

2011 Tropical Storm Irene
NH Public Utilities Commission
After Action Event Report

Prepared by: Emergency Management

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## **EXECUTIVE SUMMARY**

On Sunday, August 28<sup>th</sup>, 2011, New England was impacted by Tropical Storm Irene. The storm's impact was widespread and stretched from the Carolinas to New England. In the wake of Irene, more than 7 million homes and businesses across 13 states and the District of Columbia lost power and at least 21 deaths were attributed to the event.

Unitil Energy Systems (UES) experienced the worst of Tropical Storm Irene throughout the morning of August 28th. The tropical storm system brought sustained winds between 35 and 40 miles per hour (mph) and wind gust upwards of 60 mph and more than three inches of rainfall. The event lasted well into the afternoon with winds diminishing throughout the day, although a second peak of decreased wind gusts was reported in the early evening hours.

Unitil mobilized its Incident Command System (ICS) well in advance of the storm's impact and was able to respond with over 200 line crews, tree crews, damage assessment, wires down, and support personnel across the New Hampshire service territories. Due to the forecasted path of Irene along the east coast, resource availability in the mid-Atlantic, New England, and New York regions was already limited (noticeably) by Wednesday, August 24th. As a result, commitments were made with resources from the mid-West, southern Appalachia, and Canada.

As the storm approached New England, Unitil implemented its multi-layered, communications protocols detailed within its Electric Emergency Response Plan (ERP). This implementation focused on informing customers via social networking, coordinating with local and state emergency response officials, providing frequent updates to regulators and elected officials, partnering with the news and print media to distribute public service announcements (PSAs), briefing emergency response agencies like the American Red Cross (ARC) on our preparations, and updating employees and contractors on the Company's preparations.

The peak of Tropical Storm Irene's impact to the UES system occurred around 2:00 p.m. on August 28th. At that time, 31,355 customers (42% of the Company's customers in New Hampshire) were without power, while over the course of the restoration effort about 42,326 customers experienced interruptions. However, Unitil completed restoring all storm-impacted customers during the evening of Monday, August 29th – a time period of 43 hours after the effects of Irene were initially felt.

The relative quickness of Unitil's restoration effort is attributed to its preplanning and preparation activities. Aiding the restoration was the early securement of resources beyond the Northeast, allowing them to travel to New England prior to the storm's impact and the activation and implementation of the ERP in a timely, consistent and disciplined manner.

An added benefit of the swiftness of the restoration effort was Unitil's ability to provide much needed resources to other New England utilities more severely impacted by Tropical Storm Irene. By the morning of Tuesday, August 30th, Unitil had released 256 contractor line and tree crews to five (5) utilities in four (4) states, with 67 of these crews directed to other New Hampshire utilities. Additionally, Unitil rendered a total of nine (9) mutual assistance line crews to two other utilities – one of those located in New Hampshire.

Unitil is proud of the professionalism its employees and contractors displayed in the work performed restoring customers, as well as in their successful execution of the ERP.

## **EVENT OVERVIEW**

### THE STORM

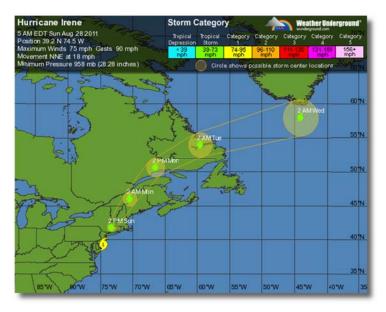
On Tuesday, August 15, 2011, a well-defined tropical wave emerged off the African coast in the eastern Atlantic Ocean, which moved steadily westward toward the Cape Verde Islands. By Saturday, August 20<sup>th</sup>, the National Hurricane Center (NHC) in Florida predicted that a tropical cyclone formation was imminent as the wave neared the Lesser Antilles. Shortly thereafter, Irene was formally named as a tropical storm. The cyclone was upgraded to a Category 1 hurricane after it made landfall on Hispaniola on Sunday, August 21<sup>st</sup>, making it the first hurricane of the 2011 season.

As Hurricane Irene moved over the Bahamas on Tuesday, August 23<sup>rd</sup>, it quickly expanded and intensified into a Category 3 hurricane, making it the first major hurricane of the 2011 season, and curved toward the northwest. On Saturday, August 27<sup>th</sup>, Irene weakened to a Category 1 hurricane as it approached the Outer Banks of North Carolina and made its first stateside landfall at 7:30 a.m. near Cape Lookout, North Carolina with sustained winds of 85 mph. After tracking across land for nearly 10 hours,

Irene re-emerged over water near the southern end of the Chesapeake Bay in Virginia.

Shortly before sunrise the following day (Sunday, August 28<sup>th</sup>), Irene made a second stateside landfall at the Little Egg Inlet in New Jersey with sustained winds of 75 mph and quickly moved back over water once again. Several hours later, Irene had weakened to a tropical storm with sustained winds of 65 mph as it made its third and final stateside landfall near Coney Island (Brooklyn) in New York at about 9:00 a.m.

Following its final landfall, Irene moved northeast over New England causing considerable damage across eastern New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine before moving into eastern



Quebec Province in Canada. The system moved across the St. Lawrence River before emerging into the Labrador Sea later on Monday, August 29<sup>th</sup>.

The most adversely impacted areas in New England with respect to power interruptions were Connecticut (700,000 customer outages at peak), Massachusetts (500,000), Rhode Island (240,000), and New Hampshire (165,000). The states of Vermont and Maine also suffered extensive damage to their road systems with the reported isolation of certain towns due to the heavy rainfall and flooding experienced.

The photographs on the following page illustrate the storm's damage and its impact across New England.









### PRE-EVENT PREPARATIONS

Unitil's formal planning activities for Hurricane Irene began on Monday, August 22, 2011, although the storm's progress had been monitored since its formation during the previous week.

Monday, August 22<sup>nd</sup>

Emergency Management monitored the storm's progress across the Bahamas. When Irene's track (as detailed in the published ensemble models) forecasted a north, northeast curve toward and along the United States, Emergency Management initiated communications with the section leads of the ICS organization to commence storm preparations.

Tuesday, August 23<sup>rd</sup>

Under the direction of the Incident Commander (IC), the Logistics Section made inquiries with local contractor resources to determine their availability for storm response.

Wednesday, August 24th

The weather models had resolved enough to predict that New England should expect a tropical storm force impact from Irene sometime on the weekend (Saturday or Sunday, August 27-28). With this prediction, Robert Schoenberger, Unitil's Chief Executive Officer (CEO) and President, convened a meeting of the Strategic Response Committee (SRC) to establish the Company's strategy for storm

planning. The SRC was briefed by Richard Francazio, the IC for storm responses, on the likelihood of a tropical storm impact and the planning activities (at that time) of the Tactical Response Team (TRT).

At the conclusion of the meeting, the SRC concurred with the following TRT recommendations:

- Employee vacations to be cancelled (effective immediately),
- Additional resources to be secured,
- The Storm Assignment List (SAL) be mobilized and notifications made,
- Emergency Operations Centers (EOC) to be activated and staffed,
- Storm work schedules drafted, and
- Pre-event communications to customers and external entities initiated.

Thursday, August 25th

The daily, system-wide storm conference calls were initiated and pre-event activities associated with the 3-Day Checklist (detailed in the ERP) were implemented. At this time, Irene was a Category 3 hurricane with sustained winds of 115 mph, skirting the Florida, Georgia, and South Carolina coastlines as it headed north. On the storm conference call, the IC instructed the regional emergency operations centers (R-EOCs) in Fitchburg, Concord, NH, and Kensington, NH, as well as the system emergency operations center (S-EOC) in Hampton, NH to be open on Sunday, August 28<sup>th</sup>. In accordance with the communications protocol, this decision triggered outreach communications to customers, regulators, municipal emergency officials, and life support customers. Lastly, Unitil submitted its initial Pre-event Staging Report to the New Hampshire Public Utilities Commission (PUC) at 4:00 p.m.

Friday, August 26<sup>th</sup>

Unitil focused on Day 2 activities on the 3-Day Checklist, which included, among other activities: (1) finalizing committed resource arrivals and lodging accommodations, (2) establishing the setups of the R-EOCs and S-EOC, (3) coordinating with material vendors, and (4) distributing storm-related materials and supplies (e.g., storm kits) to the Concord and Seacoast region. Unitil also participated in the first Northeast Mutual Assistance Group (NEMAG) conference call to discuss the anticipated impacts and resource acquisition across the members' service territories. Lastly, the SRC convened again to review/revise the storm planning strategy, and SAL personnel were notified of their reporting times and work schedules, which began on Sunday morning at 6:00 a.m. Also, a state of emergency was declared for New Hampshire this day by Governor John Lynch.

Saturday, August 27th

The Company focused on Day 1 activities on the 3-Day Checklist, which included, among other activities: (1) confirming SAL reporting times, (2) confirming communication internal and external channels, and (3) finalizing resource, meals and lodging, and material availability. At this time, Irene had weakened to a Category 1 hurricane, as it made landfall near the Outer Banks of North Carolina and then headed toward Chesapeake Bay in Virginia. Following the second NEMAG conference call, outstanding resource requests for New England totaled approximately 1,600 line crews. Irene's impact along a significant portion of the Atlantic coast committed resources in advance of New England's impact and need, thereby reducing the total population of available resources to the NEMAG by a significant number.

Sunday, August 28th

Unitil's three R-EOCs (including Capital and Kensington) and the S-EOC opened at 6:00 a.m. with the ICS organization making final adjustments to the pre-storm preparations (e.g., resource staging times and locations) as the storm made landfall in New York and then again in Connecticut.

### **EVENT IMPACT**

Over the course of restoration efforts, Unitil committed nine (9) internal crews, 95 contractor line crews, 38 tree crews, eight (8) damage assessment crews, 32 wires down personnel, and 40 internal support personnel in the NH service territories with additional resources held at the system level if required. UES began to experience storm-related interruptions at 3:00 a.m. on Sunday, August 28<sup>th</sup> with a peak interruption of 31,355 occurring at 2:00 p.m. of the same day. By 11:00 p.m. on Monday, August 29<sup>th</sup>, Unitil had restored all of the storm-impacted customers. Table 1 and 2 details the timeline for restoration and customer interruptions throughout the event.

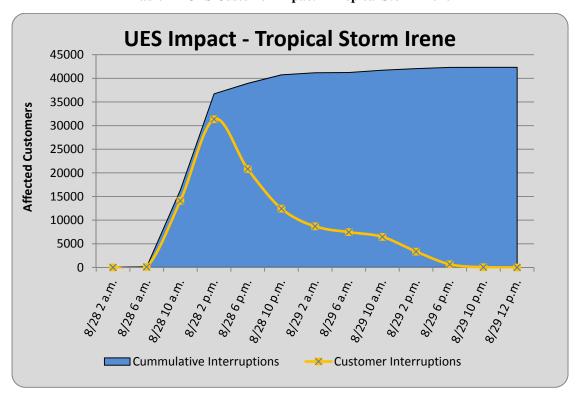


Table 1 – UES Customer Impact – Tropical Storm Irene

**Table 2 – Customer Interruption Summary** 

Day	Date	Time	<b>Customers Affected</b>
		2 a.m.	0
		6 a.m.	88
Sunday	August 20	10 a.m.	14117
Sunday	August 28	2 p.m.	31355
		6 p.m.	20820
		10 p.m.	12431
		2 a.m.	8685
		6 a.m.	7462
Monday	August 29	10 a.m.	6460
Monday		2 p.m.	3350
		6 p.m.	659
		10 p.m.	48
Tuesday	August 30	2 a.m.	0

Throughout the evening and early morning hours of the storm, significant damage was made to the UES system. 30 out of the 31 towns served by Unitil were impacted throughout the storm with 31,355 (42%) of Unitil's NH customer base affected at peak. Repairs were necessary in various locations with a total number of 247 trouble cases occurring throughout the event. Due to damage incurred by the storm, 13 transformers and 10 cross arms were replaced or repaired and over 2,400 feet of wire was re-strung.

Table 3 provides a breakdown of Customer Service's statistics for the system.

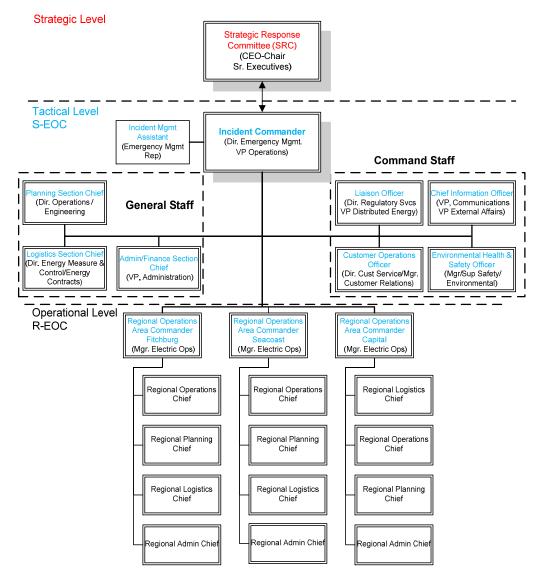
**Table 3 – Customer Service Statistics** 

	Lines	IVR		IVR/CSR Combined	CSR			Web	
Date	# Installed Lines	# Calls in IVR	% Reporting Outage	Tickets UES	% Answered (20 secs)	# CSR Calls Received	# CSR Calls Answered	% Answered (20 secs)	# Web Outage Forms
Aug 28	114	18,744	52%	5941	83%	9,746	7,424	68%	952
Aug 29	114	8,033	43%	930	95%	3,424	3,377	89%	169
Total	114	26,777	49%	6871	87%	13,170	10,801	74%	1,121
Average	114	13,389	49%	3435	87%	6,585	5,401	74%	561

## **STORM RESTORATION**

### EMERGENCY RESPONSE AND STRUCTURE

Unitil utilized the National Incident Management System (NIMS) to manage its emergency response to Tropical Storm Irene. NIMS is a comprehensive and unified approach to incident management, applicable at all jurisdictional levels and across functional disciplines. Furthermore, it improves the effectiveness of emergency response providers and incident management organizations across a full spectrum of potential incidents and hazard scenarios. NIMS relies on ICS to coordinate and manage an organization's mobilization, response, and demobilization.



