Panel II: Are We Prepared?
Emergency Preparedness & Response

March 13, 2013

Connecticut Energy, Environment and Economic Development Conference

Douglas S. McCracken
CL&P Director
Emergency Preparedness
Combined, the new NU has:

- Seven regulated companies
  - Four electric companies
  - Two gas companies
  - One three-state electric transmission company

- Serving 525 cities and towns throughout New England

- Providing reliable electric and gas service to:
  - 3,000,000 electric customers
  - 500,000 natural gas customers

- Leveraging investments for our customers and shareholders:
  - $12.4 billion combined rate base (2011)
- 1,242,000 customers
- 149 Connecticut cities and towns
- 4,400 square mile service territory
- Distribution – 13 Area Work Centers
  - 16976 overhead miles
  - 6352 underground miles
  - 219 substations
- Transmission
  - 1638 overhead miles
  - 135 underground miles
6 Focus Areas and 26 Initiative Areas

- Preparedness
  - Plans, Processes & Procedures
  - Training/Drills/Exercises
  - Storm Forecasting
  - Public Education
  - Post-Storm Assessment
  - Transmission

- Scalability
  - Incident Command Structure & Staffing
  - Contractor Agreements
  - Mutual Aid
  - Logistics
  - Restoration Strategy

- Coordination
  - Partnership with Municipalities
  - Partnership with State Agencies
  - Partnership with Other Utilities

- Communications
  - Restoration Projections
  - Town Liaison Program
  - Crisis Management
  - Customer Engagement

- Situational Awareness
  - Crew & Work Tracking
  - Damage Assessment

- Infrastructure Hardening
  - Vegetation Management
  - Standards Review
  - Electrical & Structural Hardening
  - Selective Hardening
  - System Automation
  - Post-Storm Forensics

- Response / Recovery

- Mitigation
## Emergency Plan Revision

Restoration Strategies up to 100% Customers Out

<table>
<thead>
<tr>
<th>Event Level</th>
<th>Typical Number of Customers out at Peak</th>
<th>Typical Number of Trouble Spots</th>
<th>Typical Restoration Duration</th>
<th>Typical Global ETR Availability Timeframe</th>
<th>Typical ICS Structure Activation Level</th>
<th>Typical Restoration Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>0% - 9% &lt;sup&gt;2&lt;/sup&gt; (&lt;125k)</td>
<td>&lt;2000</td>
<td>1-3 Days</td>
<td>&lt;24 hours</td>
<td>General Staff / PIO</td>
<td>Event</td>
</tr>
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<td>II</td>
<td>10% - 29% &lt;sup&gt;2&lt;/sup&gt; (125k – 380K)</td>
<td>1500 – 10,000</td>
<td>2-6 Days</td>
<td>&lt;36 hours</td>
<td>General Staff / PIO / All</td>
<td>Event / Hybrid (Event/Area by District)</td>
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<tr>
<td>III</td>
<td>30% - 49% &lt;sup&gt;2&lt;/sup&gt; (375K – 650K)</td>
<td>8,000 – 25,000</td>
<td>5-10 Days</td>
<td>&lt;48 hours</td>
<td>All &lt;sup&gt;1&lt;/sup&gt;</td>
<td>Hybrid (Event - Area - Circuit by District)</td>
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<tr>
<td>IV</td>
<td>50% - 69% &lt;sup&gt;2&lt;/sup&gt; (625k – 870k)</td>
<td>15,000 – 48,000</td>
<td>8-21 Days</td>
<td>Global &lt;48 hours</td>
<td>All &lt;sup&gt;1&lt;/sup&gt;</td>
<td>Area - Circuit</td>
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<tr>
<td>V</td>
<td>70% - 100% &lt;sup&gt;2&lt;/sup&gt; (&gt; 870K)</td>
<td>&gt;35,000</td>
<td>&gt;18 Days</td>
<td>Global &lt;48 hours</td>
<td>All &lt;sup&gt;1&lt;/sup&gt;</td>
<td>Circuit</td>
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</tbody>
</table>

Event Level Matrix Identifies Global ETR Timeframe

<sup>1</sup> Includes all ETR Energy and Non-Energy activities
<sup>2</sup> Applies to Customers in Region/Zone/Market Area
Scalability - Incident Command Structure

