



Connecticut
Light & Power

CL&P Emergency Preparedness & Response in Coordination with Our Communities

April 3, 2014

*Douglas S. McCracken
Director Emergency Preparedness*



Northeast Utilities

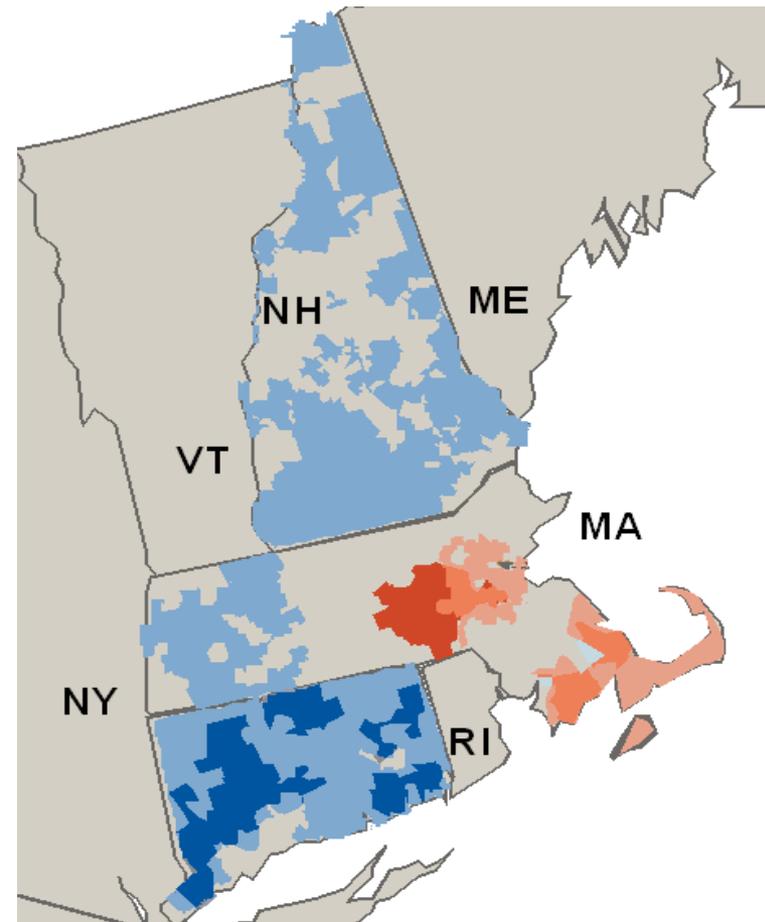


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2012 Merger with NSTAR

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



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1,242,000 customers

149 Connecticut cities and towns

4,400 square mile service territory

Distribution – 13 Area Work Centers

- 16,976 overhead miles
- 6,352 underground miles
- 219 substations

Transmission

- 1,638 overhead miles
- 135 underground miles

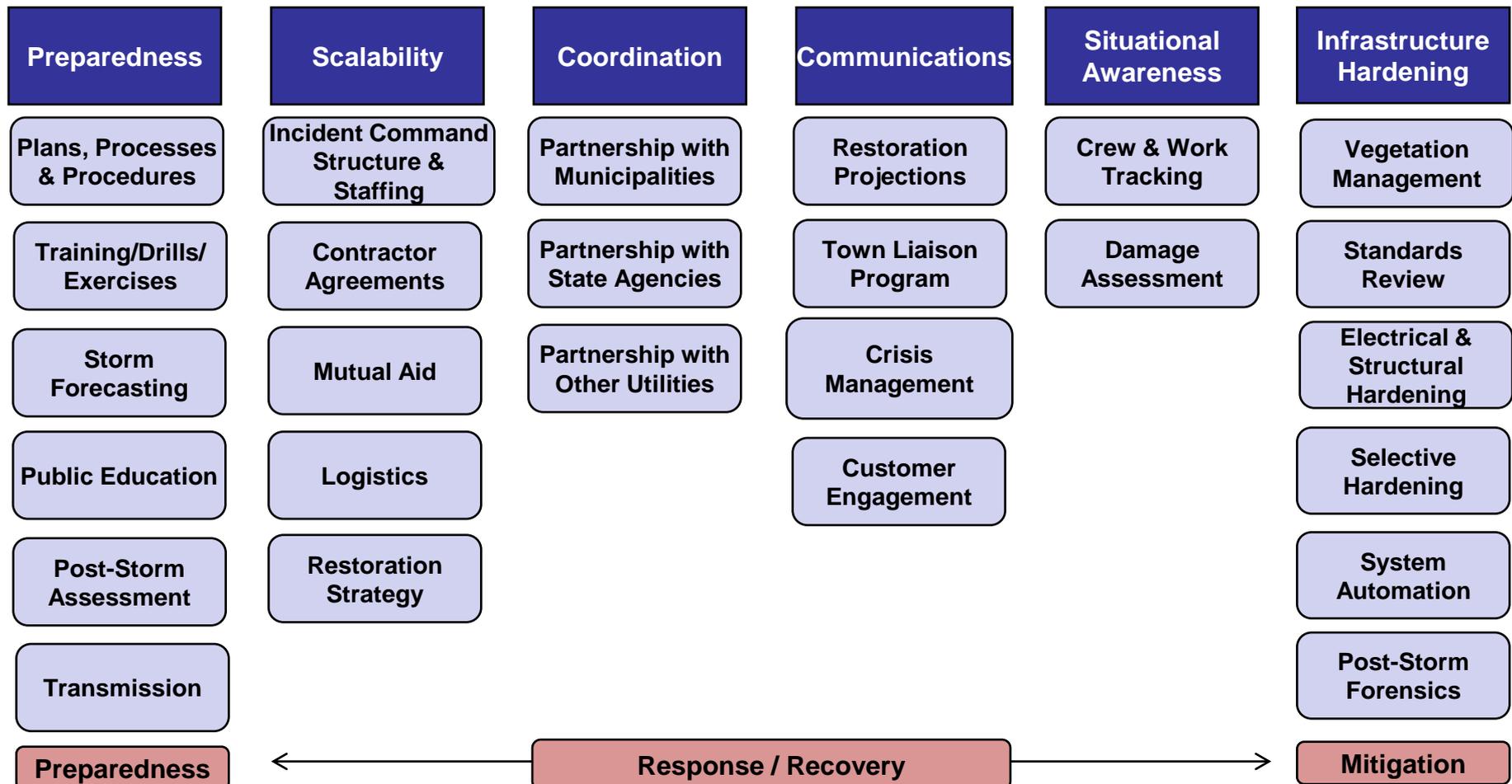


Emergency Preparedness Enhancements



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CL&P's objective is to become a recognized industry leader and trusted partner in emergency preparedness



Emergency Management Cycle



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Process, Procedures, Training & Drills

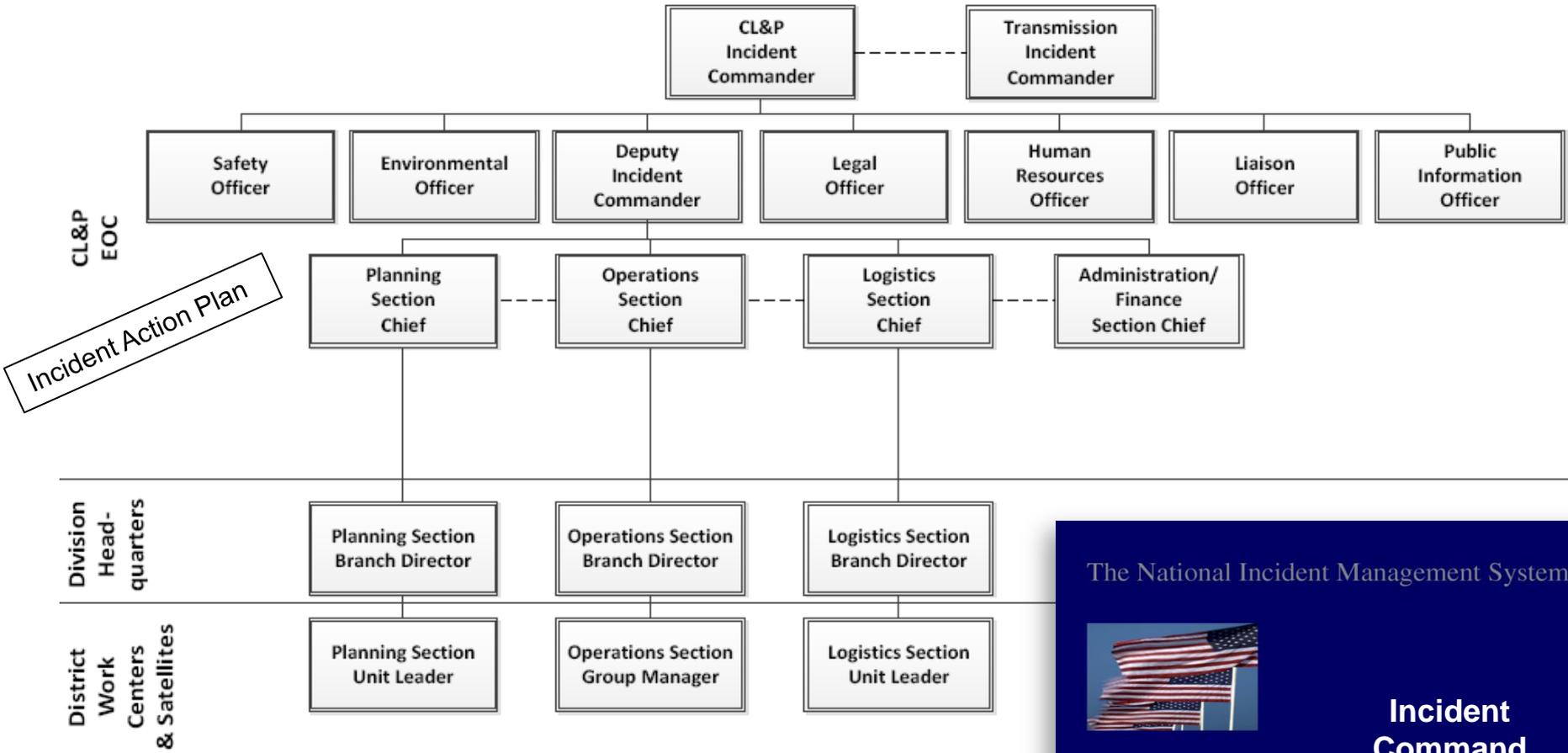
- **Preparedness** – Activities performed when threat is identified, prior to impact
- **Response** – Activities performed immediately after event (24-48 hours) for life / safety
- **Recovery** – Activities performed to “return system to normal”
- **Mitigation** – Activities performed to prevent or reduce the impact of future events



Incident Command System



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The National Incident Management System



Incident
Command
Structure



Department of
Homeland
Security



Restoration Priority Guidelines balance resources with the agreed priorities with State authorities

- Police & Fire Life Safety (E-911) (priority 1 & 2)

Remove electrical hazards from Blocked Roads

Restore substations, transmission lines, Critical Facilities

Restore greatest number of customers per resource

**Damage Assessment to Support Global
Estimated Time of Restoration (ETR)**

Focus on Timely/Accurate ETR



Guiding Principal - We complete an initial damage assessment and provide a global ETR within 48 hours after a major storm has left our service territory

Emergency Plan Event Level Matrix

Event Level	Typical Number of Customers out at Peak	Typical Number of Trouble Spots	Weather Type ²	Typical Resource Strategy ³	Typical Restoration Duration	Typical Global ETR Availability Timeframe	Typical ICS Structure Activation Level	Typical Damage Assessment and Typical Restoration Strategy ⁶	Typical Logistics Strategy ⁷
I	0% - 9% ¹ (<125k)	<2000	Warm Weather	200 – 300 Line Resources	1-3 Days	< 24 hours	General Staff / PIO	Event / Hybrid	Centralized / Centralized Support with Division Staging Sites
			Cold Weather	250 – 350 Line Resources			EOC ⁵ : Inactive - Active		
II	10% - 29% ¹ (125k – 380k)	1500 – 10,000	Warm Weather	250 – 800 Line Resources	2-6 Days	< 36 hours	General Staff / PIO / All ⁴	Event / Hybrid / Circuit	Centralized Support with Division Staging Sites
			Cold Weather	300 – 1000 Line Resources			EOC ⁵ : Active		
III	30% - 49% ¹ (375K – 650K)	8,000 – 25,000	Warm Weather	750 – 1250 Line Resources	5-10 Days	< 48 hours	All ⁴	Hybrid / Circuit	Decentralized Support with Division and District Staging Sites
			Cold Weather	800 – 1500 Line Resources			EOC ⁵ : Active		
IV	50% - 69% ¹ (625k – 870k)	15,000 – 48,000	Warm Weather	1000 – 1800 Line Resources	8-21 Days	<48 hours	All ⁴	Hybrid / Circuit	Decentralized Support with District and Satellite Staging Sites
			Cold Weather	1250 – 2000 Line Resources			EOC ⁵ : Active		
V	70% - 100% ¹ (> 870k)	> 35,000	Warm Weather	> 1500 Line Resources	> 18 Days	<48 hours	All ⁴	Circuit	Decentralized Support with District and Satellite Staging Sites
			Cold Weather	> 1750 Line Resources			EOC ⁵ : Active		

Communications Priorities



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Communications to the Public is as important as restoration

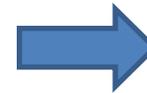
Operations

Damage Assessment

Resource Tracking



Global
ETR



Communications

Event Communications

Unified Messaging to
all stakeholders

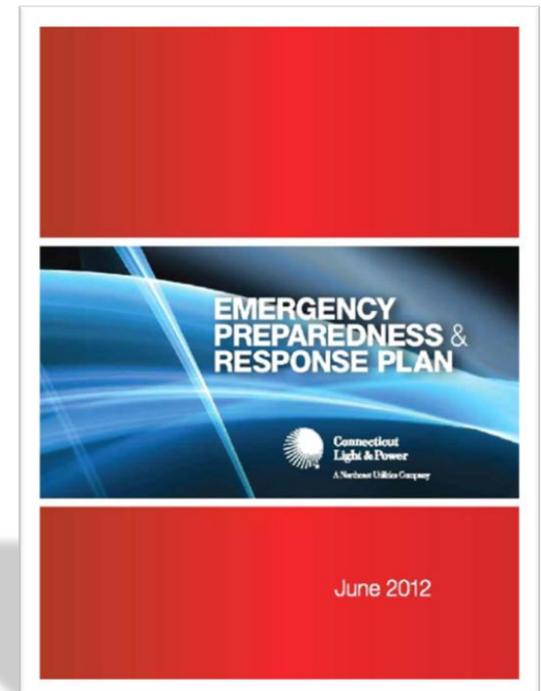
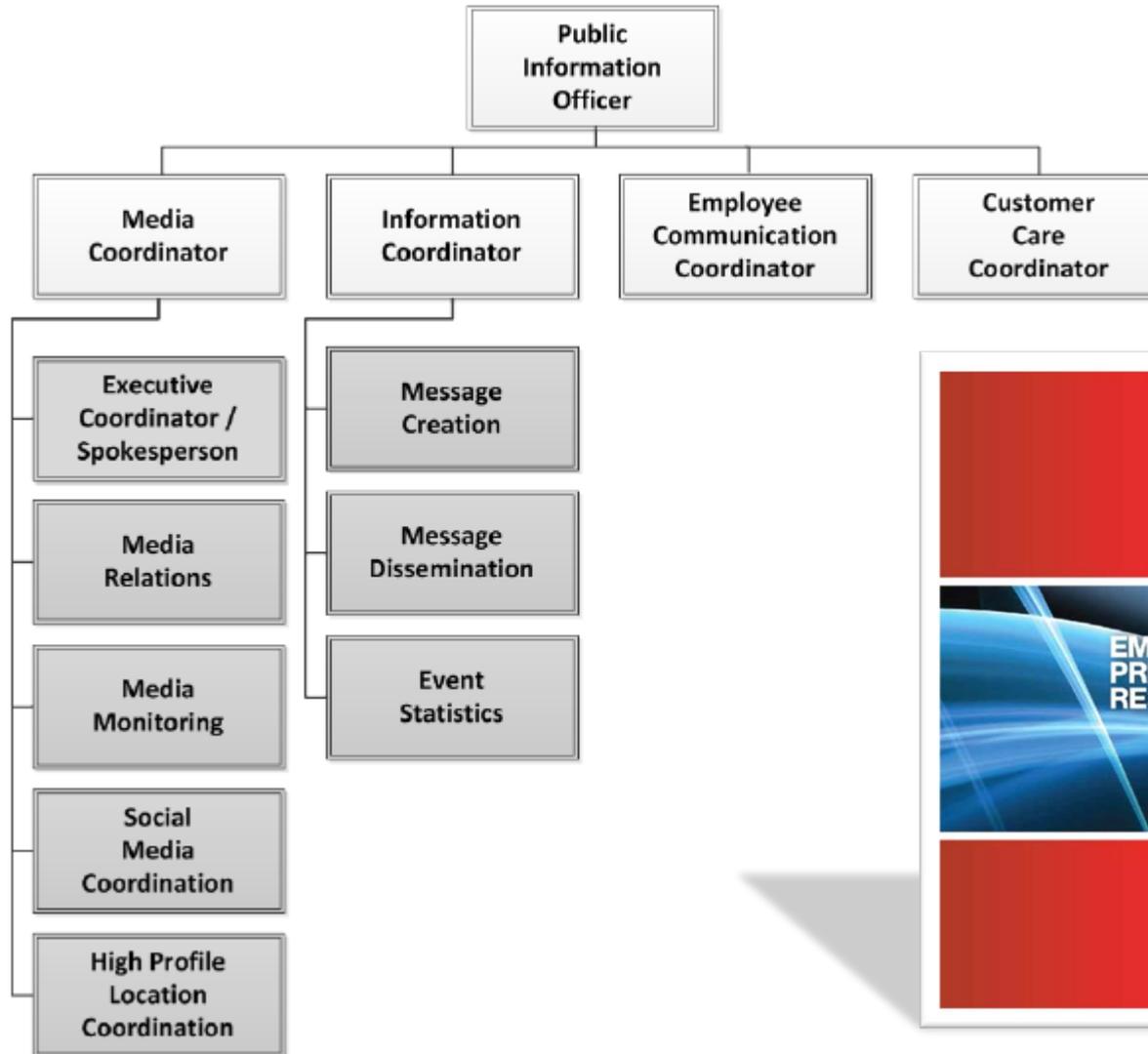
Town Liaison Program
/ State Coordination



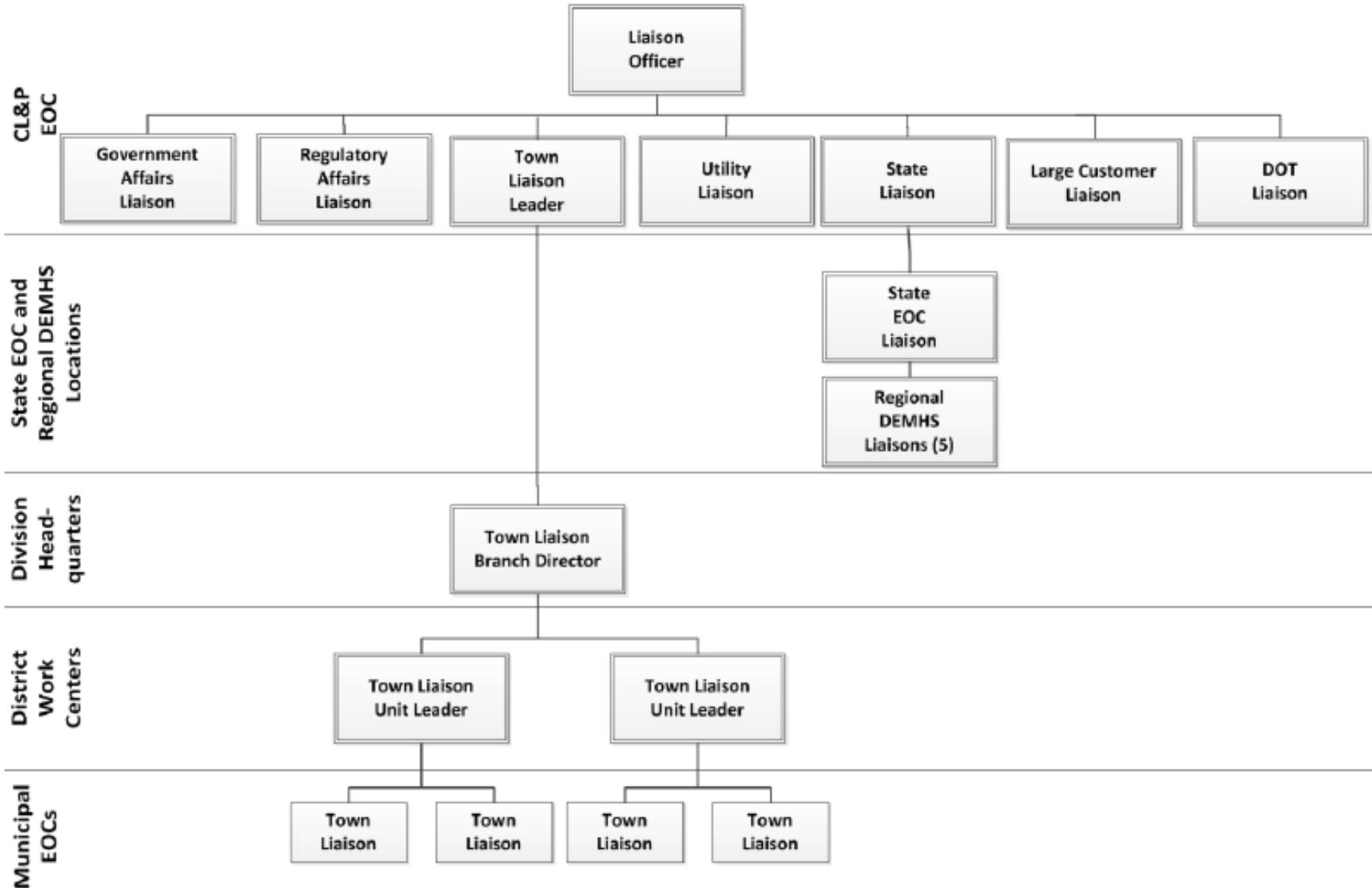
Communications ICS Reporting Structure



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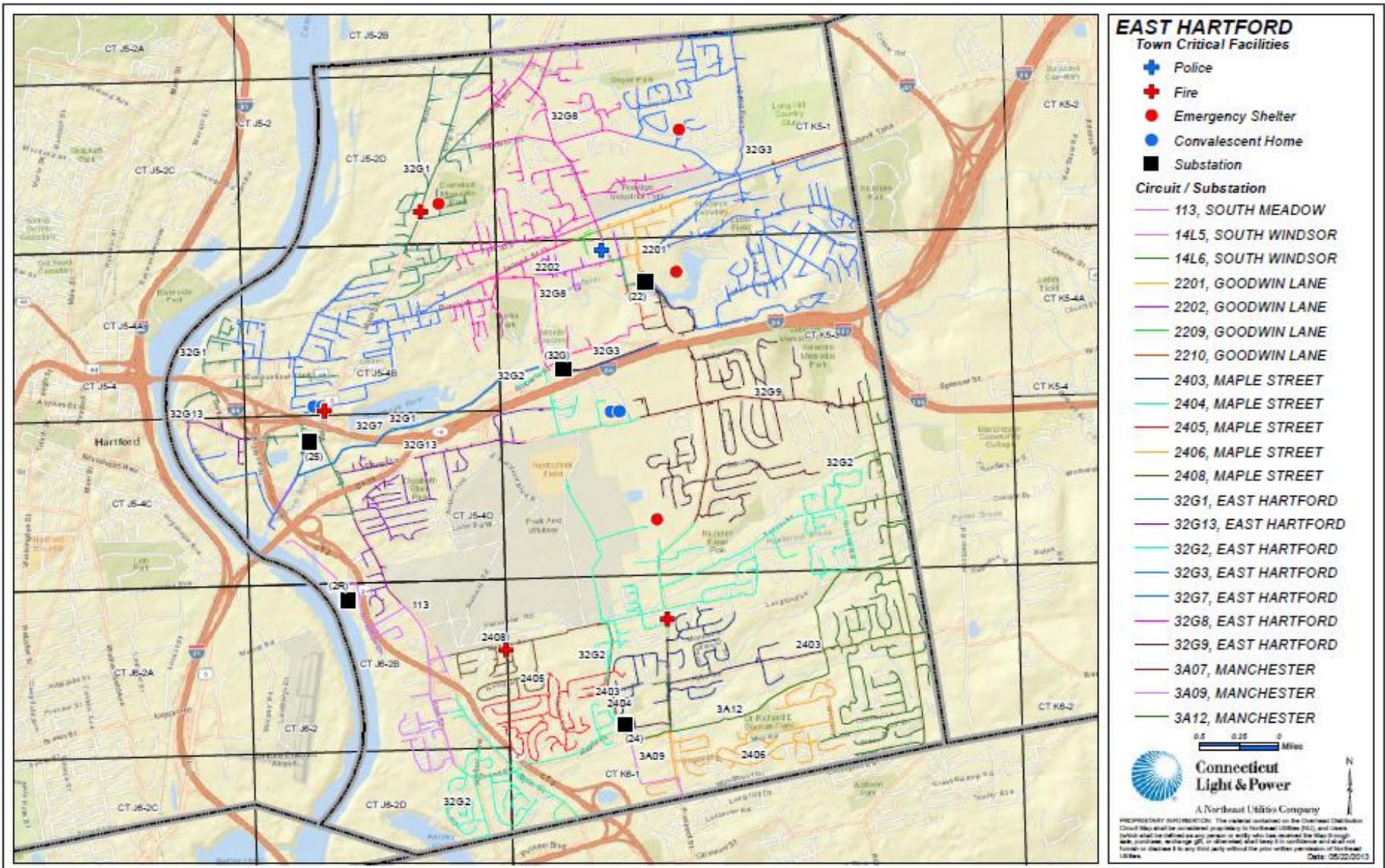
Liaison Organization ICS Structure



Situational Awareness: 11 x 17 Town Maps



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Critical Facility Definition



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Critical facility lists reviewed annually with each municipality

Critical Facility—A building or structure where loss of utility services may interrupt functions considered essential for the delivery of vital services and the life safety of the community. They usually include emergency response facilities (fire, police, rescue, emergency operations centers), hospitals, licensed convalescent homes, facilities designated as emergency shelters, (public) water supply, and waste water treatment as provided by DPH and DEEP, communications facilities (E911 and Public Safety Answering Points), and any other assets pre-identified, or identified at the time of the emergency as needed, jointly by the municipality or DEMHS, and the utilities to be of critical importance for the protection of the health and safety of the population.

-Process in place for emergent priority requests through Town Liaisons

Situational Awareness: Event Status



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Critical Customer Dashboard

Status of Critical Facilities

Towns

AWC: SIMSBURY AWC

Identified Critical Customers by Town for SIMSBURY AWC							
Avon	West Hartford	Simsbury	New Britain	Plainville	Hartford	Granby	Farmington
● Avon Old Farms	● Police	● School 2	● Police	● Police	● Hospital 1	● Police	● Hospital 1
● Sewage Plant 1	● Sewage Plant 1	● Sewage Plant 1	● Sewage Plant 1	● Sewage Plant 1	● Sewage Plant 1	● Sewage Plant 1	● Sewage Plant 1
● Hospital 2	● School 1	● Police	● Conv Home 1	● School 1	● Hospital 2	● School 1	● Hospital 2
● School 1	● School 2	● School 1	● School 1	● School 2	● School 1	● School 2	● School 1
● School 2		● School 2		● Conv Home 1	● School 2	● Conv Home 1	● Police
● Police				● Conv Home 2	● Police		
● Conv Home 2							
● Conv Home 1							

Patrolled events with Damage Assessment							
Town	Event	# Cust Affected	# Resource Hours	Customers per Crew Hour	Status	Referral Type	Remarks
Avon	191000	1000	40	25.00	ENR	LNE	Patrolled - 2 broken poles, 6 spans primary and 1 bad xf
Simsbury	191005	800	20	40.00	ENR	LNE	Patrolled - 1 broken poles, 2 spans primary. Large tree on wires needs removal
Simsbury	191002	300	20	15.00	UAS	LNE	Patrolled - 3 large oak trees on primary. Pole leaning with broken xarm
Avon	191003	100	5	20.00	UAS	LNE	Patrolled - tree needs removal from lines. 25KVA XF needs to be replaced at pole 567
West Hartford	191004	25	4	6.25	ENR	LNE	Patrolled - Sagging primaries ned to be rehung. Fuse neds replacing at pole 45678
Avon	191009	1	3	0.33	UAS	LNE	Patrolled - service neds to be rehung
Avon	191007	1	3	0.33	UAS	LNE	Patrolled - service ripped off pole. OK at house

UnPatrolled events awaiting Damage Assessment							
Town	Event	# Cust Affected	# Resource Hours	Customers per Crew Hour	Status	Referral Type	Remarks
Avon	191011	570			NEW		
Simsbury	191012	345			UAS	PTL	
Simsbury	191013	234			NEW		
Avon	191014	100			NEW		
West Hartford	191015	11			UAS	PTL	
Avon	191016	1			UAS	PTL	
Avon	191017	1			UAS	PTL	

Unpatrolled events

Patrolled events

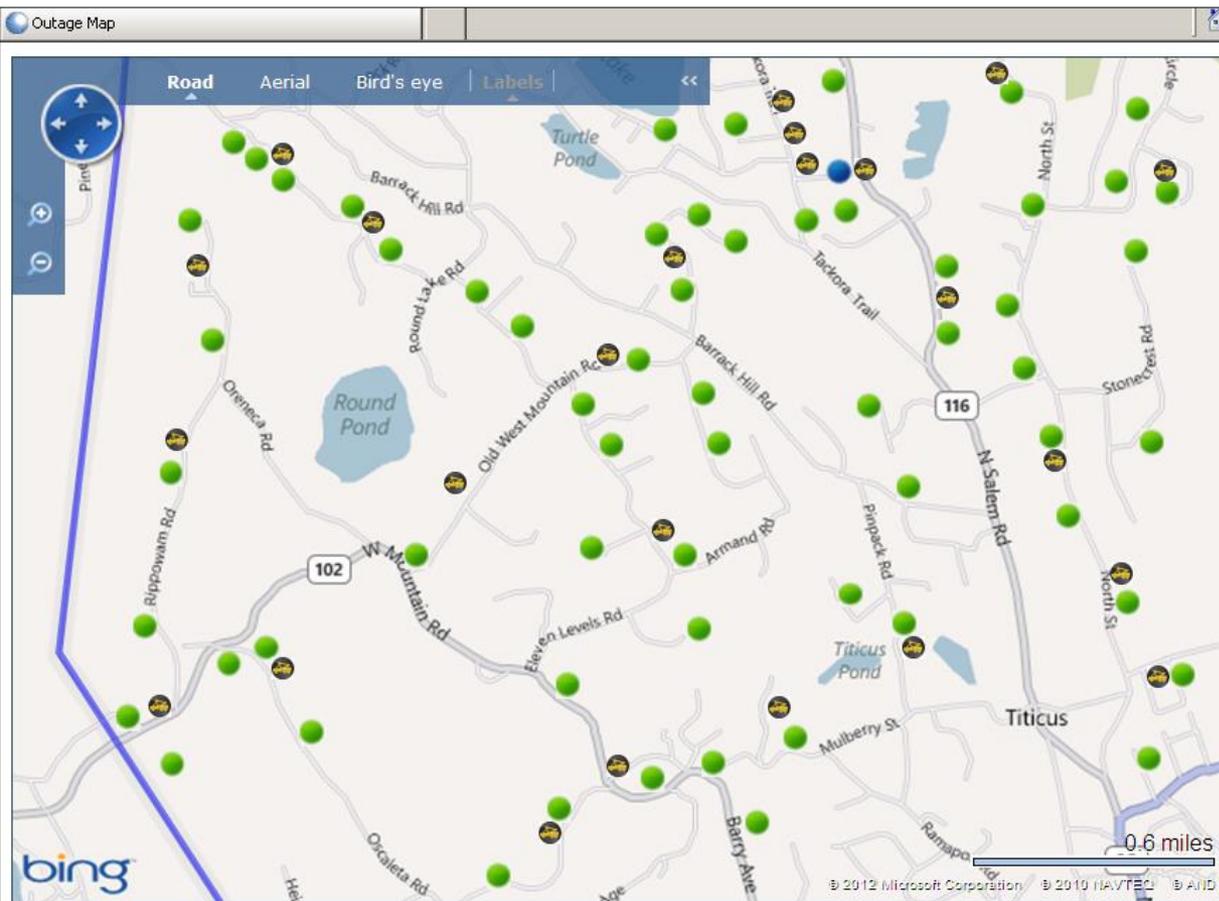
Damage remarks

Situational Awareness: Crew and Work Tracking



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GPS Technology in all Bucket Trucks Provides Real Time Information



Situational Awareness: Event Status



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Event detail includes damage information and ETR through Town Liaisons

Status

Event Detail

Event Id:	1954436
Event Start:	1/5/2012 4:01:20 PM
Event State:	NEW
Division:	CT SOUTHERN
Region:	NEWTOWN AWC
City:	RIDGEFIELD
Street:	FARRAR LN
Circuit:	22N2
Customers Out:	62
Restoration Date & Time:	01-05-12 19:15
Device Name:	1P_RR:4339:10919314
Remarks:	

Device Location

Customers Impacted

Damage Remarks

- Assigned (ASN)
- Enroute (ENR)
- Onsite (ONS)
- Show Non-Served Towns
- Enable 5 Minute Auto Refresh

Event filter is on

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: Town Dashboard



Town Summary Information

Outages

State: **CT** Town: **NAUGATUCK** 

NAUGATUCK  Events: 5 Calls: 112 Town Customers Out: 953 Wide View

CO	Division AWC	Town	Circuit	Event	Device Street	Event Cust Affected	Device Type	Event Type	Event Status	Call Count	Town Cust Affected	Street	Town	Count
CL&P	WATERBURY AWC	NAUGATUCK	19K4	1947715	MILLVILLE AVE	868	SCADA_Recloser	OUT	NEW	106	868	QUINN ST	NAUGATUCK	138
CL&P	WATERBURY AWC	NAUGATUCK	21L1	1948084	CONRAD ST	82	Transformer_OH	OUT	NEW	3	82	CONRAD ST	NAUGATUCK	111
CL&P	WATERBURY AWC	NAUGATUCK	21L8	1948537	BEACON MANOR RD	1	Transformer_OH	OUT	NEW	1	1	N HOADLEY ST	NAUGATUCK	106
CL&P	WATERBURY AWC	NAUGATUCK	19K3	1947763	BINGHAM ST	1	Transformer_OH	OUT	NEW	1	1	PARK AVE	NAUGATUCK	105
CL&P	WATERBURY AWC	NAUGATUCK	21L1	1948709	DAYTON RD	1	Transformer_OH	OUT	NEW	1	1	MILLVILLE AVE	NAUGATUCK	80
# of Events: 5 Affected: 953 # of Calls: 112												WALNUT ST	NAUGATUCK	57
												FERN ST	NAUGATUCK	55
												HILLSIDE AVE	NAUGATUCK	30
												MAY AVE	NAUGATUCK	29
												PHYLLIS DR	NAUGATUCK	28
												DAMSON LN	NAUGATUCK	25
												CHESTNUT ST	NAUGATUCK	19
												WOODLAWN AVE	NAUGATUCK	17
												PINE ST	NAUGATUCK	17
												NEW ST	NAUGATUCK	16
												GROVE ST	NAUGATUCK	16
												CLEARVIEW CIR	NAUGATUCK	13
												HOADLEY ST	NAUGATUCK	13
												TERRACE AVE	NAUGATUCK	13
												DEERING LN	NAUGATUCK	12
												SWEENEY ST	NAUGATUCK	11
												LYNN CIR	NAUGATUCK	7
												GARDEN ST	NAUGATUCK	5
												EAST DR	NAUGATUCK	5
												Out On Streets: 949		

Outage Locations

Streets Affected in Town

Blocked Roads Protocol



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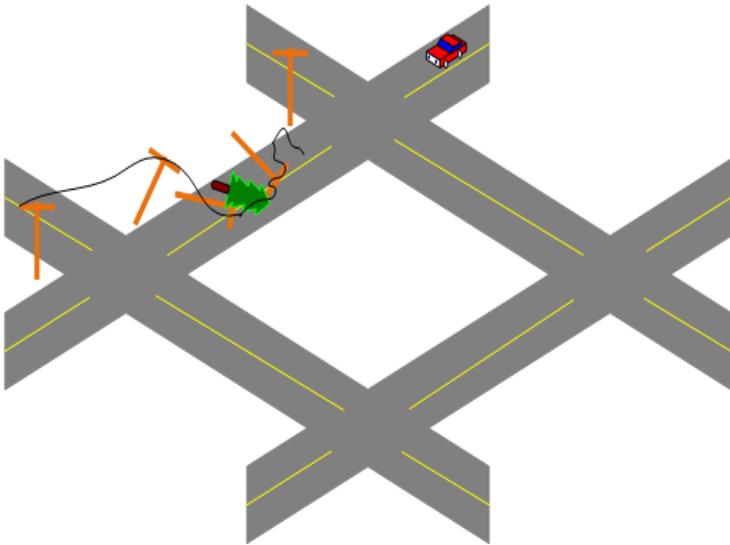
- Blocked roads list reviewed in Town EOCs and prioritized
- Utility notified through Town Liaisons of need to dispatch line / tree crews to clear electrical hazards from roads in prioritized sequence
- In coordination with Town DPW crews and phone / cable companies, electrical hazards removed by line crews and each location turned over to Town DPW
- Town DPW removes trees

Blocked Roads Protocol

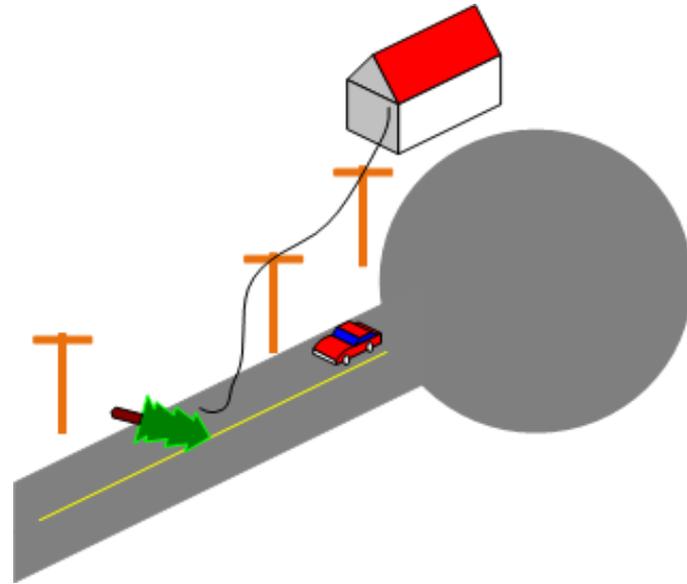


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Passable roadway for emergency vehicle access – 9 feet wide by 14 feet high



Road not blocked –
alternate access route



Road not blocked –
one lane passable

Formal Training and Exercise Program



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2012 Statewide Exercise: Simulating a Category 3 Hurricane



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- Communications
- Blocked Roads
- Critical Customers
- Emergent Priorities



2013 Statewide Exercise: Simulating an Ice Storm



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- Communications
- Blocked Roads
- Logistics Staging



GIS-Based Damage Assessment Tool

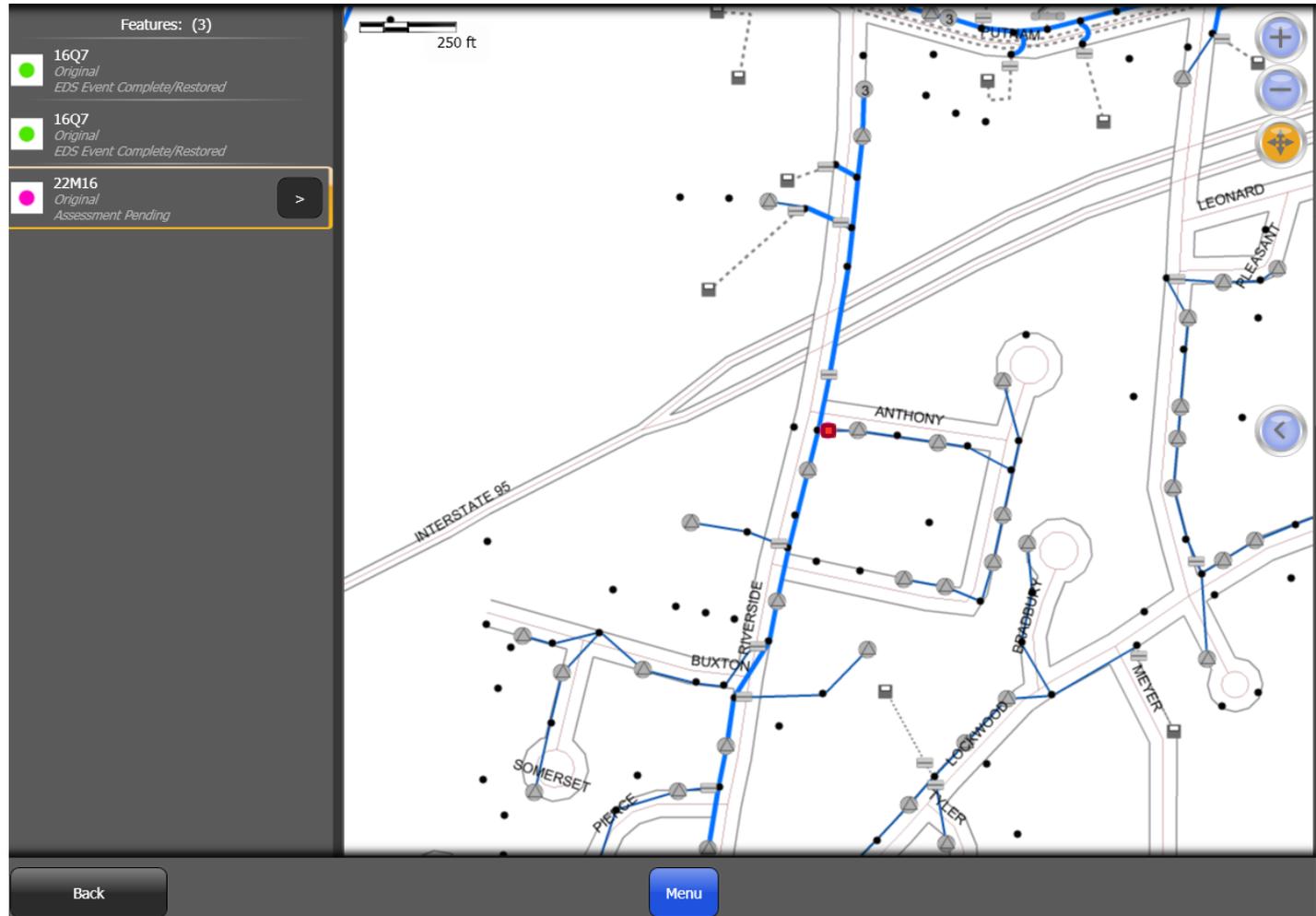


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Mobile Application utilizes GIS equipment configuration inventory and EDS event IDs

- The list of assessments to a Patrol Crew displays on left side of map view

- Clicking zooms map to assessment location and highlights in red



GIS-Based Damage Assessment Tool



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Example - Service Damage Information uploads to the OMS when dialog box is closed. Data “stores forward” if connectivity lost.

Select whether the service damage location is **Down at Pole**, **Down at House**, or, **Down at Pole & House**.

Select whether customer work is required; **Yes** or **No**

Damage Info

Damage Location: Down at Pole

Customer Work Required: Down at Pole

Physical Address:

OK

Damage Info

Damage Location: Down at Pole

Customer Work Required: No

Physical Address:

Yes

No

OK

Damage Info

Damage Location: Down at Pole

Customer Work Required: No

Physical Address: 123 Main St,

OK Cancel

Input the physical address of where the service damage exists (not the location of the transformer) then select **OK**.

Leveraging Technology from Damage Assessment Tool



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GIS reports enable rapid, targeted response by support groups

- End User Maps / Lists
 - Environmental – leaking transformers
 - Stores – transformers / poles
 - Debris pickup
 - Hazard tree removal
 - Blocked roads

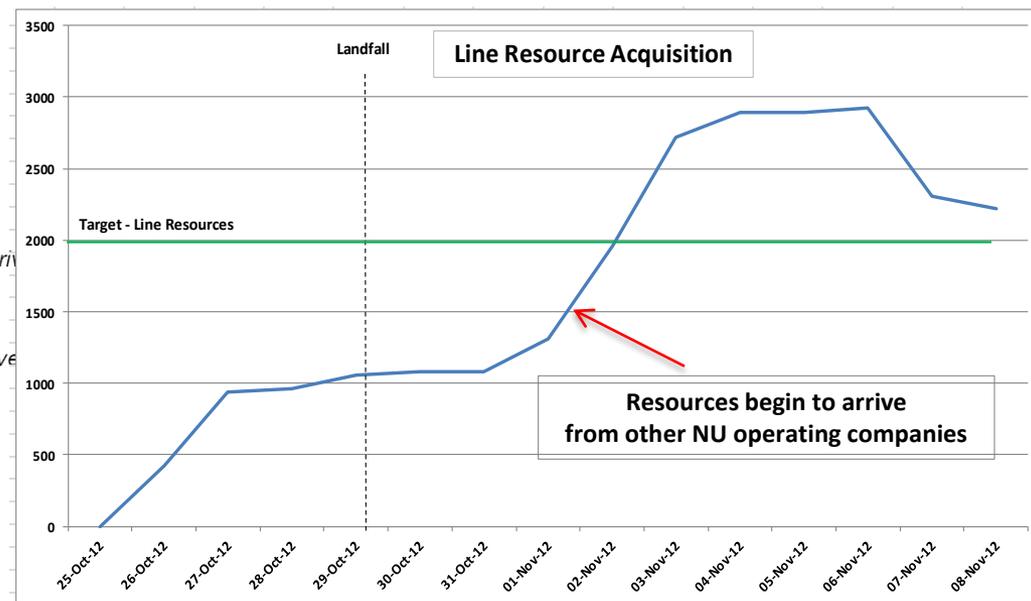


Scalability - Resource Acquisition



Almost 3,000 external line resources from 25 states and 4 Canadian provinces assisted CL&P's Storm Sandy restoration efforts

- Widespread nature of damage limited our ability to rely on mutual aid
- Strong contractor relationships facilitated acquisition of significant resources
- Early decision to secure external resources allowed us to reach well beyond eastern seaboard
- Over 50 percent of targeted external line resources were secured before the event
- Resources from other NU operating companies allowed CL&P to exceed initial target



Scalability - Gateways



Concentrating Efforts and Mitigating the Onboarding Congestion at Area Work Centers

Capabilities

Ingress/Egress

Feeding

Lodging

Fuel

Bussing

Materials

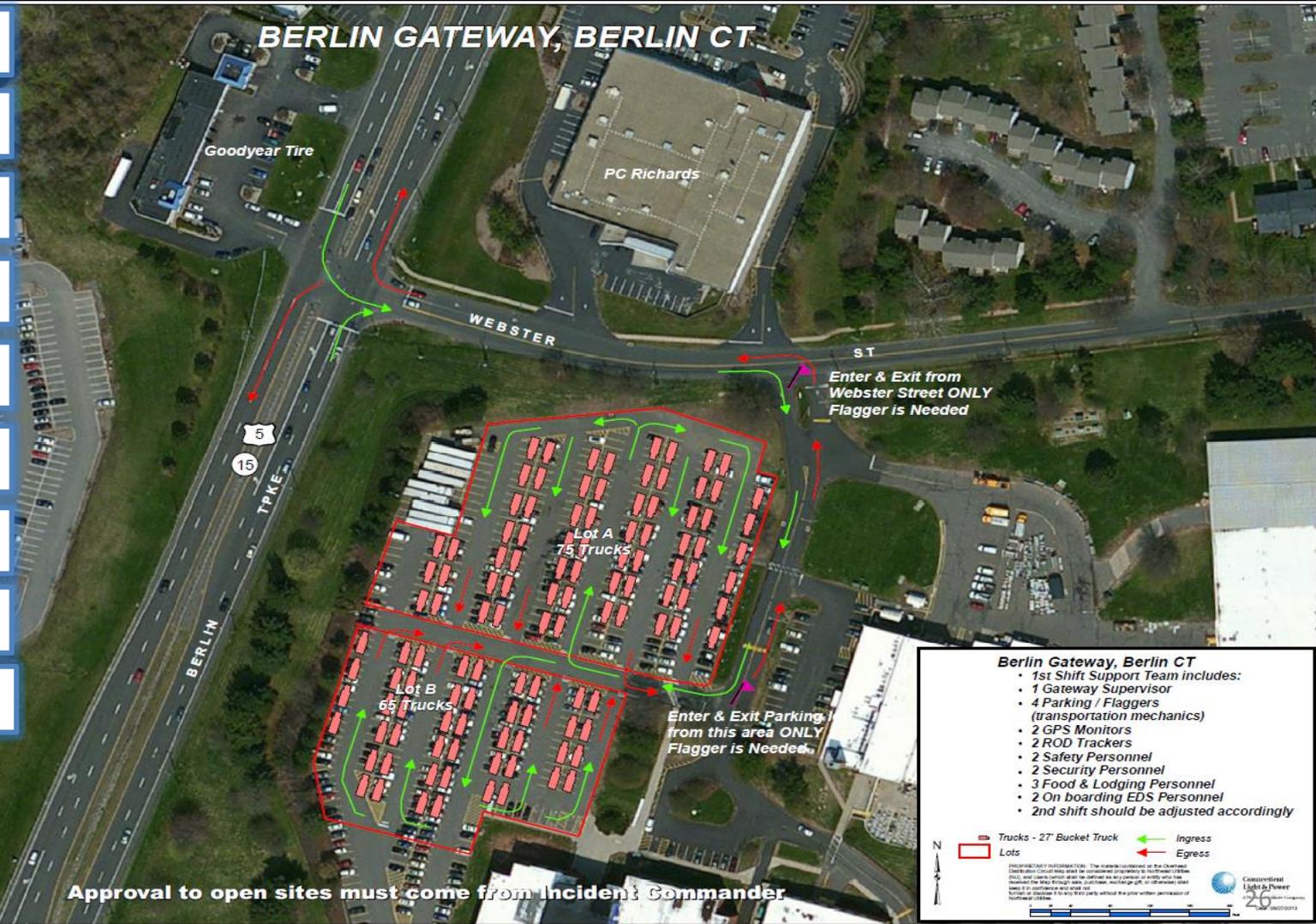
Communications

Contracts

Notes:

- For Safety reasons, Enter & Exit through Webster Street ONLY
- Overflow backup parking plan is to park at Berlin Fairgrounds & shuttle to NU
- 24 Hour notice of crew arrival will allow lots to be cleaned if event occurs during the week. Maintenance will notify employees.

Approval to open sites must come from Incident Commander



- Berlin Gateway, Berlin CT**
- 1st Shift Support Team includes:
 - 1 Gateway Supervisor
 - 4 Parking / Flaggers (transportation mechanics)
 - 2 GPS Monitors
 - 2 ROD Trackers
 - 2 Safety Personnel
 - 2 Security Personnel
 - 3 Food & Lodging Personnel
 - 2 On boarding EDS Personnel
 - 2nd shift should be adjusted accordingly

Scalability - Staging Area



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11 Staging Areas in use for Storm Sandy





Enhanced Capabilities with Telecommunications Platforms

Network in a Box



Satellite Technology



- Mobile Office, emulates a NU Office / Area Work Center.
- Supports Cellular and Satellite
- Works with “wired “ and “wireless” Desktops and Laptops
- Fully integrated with NU network supporting IP Phones, Printers, Drive Mappings, and Applications

Scalability - Telecommunications



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Enhanced Capabilities with Telecommunications Platforms

Mobile Command Center



Communications Trailer



Preventing and reducing risk of future incidents

- Enhanced Tree Trimming
- Standards Review
- Electrical & Structural Hardening
 - Selective Hardening
 - Critical facilities
- System Automation
- Post-Storm Forensics



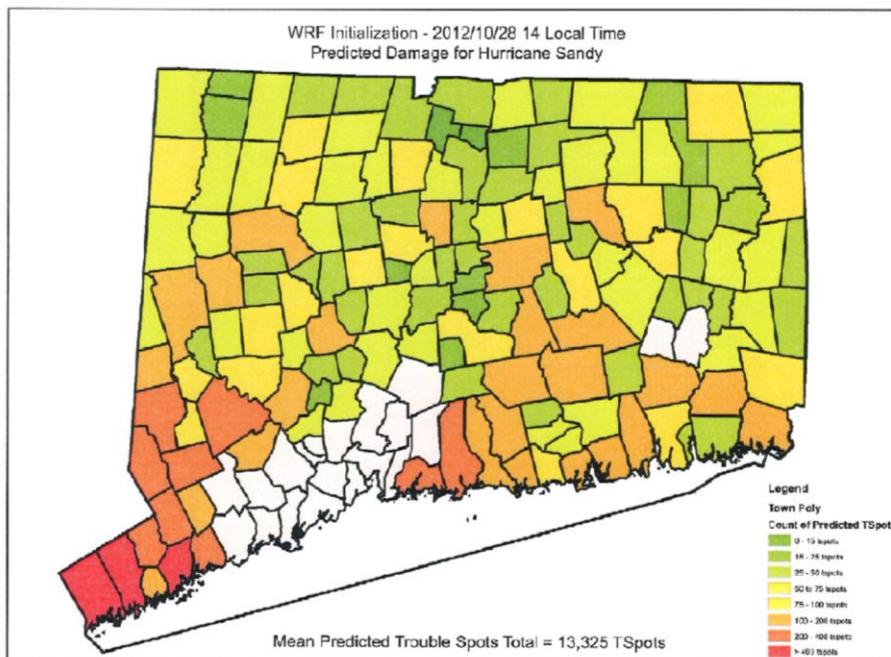
Damage Forecasting Tool



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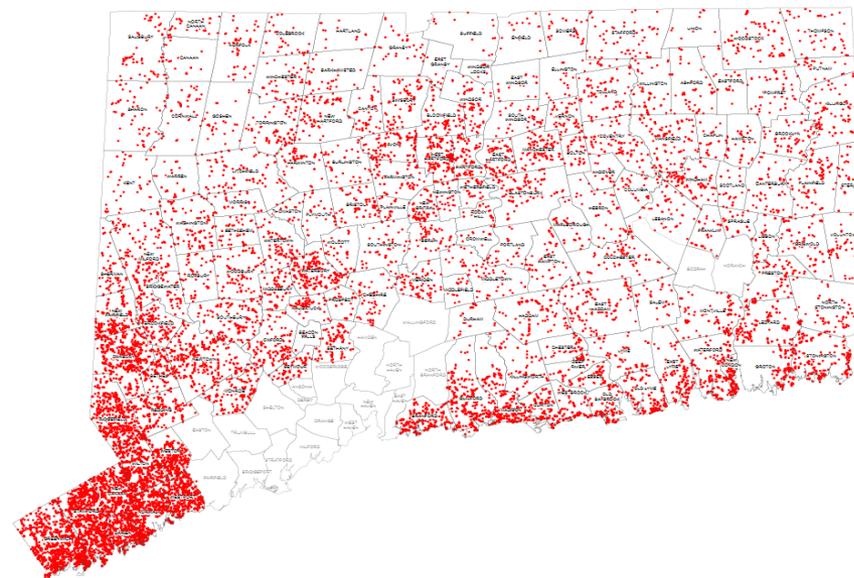
CL&P has partnered with University of Connecticut to pilot a storm forecasting and predictive damage model

Model Predicted Trouble Spots



- Pilot model predicted 13325 trouble spots, primarily in SW CT

Storm Sandy Actual Trouble Spots



- Storm damage caused customer outages in every one of the 149 municipalities served by CL&P
- Restoration of customer outages required repairing over 16,000 trouble spots statewide
- Over 850,000 customers experienced outages (almost 70% of total customer base)

Storm Sandy - Connecticut Impact



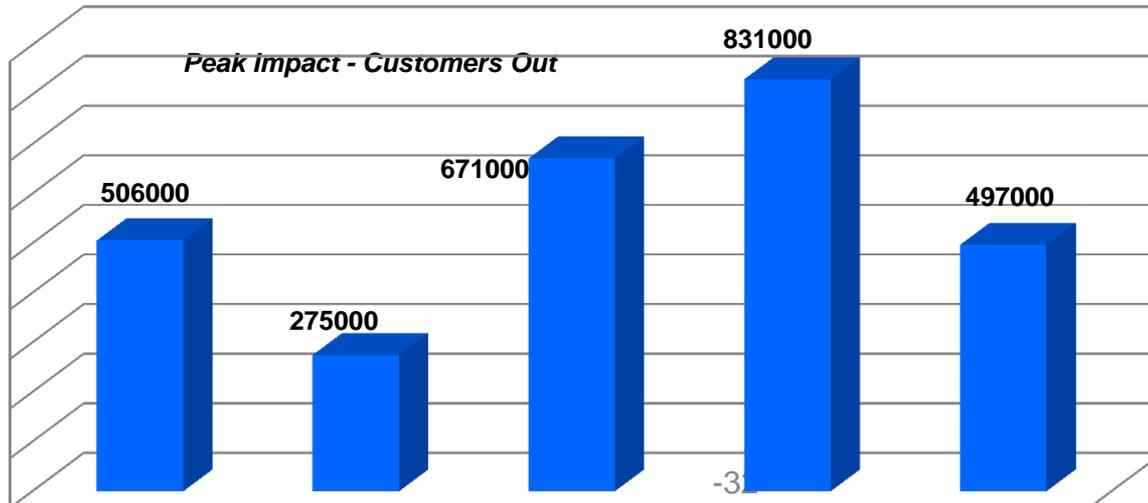
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Connecticut sustained severe damage due to a combination of high winds and historic flooding



- Sustained winds over 50 mph with peak hurricane force gusts of 85 mph
- Thousands of roads blocked by fallen trees and electrical infrastructure
- Unprecedented coastal flooding caused by multiple 'full moon' tides intensified by strong easterly winds and historic storm surge

CL&P - Top 5 Storms of All Time

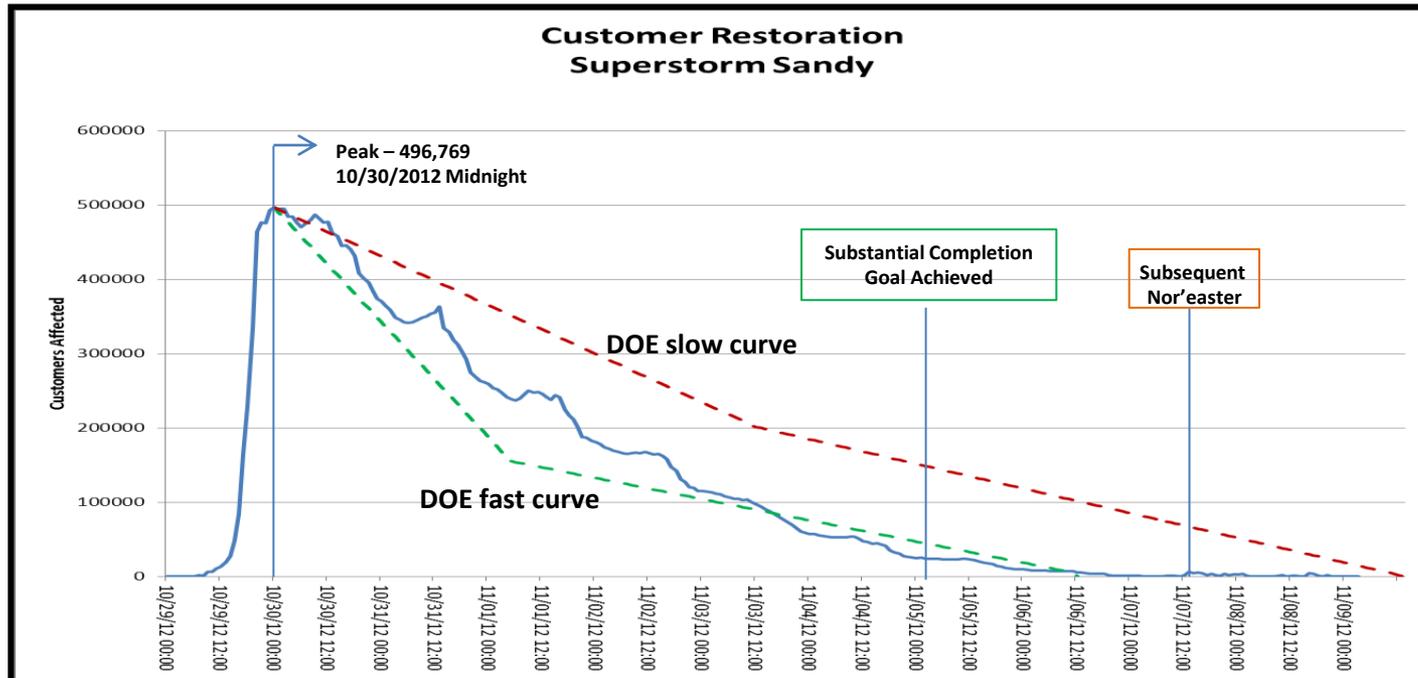


Storm Sandy - Restoration Performance



CL&P delivered a strong event response and achieved all of its 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



Current Corporate Landscape



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- 24 response plans
- Each Electric Operating Company separate
- Transmission separate and integrated
- Gas Companies separate
- 120+ separate business continuity plans
- New threats generate new separate plans and processes



- Comprehensively design what had grown incrementally over time
- Integrate and coordinate resources for efficiency and effectiveness
- Evaluate disparate processes and practices to find best approach and replicate them, integrate other best practices
- Leverage technology through common approach
- Simplify and streamline for easier training, integrated drills and more predictable capability
- Uniform and predictable outcomes

Approach



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- Perform gap analysis between existing state and desired state
- Design a comprehensive framework – ICS based
- Make sure adequate governance is in place
- Understand all stakeholder requirements to guide outcomes
- Deep dive into processes to align to “best way” – remain outcome focused



NU Conceptual Overall Plans Structure

Identical or similar modules with managed exceptions across all operating companies

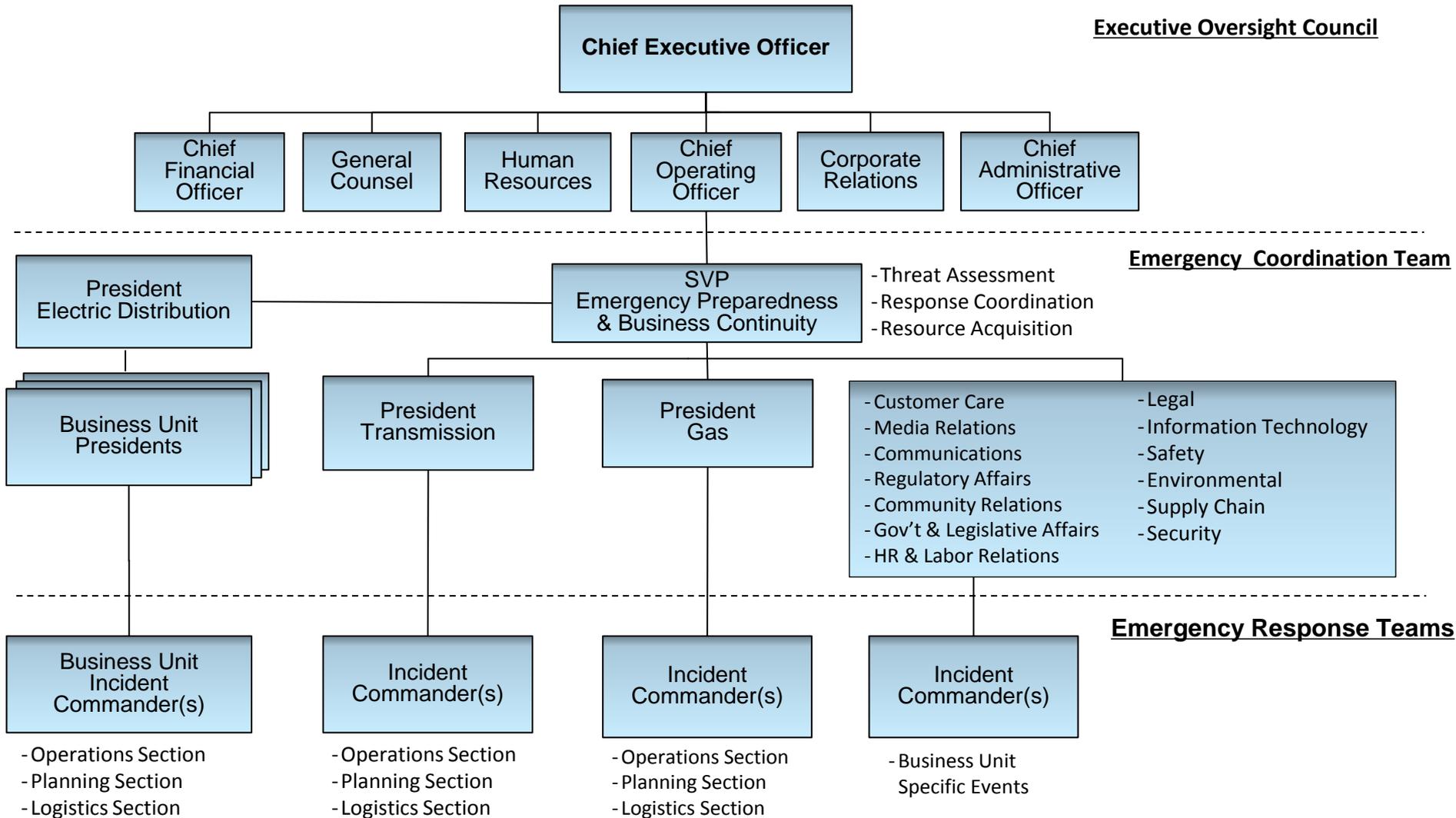
NU Core Plan



Companywide Core Plan

		Shared Services	CL&P	NSTAR	WMECo	PSNH	Transmission	Yankee Gas	NSTAR Gas
Business Unit Core Plans									
Hazard Specific Appendices	Hurricane								
	Winter Storm								
	Flood								
	Cyber								
Function Specific Plans	Pandemic								
	Workplace Violence								
	Business Continuity								
	Disaster Recovery								
	Other								

NU Conceptual Response Structure



Desired Outcomes



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- Aligned – top down, bottom up and side to side
- Clear governance structure to guide ICS not override it- roles and responsibilities
- Coordinated across business units and coordinated within a business unit or shared service
- Coordinated and integrated with infrastructure hardening & system resiliency initiatives
- Common processes enables interchangeability of personnel, leverage of technology and consistent outcomes - scalability

***Being there for our customers
when they count on us most***



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