be enhanced by a THIRA include:
  - Emergency operations plan production
  - Hazard mitigation plans
  - Strategic planning for prioritizing assets
  - Equipment purchases and personnel hiring
  - Public awareness campaigns
  - Exercises
  - Training
Questions?

PPD8-NationalPreparedness@fema.dhs.gov