Key

- Communication and Coordination Relationship
- Supervisory Relationship

The National Incident Management System
Almost 3,000 external line resources from 25 states and 4 Canadian provinces assisted CL&P’s Storm Sandy restoration efforts.
Restoration Priority Guidelines balance resources with the impact from agreed priorities with State authorities

Incident Action Plan from EOC
- Formal daily plan outlines goals and objectives consistent with the Emergency Plan

District Operating Plans (17)
- Formal tactical plans support the goals and objectives
Communications Priorities

Communications to the Public as important as restoration

Operations

- Damage Assessment
- Resource Tracking

Estimated Time to Restoration

- Global ETR

Communications

- Crisis Management / Communications
- Town Liaison Program / State Coordination

Communications to the Public as important as restoration
Situational Awareness – 11 x 17 Town Maps

Pre-identified Critical Facilities

WILTON
Town Critical Facilities
- Police
- Fire
- Emergency Shelter
- Convalescent Home
- DPS/DPW Communication Tower
- Substation

Circuit / Substation
- 12N10, PEACEABLE
- 12N16, PEACEABLE
- 21N2, WESTON
- 21N3, WESTON
- 21N4B, WESTON
- 22N3, RIDGEFIELD
- 22N7, RIDGEFIELD
- 31A8, LAKEVIEW
- 31A9, LAKEVIEW
- 35A4, WILTON
- 35A4B, WILTON
- 35A4C, WILTON
- 35A4D, WILTON
- 35A4E, WILTON
- 35A4F, WILTON
- 35A4G, WILTON
- 35A5, WILTON
- 35A5B, WILTON
- 35A5C, WILTON
- 35A5D, WILTON
- 95A15, NORWALK
- 95A18, NORWALK
- 95A41, NORWALK

[Map showing critical facilities in Wilton]
Situational Awareness – 11 x 17 Town Maps

Back-side: Critical Facility street addresses with circuits

<table>
<thead>
<tr>
<th>Town Critical Customer</th>
<th>Town Priority Sequence</th>
<th>Name</th>
<th>Address</th>
<th>City</th>
<th>State</th>
<th>Circuit</th>
<th>Substation Name/Town Located</th>
<th>Date</th>
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<tbody>
<tr>
<td>Police</td>
<td></td>
<td></td>
<td>236-240 Danbury Rd</td>
<td>Wilton</td>
<td>CT</td>
<td>35A3</td>
<td>WILTON / WILTON</td>
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<tr>
<td>Fire</td>
<td></td>
<td></td>
<td>707 Ridgefield Rd</td>
<td>Wilton</td>
<td>CT</td>
<td>35A4</td>
<td>WILTON / WILTON</td>
<td>09/24/2012</td>
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<tr>
<td>Emergency Shelter</td>
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<td></td>
<td>404 Danbury Rd</td>
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<td>CT</td>
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<td>CT</td>
<td>35A4</td>
<td>WILTON / WILTON</td>
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<tr>
<td>Waste Water Treatment Plant</td>
<td></td>
<td></td>
<td>Danbury Rd</td>
<td>Wilton</td>
<td>CT</td>
<td>35A4</td>
<td>WILTON / WILTON</td>
<td>09/24/2012</td>
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<tr>
<td>Convalescent Home</td>
<td></td>
<td></td>
<td>345 Barden Hill Rd</td>
<td>Wilton</td>
<td>CT</td>
<td>35A11</td>
<td>WILTON / WILTON</td>
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<td>Convalescent Home</td>
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<td>438 Danbury Rd (Route 71)</td>
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<tr>
<td>Convalescent Home</td>
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<td></td>
<td>345 Barden Hill Rd</td>
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<td>345 Barden Hill Rd</td>
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<td>Other</td>
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<td>128 Mathis St</td>
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<td>CT</td>
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<td>WILTON / WILTON</td>
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</tbody>
</table>

Date: __________________ Town Critical: _____________________ CLEP Account Exec.: _____________________
### Status of Critical Facilities

<table>
<thead>
<tr>
<th>Town</th>
<th>Event</th>
<th># Cost Affected</th>
<th># Resource Hours</th>
<th>Customers per Crew Hour</th>
<th>Status</th>
<th>Referral Type</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avon</td>
<td>191000</td>
<td>1000</td>
<td>40</td>
<td>25.00</td>
<td>ENR</td>
<td>LNE</td>
<td>Patrolled - 2 broken poles, 5 spans primary and 1 bad sf</td>
</tr>
<tr>
<td>Simsbury</td>
<td>191003</td>
<td>800</td>
<td>20</td>
<td>40.00</td>
<td>ENR</td>
<td>LNE</td>
<td>Patrolled - 1 broken poles, 2 spans primary. Large tree on wires needs removal</td>
</tr>
<tr>
<td>Simsbury</td>
<td>191002</td>
<td>300</td>
<td>20</td>
<td>15.00</td>
<td>UAS</td>
<td>LNE</td>
<td>Patrolled - 3 large oak trees on primary. Pole leaning with broken xarm</td>
</tr>
<tr>
<td>Avon</td>
<td>191003</td>
<td>100</td>
<td>5</td>
<td>25.00</td>
<td>UAS</td>
<td>LNE</td>
<td>Patrolled - tree needs removal from lines. 25KVA XF needs to be replaced at pole 567</td>
</tr>
<tr>
<td>West Hartford</td>
<td>191004</td>
<td>25</td>
<td>4</td>
<td>20.00</td>
<td>ENR</td>
<td>LNE</td>
<td>Patrolled - Sagging primaries need to be repaired. Fuse needed replacing at pole 55678</td>
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<tr>
<td>Avon</td>
<td>191009</td>
<td>1</td>
<td>3</td>
<td>0.33</td>
<td>UAS</td>
<td>LNE</td>
<td>Patrolled - service needed to be repaired</td>
</tr>
<tr>
<td>Avon</td>
<td>191017</td>
<td>1</td>
<td>3</td>
<td>0.33</td>
<td>UAS</td>
<td>PTL</td>
<td>Unpatrolled - service ripped off pole. OK at house</td>
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<tr>
<td>simsbury</td>
<td>191012</td>
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<td>10</td>
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<td>UAS</td>
<td>Unpatrolled - tree removed</td>
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<tr>
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<td>234</td>
<td>10</td>
<td>25.00</td>
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<td>UAS</td>
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<td>Avon</td>
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<td>UAS</td>
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<tr>
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<td>11</td>
<td>1</td>
<td>25.00</td>
<td>UAS</td>
<td>PTL</td>
<td>Unpatrolled - tree removed</td>
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<tr>
<td>Avon</td>
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<td>1</td>
<td>25.00</td>
<td>UAS</td>
<td>PTL</td>
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<tr>
<td>Avon</td>
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<td>1</td>
<td>25.00</td>
<td>UAS</td>
<td>PTL</td>
<td>Unpatrolled - tree removed</td>
</tr>
</tbody>
</table>

### Patrolled events with Damage Assessment

<table>
<thead>
<tr>
<th>Town</th>
<th>Event</th>
<th># Cost Affected</th>
<th># Resource Hours</th>
<th>Customers per Crew Hour</th>
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<td>20</td>
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<tr>
<td>Avon</td>
<td>191003</td>
<td>100</td>
<td>5</td>
<td>25.00</td>
<td>UAS</td>
<td>LNE</td>
<td>Patrolled - tree needs removal from lines. 25KVA XF needs to be replaced at pole 567</td>
</tr>
<tr>
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<td>191004</td>
<td>25</td>
<td>4</td>
<td>20.00</td>
<td>ENR</td>
<td>LNE</td>
<td>Patrolled - Sagging primaries need to be repaired. Fuse needed replacing at pole 55678</td>
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<tr>
<td>Avon</td>
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<td>1</td>
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<td>0.33</td>
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<td>LNE</td>
<td>Patrolled - service needed to be repaired</td>
</tr>
<tr>
<td>Avon</td>
<td>191017</td>
<td>1</td>
<td>3</td>
<td>0.33</td>
<td>UAS</td>
<td>PTL</td>
<td>Unpatrolled - service ripped off pole. OK at house</td>
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</table>

### Unpatrolled events awaiting Damage Assessment

<table>
<thead>
<tr>
<th>Town</th>
<th>Event</th>
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<th># Resource Hours</th>
<th>Customers per Crew Hour</th>
<th>Status</th>
<th>Referral Type</th>
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<td>Simsbury</td>
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<td>UAS</td>
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<td>1</td>
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<td>NEW</td>
<td>UAS</td>
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<tr>
<td>Avon</td>
<td>191017</td>
<td>1</td>
<td>1</td>
<td>25.00</td>
<td>NEW</td>
<td>UAS</td>
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</tbody>
</table>
Situational Awareness – Event Status

Event detail including ETR for Town Liaisons

Status

Total CL&P Customers Served: 1,235,291
Total CL&P Customers Reported Affected: 185,145
% of CL&P Customers Reported Affected: 14
Situational Awareness – Crew Locations

Event map with GPS tracking overlay
Mobile Application in development uses GIS equipment configuration inventory and Bluetooth/USB GPS device for navigation.
July 12, 2012 Company Exercise with 6 Municipalities

Formal Systematic Approach to Training (SAT) & Exercise Program
Statewide Exercise
with 149 Municipalities

Scenario:
Category 3 Hurricane
July 28-31, 2012

- Communications
- Make Safe
- Critical Customers
- Emergent Priorities
CL&P is working to educate the public on emergency preparedness

- Published restoration process information packets and video
- Conducted ‘Storm School’ for media
- Launching state-wide public information forums
- Enhancing crisis communications capabilities
CL&P has enhanced its partnerships with the State

- DEHMS interface – 5 regions
- State Vegetation Management Task Force
- Debris Management Task Force
- GIS Task Force
- Technology Task Force
- Make Safe Task Force
- ESF 12 Task Force
- State Exercise Planning
- Preparedness Summits
CL&P’s initial plan is a 5-year, $300 million investment

- Vegetation Management
- Electrical & Structural Hardening
- System Automation
- Selective Hardening
CL&P delivered a strong event response and achieved all restoration goals

- Conducted comprehensive damage assessment by Day 2
- Announced statewide restoration goal
- Achieved statewide goal for substantially completing restoration on Day 6
- Achieved substantial completion goals in all 4 divisions on or ahead of schedule
- Effective external communication with media, municipalities and customers
Going Forward

Each event presents unique challenges

- **Continued partnering at all levels**
  - Leveraging volunteer organizations
  - Pre-staging interfaces & assistance agreements
  - Logistics

- **Mutual understandings**
  - Blocked road definition
  - ICS command structures
  - Restoration priorities & sequence

- **Continued education on electrical hazards**

- **Training & exercises**
Being there for our customers when they count on us most
Are We Prepared?

A Municipal Utility Perspective
Threats to Utility Systems

- Natural
- Human (Terrorism, etc)
- Market
- Regulatory
Preventative Measures

• “Hardening” the infrastructure
  – Tree Trimming (4 year cycle)
  – Locating “weak” spots in system
  – Micro-grid
Preventative Measures (cont.)

• Human Resources
  – Good Labor Relations (mission “buy-in”)
  – Cross Training Crews
  – Strategic Human Resources Management
  – Constant Training and Education
  – NPU Personnel are Local
    • Years of local / institutional knowledge
Preventative Measures (cont.)

• Local Response Coordination
  – NPU Hosts Norwich EOC
  – Norwich EOC Utilizes ICS Structure
    • NPU staff in EOC at all times
    • NPU staff at times serves as Incident Commander
    • NPU provides technical, logistical, and administrative support to Norwich EOC
Preventative Measures (cont.)

- Customer Communication
  - We have found that a better informed public greatly improves restoration efforts
  - Customers speak to CSR’s who are empowered and informed
- IVR
- New, easily updated website
- Social Media
  - Staffed during emergencies to answer questions / concerns
  - Access to real-time information via “smart phone” in the event of a power outage
Storm Irene
Irene Outages and Restoration Time

Sunday

5:53 AM
6:30 AM
7:30 AM
8:15 AM
9:30 AM
11:05 AM
2:00 PM
5:00 PM
7:00 PM
10:30 PM
3:30 PM
9:45 PM
6:00 PM
10:00 PM
8:00 AM
12:00 PM
2:00 PM
5:00 PM
10:00 PM
11:00 PM

Monday
Tuesday
Wednesday
Superstorm Sandy

Sandy Outages and Restoration Times
The Next Steps

• New Control Room and EOC
  – Tier 3 Data Center
  – 911 Dispatch Located in EOC During Emergencies
  – Greater Coordination of City Assets
The Next Steps (cont.)

• Leveraging Technology
  – Updating and Improving OMS
    • Coordination with GIS system
  – Continuing to Update Communication Efforts
    • Phase II Website (Mobile APP)
    • Phase II IVR
    • Tools to better communicate internally
    • Keeping abreast of social media trends
The Next Steps (cont.)

• Mutual Aid Changes
  – Northeast Public Power Association (NEPPA)
    • Leverage Technology to Improve the System
    • Expand the System to Include Nation-Wide Assets
    • Adjust Staff at NEPPA Level for Better Coordination
Are We Prepared?

• We Have a Good System in Place
• Not Resting on our Laurels
• Lessons Learned Lead to Changes
  – Plans
  – Staffing
• We Must Continue to Improve
Connecticut Energy, Environment and Economic Development Conference:

Keeping the Lights On
Housatonic River Project
Emergency Planning

Connecticut Energy, Environment and
Economic Development Conference

March 13, 2013
Introduction

• Emergency Planning for worst case dam failure events
• Preparations and response to major storms
• Contingency planning for unanticipated events
Housatonic River System
Candlewood Lake

Rocky River Hydro-Electric Development

Index Map

Main Dam

Danbury Dike

South Lanesville Dike

Middle Lanesville Dike

North Lanesville Dike

New Fairfield

Brookfield

New Milford

Canal Dike
Rocky River Dam
Rocky River Main Dam
Shepaug Dam
Stevenson Dam
FERC Public Safety Requirements

- Dam monitoring and inspections
- Dam breach analysis and inundation mapping
- Emergency Action Plans
- Periodic Exercises
Routine Dam Monitoring

Rocky River Main Dam Section 1 - Sta. 5+50

- tp 2
- tp 1
- tp 22
- tp 23
- Core wall
Dam Monitoring (cont.)

Rocky River - Main Dam Weirs

Flow in CFS vs Date

Water Elevation in feet

- WEIR C
- WEIR D
- WEIR K
- RR level
EAP Current & Future Improvements

- Updated Breach Analysis
- Inundation Maps Using Latest Methodology
- EAP Enhancements
- Everbridge Notification System
FERC Dam Breach Analysis & Inundation Mapping

- High hazard classification dams
- Modeling for “Sunny Day” and Probable Maximum Flood Events
- Mapping
  - Threat to life or property (2 ft inundation of “inhabited space”)
  - Cross-sections
    - Flood arrival and peak time
    - Peak flood elevation
    - Flooding increment height
FERC Emergency Action Plans

I. Emergency Notifications
II. Statement of Purpose
III. Project Description
IV. Emergency Detection, Evaluation & Classification
V. General Responsibilities
VI. Preparedness
VII. Inundation Maps

Appendices
- Dam Breach Analysis; EAP Updating; Site specific Concerns
- EAP Documentation
Five types of exercises:

- Orientation seminar
- Annual drill
- Tabletop Exercise
- Functional Exercise
- Full scale exercise
Functional Exercise

- Designed to simulate actual event
- Valuable in identifying problems with plans
- Highest level EAP exercise w/o activating field personnel
Goals of an Exercise

• Testing emergency functions:
  - Alert, notification, and warning
  - Evacuation
  - Interagency coordination
  - Transportation interruptions
  - Public information dissemination

• Preparedness and plans of FirstLight’s and agency-specific materials & capabilities
Desired Outcome of an Exercise

- Increase awareness/use of the EAP
- Clarify roles and responsibilities
- Improve coordination
- Identify enhancements to the EAP/inundation maps
- Self assessment of ability to serve impacted communities
What if the Main Dam Failed?