Unitil's ERP is used for a broad spectrum of emergencies, from small to complex incidents, both natural and manmade, including acts of catastrophic terrorism and major equipment failures. The Company's planning for Tropical Strom Irene was organized around five (5) major functional areas: Incident Command, Operations, Planning, Logistics, and Administration/Finance. The ICS system allowed the organization to combine facilities, equipment, personnel, procedures, and communications under a unified and scalable response structure, which was designed to specifically manage incidents (like storm impacts) and their associated activities.

Many storms begin and end as a regional emergency; however, for those that escalate beyond a region's ability to respond effectively, a system emergency is often declared. In the case of Tropical Storm Irene, the Company concluded (prior to impact) that it likely represented a Level 4 Response event. This classification indicated the Company should implement its full ICS structure with the three R-EOCs and the S-EOC opening just prior to the storm's forecasted New England landfall.

The restoration effort was executed as designed with each ICS Section and Area Chief utilizing their own checklists to prepare their teams for the identified activities. The IC scheduled system conference calls to coordinate the efforts of all three regions into a cohesive Company response. Also, the IC was positioned in the S-EOC, which formed the hub for all support and coordination activities across the Company.

The philosophy employed by implementing ICS was to shift ancillary activities such as: delivery materials, procuring hotels, or establishing staging sites, away from the regions to ensure their continued focus on restoring customers. Additionally, the S-EOC served as the communications hub, which was centralized to ensure a continuity of messaging and to again keep the focus on restoring customers.

Unitil's response to Tropical Storm Irene demonstrates the effectiveness and flexibility of its ERP. The Company's proactive approach in pre-positioning crews and storm kits, while taking part in mutual assistance calls greatly assisted with the restoration effort. Not only did Unitil complete the restoration of its own customers by Monday, August 29<sup>th</sup>, despite over 100 trouble cases and 29% of its customers interrupted, the Company also provided mutual assistance to other utilities in New Hampshire, aiding in the restorations of their customers.

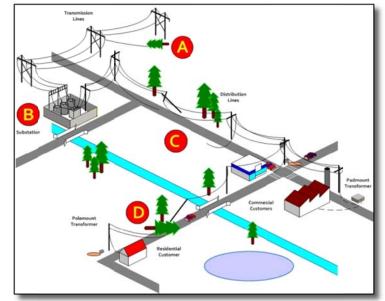
#### **RESTORATION PRIORITIES**

Unitil's ERP provides the framework for the orderly response of system resources when these events arise. These procedures provide instruction on action taken during major emergencies for (1) public safety and the restoration of electric service, (2) the notification of applicable government agencies and the public of emergency restoration progress, and (3) the response to official municipal requests for specific emergency events or actions.

The ERP is intended to be simple, flexible, and easily adapted to specific emergency events like Tropical Storm Irene. Whenever possible, the procedures parallel normal operating procedures to avoid confusion. This also reduces the need for specialized training or work practices.

In general Unitil's standard restoration approach focuses initially on securing the public safety. The restoration then addresses damage on the following systems (in order) with an emphasis on critical infrastructure:

- A. Sub-transmission lines
- B. Substations
- C. Distribution lines
- D. Residential and Commercial Service drops



#### **LOGISTICS**

Logistics was formally activated (in a limited capacity) on Tuesday, August 23<sup>rd</sup>. The intent of this limited activation was to evaluate the availability of line, tree, and damage assessment crew commitment for later in the week. By Tuesday afternoon, it was apparent that local resources were not being released by their respective employers. The Resource Team in the Logistics Section conveyed this information to the IC, who then authorized expanding the resource search to other portions of the nation.

Also, the IC authorized initiating commitments for resource arrivals beginning on Saturday, August 27<sup>th</sup> and staggered arrivals through Monday, August 29<sup>th</sup> to align with the anticipated impact from the storm and the subsequent public safety phase of restoration. Through these proactive efforts, Unitil was able to acquire about 150 contractor line crews, 60 tree crews, 15 damage assessment crews, and 50 wires down personnel. Ultimately, 95 line crews, 38 tree crews, and 40 wires down and damage assessment personnel plus additional internal support were allocated to the UES system in New Hampshire.

While the resources were being committed, the Procurement Team in the Logistics Section made arrangements for material, focusing on longer lead time items (e.g., poles and transformers) and working with the Company's vendors to ensure a steady resupply of material, if needed. In addition, storm kits were deployed to staging sites, material laydown areas in substations, and the regional DOC's. Lastly, vehicle and equipment rental needs were reviewed with additional standby generation retained to ensure a continuity of operations should the DOC's lose power and the existing, on-site generators fail.

The Staging Site Team in the Logistics Section began identifying possible locations along with the Resource Team, anticipating a large influx of personnel onto the system. In the Fitchburg service territory, contact was made with the property owners of the Seabrook Dog Track in Seabrook, NH. The Company's staging site vendor, Base Logistics, worked in conjunction with the team to refine the site layout for quicker mobilization and operation, once the storm had passed. Although the R-EOC did not open a full staging site due to the abbreviated estimated time of restoration, the Company had made the logistical arrangements to ensure each location's success and did setup a small staging area in Hampton Beach to feed the large amount of crews in the Seacoast area.

Other arrangements were made by the Meals & Lodging Team to support the staging site operations by procuring food and lodging for the anticipated resources being directed to each DOC location. This team acquired about 175 rooms and coordinated with Base Logistics and local restaurateurs.

The Logistics Section was active throughout the event and restoration effort. Having participated in a number of early NEMAG calls, Unitil realized that other members would continue to have outstanding resource requests throughout the following days. During Unitil demobilization, the Resource Team supported other utilities in New Hampshire through the structured release of resources; once Unitil was assured it had completed its restoration effort.

#### **ENVIRONMENTAL & SAFETY**

Where the Company anticipated all three regions being impacted by Tropical Storm Irene, the Environmental, Health & Safety (EHS) Officer retained additional resources to provide a regional presence at each DOC. Environmental and safety professionals from two separate consultants, familiar in utility operations, were available for deployment at the start of the public safety phase. These resources were assigned to the regional staging sites and/or DOC.

The EHS Officer confirmed the availability of two (2) of its three (3) retained environmental contractors. Both contractors' safety and environmental personnel had been mobilized for the storm but were prepared to concurrently support several of the New England utilities, if necessary.

Due to the short estimated time for restoration, only the internal safety resources were mobilized. The limited number of transformer spills was managed directly by the EHS Officer from the S-EOC and through the deployed environmental contractors. No injuries, illnesses, or vehicle accidents were reported for either internal or external resources during the event.

### **COMMUNICATIONS**

Unitil prepared for and executed a coordinated, multi-layered communications plan focused on target audiences including customers, municipal emergency response and management officials, elected-public officials, media, and employees.

The multi-layered means of communication laid out in the 3-Day checklist include phone calls, PSAs distributed via e-mail, Twitter, phone, and on-camera interviews with local media stations, as well as phone interviews with radio stations and newspapers.

A total of 11 PSAs were sent to the noted media outlets before and during the event. The first two (2) PSAs (issued Thursday, August 25<sup>th</sup> and Friday, August 26<sup>th</sup>) were part of the Company's pre-event communications. These PSAs included messaging that detailed (1) how Unitil was preparing for the potential of a major tropical storm, (2) how customers should prepare, (3) established expectations for a potential, multi-day power interruption, (4) the nature of the storm with high winds and rain, (5) explained how Unitil would be communicating during the event and (6) announce when Unitil planned to open its regional and system emergency operation centers. The remaining nine (9) PSAs provided updates on outages, restoration status, safety messaging (e.g., downed wires an, generator safety), and reported the completion of the restoration effort.

Unitil also used social media, via Twitter, as a means of communication during this event. This medium was used to communicate preparation, safety, outage, and restoration information during the event and restoration effort, allowing for back and forth communication with subscribed "followers." The Company's followers reached more than 1,000 by the completion of restoration and a significant percentage of those followers included members of the media. Other noted followers included customers, elected officials, regulators and municipal officials.

All PSAs were distributed via Twitter or "tweeted" using links to the Company's public web site. Unitil's online Outage Center also featured the latest tweets so those not on Twitter could follow the conversation, access the PSAs and keep abreast of the latest information using the web site and not Twitter as the communications vehicle. Most media outlets used outage content from Unitil's Tweets for their broadcasts, online content, and streaming ticker content.

In addition, Customer Service processed almost 18,000 calls and more than 1,000 web outage forms during the Tropical Storm Irene in a timely and efficient manner.

Unitil dedicated resources focused solely on ensuring consistent and timely communications with municipal and state elected officials. These communications included e-mail correspondence, individual phone calls, as well as two (2) municipal/leader conference calls held prior to and during the event.

The correspondence included pre-event e-mails, outlining preparations, specifically how Unitil would communicate with them during the event, where to find additional emergency information, and resources on Unitil's public web site and on the Company's password-protected Municipal Access section of the public web site. The correspondence for the municipal officials also included the password for those that did not have it readily available.

Prior to the time of the R-EOCs and S-EOC's opening at 6:00 a.m. on Sunday, August 28<sup>th</sup>, e-mail notification was sent to the elected and municipal officials informing them of the centers' openings, as well as the establishment of the regional Municipal Rooms in Seacoast and Capital, and a pre-impact coordination conference call for all of the municipal officials. The dedicated phone numbers were included and the Municipal Room was staffed 24/7 throughout the event and restoration effort. The room received calls and e-mails during the event, and its staff sent e-mails to municipal officials each time a PSA was issued throughout the event. Other e-mails included periodic updates, notifications of municipal/leader conference calls, and notification of the closing of the Municipal Room after the restoration effort was complete the evening of Monday, August 29<sup>th</sup>. Additionally, e-mails sent to elected officials included restoration activities and often prompted the elected officials to proactively communicate with the company via e-mail or phone call regarding any specific restoration activities that were of interest to them or their constituents. These communications continued until the restoration was completed.

In accordance with the ERP, municipal/leader conference calls typically begin 48 hours into a restoration effort following a major storm, however, due to the storm's intensity increase the Company initiated the first call shortly after the storm's impact to better facilitate communications with the concerned municipal officials. The first conference call was held on Sunday, August 28<sup>th</sup> at 6:30 p.m. with a final wrap-up call at 10:00 a.m. on Monday, August 29<sup>th</sup> as restoration was expected to be completed throughout the day.

Mobile phones were used for the majority of internal communications and radios were also used for calling internal crews that were working or acting as field guides for external resources unfamiliar with the New Hampshire area. The field guide ensured, among other duties, that documentation related to their respective resources was quickly sent or received to and from the DOC. The company retains spare mobile phones for any contractors or crew guides that may not have one and has a limited number of satellite phones available if needed.

Unitil's response to Irene demonstrates the effectiveness and flexibility of its ERP. The Company's proactive approach in pre-positioning crews and storm kits, while taking part in mutual assistance calls greatly assisted with the restoration effort. Not only did Unitil complete the restoration of its own customers on Monday, August 29<sup>th</sup>, despite over 247 trouble cases and 42% of its customers interrupted, the Company also provided mutual assistance to other utilities in New Hampshire, aiding in the restorations of their customers.

## **AFTER ACTION REVIEW**

Unitil conducted a storm critique of its response to Tropical Storm Irene on Thursday, September 8<sup>th</sup>, 2011. Section leads in the ICS organization, as well as other key personnel submitted evaluations of their respective groups' performance before, during, and after the event. The evaluation results were summarized and provided structure for conducting the storm critique. Critical challenges and improvement opportunities, tempered by a historical comparison of recent Unitil storm responses, have been identified in the following sections.

### **CRITICAL CHALLENGES**

Unitil's ERP is a robust set of protocols designed to minimize and anticipate the challenges that occur during major events. Unitil faced few significant challenges during this event. However, with any complex response, there were two situations that required attention.

One area which Unitil continues to stress with the municipal officials is communications. More specifically is the manner in which the Company may best leverage the daily municipal/leader conference calls, which are designed to raise and resolve local emergency response issues.

The purpose of these conference calls is to coordinate efforts between local emergency response officials and Unitil's storm restoration resources. Several issues have been noted, which concern the release of the confidential information to persons not authorized by the Company. This information has included the conference call and Municipal Room phone numbers, as well as the login credentials to the Municipal Access on Unitil's public web site. Such a compromise makes restoration planning difficult for not only the Company but municipal officials, as well.

The second area concerned resource acquisition. This became a challenge early on in the pre-event staging for the storm. Given the limited number of resources available within the New England region and scarcity of the same along the east coast, Unitil needed to commit to resources well in advance of when the models provided a high confidence of significant impact from Irene. A failure to commit early would likely have resulted in an inability to acquire resources later. Unitil overcame this challenge by expanding the resource acquisition external to the Northeast, but was forced to acquire resources with longer travel times earlier than in past storm events.

#### IMPROVEMENT OPPORTUNITIES

The following are the significant areas of improvement or learning from the Company response to Tropical Storm Irene:

- Municipal personnel have requested multiple means of communication when notified of
  municipal/leader conference calls or the opening of the Municipal Room. Unitil's current process
  is to issue an e-mail to the municipal contacts whenever these activities occur. Unitil believes it
  can incorporate an automated "Call Blast" to the notification protocol, which will access
  telecommunications interfaces such as: mobile phones, text-enabled pagers, or land line phones.
- Municipal personnel have requested a better definition by Unitil of when municipal/leader conference calls begin, if the event is not expected to last greater than 48 hours. Unitil's ERP currently identifies twice daily municipal/leader conference calls only if the event is greater than 48 hours in duration.

- Unitil recently created a System Arborist (Forestry Manager) position; the ERP needs to be revised to ensure the Forestry Manager has both system and regional roles in the coordination of tree resources.
- While OMS installation and testing is ongoing, Centralized Electric Dispatch (CED) has assigned its operators to the R-EOCs to operate the OMS terminal because they are the most adept with the application. However, the limited number of CED operators creates staffing problems when local control is returned to CED (which provides 24-hour coverage) upon completion of the restoration effort. Unitil intends to develop a methodology to train and drill SAL personnel routinely, ensuring that skilled employees are assigned, as needed.
- OMS proved to be an accurate and reliable tracker of customer outages both at the electric circuit and municipal level. The Company will develop a strategy for releasing previously-identified OMS information to the public on Unitil's web site.
- The Company needs to enhance the process for tagging failed transformers retuned from the field to ensure the necessary remediation, if needed, was completed at a specific site. This will ensure that no transformers are inadvertently left in the field without remediation occurring in a timely manner.

#### HISTORICAL COMPARISON

To evaluate the effectiveness of improvements made to the ERP after each major storm event, Unitil tracks certain metrics related to storm response. This review incorporates both internal and external perspectives on the Company's response. Feedback from municipal emergency response officials, elected officials, and our customers is solicited post-restoration effort and any perceived enhancements are included in the Company's ERP.

Unitil has experienced three (3), notable storm events in the past three (3) years – the December 2008 Ice Storm, the February 2010 Wind Event, and now Tropical Storm Irene in August 2011. The Ice Storm was post-classified by the Company as a Level 5 event with the most adverse impact of the three historical storms. The Wind Event was also classified as a Level 5 event with damage largely confined to the New Hampshire service territory. Tropical Storm Irene was classified as a Level 4 event but represented a system-wide impact.

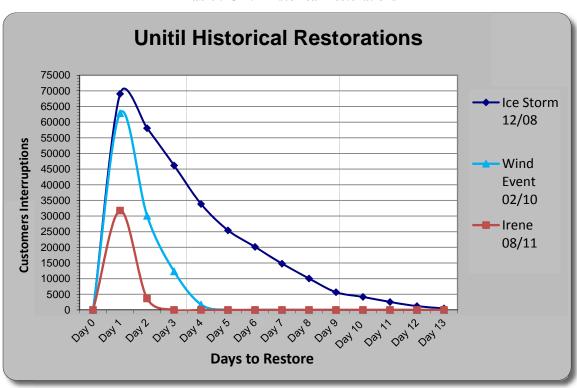
While each of these storms had differing weather characteristics associated with them, certain metrics revealed that Unitil has significantly improved its restoration performance over the past three years. Using trouble locations as a reference point, the three (3) storm events are comparable with the exception of the quantity of damage at each work location. In this regard, the Ice Storm felled more sections of wire and had significantly more additional crew hours assigned to each trouble case. Table 4 on the following page provides a general comparison of the three (3) events at the system level.

**Table 4 – Unitil Historical Storm Comparisons** 

Unitil Historical Storm Comparisons  December 08 Ice Storm vs. Feb 10 Wind Event vs. Tropical Storm Irene								
	Ice Storm December 2008	Wind Event February 2010	Tropical Storm Irene August 2011					
	Unitil System	Unitil System	Unitil System					
Customers Out -Total	69,041	63,123	35,114					
Crews Worked	403	254	256					
Wire Reattached or Replaced (ft)-Total	285,741	103,900	2,684					
Transformers Replaced Total	241	67	15					
Poles Set-Total	279	126	2					
Cross-arms Replaced	520	325	11					
Restoration Days	14	4	1.5					

Additionally, Table 5 reiterates the positive effect that successive improvements to the ERP have on Unitil's restoration efforts.

**Table 5 Unitil Historical Restorations** 



## **CONCLUSIONS**

Unitil's restoration effort during Tropical Storm Irene demonstrated the effectiveness and flexibility of the Company's emergency plans, as well as the company's ability to execute those plans. As a corporate neighbor, Unitil recognized the collective needs of the customers and citizens of the communities we serve, especially in the widespread wake of the storm's passage.

Unitil's response to Irene provided the company a real-world opportunity to implement many of the best practices it has developed within its ERP. Many of these best practices are communications-oriented, which in Unitil's perspective is the other side of a successful restoration. While traditional means of communication, such as radio and newspaper, continue to help customers and communities stay informed during a power outage, without question, the most "instant" way to communicate to and with the public has increasingly been the use of social media applications like Twitter.

Even when the power is out, customers and municipalities use battery-powered laptop computers or other handheld portable devices to interact with Unitil and receive information concerning local outages. During Irene, while thousands of customers continued to receive restoration updates by calling Unitil's 24/7 Call Center, the Company's Media personnel regularly interacted with customers who used social media in record-setting fashion.

From the days preceding Irene's arrival until the final customers were restored, Unitil's Twitter followers increased by more than 1,000 and included customers, media and elected officials. Unitil anticipates this number will only grow with future storm events and the planned released of additional OMS information to the public.

Prior to the storm impact, Unitil opened its Municipal Rooms and staffed them with a Community Services manager and Business Development employees, who routinely work with municipal officials on a daily basis. These liaisons kept emergency responders and municipal leaders appraised of the restoration efforts in their respective community and helped to speed the restoration process by relaying information from municipal emergency response officials who had identified priority trouble locations (e.g., such as blocked roads and downed wires endangering the public) directly to the regional Planning and Operations Sections.

The employees of Unitil take seriously their duty to provide customers with safe, reliable electric service. Although a storm may temporarily interrupt that supply, an effective and efficient restoration is the goal of every Unitil employee, as part of their commitment to the communities we serve.

Unitil is proud of its response to Tropical Storm Irene and is especially grateful for the support offered by its many customers, municipalities, and government officials during the restoration effort. In light of the devastation caused by the storm, a "team" effort by multiple parties was, undoubtedly, the most effective means to restore power. Unitil understands, however, the need for continuous improvement on existing procedures and processes, so that these procedures and processes may work more efficiently during future storm events. With this in mind, the Company welcomes the opportunity to review its storm response, which is detailed in this report, realizing that it will help solidify its commitment to its customers in New Hampshire.

## **ACKNOWLEDGEMENTS**

We wish to express our gratitude to the citizens of New Hampshire, especially our customers. They showed remarkable resilience and patience during this event, and their support of our efforts was gratifying. Further, we thank the municipal leaders, government officials, and emergency responders, who helped us and our customers with the restoration effort. Their actions reflect great credit upon themselves, their agencies, and the citizens they serve.

# <u>Attachment 1 – Telvent DTN Weather Forecast Reports</u>

## **Severe Weather Alert Service From Telvent**

# **For Unitil Services Corp**

Date: Aug 28, 2011 Time: 6:00 AM

Forecaster: N Hamblin

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND	
Event	RAIN/WIND	RAIN/WIND	RAIN/WIND	RAIN/WIND	
Event Begin Time	NOW	NOW	NOW	NOW	
Event End Time	4AM	4AM	2AM	5AM	
Day 1 EII	3	3	3 3		
Event Confidence	HIGH	HIGH	HIGH	HIGH	
Tstrm Wind Gusts					
Ltng Intensity	LOW	LOW	LOW	LOW	
Storm Mvmt Dir	N	N	N	N	
Rain Amount	1.00-3.00	2.00-4.00	2.00-4.00	1.00-3.00	
Snow Amount					
Snow Character					
Ice Amount					
Sustained Wind	30-45	30-45	30-45	30-45	
Wind Gust	50-60	50-60	50-60	50-60	
Temp. Extremes	72/59	70/54	73/53	69/59	
EII	SEACOAST	CAPITAL	FITCHBURG	PORTLAND	
Day 2 Snow	1	1	1	1	
Day 2 Ice	1	1	1	1	
Day 2 Wind	1	1	1	1	
Day 2 Gust	3	2	2	3	
Day 2 Confidence	Low	Low	Low	Low	
Day 3 Snow	1	1	1	1	
Day 3 Ice	1	1	1	1	
Day 3 Wind	1	1	1	1	
Day 3 Gust	1	1	1	1	
Day 3 Confidence	High	High	High	High	

#### **TODAY**

Today, the main impacts of Hurricane Irene will move across the region. Irene should pass through interior sections of New England during the day. Significant coastal flooding is expected across coastal southern New England early and across the Maine Coast during the second half of the day from the dangerous storm surge. The worst of the surge should be along the south coast. Isolated tornadoes will be possible across mainly eastern portions of New England, depending on which areas remain to the east and northeast of the center of the storm. Heavy rain will be likely across most of New England. The heaviest rain should be across western and central areas where 4-8 inches of total rainfall are expected. Locally higher totals of over 10 inches will be possible. We will see lesser totals along the coast. These totals should range from 3-6 inches across coastal northern New England to an inch or less across the Cape/Islands of Massachusetts. The heavy rain should taper off across southern New England by mid-day or early afternoon and across northern New England by this evening. Scattered rain showers could linger through much of the night close to the St. Lawrence River Valley. Peak wind gusts of 50-60 mph will be possible across inland areas and across coastal northern New England. We should see peak sustained winds of 35-55 mph, with gusts to 55-70 mph across coastal southern New England, highest along the south Coast during the morning and perhaps into the early afternoon. After that, we should see the winds switch to the offshore direction with gusts to 45-60 mph, similar in magnitude to interior areas. Winds should gradually settle down tonight across the region from south to north.

TODAY'S Forecast Confidence: Medium - Low

Highs could trend 2-4 degrees warmer across portions of southern New England if the rain shield takes longer than expected to diminish across the region. However, if rain and clouds hold in, temperatures could go 1-3 degrees cooler. Otherwise, temperatures look okay.

CAPITAL: Hurricane Irene's impacts will be felt across the region today. We should see a risk for isolated tornadoes from 8am through 5pm. We should see period of rain, very heavy at times. Rainfall amounts will be 2-4 inches, but there will be occasional squalls where we get in excess of a half inch per hour. We should see the heavy rain diminish across the region later in the afternoon. Flooding will be an issue. We should see winds pick up this morning. Gusts should exceed 35 mph by noontime. Peak gusts should be from 1pm through around 11pm.We should see peak sustained winds of 30-45 mph, with gusts to 50-60 mph. We should see winds gradually diminish after 10pm, with gusts dropping below 35 mph by 4am. It is worth noting that winds will oscillate up and down and the peak winds will not be observed during the entire time.

SEACOAST / PORTLAND: Hurricane Irene's impacts will be felt across the region today. We should see a dangerous storm surge later this morning through a good chunk of the afternoon. This could produce significant coastal flooding. We should see a risk for isolated tornadoes from 8am through 5pm. We should see period of rain, very heavy at times. Rainfall amounts will be 1-3 inches, but there will be occasional squalls where we get in excess of a half inch per hour. We should see the heavy rain diminish across the region later in the afternoon. Flooding will be an issue. We should see winds pick up this morning. Gusts should exceed 35 mph by 9-10am. Peak gusts should be from noontime through around midnight. We should see peak sustained winds of 30-45 mph, with gusts to 50-60 mph. We should see winds gradually diminish after midnight, with gusts dropping below 35 mph by 4-5am. It is worth noting that winds will oscillate up and down and the peak winds will not be observed during the entire time.

EII index values for day 2 wind gusts are for values that occur just after midnight tonight.

The EII index for wind gusts will drop to 1 through the day on Monday at all areas after 5am.

#### **TOMORROW**

Tomorrow, Irene will be long gone and the cleanup can begin. Any remaining light rain showers across northern Maine will end quickly in the morning. Winds across northern Maine will gust to 25-40 mph

through much of the afternoon. Otherwise, we should see dry weather and light winds across the entire region. Temperatures will be near normal.

# TOMORROW'S Forecast Confidence: High

Highs look reasonable tomorrow with good model agreement. A few locations could see lows trend 1-4 degrees cooler at night in spots that see clear skies and light winds.

## 3-5 DAY EXTENDED OUTLOOK

The next front will bring a risk of showers and a few rumbles of thunder across portions of northern New England late Tuesday afternoon and Tuesday night. We should see dry conditions to the south. High pressure will bring dry weather to the region on Wednesday and Thursday. Temperatures will be near to slightly above normal.

### **Severe Weather Alert Service From Telvent**

## For Unitil Services Corp

Date: Aug 28, 2011

Time: 1:00 PM

Forecaster: S Dumblauskas

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND	
Event	RAIN/WIND	RAIN/WIND	RAIN/WIND	RAIN/WIND	
Event Begin Time	NOW	NOW	NOW	NOW	
Event End Time	4AM	4AM	2AM	5AM	
Day 1 EII	3	3	3	3	
Event Confidence	HIGH	HIGH	HIGH	HIGH	
Tstrm Wind Gusts					
Ltng Intensity	LOW			LOW	
Storm Mvmt Dir	N			N	
Rain Amount	1.00-2.00	0.20-0.50	0.10-0.25	1.00-2.00	
Snow Amount					
Snow Character					
Ice Amount					
Sustained Wind	30-45	30-45	30-45	30-45	
Wind Gust	45-55	45-55	45-55	45-55	
Temp. Extremes	72/59	70/54	73/53	69/59	
EII	SEACOAST	CAPITAL	FITCHBURG	PORTLAND	
Day 2 Snow	1	1	1	1	
Day 2 Ice	1	1	1	1	

Day 2 Wind	1	1	1	1
Day 2 Gust	2	2	2	2
Day 2 Confidence	Low	Low	Low	Low
Day 3 Snow	1	1	1	1
Day 3 Ice	1	1	1	1
Day 3 Wind	1	1	1	1
Day 3 Gust	1	1	1	1
Day 3 Confidence	High	High	High	High

#### **TODAY**

Today, the main impacts of Hurricane Irene will move across the region. Irene should pass through interior sections of New England during the day. Significant coastal flooding is expected across coastal southern New England early and across the Maine Coast during the second half of the day from the dangerous storm surge. The worst of the surge should be along the south coast. Isolated tornadoes will be possible across mainly eastern portions of New England, depending on which areas remain to the east and northeast of the center of the storm. Heavy rain will be likely across most of New England. The heaviest rain should be across western and central areas where 4-8 inches of total rainfall are expected. Locally higher totals of over 10 inches will be possible. We will see lesser totals along the coast. These totals should range from 3-6 inches across coastal northern New England to an inch or less across the Cape/Islands of Massachusetts. The heavy rain should taper off across southern New England by mid-day or early afternoon and across northern New England by this evening. Scattered rain showers could linger through much of the night close to the St. Lawrence River Valley. Peak wind gusts of 50-60 mph will be possible across inland areas and across coastal northern New England. We should see peak sustained winds of 35-55 mph, with gusts to 55-70 mph across coastal southern New England, highest along the south Coast during the morning and perhaps into the early afternoon. After that, we should see the winds switch to the offshore direction with gusts to 45-60 mph, similar in magnitude to interior areas. Winds should gradually settle down tonight across the region from south to north.

## TODAY'S Forecast Confidence: Medium - Low

Highs could trend 2-4 degrees warmer across portions of southern New England if the rain shield takes longer than expected to diminish across the region. However, if rain and clouds hold in, temperatures could go 1-3 degrees cooler. Otherwise, temperatures look okay.

CAPITAL: Rains will continue for the area through the afternoon, gradually tapering off by hour ending 5pm. Additional rainfall totals up to half an inch will be possible, but intensity will be falling fairly rapidly after 3pm. Gusty winds will continue through the afternoon, evening and the mid-overnight hours. Sustained speeds of 25-40 mph with gusts of 35-55mph are expected. There may be a brief lull or reduction in wind speeds later this afternoon as the eye passes nearby, but winds will quickly increase on the backside of the remains of the eye. Winds will begin to spin down after 11pm-midnight with a fall below hazard criteria by 4am.

SEACOAST / PORTLAND: Heavy rains are anticipated to continue for the bulk of the afternoon hours, finally relenting by 5-6pm. An additional 1-2 inches of rain will be possible depending on where precisely the heavier bands track later this afternoon. Ongoing flooding concerns will only be exacerbated. There also remains a threat for isolated tornadoes through 5pm, although this will be solely across the coastal locales. Sustained wind speeds of 25-40 mph will continue with gusts of 35-55 mph. There may be a few hour reduction of wind speeds later this afternoon or early evening, but any reduction will be brief and

winds are anticipated to pick back up again later this evening. General wind speeds are anticipated to diminish after midnight tonight, with winds falling below hazard criteria by 4-5am Monday morning, and a rapid reduction in wind speeds by daybreak Monday morning.

EII values for Monday reflect wind speeds between midnight and 6am. After 6am, EII values of 1 are anticipated as high pressure quickly moves in.

#### **TOMORROW**

Tomorrow, Irene will be long gone and the cleanup can begin. Any remaining light rain showers across northern Maine will end quickly in the morning. Winds across northern Maine will gust to 25-40 mph through much of the afternoon. Otherwise, we should see dry weather and light winds across the entire region. Temperatures will be near normal.

# TOMORROW'S Forecast Confidence: High

Highs look reasonable tomorrow with good model agreement. A few locations could see lows trend 1-4 degrees cooler at night in spots that see clear skies and light winds.

### 3-5 DAY EXTENDED OUTLOOK

The next front will bring a risk of showers and a few rumbles of thunder across portions of northern New England late Tuesday afternoon and Tuesday night. We should see dry conditions to the south. High pressure will bring dry weather to the region on Wednesday and Thursday. Temperatures will be near to slightly above normal.

#### **Severe Weather Alert Service From Telvent**

## **For Unitil Services Corp**

Date: Aug 28, 2011

Time: 7:15 PM

Forecaster: Tony Dello

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	WIND	WIND	WIND	WIND
Event Begin Time	NOW	NOW	NOW	NOW
Event End Time	3AM	2AM	1AM	4AM
Day 1 EII	3	2	2	3
Event Confidence	HIGH	HIGH	HIGH	HIGH
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount				
Snow Amount				
Snow Character				
Ice Amount				

Sustained Wind	20-30	15-25	15-25	20-30
Wind Gust	35-45	25-35	25-35	35-45
Temp. Extremes	78/59	80/54	81/53	77/59
EII	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Day 2 Snow	1	1	1	1
Day 2 Ice	1	1	1	1
Day 2 Wind	1	1	1	1
Day 2 Gust	2	2	2	2
Day 2 Confidence	Low	Low	Low	Low
Day 3 Snow	1	1	1	1
Day 3 Ice	1	1	1	1
Day 3 Wind	1	1	1	1
Day 3 Gust	1	1	1	1
Day 3 Confidence	High	High	High	High

#### **TODAY**

Today, the main impacts of Hurricane Irene will move across the region. Irene should pass through interior sections of New England during the day. Significant coastal flooding is expected across coastal southern New England early and across the Maine Coast during the second half of the day from the dangerous storm surge. The worst of the surge should be along the south coast. Isolated tornadoes will be possible across mainly eastern portions of New England, depending on which areas remain to the east and northeast of the center of the storm. Heavy rain will be likely across most of New England. The heaviest rain should be across western and central areas where 4-8 inches of total rainfall are expected. Locally higher totals of over 10 inches will be possible. We will see lesser totals along the coast. These totals should range from 3-6 inches across coastal northern New England to an inch or less across the Cape/Islands of Massachusetts. The heavy rain should taper off across southern New England by mid-day or early afternoon and across northern New England by this evening. Scattered rain showers could linger through much of the night close to the St. Lawrence River Valley. Peak wind gusts of 50-60 mph will be possible across inland areas and across coastal northern New England. We should see peak sustained winds of 35-55 mph, with gusts to 55-70 mph across coastal southern New England, highest along the south Coast during the morning and perhaps into the early afternoon. After that, we should see the winds switch to the offshore direction with gusts to 45-60 mph, similar in magnitude to interior areas. Winds should gradually settle down tonight across the region from south to north.

#### TODAY'S Forecast Confidence: Medium - Low

Highs could trend 2-4 degrees warmer across portions of southern New England if the rain shield takes longer than expected to diminish across the region. However, if rain and clouds hold in, temperatures could go 1-3 degrees cooler. Otherwise, temperatures look okay.

CAPITAL: Maybe a few sprinkles around on the backside of Irene here this evening but most of the night will be dry finally. Rainfall amounts will remain under 0.05 inches. Winds will remain somewhat of an issue this evening and into the early morning hours. Southerly winds will become more southwest and west tonight across the area and will be sustained at 15-25 mph through the early morning hours with a

few gusts up to 35 mph possible. By 2-4am wind gusts will fall to below 30 mph and by daybreak they should be below 20 mph across the region. Fairly light winds and dry tomorrow across the region.

SEACOAST / PORTLAND: The coastal areas of the operations continue to see some fairly windy conditions, especially along the immediate coast. Southeast winds of 15-30 mph sustained and gusts of 30-45 mph are continuing to be quite common across these areas this evening. Winds should turn more southwest and maybe even mostly westerly by tomorrow morning and continue to remain around 15-25 mph with gusts up to 40 mph through much of tonight. However by 4-5am winds even across these areas should fall to below 35 mph and shortly around daybreak or there after gusts should all be below 25 mph region-wide. Dry and a lot less windy across the region Monday.

EII values for Monday reflect wind speeds between midnight and 6am. After 6am, EII values of 1 are anticipated as high pressure quickly moves in.

#### **TOMORROW**

Tomorrow, Irene will be long gone and the cleanup can begin. Any remaining light rain showers across northern Maine will end quickly in the morning. Winds across northern Maine will gust to 25-40 mph through much of the afternoon. Otherwise, we should see dry weather and light winds across the entire region. Temperatures will be near normal.

## TOMORROW'S Forecast Confidence: High

Highs look reasonable tomorrow with good model agreement. A few locations could see lows trend 1-4 degrees cooler at night in spots that see clear skies and light winds.

#### 3-5 DAY EXTENDED OUTLOOK

The next front will bring a risk of showers and a few rumbles of thunder across portions of northern New England late Tuesday afternoon and Tuesday night. We should see dry conditions to the south. High pressure will bring dry weather to the region on Wednesday and Thursday. Temperatures will be near to slightly above normal.

#### **Severe Weather Alert Service From Telvent**

#### **For Unitil Services Corp**

Date: Aug 29, 2011 Time: 6:00 AM

Forecaster: N. Hamblin

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	NONE	NONE	NONE	NONE
Event Begin Time				
Event End Time				
Day 1 EII				
Event Confidence				
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				

Rain Amount				
Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	77/56	77/49	75/49	75/54
EII	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Day 2 Snow	1	1	1	1
Day 2 Ice	1	1	1	1
Day 2 Wind	1	1	1	1
Day 2 Gust	1	1	1	1
Day 2 Confidence	High	High	High	High
Day 3 Snow	1	1	1	1
Day 3 Ice	1	1	1	1
Day 3 Wind	1	1	1	1
Day 3 Gust	1	1	1	1
Day 3 Confidence	High	High	High	High

#### **TODAY**

Today, the last of the light rain close to the Canadian Border will come to an end early this morning. We should see the winds settle down for most areas before sunrise. However, winds could gust to 25-35 mph for a good chunk of the day across northern Maine. Otherwise, we should see dry weather and light winds. This should provide an ideal day for cleanup and restoration processes to begin. Temperatures will be near normal.

### TODAY'S Forecast Confidence: High

Highs look reasonable tomorrow with good model agreement. A few locations could see lows trend 1-4 degrees cooler at night in spots that see clear skies and light winds.

CAPITAL: Today and tonight, high pressure will bring dry conditions. Any breezy winds with gusts of 20-25 mph early this morning will settle down quickly. Otherwise, the winds should be light. Any clean up and restoration processes should have good cooperation from the weather.

SEACOAST / PORTLAND: Today, we should see winds continue to subside through the morning. A few leftover gusts of 20-30 mph will persist through 10am or so before the winds settle down. Otherwise, we should see dry weather through tonight. Any clean up and restoration processes should have good cooperation from the weather.

#### **TOMORROW**

Tomorrow, there will be scattered showers and perhaps a few rumbles of thunder across portions of northern New England close to the Canadian Border during the afternoon and evening hours. Nothing

strong is expected. Otherwise, we should see dry weather and light winds continue across the region. Temperatures will be near to a little above normal.

TOMORROW'S Forecast Confidence: Medium - High

Temperatures generally look good with decent model agreement. A few places closer to the Canadian Border could see highs come in 1-4 degrees cooler if they get a rain shower. These will be few and far between. Also, a few locations in the south and away from urban areas could see lows trend 1-4 degrees cooler at night in spots that see clear skies and light winds.

#### 3-5 DAY EXTENDED OUTLOOK

High pressure will bring dry weather and light winds to the region on Wednesday and Thursday. We could even see the dry weather extend through Friday across most of the region. We cannot rule out a few showers and storms across western areas, though. Temperatures will generally be near normal.

# **<u>Attachment 2 – Customer Impact Data</u>**

			HOURLY %	act - Tropical Sto		CUMULATIVE %	
DATE	HOURLY OUTAGES	HOURLY AFFECTED	INTERRUPTED PEAK	CUMULATIVE OUTAGES	CUMULATIVE AFFECTED	INTERRUPTED PEAK	TOTAL CUSTOMERS
8/28/2011 1:00:00	0	0	0.00%	0	0	0.00%	2933
8/28/2011 2:00:00	0	0	0.00%	0	0	0.00%	2933
8/28/2011 3:00:00	1	42	0.14%	1	42	0.14%	2933
8/28/2011 4:00:00	1	42	0.14%	1	42	0.14%	2933
8/28/2011 5:00:00	2	78	0.27%	2	78	0.27%	2933
8/28/2011 6:00:00	1	36	0.12%	2	78	0.27%	2933
8/28/2011 7:00:00	2	1028	3.50%	4	1106	3.77%	2933
8/28/2011 8:00:00	3	228	0.78%	6	1275	4.35%	2933
8/28/2011 9:00:00	4	249	0.85%	7	1296	4.42%	2933
8/28/2011 10:00:00	16	3540	12.07%	19	4587	15.64%	2933
8/28/2011 11:00:00	32	6678	22.77%	39	7974	27.18%	2933
8/28/2011 12:00:00	33	6882	23.46%	44	8730	29.76%	2933
8/28/2011 13:00:00	43	9439	32.18%	54	11287	38.48%	2933
8/28/2011 13:00:00	43	10265	34.99%	60	12906	44.00%	2933
8/28/2011 15:00:00	45 46	8289 6380	28.26% 21.75%	66 71	13462 13609	45.89% 46.39%	2933 2933
8/28/2011 16:00:00							
8/28/2011 17:00:00	45	5968	20.35%	73	13682	46.64%	2933
8/28/2011 18:00:00	52	6510	22.19%	81	14294	48.73%	2933
8/28/2011 19:00:00	48	3951	13.47%	84	14425	49.18%	2933
8/28/2011 20:00:00	48	3875	13.21%	86	14633	49.89%	2933
8/28/2011 21:00:00	48	4655	15.87%	89	15576	53.10%	2933
8/28/2011 22:00:00	47	4520	15.41%	91	15656	53.37%	2933
8/28/2011 23:00:00	46	4389	14.96%	94	15775	53.78%	2933
8/29/2011	43	3773	12.86%	94	15775	53.78%	2933
8/29/2011 1:00:00	44	3777	12.88%	95	15779	53.79%	2933
8/29/2011 2:00:00	44	2946	10.04%	96	15785	53.81%	2933
8/29/2011 3:00:00	43	2833	9.66%	96	15785	53.81%	2933
8/29/2011 4:00:00	43	2833	9.66%	96	15785	53.81%	2933
8/29/2011 5:00:00	44	2837	9.67%	97	15789	53.83%	2933
8/29/2011 6:00:00	44	2796	9.53%	98	15790	53.83%	2933
8/29/2011 7:00:00	46	2991	10.20%	100	15985	54.49%	2933
8/29/2011 8:00:00	48	3009	10.26%	102	16003	54.56%	2933
8/29/2011 9:00:00	49	2977	10.15%	105	16067	54.77%	2933
8/29/2011 10:00:00	49	1822	6.21%	110	16229	55.33%	2933
8/29/2011 11:00:00	42	1433	4.89%	110	16229	55.33%	2933
8/29/2011 12:00:00	40	1343	4.58%	112	16324	55.65%	2933
8/29/2011 13:00:00	30	787	2.68%	112	16324	55.65%	2933
8/29/2011 14:00:00	31	851	2.90%	116	16562	56.46%	2933
8/29/2011 14:00:00	27	764	2.60%	119	16656	56.78%	2933
8/29/2011 15:00:00	21	387	1.32%	122	16695	56.92%	2933
8/29/2011 17:00:00	16	264	0.90%	122	16695	56.92%	2933
8/29/2011 18:00:00	11	183	0.62%	122	16695	56.92%	2933
8/29/2011 19:00:00	11	38	0.13%	126	16702	56.94%	2933
8/29/2011 20:00:00	8	15	0.05%	126	16702	56.94%	2933
8/29/2011 21:00:00	10	18	0.06%	128	16705	56.95%	2933
8/29/2011 22:00:00	7	12	0.04%	128	16705	56.95%	2933
8/29/2011 23:00:00	4	8	0.03%	128	16705	56.95%	2933
8/30/2011	0	0	0.00%	128	16705	56.95%	2933

Seacoast Region Outage Impact - Tropical Storm Irene HOURLY % CUMULATIVE %								
DATE	HOURLY OUTAGES	HOURLY AFFECTED	INTERRUPTED PEAK	CUMULATIVE OUTAGES	CUMULATIVE AFFECTED	INTERRUPTED PEAK	TOTAL CUSTOMERS	
8/28/2011 1:00:00	0	0	0.00%	0	0	0.00%	44762	
8/28/2011 2:00:00	0	0	0.00%	0	0	0.00%	44762	
8/28/2011 3:00:00	0	0	0.00%	0	0	0.00%	44762	
8/28/2011 4:00:00	0	0	0.00%	0	0	0.00%	44762	
8/28/2011 5:00:00	1	52	0.12%	1	52	0.12%	44762	
8/28/2011 6:00:00	1	52	0.12%	1	52	0.12%	44762	
8/28/2011 7:00:00	5	167	0.37%	5	167	0.37%	44762	
8/28/2011 8:00:00	13	4542	10.15%	14	4594	10.26%	44762	
8/28/2011 9:00:00	23	6279	14.03%	26	6437	14.38%	44762	
8/28/2011 10:00:00	39	10577	23.63%	46	11804	26.37%	44762	
8/28/2011 11:00:00	62	19115	42.70%	72	21792	48.68%	44762	
8/28/2011 12:00:00	70	20109	44.92%	80	22786	50.90%	44762	
8/28/2011 13:00:00	71	20170	45.06%	81	22847	51.04%	44762	
8/28/2011 14:00:00	79	21090	47.12%	89	23818	53.21%	44762	
8/28/2011 15:00:00	80	19394	43.33%	92	23866	53.32%	44762	
8/28/2011 16:00:00	79	18620	41.60%	93	23891	53.37%	44762	
8/28/2011 17:00:00	78	14689	32.82%	96	24013	53.65%	44762	
8/28/2011 18:00:00	79	14310	31.97%	99	24637	55.04%	44762	
8/28/2011 19:00:00	73	13412	29.96%	99	24637	55.04%	44762	
8/28/2011 20:00:00	74	10328	23.07%	102	24871	55.56%	44762	
8/28/2011 21:00:00	73	9653	21.57%	103	24895	55.62%	44762	
8/28/2011 22:00:00	73	7911	17.67%	106	25087	56.05%	44762	
8/28/2011 23:00:00	75	7981	17.83%	109	25370	56.68%	44762	
8/29/2011	72	7027	15.70%	109	25370	56.68%	44762	
8/29/2011 1:00:00	72	6637	14.83%	111	25400	56.74%	44762	
8/29/2011 2:00:00	67	5739	12.82%	111	25400	56.74%	44762	
8/29/2011 3:00:00	64	5600	12.51%	111	25400	56.74%	44762	
8/29/2011 4:00:00	66	5570	12.44%	114	25436	56.82%	44762	
8/29/2011 5:00:00	64	4654	10.40%	115	25438	56.83%	44762	
8/29/2011 6:00:00	65	4666	10.42%	116	25450	56.86%	44762	
8/29/2011 7:00:00	64	4642	10.37%	116	25450	56.86%	44762	
8/29/2011 8:00:00	69	4685	10.47%	121	25493	56.95%	44762	
8/29/2011 9:00:00	69	4685	10.47%	121	25493	56.95%	44762	
8/29/2011 10:00:00	69	4638	10.36%	122	25495	56.96%	44762	
8/29/2011 11:00:00	64	4311	9.63%	122	25495	56.96%	44762	
8/29/2011 12:00:00	57	2996	6.69%	122	25495	56.96%	44762	
8/29/2011 13:00:00	49	2638	5.89%	122	25495	56.96%	44762	
8/29/2011 14:00:00	45	2499	5.58%	122	25495	56.96%	44762	
8/29/2011 15:00:00	37	1915	4.28%	124	25502	56.97%	44762	
8/29/2011 16:00:00	35	1882	4.20%	127	25543	57.06%	44762	
8/29/2011 17:00:00	28	744	1.66%	129	25618	57.23%	44762	
8/29/2011 18:00:00	19	476	1.06%	130	25619	57.23%	44762	
8/29/2011 19:00:00	15	374	0.84%	130	25619	57.23%	44762	
8/29/2011 20:00:00	11	300	0.67%	130	25619	57.23%	44762	
8/29/2011 21:00:00	10	127	0.28%	130	25619	57.23%	44762	
8/29/2011 22:00:00	8	36	0.08%	132	25621	57.24%	44762	
8/29/2011 23:00:00	5	17	0.04%	132	25621	57.24%	44762	
8/30/2011	0	0	0.00%	132	25621	57.24%	44762	

			HOURLY %			CUMULATIVE %	
DATE	HOURLY OUTAGES	HOURLY AFFECTED	INTERRUPTED PEAK	CUMULATIVE OUTAGES	CUMULATIVE AFFECTED	INTERRUPTED PEAK	TOTAL CUSTOMERS
8/28/2011	0	0	0.0%	0	0	0.0%	7409
8/28/2011 1:00:00	0	0	0.0%	0	0	0.0%	7409
8/28/2011 2:00:00	0	0	0.0%	0	0	0.0%	7409
8/28/2011 3:00:00	1	42	0.1%	1	42	0.1%	7409
8/28/2011 4:00:00	1	42	0.1%	1	42	0.1%	7409
8/28/2011 5:00:00	3	130	0.2%	3	130	0.2%	7409
8/28/2011 6:00:00	2	88	0.1%	3	130	0.2%	7409
8/28/2011 7:00:00	7	1195	1.6%	9	1273	1.7%	7409
8/28/2011 8:00:00	16	4770	6.4%	20	5869	7.9%	7409
8/28/2011 9:00:00	27	6528	8.8%	33	7733	10.4%	7409
3/28/2011 10:00:00	55	14117	19.1%	65	16391	22.1%	7409
3/28/2011 11:00:00	94	25793	34.8%	111	29766	40.2%	7409
/28/2011 12:00:00	103	26991	36.4%	124	31516	42.5%	7409
3/28/2011 13:00:00	114	29609	40.0%	135	34134	46.1%	7409
3/28/2011 14:00:00	127	31355	42.3%	149	36724	49.6%	7409
/28/2011 15:00:00	125	27683	37.4%	158	37328	50.4%	7409
/28/2011 16:00:00	125	25000	33.7%	164	37500	50.6%	7409
/28/2011 17:00:00	123	20657	27.9%	169	37695	50.9%	7409
/28/2011 18:00:00	131	20820	28.1%	180	38931	52.5%	7409
/28/2011 19:00:00	121	17363	23.4%	183	39062	52.7%	740
/28/2011 19:00:00	122	14203	19.2%	188	39504	53.3%	7409
/28/2011 20:00:00	121	14308	19.3%	192	40471	54.6%	7409
/28/2011 21:00:00	121						7409
		12431	16.8%	197	40743	55.0%	
/28/2011 23:00:00	121	12370	16.7%	203	41145	55.5%	7409
8/29/2011	115	10800	14.6%	203	41145	55.5%	740
8/29/2011 1:00:00	116	10414	14.1%	206	41179	55.6%	740
8/29/2011 2:00:00	111	8685	11.7%	207	41185	55.6%	740
8/29/2011 3:00:00	107	8433	11.4%	207	41185	55.6%	7409
8/29/2011 4:00:00	109	8403	11.3%	210	41221	55.6%	7409
8/29/2011 5:00:00	108	7491	10.1%	212	41227	55.6%	7409
8/29/2011 6:00:00	109	7462	10.1%	214	41240	55.7%	7409
8/29/2011 7:00:00	110	7633	10.3%	216	41435	55.9%	740
8/29/2011 8:00:00	117	7694	10.4%	223	41496	56.0%	7409
8/29/2011 9:00:00	118	7662	10.3%	226	41560	56.1%	7409
/29/2011 10:00:00	118	6460	8.7%	232	41724	56.3%	7409
/29/2011 11:00:00	106	5744	7.8%	232	41724	56.3%	7409
/29/2011 12:00:00	97	4339	5.9%	234	41819	56.4%	7409
/29/2011 13:00:00	79	3425	4.6%	234	41819	56.4%	7409
/29/2011 14:00:00	76	3350	4.5%	238	42057	56.8%	740
/29/2011 15:00:00	64	2679	3.6%	243	42158	56.9%	740
/29/2011 16:00:00	56	2269	3.1%	249	42238	57.0%	740
/29/2011 17:00:00	44	1008	1.4%	251	42313	57.1%	740
/29/2011 18:00:00	30	659	0.9%	252	42314	57.1%	7409
/29/2011 19:00:00	26	412	0.6%	256	42321	57.1%	740
/29/2011 20:00:00	19	315	0.4%	256	42321	57.1%	740
3/29/2011 21:00:00 T	20	145	0.2%	258	42324	57.1%	740
/29/2011 22:00:00	15	48	0.1%	260	42326	57.1%	740
3/29/2011 23:00:00	9	25	0.1%	260	42326	57.1%	7409
8/30/2011	0	25	0.0%	260	42326	57.1%	7409





2011 October Nor'easter
NH Public Utilities Commission
After Action Event Report

Prepared By: Emergency Management

Date: December 15, 2011

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## **EXECUTIVE SUMMARY**

On Saturday, October 29, 2011, New England was impacted by a nor'easter. The storm's impact was widespread across the northeast, stretching from the Mid-Atlantic to the Canadian Maritimes. In the wake of the nor'easter, more than 3.3 million homes and businesses across 12 states and the Canadian Maritimes lost power and at least 39 deaths were attributed to the event with 35 of those in the United States.

Unitil Energy Systems (UES) experienced the worst of the nor'easter overnight on October 29<sup>th</sup> into the early morning hours with peak interruptions occurring at approximately 2:00 AM on October 30<sup>th</sup>. The nor'easter brought sustained winds of 17 miles per hour (mph) and wind gusts of 30 mph and between 19 – 25 inches of snow across the NH service territory. The event lasted throughout the evening and early morning hours with snow and winds diminishing throughout late morning and early afternoon hours of October 30<sup>th</sup>.

Unitil mobilized its Incident Command System (ICS) in advance of the storm's impact and was able to respond with over 200 line crews, tree crews, damage assessment, wires down, and support personnel across the New Hampshire service territories. Due to the forecasted track of the storm, resource availability in the mid-Atlantic, New England, and New York regions was already limited (noticeably) by Friday, October 28<sup>th</sup>. As a result, commitments were made with resources outside the region from Michigan, Pennsylvania and Canada.

As the storm developed, Unitil implemented its multi-layered, communications protocols detailed within its Electric Emergency Response Plan (ERP). This implementation focused on informing customers via social networking, coordinating with local and state emergency response officials, providing frequent updates to regulators and elected officials, partnering with the news and print media to distribute public service announcements (PSAs), briefing emergency response agencies like the American Red Cross (ARC) on our preparations, and updating employees and contractors on the Company's preparations.

The peak of the storm's impact on the UES service territory occurred at 2:00 a.m. on Sunday, October 30<sup>th</sup>. At that time, 51,262 customers (69% of the Company's New Hampshire customers) were without power, while over the course of the restoration effort about 71,928 customers experienced interruptions. Until restored power to 99% of its affected customers by the evening of Tuesday, November 1<sup>st</sup> (a time period of 72 hours) with the remaining individual customers restored by 6 a.m. on Wednesday, November 2<sup>nd</sup>.

The relative quickness of Unitil's restoration effort is attributed to its preplanning and preparation activities. Aiding the restoration was the early securement of resources beyond the Northeast, allowing them to travel to New England prior to the storm's impact and the activation and implementation of the ERP in a timely, consistent and disciplined manner.

An added benefit of the swiftness of the restoration effort was Unitil's ability to provide much needed resources to other New England utilities more severely impacted by the nor'easter. By the morning of Wednesday, November 2<sup>nd</sup>, Unitil had released over 130 contractor line and tree crews to four (4) utilities in three (3) states, with 46 of these crews directed to other New Hampshire utilities. Additionally, Unitil rendered a total of five (5) mutual assistance line crews to two other utilities – one of those located in New Hampshire.

2011 October Nor'easter - After Action Report

Unitil is proud of the professionalism its employees and contractors displayed in the work performed restoring customers, as well as in their successful execution of the ERP.

## **EVENT OVERVIEW**

### THE STORM

Early on October 28th, an unseasonably cold air mass moved across Canada towards the Mid-Atlantic States and New England; At the same time, a surface low area pressure began developing in the south while a cold front extended from the western Atlantic Ocean moving into the low pressure area. An area of precipitation extending from South Carolina to Pennsylvania, mostly rain with some snow observed at higher elevations began to intensify and move across New England. As the system moved through the northeast, it produced widespread heavy, wet snow and elevated winds as high as 30 mph in New Hampshire.

Overnight the storm produced accumulations of snow across the state of New Hampshire from 12 to 25 inches. Snow fall total records were broken in many cities and towns as a result of the massive storm with snow totals reaching over 25 inches in the Unitil service territory.

Across the northeast United States, the combination of high winds and wet, heavy snow downed trees, most of which retained their fall leaves. This caused hundreds of thousands of downed trees and limbs across the northeast; In New York City, a thousand trees were estimated to have fallen in Central Park.

The storm diminished moving north to Canada throughout the afternoon of Sunday, October 30<sup>th</sup> leaving a trail of destruction behind. Falling trees and limbs caused widespread outages with over 3 million people interrupted in the United States, some for up to 10 days. Traffic accidents, electrocution, and even falling limbs caused by the storm claimed lives throughout and immediately after the storm with a total number of 35 deaths in the United States.

As a result of the storm's impact, New Jersey, Connecticut, and Massachusetts declared states of emergencies with limited declarations in New York and New Hampshire.

Public transportation was disrupted across the northeast with rail and Amtrak services delayed or cancelled and road travel dangerous during and immediately after the storm. Halloween events, including trick or treating, were postponed in many cities and many schools were forced to use snow days for closures. In the aftermath of this early season snow storm, it was determined that it became the fourteenth multi-billion dollar weather related disaster of 2011 in the US.

The photographs on the following page illustrate the storm's damage and its impact across New England.









#### PRE-EVENT ACTIVITIES

Unitil's formal planning activities for the October Snow Storm began on Thursday, October 27<sup>th</sup>, 2011, although the storm's progress had been monitored since its formation earlier in the day.

Thursday, October 27<sup>th</sup>

Emergency Management monitored the storm's development across the Mid-Atlantic. When the storm's intensity (as detailed in the published ensemble models) increased, Emergency Management initiated communications with the section leads of the ICS organization to commence storm preparations. Under the direction of the Incident Commander (IC), the Logistics Section made inquiries with local contractor resources to determine their availability for storm response. Activities related to the 3-day checklist began, however some had to be expedited due to the short preparation time.

Friday, October 28<sup>th</sup>

The weather models had aligned enough to predict that the New England region should expect a significant impact from the snow storm throughout the evening of Saturday, October 29<sup>th</sup>. Given the increase in snow amounts and wet composition coupled with the fact that many trees still retained their leaves, a storm call was held by the IC at 9:30 a.m. with the appropriate ICS

personnel and preparation activities from the 3-day checklist continued. Following the storm call, Robert Schoenberger, Unitil's Chief Executive Officer (CEO) and President, convened a meeting of the Strategic Response Committee (SRC) to establish the Company's strategy for storm planning. The SRC was briefed by Richard Francazio, the IC for storm responses, on the likelihood of a significant impact and the planning activities (at that time) of the Tactical Response Team (TRT).

The SRC was updated on the following preparation activities made at that time:

- The securement of outside line and tree crews, as well as damage assessors
- Setting up of the 3 Regional Emergency Operations Centers (R-EOCs) and the System Emergency Operations Center (S-EOC),
- Mobilization of key ICS personnel,
- Pre-impact conferences with municipal officials setup;
- Customer Service enhancements and staffing protocols, and
- Pre-event communications to customers and external entities initiated.

Following the briefing by the IC, the SRC gave the following recommendations:

- Employee vacations were cancelled (effective immediately),
- Additional resources to be secured as necessary,
- The Storm Assignment List (SAL) be mobilized and notifications made, and
- Storm work schedules drafted for EOC opening times

Following the SRC briefing, another storm call was held with ICS personnel to receive additional updates on preparation activities and communicate the strategic objectives for the storm. The EOCs were setup and all company response personnel were notified of vacation cancellations, their storm assignments and reporting times via a Storm Assignment List (SAL) email blast.

A public service announcement (PSA) was released for the potential of a high-impact storm, which triggered outreach communications to customers, regulators, municipal emergency officials, and life support customers. Life support and Critical Care Customers were notified throughout the afternoon via a call blast of the upcoming weather event and useful information in the event they experienced an interruption.

Municipal officials were notified via email of the company's preparations and the S-EOC and R-EOC opening time of Saturday, October 29<sup>th</sup> at 6:00 p.m. to coordinate communications throughout the event. They were also notified via email and also by call blast of a municipal conference call that would be held by the company on Saturday, October 29<sup>th</sup> at 7:00 p.m. prior to the impact of the event.

Regulatory officials were notified of Unitil's preparations throughout the day by submitted Preevent stage reports. The first report was sent at 12 p.m. with another update at 8:00 p.m.

Saturday, October 29th

At 8:00 a.m. on Saturday, October 29<sup>th</sup>, Unitil hosted the first NEMAG call with other regional utilities to discuss the pending weather event and coordinate resource requests and availability if necessary.

The IC also held the third storm conference call to confirm resources and logistical information for the incoming crews.

The R-EOCs in Capital and Seacoast, as well as the S-EOC in Hampton, NH were activated on Saturday, October 29<sup>th</sup> at 6:00 p.m. and began their 24/7 storm mode operations, which also included the opening of the regional municipal rooms. While the company awaited the storm's impact, activities from the 3-day checklist were completed and final arrangements made for arriving crews.

Regulatory officials were once again updated via the Pre-Event report stage at 11:00 a.m., which would be the final pre-event update before interruption updates would begin every 4 hours. The municipal room was activated and a pre-event municipal conference call was held on Saturday, October 29<sup>th</sup> at 7:00 p.m. with municipal officials to update them on preparations and ensure lines of communication for the event were clear.

Another PSA was sent out of the Company's preparations, the R-EOC and S-EOC opening times, wire down safety tips, and useful information for customers to report and prepare for an interruption. Unitil also used their twitter social networking site to release updates and safety information throughout the day with an average of 1 every hour and utilized local radio stations to broadcast additional safety messages.

Logistics teams worked throughout the day and evening to support the outside crews arriving that evening. The storm's progression was monitored throughout the night with Unitil's overnight response organization responding to public safety issues.

The first interruption in the New Hampshire service territory occurred at 4 p.m. on Saturday, October 29<sup>th</sup> with peak interruptions occurring at 2:00 a.m. on Sunday, October 30<sup>th</sup>.

Unitil continued to hold NEMAG calls throughout the event with two (2) calls on Sunday, October 30<sup>th</sup> and one (1) each day following until November 8<sup>th</sup>.

## **EVENT IMPACT**

Over the course of restoration efforts, Unitil committed eleven (11), internal line crews, 70 contractor line crews (81 total line crews), 34 tree crews, and 61 damage assessment and wire down personnel, and over 30 support personnel in the New Hampshire service territory, with additional resources held at the System level if required. Unitil began to experience storm-related interruptions around 4:00 p.m. on Saturday, October 29<sup>th</sup>. A peak of 51,262 customer interruptions was reported around 2:00 a.m. the following morning, and by Wednesday, November 2<sup>nd</sup>, Unitil had restored all of the storm-impacted customers.

Table 1 and 2 on the following page detail the timeline for restoration and customer interruptions throughout the event

**UES Customer Impact - October Nor'easter** 80000 70000 60000 **Customers Affected** 50000 40000 30000 20000 10000 0 11/1 12 AM 10/314 AM 10/318 AM 10/3112 PM 10/314 PM 10/30.4 AM 10/30.4 AM 10/30.12 PM 10/30.4 PM 10/30.8 PM 10/30.8 PM 10/31.12 AM 10/31.12 AM Cumulative Customers Affected **Customer Interruptions** 

Table 1 – UES Customer Impact – October Nor'easter

A summary of the customer interruptions at four-hour intervals is detailed below in the Table 2:

**Table 2 – Customer Interruption Summary** 

Day	Date	Time	Customer Interruptions
Catandan	October 29	4:00 p.m.	998
Saturday	October 29	8:00 p.m.	37,646
		12:00 a.m.	48,852
		2:00 a.m.	51,262
		4:00 a.m.	48,501
Sunday	October 30	8:00 a.m.	38,951
		12:00 p.m.	35,291
		4:00 p.m.	26,972
		8:00 p.m.	21,921
		12:00 a.m.	20,207
		4:00 a.m.	16,800
Nr. 1	0.1.21	8:00 a.m.	16,327
Monday	October 31	12:00 p.m.	14,566
		4:00 p.m.	10,731
		8:00 p.m.	6,266

Day	Date	Time	Customer Interruptions
		12:00 a.m.	4,896
		4:00 a.m.	3,905
Tuesday	November 1	8:00 a.m.	2,692
Tuesday	November 1	12:00 p.m.	1,404
		4:00 p.m.	806
		8:00 p.m.	92
		12:00 a.m.	17
Wednesday	November 2	4:00 a.m.	4
		8:00 a.m.	0

Throughout the evening and early morning hours of the storm, significant damage was made to the UES system. Nearly all of the New Hampshire towns that Unitil serves were impacted by the storm, with a reported 172 cases of trouble in the Capital region and 196 cases in the Seacoast region, totaling 368 individual cases of trouble for the New Hampshire service territory. As a result, UES experienced interruptions to seven (7) sub-transmission and 23 distribution circuits primarily in the Seacoast region. Due to the damage caused by falling trees and limbs nine (9) poles, eight (8) transformers, and 35 cross arms were replaced or repaired and over 5,700 feet or wire was re-strung.

Table 3 provides a breakdown of Customer Service's statistics for the system.

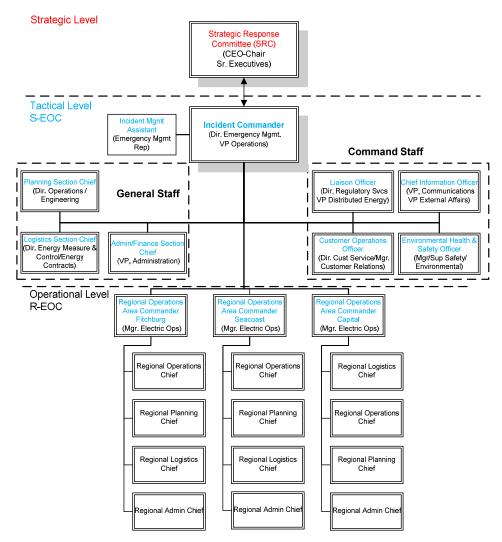
**Table 3 – Customer Service Statistics** 

	Lines		IVR		IVR/CSR Combined	CS	R's	Web
Date	# Installed Lines	# Calls in IVR	% Reporting Outage	Tickets UES	% Answered (20 secs)	# CSR Calls Received	# CSR Calls Answered	# Web Outage Forms
Oct 29	114	10,784	83%	8,912	83%	2,351	1,266	670
Oct 30	114	34,121	78%	26,741	98%	6,664	6,427	1458
Oct 31	114	17,748	62%	11,039	92%	5,428	4,897	797
Nov 1	114	5,540	45%	2,506	85%	4,463	4,263	253
Total	114	68,193	72%	49,198	91%	17,968	14,067	3178

## STORM RESTORATION

## EMERGENCY RESPONSE AND STRUCTURE

Unitil utilized the National Incident Management System (NIMS) to manage its emergency response to the nor'easter. NIMS is a comprehensive and unified approach to incident management, applicable at all jurisdictional levels and across functional disciplines. Furthermore, it improves the effectiveness of emergency response providers and incident management organizations across a full spectrum of potential incidents and hazard scenarios. NIMS relies on ICS to coordinate and manage an organization's mobilization, response, and demobilization.



Unitil's ERP is used for a broad spectrum of emergencies, from small to complex incidents, both natural and manmade, including acts of catastrophic terrorism and major equipment failures. The Company's planning for the nor'easter was organized around five major functional areas: Incident Command, Operations, Planning, Logistics, and Administration/Finance. The ICS system allowed the organization to combine facilities, equipment, personnel, procedures, and communications under a unified and scalable response structure, which was designed to specifically manage incidents (like storm impacts) and their associated activities.

Many storms begin and end as a regional emergency; however, for those that escalate beyond a region's ability to respond effectively, a system emergency is often declared. In the case of the nor'easter, the Company concluded (prior to impact) that it likely represented a Level 4 response event. This classification indicated the Company should implement its full ICS structure with the three R-EOCs and the S-EOC opening just prior to the storm's forecasted New England impact.

The restoration effort was executed as designed with each ICS Section and Area Chief utilizing their own checklists to prepare their teams for the identified activities. The IC scheduled system conference calls to coordinate the efforts of all three (3) regions into a cohesive Company response. Also, the IC was positioned in the S-EOC, which formed the hub for all support and coordination activities across the Company.

The philosophy employed by implementing the ICS was to shift ancillary activities such as: delivery materials, procuring hotels, or establishing staging sites, away from the regions to ensure their continued focus on restoring customers. Additionally, the S-EOC served as the communications hub, which was centralized to ensure a continuity of messaging and to again keep the focus on restoring customers.

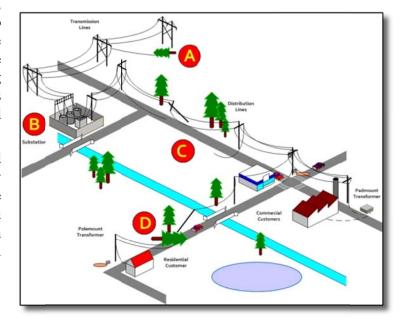
#### RESTORATION PRIORITIES

Unitil's ERP provides the framework for the orderly response of system resources when these events arise. These procedures provide instruction on actions to take during major emergencies for (1) public safety and the restoration of electric service, (2) the notification of applicable government agencies and the public of emergency restoration progress, and (3) the response to official municipal requests for specific emergency events or actions.

The ERP is intended to be simple, flexible, and easily adapted to specific emergency events like the nor'easter. Whenever possible, the procedures parallel normal operating procedures to avoid confusion. This also reduces the need for specialized training or work practices.

In general Unitil's standard restoration approach focuses initially on securing the public safety. The restoration then addresses damage on the following systems (in order) with an emphasis on critical infrastructure:

- A. Sub-transmission lines
- B. Substations
- C. Distribution lines
- D. Residential and Commercial Service drops



#### LOGISTICS

Logistics was formally activated (in a limited capacity) on Thursday, October 27<sup>th</sup>. The intent of this limited activation was to evaluate the availability of line, tree, and damage assessment crew commitment for the weekend. By Friday morning, it was apparent that local resources were not being released by their respective employers. The Resource Team in the Logistics Section conveyed this information to the IC, who then authorized expanding the resource search to other portions of the nation.

Through these proactive efforts, Unitil was able to acquire 167 contractor line crews from Massachusetts, New Hampshire, Pennsylvania, Michigan, and Canada, 55 tree crews from Ohio, West Virginia, Connecticut, Massachusetts and New Hampshire, and 109 damage assessment and wires down personnel from New Jersey, New York and Massachusetts. Ultimately, 81 line crews, 34 tree crews, and 61 damage assessment and wire down personnel plus additional internal support were allocated to the UES system in New Hampshire. The majority of additional resources began arriving on the morning of Sunday, October 30<sup>th</sup>, with staggered arrivals through Monday, October 31<sup>st</sup> to align with the anticipated impact from the storm and the subsequent public safety phase of the restoration.

While the resources were being committed, the Procurement Team in the Logistics Section made arrangements for material, focusing on longer lead time items (e.g., poles and transformers) and working with the Company's vendors to ensure a steady resupply of material, if needed. In addition, storm kits were deployed to staging sites, material laydown areas in substations, and the regional DOC's. Lastly, vehicle and equipment rental needs were reviewed and additional standby generation retained to ensure a continuity of operations should the DOC's lose power and the existing, on-site generators fail.

The Staging Site Team in the Logistics Section began identifying possible locations for the large influx of personnel and began outreaching to the property owners of the staging sites. Although the R-EOC did not open a staging site due to the abbreviated estimated time of restoration, the Company had made the logistical arrangements to ensure each location's success and did setup a small staging area in the Exeter High School to feed the large amount of crews in the Seacoast area.

Arrangements were also made by the Meals & Lodging Team to support the staging site operations by procuring food and lodging for the anticipated resources being directed to each DOC location. This team acquired about 257 rooms and coordinated with local restaurateurs to provide box lunches and meals.

The Logistics Section was active throughout the event and restoration effort. Having participated in a number of early NEMAG calls, Unitil realized that other members would continue to have outstanding resource requests throughout the following days. During Unitil demobilization, the Resource Team supported utilities in New Hampshire through the structured release of resources; once Unitil was assured it had completed its restoration effort.

#### **ENVIRONMENTAL & SAFETY**

Where the Company anticipated all three regions being impacted by the nor'easter, the Environmental, Health & Safety (EHS) Officer retained additional resources to provide a regional presence at each DOC. Environmental and safety professionals from two separate

consultants, familiar in utility operations, were available for deployment at the start of the public safety phase. These resources were assigned to the regional staging sites and/or DOC.

The EHS Officer confirmed the availability of its retained environmental contractors. Although the contractors' safety and environmental personnel had been mobilized for the storm, they were prepared to concurrently support several of the New England utilities, if necessary.

Due to the short estimated time for restoration, only the safety resources were mobilized. The limited number of transformer spills was managed directly by the EHS Officer from the S-EOC and through the deployed environmental contractors

No injuries, illnesses, or vehicles accidents were reported for either internal or external resources in the New Hampshire territory during the event.

## **COMMUNICATIONS**

Unitil prepared for and executed a coordinated, multi-layered communications plan focused on target audiences including customers, municipal emergency response and management officials, elected-public officials, media, and employees.

The multi-layered means of communication laid included phone calls, PSAs distributed via email, Twitter, phone, and on-camera interviews with local media stations, as well as phone interviews with radio stations and newspapers. Interviews with media outlets (i.e., print, radio and television) began on Friday, Oct. 28 and continued through Wednesday, Nov. 2.

A total of 18 PSAs were sent to the noted media outlets before and during the event. The first two (2) PSAs (issued Friday, Oct. 28 and Saturday, Oct. 29) were part of the Company's preevent communications. These PSAs included messaging that detailed (1) how Unitil was preparing for the potential of a major snowstorm, (2) how customers should prepare, (3) established expectations for a potential, multi-day power interruption, (4) the unique nature of this snow event (wet snow and leaves still on the trees), (5) explained how Unitil would be communicating during the event and (6) announce when Unitil planned open its regional and system emergency operation centers. The remaining 16 PSAs provided updates on outages, restoration status, safety messaging (e.g., downed wires and, generator safety), and reported the completion of the restoration effort.

Unitil also used social media, via Twitter, as a means of communication during this event. This medium was used to communicate preparation, safety, outage, and restoration information during the event and restoration effort, allowing for back and forth communication with subscribed "followers." The Company's followers approached 2,000 by the completion of restoration and a significant percentage of those followers included members of the media. Other noted followers included customers, elected officials, regulators and municipal officials.

All PSAs were distributed via Twitter or "tweeted" using links to the Company's public web site. Unitil's online Outage Center also featured the latest tweets so those not on Twitter could follow the conversation, access the PSAs and keep abreast of the latest information using the web site and not Twitter as the communications vehicle. Most media outlets used outage content from Unitil's Tweets for their broadcasts, online content, and streaming ticker content. Twitter posts also included regular updates on town-by-town outage information, which was also available on the Company's outage center web site.

Unitil dedicated resources focused solely on ensuring consistent and timely communications with municipal and state elected officials. These communications included e-mail correspondence, individual phone calls, as well as eight (8) municipal/leader conference calls held prior to and during the event.

The correspondence included pre-event e-mails outlining preparations, specifically how Unitil would communicate with them during the event, where to find additional emergency information and resources on Unitil's public web site and on the Company's password-protected Municipal Access section of the public web site. The correspondence for the municipal officials also included the password for those that did not have it readily available.

Prior to the time of the R-EOCs and S-EOC's opening at 6:00 p.m. on Saturday, October 29<sup>th</sup>, e-mail notification was sent to the elected and municipal officials informing them of the centers' openings, as well as the establishment of the regional Municipal Rooms in Seacoast and Capital, and a pre-impact coordination conference call for all of the municipal officials. The dedicated phone numbers were included and the Municipal Room was staffed 24/7 throughout the event and restoration effort. The room received calls and e-mails during the event, and its staff sent e-mails to the municipal officials each time a PSA was issued throughout the event. Other e-mails included periodic updates, notifications of municipal/leader conference calls, and notification of the closing of the Municipal Room after the restoration effort was complete on the evening of Tuesday, November 2<sup>nd</sup>. Additionally, e-mails sent to elected officials included restoration activities and often prompted the elected officials to proactively communicate with the company via e-mail or phone call regarding any specific restoration activities that were of interest to them or their constituents. These communications continued until the restoration was completed.

In accordance with the ERP, municipal/leader conference calls typically begin 48 hours into a restoration effort following a major storm, however, due to the storm's intensity increase the Company initiated the first call shortly after the storm's impact to better facilitate communications with the concerned municipal officials. The first conference call was held on Saturday, October 29<sup>th</sup> at 7:00 p.m. with a final wrap-up call at 9:00 a.m. on Tuesday, November 29<sup>th</sup> as restoration was expected to be completed throughout the day.

Mobile phones were used for the majority of internal communications and radios were used for calling internal crews that were working or acting as field guides for external resources unfamiliar with the New Hampshire area. The field guide ensured, among other duties, that documentation related to their respective resources was quickly sent or received to and from the DOC. The company retains spare phones for any contractors or crew guides that may not have one and has a limited number of satellite phones available if needed.

Unitil's response to the October nor'easter demonstrates the effectiveness and flexibility of its ERP. The Company's proactive approach in pre-positioning crews and storm material kits, while taking part in mutual assistance calls greatly assisted with the restoration effort. Not only did Unitil complete the restoration of its own customers on Wednesday, November 2<sup>nd</sup>, despite over 368 trouble cases and 69% of its customers interrupted, the Company also provided mutual assistance to other utilities in New Hampshire, aiding in the restorations of their customers.

## **AFTER ACTION REVIEW**

Unitil conducted a storm critique of its response to the nor'easter on Thursday, November 10<sup>th</sup>, 2011. Section leads in the ICS organization, as well as other key personnel (e.g., EHS Officer) submitted evaluations of their respective groups' performance before, during, and after the event. The evaluation results were summarized and provided the basis for conducting the storm critique. Critical challenges and improvement opportunities, tempered by an historical comparison of recent Unitil storm responses, are identified in the following sections.

## **CRITICAL CHALLENGES**

Unitil's ERP is a robust set of protocols designed to minimize and anticipate the challenges that occur during major events. Unitil faced few significant challenges during this event. However, with any complex response, there were two situations that required attention.

As with any major storm affecting a broad area of the country, resource acquisition may be challenging. This became a challenge early on in the pre-event staging for the storm. Given the limited number of resources available with the New England region, Unitil needed to commit to resources well in advance of the storm, when weather models provided a high confidence level of a significant impact. A failure to commit early would likely have resulted in an inability to acquire resources later. Unitil overcame this challenge by expanding the resource acquisition external to the Northeast, but was forced to acquire resources with longer travel times earlier than in past events.

#### IMPROVEMENT OPPORTUNITIES

The following are the significant areas of improvement or learning from the Company response to the nor'easter:

- Unitil recently created a System Arborist (Forestry Manager) position; the ERP needs to be revised to ensure the Forestry Manager has both system and regional roles in the coordination of tree resources.
- While OMS installation and testing is ongoing, Centralized Electric Dispatch (CED) has assigned its operators to the R-EOCs to operate the OMS terminal because they are the most adept with the application. However, the limited number of CED operators creates staffing problems when local control is returned to CED (which provides 24-hour coverage) upon completion of the restoration effort. Unitil intends to develop a methodology to train and drill SAL personnel routinely, ensuring that skilled employees are assigned, as needed.
- OMS proved to be an accurate and reliable tracker of customer outages both at the electric circuit and municipal level. The Company will develop a strategy for releasing previously-identified OMS information to the public on Unitil's web site.
- The Company needs to enhance the process for tagging failed transformers retuned from the field to ensure the necessary remediation, if needed, was completed at a specific site. This will ensure that no transformers are inadvertently left in the field without remediation occurring in a timely manner.

#### HISTORICAL COMPARISON

To evaluate the effectiveness of improvements made to the ERP after each major storm event, Unitil tracks certain metrics related to storm response. This review incorporates both internal and external perspectives on the Company's response. Feedback from municipal emergency response officials, elected officials, and our customers is solicited post restoration effort and any perceived enhancement are included in the Company's ERP.

Unitil has experienced four (4), notable storm events in the past three (3) years – the December 2008 Ice Storm, the February 2010 Wind Event, Tropical Storm Irene in August 2011, and now the October Nor'easter. The Ice Storm was post-classified by the Company as a Level 5 event with the most adverse impact of the three (3) historical storms. The Wind Event was also classified as a Level 5 event with damage largely confined to the New Hampshire service territory. Tropical Storm Irene and the October Nor'easter were both classified as a Level 4 event but represented system-wide impacts.

While each of these storms had differing weather characteristics associated with them, certain metrics reveal that Unitil has significantly improved its restoration performance over the past three years. Using trouble locations as a reference point, the three storm events are comparable with the exception of the quantity of damage at each work location. In this regard, the Ice Storm felled more sections of wire and had significantly more additional crew hours assigned to each trouble case. Table 4 provides a general comparison of the three events at the system level.

**Table 4 – Unitil Historical Storm Comparisons** 

Unitil Historical Storm Comparisons  Dec 08 Ice Storm vs. Feb 10 Wind Event vs. Tropical Storm Irene vs. 2011 October Nor'easter						
	Ice Storm December 2008	Wind Event February 2010	Tropical Storm Irene August 2011	Nor'easter October 2011		
	Unitil System	Unitil System	Unitil System	Unitil System		
<b>Customers Out -Total</b>	69,041	63,123	35,114	76,324		
Crews Worked	403	254	256	331		
Wire Reattached or Replaced (ft)-Total	285,741	103,900	2,684	6,860		
Transformers Replaced Total	241	67	15	11		
Poles Set-Total	279	126	2	19		
Cross-arms Replaced	520	325	11	75		
Restoration Days	14	4	1.5	4		

Additionally, Table 5 on the following page reiterates the positive effect that successive improvements to the ERP have on Unitil's restoration efforts.

2011 October Nor'easter - After Action

**Unitil Historical Restorations** 85000 80000 75000 --- Ice Storm 70000 12/08 65000 60000 **Customers Interruptions** Wind Event 55000 50000 02/10 45000 40000 ---Irene 35000 08/11 30000 25000 20000 Nor'easter 15000 10/11 10000 5000 Orgo Orgo Orgo Orgo Orgo Orgo Orgo Orgo **Days to Restore** 

**Table 5 - Unitil Historical Restorations** 

## **CONCLUSIONS**

Unitil's restoration effort during the nor'easter demonstrated the effectiveness and flexibility of the Company's emergency plans, as well as the company's ability to execute those plans. As a corporate neighbor, Unitil recognized the collective needs of the customers and citizens of the communities we serve, especially in the widespread wake of the storm's passage.

Unitil's response to the storm provided the company a real-world opportunity to implement many of the best practices it has developed within its ERP. Many of these best practices are communications-oriented, which in Unitil's perspective is the other side of a successful restoration. While traditional means of communication, such as radio and newspaper, continue to help customers and communities stay informed during a power outage, without question, the most "instant" way to communicate to and with the public has increasingly been the use of social media applications like Twitter.

Even when the power is out, customers and municipalities use battery-powered laptop computers or other handheld portable devices to interact with Unitil and receive information concerning local outages. During the storm, while thousands of customers continued to receive restoration updates by calling Unitil's 24/7 Call Center, the Company's Media personnel regularly interacted with customers who used social media in record-setting fashion.

From the day preceding the storms arrival until the final customers were restored, Unitil's Twitter followers increased by more than 2,000 and included customers, media and elected officials and had over 25,000 visitors to the Company's website and outage center.

Prior to the arrival of the storm, Unitil opened its Municipal Rooms and staffed them with a Community Services manager and Business Development employees, who routinely work with municipal officials on a daily basis. These liaisons kept emergency responders and municipal leaders appraised of the restoration efforts in their respective community and helped to speed the restoration process by relaying information from municipal emergency response officials who had identified priority trouble locations (e.g., such as blocked roads and downed wires endangering the public) directly to the regional Planning and Operations Sections.

The employees of Unitil take seriously their duty to provide customers with safe, reliable electric service. Although a storm may temporarily interrupt that supply, an effective and efficient restoration is the goal of every Unitil's employee, as part of their commitment to the communities we serve.

Unitil is proud of its response to the nor'easter and is especially grateful for the support offered by its many customers, municipalities, and government officials during the restoration effort. In light of the devastation caused by the storm, a "team" effort by multiple parties was, undoubtedly, the most effective means to restore power. Unitil understands, however, the need for continuous improvement on existing procedures and processes, so that these procedures and processes may work more efficiently during future storm events. With this in mind, the Company welcomes the opportunity to review its storm response, which is detailed in this report, realizing that it will help solidify its commitment to its customers in New Hampshire.

Unitil Energy Systems d/b/a Unitil Corporation 2011 October Nor'easter - After Action Report

## **ACKNOWLEDGEMENTS**

We wish to express our gratitude to the citizens of New Hampshire, especially our customers. They showed remarkable resilience and patience during this event, and their support of our efforts was gratifying. Further, we thank the municipal leaders, government officials, and emergency responders, who helped us and our customers with the restoration effort. Their actions reflect great credit upon themselves, their agencies, and the citizens they serve.

# **Attachment 1 – Telvent DTN Weather Reports**

## **Severe Weather Alert Service From Telvent**

# **For Unitil Services Corp**

Date: October 27, 2011 Time: 6:00 AM EDT Forecaster: S Gillespie

- Torcoaster: O Omespie				
Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	NONE	NONE	NONE	NONE
Event Begin Time				
Event End Time				
Day 1 EII	1	1	1	1
Event Confidence				
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount				
Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	47/31	46/23	47/28	48/29
EII	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Day 2 Snow	1	1	1	1
Day 2 Ice	1	1	1	1
Day 2 Wind	1	1	1	1
Day 2 Gust	2	1	1	2
Day 2 Confidence	Medium	Medium	Medium	Medium
Day 3 Snow	1	2	1	1
Day 3 Ice	1	1	1	1
Day 3 Wind	1	1	1	1
Day 3 Gust	2	2	2	2
Day 3 Confidence	Medium	Low	Low	Medium

UNITIL SERVICE AREA 48 HOUR OUTLOOK

CAPITAL: Dry weather is expected across the area today and tonight. Winds will remain below hazard criteria with gusts up around 20 mph possible this afternoon. Tomorrow, clouds will be on the increase during the morning with dry conditions holding through the early afternoon. A strengthening low pressure system will lift up the Mid-Atlantic coast tomorrow with snow showers beginning in the area sometime around 5-9pm. Snow is then expected through Saturday night, with moderate to heavy snow possible at times during the evening and early overnight. Snow will begin to taper off late Saturday night before coming to an end Sunday morning. Snowfall amounts of 4-8" will be possible, with locally higher amounts. In addition, winds will increase Saturday afternoon and Saturday night with gusts of 20-30 mph possible.

FITCHBURG: Dry weather is expected across the area today and tonight. Winds will remain below hazard criteria with gusts up around 20 mph possible this afternoon. Tomorrow, clouds will be on the increase during the morning with dry conditions holding into the early afternoon. A

strengthening low pressure system will lift up the Mid-Atlantic coast tomorrow with precipitation beginning in the area sometime around 3-7pm. Precipitation could initially begin as rain, but it will quickly change over to snow within an hour or two. Snow is then expected through Saturday night, becoming moderate to heavy at times during the evening and early overnight. Snow will begin to taper off late Saturday night before coming to an end Sunday morning. Snowfall amounts of 4-8" will be possible, with locally higher amounts. In addition, winds will increase Saturday afternoon and Saturday night with gusts of 20-30 mph possible.

SEACOAST / PORTLAND: Dry weather is expected across the area today and tonight. Winds will remain below hazard criteria with gusts up around 25 mph possible this afternoon. Tomorrow, clouds will be on the increase during the morning with dry conditions holding through the early afternoon. A strengthening low pressure system will lift up the Mid-Atlantic coast tomorrow with precipitation beginning in the area sometime around 5-9pm. Precipitation may begin as rain or rain/snow mix initially before changing over to snow Saturday night. Snow is then expected through the remainder of the night, with moderate to heavy snow possible at times. Snow will begin to taper off late Saturday night before coming to an end late Sunday morning. Snowfall amounts of 2-5" will be possible, highest away from the coast. In addition, winds will increase Saturday afternoon and Saturday night with gusts of 30-40 mph possible, strongest near the coast.

## UNITIL SERVICE AREA 3-5 DAY OUTLOOK

High pressure will bring dry weather throughout the extended period Sunday through Tuesday.

Winds will remain breezy through Sunday afternoon with gusts of 25-35 mph possible over the entire region. The strongest winds will be in the higher elevations and along the coast. Winds will diminish by Sunday evening and will remain light through the remainder of the period.

### NORTHEASTERN US GENERAL WEATHER OUTLOOK

#### **TODAY**

High pressure will build in today bringing dry conditions to the region. Winds will be breezy from coastal Maine through coastal Massachusetts with gusts of 25-35 mph possible. Temperatures will be 5-15 degrees below normal.

## TODAY'S Forecast Confidence: Medium

Highs today look good. Lows tonight will depend on how quickly clouds begin to develop ahead of the next system. Lows could run 1-4 degrees warmer or cooler over the southern half of the region depending on clouds.

#### **TOMORROW**

On Saturday, a low pressure system will lift up the coast likely bringing heavy precipitation to the area. Conditions are expected to remain dry through much of the morning. Precipitation will begin to develop near NYC and Long Island by late morning or midday, along the South Shore by the early to midafternoon hours, and then spreading northward reaching southern Vermont and New Hampshire during the late afternoon or early evening. Precipitation will continue to spread north and eastward during the evening and overnight hours.

Precipitation will be heavy at times over southeastern New York during the afternoon and early evening and then over southern and eastern New England from the late afternoon and overnight hours. Temperatures will be cold enough for snow through much of the event over interior portions of New England and interior New York. However, precipitation may begin as rain over interior southern New England before changing over to snow later in the afternoon. Rain will likely be the primary precipitation type over southeastern New England and Long Island. At this time, it appears a swath of 3-6 inches of snow is possible from the Lower Hudson Valley through interior portions of southern New England and into eastern parts of northern New England. Higher amounts are possible especially in the higher elevations of New England. Higher amounts are possible especially in the higher elevations of New England. Lighter amounts are expected as you get closer to the coast with little to no accumulation over the Cape and Islands, Long Island, and New York City. Confidence is on the lower end with regards to snowfall amounts at this time as slight shifts in the track of the low could change accumulations significantly. In addition, winds will increase through the day with gusts of 25-35 mph common along the coast. Gusts of 45-55 mph will be possible along the Cape and Islands. Temperatures will be 5-15 degrees below normal.

## TOMORROW'S Forecast Confidence: Medium-Low

Temperature trends tomorrow will depend on the timing of precipitation. Highs could run several degrees cooler over interior portions of southern New England if precipitation begins earlier than expected.

#### 3-5 DAY EXTENDED OUTLOOK

Precipitation will begin to taper off over southern and western New England early Sunday morning with southern New England likely completely dry by midday. Moderate to heavy snow could continue over central and eastern Maine through the morning before tapering off during the early afternoon. The area looks to completely dry out by the mid to late afternoon hours. Winds will remain breezy through the afternoon with gusts of 25-35 mph along the coast from eastern Massachusetts through Maine. High pressure will then bring dry weather to the area Monday and Tuesday. Temperatures will be below normal

### **Severe Weather Alert Service From Telvent**

#### For Unitil Services Corp

Date: October 27, 2011 Time: 1:35 PM EDT

Forecaster: J Meikle

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	NONE	NONE	NONE	NONE
Event Begin Time				
Event End Time				

Day 1 EII	1	1	1	1
Event Confidence				
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount				
Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	46/34	46/32	47/33	48/34
<u> </u>		1	11700	10,01
EII	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
	SEACOAST 1			
EII		CAPITAL	FITCHBURG	PORTLAND
EII Day 2 Snow	1	CAPITAL 2	FITCHBURG 2	PORTLAND 1
EII Day 2 Snow Day 2 Ice	1	CAPITAL 2	FITCHBURG 2 1	PORTLAND  1  1
EII Day 2 Snow Day 2 Ice Day 2 Wind	1 1 1	CAPITAL 2 1	FITCHBURG  2  1  1	PORTLAND  1  1  1
EII Day 2 Snow Day 2 Ice Day 2 Wind Day 2 Gust	1 1 1 3	CAPITAL 2 1 1 2	FITCHBURG  2  1  1  2	PORTLAND  1  1  1  3
EII Day 2 Snow Day 2 Ice Day 2 Wind Day 2 Gust Day 2 Confidence	1 1 1 1 3 Medium	CAPITAL 2 1 1 2 Medium	FITCHBURG  2  1  1  2  Medium	PORTLAND  1  1  1  3  Medium
EII  Day 2 Snow  Day 2 Ice  Day 2 Wind  Day 2 Gust  Day 2 Confidence  Day 3 Snow	1 1 1 1 3 Medium 3	CAPITAL  2  1  1  2  Medium  3	FITCHBURG  2  1  1  2  Medium  2	PORTLAND  1 1 1 3 Medium 1
EII  Day 2 Snow  Day 2 Ice  Day 2 Wind  Day 2 Gust  Day 2 Confidence  Day 3 Snow  Day 3 Ice	1 1 1 1 3 Medium 3 1	CAPITAL  2  1  2  Medium  3	FITCHBURG  2  1  1  2  Medium  2  1	PORTLAND  1 1 1 3 Medium 1

## UNITIL SERVICE AREA 48 HOUR OUTLOOK

Please add to forecast for all areas. Ell levels for all regions will cross over into the 3 range by late Saturday evening and after midnight for all areas due to snow amounts and to the Seacoast Region for both snow amounts and winds. Sustained winds have also been added to forecast as well as total liquid amounts

CAPITAL: Dry weather and non-hazard winds are expected through 2pm Saturday. A light mix of rain and snow will develop vicinity 3pm to 5pm The mix of rain and snow will change to all wet snow vicinity by dark Saturday evening. Heavy wet snow will fill in by mid-evening, tapering off mid Sunday morning and ending by noon. Total snow accumulations will range from 8-12 inches with some locally higher amounts possible. The highest accumulations all areas will be over grassy areas, trees, and any colder/exposed surfaces. The snow will be wet and heavy, and is likely to cause major problems with tree limbs and power lines. Wind gusts for this storm may gust as high as 30-35 mph overnight through midday Sunday. Drier and calmer conditions are expected to develop Sunday afternoon and Sunday night. As heavier snow commences Saturday evening, temperatures will run close to 32 degrees before rising above freezing around mid-morning Sunday, peaking to around 40 in the afternoon.

FITCHBURG: Dry weather and non-hazard winds are expected through 2pm Saturday. A light mix of rain and snow will develop vicinity 2pm to 4pm the mix of rain and snow will change to all wet snow vicinity 5-7pm Saturday evening. Heavy wet snow will fill in by mid-evening, tapering off early to mid-Sunday morning and ending by late morning. Total snow accumulations will range from 8-12 inches with some locally higher amounts possible. The highest accumulations will be over grassy areas, trees, and any colder/exposed surfaces. The snow will be wet and heavy, and is likely to cause major problems with tree limbs and power lines. Wind gusts for this storm may gust as high as 30-35 mph overnight through midday Sunday. Drier and calmer conditions are expected to develop Sunday afternoon and Sunday night. As heavier snow commences Saturday evening, temperatures will run close to 32 degrees before rising above freezing around mid-morning Sunday, peaking to around 40 in the afternoon.

SEACOAST / PORTLAND: Dry weather and non-hazard winds are expected through 3pm Saturday with light rain developing 3pm to 6pm. Rain will mix with wet snow after 6pm Saturday and change to mostly all snow towards midnight, heavy and wet after midnight. Rain may still mix in at times along the immediate coast. Snow will taper mid to late Sunday morning, ending around midday Sunday. Total snow accumulations will range in the 4 to 8 inch range. Snow accumulation confidence is low here and could go either way by several inches, all depend on the exact of the storm. The highest accumulations will be over grassy areas, trees, and any colder/exposed surfaces. The snow will be wet and heavy and is likely to cause some major problems with tree limbs and power lines. Wind gusts for this storm may gust as high as 40-45 mph, possible a peak gust to 50 mph close to the coast Saturday night through late Sunday morning. