Improving Regional Resilience: Bringing It All Together

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Dams as Critical Infrastructure

- Dams Sector encompasses not only “conventional” dams but also locks (and navigation dams), levees (flood protection systems), hydropower facilities, mine tailings, and other water retention or control structures.

- DHS Office of Infrastructure Protection designated as Sector-Specific Agency.

Dams...  Locks...  ... and Levees
U.S. Army Corps of Engineers (USACE) as Dams Sector Stakeholder

627 Shallow Draft Harbors
25% of Nation’s Hydropower Production
383 Major Lakes & Reservoirs 376 M visitors/yr
11,000 miles Inland Waterways
299 Deep Draft Harbors
Emergency Operations
400 miles Coastal Structures
653 Dams 276 Locks
$500M annual Dredging Costs
14,000 miles of Levees
11.7 Million Acres Public Lands
Environmental Stewardship
4340 Recreation Areas
Regulatory Responsibilities

Cumulative Flood Damage Reduction >$419 Billion
USACE Critical Infrastructure Protection & Resilience (CIPR) Program

- Program Goal:
  - Improve protection, resilience, and lifecycle investment in critical infrastructure.

- Program Vision:
  - Achieve a more secure and more resilient civil works critical infrastructure by enhancing its protection in order to prevent, deter, or mitigate the effects of manmade incidents and improve preparedness, response, and rapid recovery in the event of an attack, natural disaster, and other emergencies.

- Integrated Approach:
  - Portfolio-Centric
  - System/Regional Focus
  - All Hazards Coordination
Challenge: A Complex Risk Profile

- Driven by multiple sources:
  - Natural hazards
  - Structural deficiencies
  - Aging
  - Accidents
  - Malfunctions
  - Deliberate aggressor actions
USACE Critical Infrastructure Protection & Resilience (CIPR) Program

- Consequence-Based Screening
- Comprehensive Facility Assessment
- Regional Resilience Pilot Efforts
  - System-Wide Implementation Actions
  - Asset-Specific Implementation Actions
- Security Configuration Assessment
- Consequence Assessment
- Damage Assessment
- Portfolio Conditional Risk
- R&D Efforts
- Risk-Informed Prioritization

Integrated Approach for Enhanced Protection & Resilience
USACE Critical Infrastructure Protection & Resilience (CIPR) Program
Regional Resilience Efforts: Dams Sector Exercise Series (DSES)

- Collaborative process to identify, analyze, assess, and enhance regional preparedness and disaster resilience involving a wide array of public & private stakeholders.
- For a given region, a particular scenario serves as the triggering event to analyze impacts, disruptions, critical infrastructure interdependencies, and stakeholder roles and responsibilities.
- Three major regional efforts conducted to date:
  - Bagnell/Truman Dams (DSES-08)
  - Columbia River Basin (DSES-09)
  - Green River Valley (DSES-10)
2010 Dams Sector Exercise Series – Green River Valley (DSES-10)

**Goals:**

- Understand potential impacts associated with significant flooding events along the Green River Valley (State of Washington).
- Identify and prioritize critical infrastructure dependencies and interdependencies.
- Assist public/private stakeholders in improving recovery strategies and business continuity plans.
DSES-10 Approach

- Implemented through a series of discussion-based activities (meetings, seminars, workshops, etc), complemented by data gathering and analysis efforts.
- A systematic process is followed to consolidate findings, and support a framework to inform future resource requirements and investment justifications.
- Comprised of 3 major areas:
  1) Regional Baseline Assessment
  2) Regional Consequence Assessment
  3) Regional Resilience Strategy
DSES-10 Initial Planning Workshop

- Conducted on April 28, 2010 in Seattle, WA.
- Served as an effective forum to discuss the multiple aspects of the DSES-10 effort.
- Over 151 participants, including 114 Federal, State, and local government representatives, 27 private stakeholders, and 10 representatives from non-profit organizations.

DSES-10 Triggering Event: A significant flooding scenario affecting the King County communities of Auburn, Kent, Renton, and Tukwila.
Scenario and Geographic Scope

- **Howard Hanson Dam**
- **Harbor Island Area**
- **Green River Valley Area** (62 miles from Dam to Elliott Bay)

**Scenario for Baseline Assessment:**

- Heavy rain overtops levees resulting in significant flooding (6-in rain over a 24-hr period)
- Flood Flow Rate: 25,000 cfs
1) Regional Baseline Assessment

- Consolidate regional baseline information.
  - Economic structure, industrial development, social landscape.
  - Potential disruption scenarios.

- Identify current public and private capabilities.
  - Preparedness, mitigation, response, and recovery.

- Identify information sharing and collaboration mechanisms used during disaster lifecycle.

- Assess infrastructure interdependencies.
Data Collection Process

- Leverage from previous studies and regional workshops.
- Conduct “open source” data collection and literature search.
- Interview process with public/private stakeholders.
  - State and local
  - Private owners
  - Non-profit organizations
A disruption in one critical infrastructure sector may impact other(s) critical infrastructure sector(s).

**Cross-Sector Interdependencies**

- Airports
- Roads
- Railroads

**Transportation Systems**

- Natural gas pipelines
- Oil terminals; Pump stations
- Electric substations

**Energy**

- Water facilities
- Wastewater facilities

**Flooding Scenario**

**18 Critical Infrastructure Sectors**

- **Sector Specific Agency**
- **Critical Infrastructure and Key Resilience Sectors**
  - Department of Agriculture
  - Department of Health and Human Services
  - Department of Defense
  - Department of Energy
  - Department of Housing and Urban Development
  - Department of Transportation
  - Environmental Protection Agency
  - Federal Communications Commission
  - Federal Reserve
  - Treasury Department
  - Department of Homeland Security
  - National Institutes of Health
  - National Oceanic and Atmospheric Administration
  - National Park Service
  - Nuclear Regulatory Commission
  - Department of Agriculture
  - Department of Energy
  - Department of the Interior
  - Department of Commerce
  - Department of Transportation
  - Department of Homeland Security

**A disruption in one critical infrastructure sector may impact other(s) critical infrastructure sector(s).**
DSES-10 Regional Baseline Assessment Workshop

- Conducted on June 30, 2010 in Seattle, WA.
- Served as a working session to review and evaluate ongoing regional baseline assessment, discuss preliminary findings, and gather active feedback and recommendations from regional stakeholders.
- Over 65 participants from Green River Valley public and private stakeholders.
2) Regional Consequence Assessment

- Estimate extent of regional direct and indirect consequences associated with significant flood events.
- Refine existing models and procedures to assess regional short-term and long-term impacts associated with significant disruption scenarios.
- Conduct scenario-specific identification of critical infrastructure dependencies and interdependencies.
Modeling of Secondary Impacts

- **Infrastructure Models:**
  - Electric Power
  - Natural Gas/Crude Oil
  - Telecommunications
  - Water
  - Healthcare/Public Health

Critical Infrastructure Interdependencies
DSES-10 Regional Consequence Assessment Workshop

- Scheduled for October 21, 2010 in Seattle, WA.
- Working session to review and discuss regional consequence assessment preliminary findings, and gather feedback and recommendations from regional stakeholders.
- Participants will include Green River Valley public and private stakeholders.
3) Regional Resilience Strategy

- Assist public and private stakeholders in jointly enhancing regional resilience.

- Support identification of integrated post-disaster recovery solutions and prioritize recommended short-term and long-term actions to improve regional disaster resilience.

- Identify regional strategy implementation mechanisms and support strategic flood risk reduction efforts and other interagency initiatives.
Towards and Integrated Outcome

DSES-10

Regional Baseline Assessment

Regional Consequence Assessment

Regional Resilience Strategy
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