- Using normal summer maximum elevation of Candlewood Lake, there would be a water release of approximately:
  - 167,000 Acre-Feet…or…
  - 7 Billion Cubic Feet…or…
  - 54 Billion Gallons of water
Rocky River Power plant … 1-1/2 hours
Intersection - Rt. 7 & Rt. 202 ... 3-1/2 Hours
Exercise Format

• Functional Exercise requires about 2 hours of scenario time
• Reading / review of Narrative
• All Town agencies in one room - “local EOC”
• “Exercise simulators” place messages into play
• Group critique and lessons learned
Exercise Notification Checklist

NOTE: Must make direct contact, leaving a message is insufficient. In the event that direct contact cannot be made, notify the next individual/organization on the list.

ROCKY RIVER STATION OPERATOR
6337

CT HYDRO SHIFT SUPERVISORS
6338

NATIONAL WEATHER SERVICE
6210

CANDLEWOOD LAKE AUTHORITY
6302

CT HYDRO OPERATIONS AND MAINTENANCE MANAGER
6207

LOCAL GOVERNMENT OFFICIALS
Monroe - 6329
Oxford - 6330
Seymour - 6211
Shelton - 6212
Derby - 6325
Orange - 7323
Milford - 6328

MILFORD FIRE DEPT
6328

YANKEE GAS
6213

CL&P—WESTERN REGION DISPATCH
6331

ISO—NEW ENGLAND
6213

IROQUOIS GAS TRANS SYSTEM
7326

ALCOONQUIN GAS TRANS SYSTEM
6213

PUBLIC NOTIFICATION

NEW MILFORD POLICE
6332

STATE DEPT of PUBLIC SAFETY
6224

CT HYDRO STATION MANAGER
6334

DEPT of EMERGENCY MANAGEMENT (DEMIS)
Region 1 - 6324
Region 2 - 6200
Region 3 - 6308

NORTHWEST CT PUBLIC SAFETY
6333

SEYMOUR FIRE COMMISSION C-Med
6211

Oxford Fire
6330

DERBY HYDROELECTRIC PROJECT
7302

GDF SUEZ BIDDING DESK
6213

FIRSTLIGHT POWER RESOURCES
VICE PRES HYDROWIND ASSETS
6213

FEDERAL ENERGY REGULATORY COMMISSION - NY
6331

FIRSTLIGHT POWER RESOURCES
EXTERNAL AFFAIRS ADMINISTRATOR
6203

DEPT of TRANSPORTATION
6331

DEPT of ENVIRONMENTAL PROTECTION
6331

LOCAL GOVERNMENT OFFICIALS
New Milford - 6322
Newtown - 6223
Southbury - 7320
Sherman - 6326

LOCAL POLICE
Brookfield - 6301
Danbury - 6214
New Fairfield - 7201
Soudsbury - 7330
Sherman - 6326
Newtown - 6223
Oxford - 6330
Monroe - 6336
Shelton - 6212
Orange - 7326
Milford - 6328
Seymour - 6211
Derby - 6325
Stratford - 6210

NOT PART OF EXERCISE

CHART 3

FirstLight Power Resources

Rest of World - Federal, State & Local Agencies - 6331
Rest of World - NGOs & All Others - 6213

Chart 1 Flowchart
Radio Communications

- Start and end of exercise
- Simulation of CSPERN and Emergency Alert System (EAS)
- Outgoing use limited to State Police (CSPERN); National Weather Service (EAS) … no other external notifications
Planning for Natural Events

- Advance warning via use of a number of meteorological experts
- Advance drawdown of Lake Lillinonah in some cases is beneficial for downstream areas
- Shift staffing both at plants and at dispatch center
- Emergency generators and communication systems
Flooding Events

- March 6-7, 2011 Flood was in top three historical events at Stevenson Dam
- Shepaug and Stevenson anchored, analyzed for much higher flows than ever seen in the river basin
- Flood operation can be done without grid power
Closure

- Robust, conservative design results in high margins of safety
- Key issue is to anticipate sudden summer thunderstorms
- Hurricanes are part of design basis
- Loss of system load for extended period of time raises concerns on operations
Questions?

Thank you ...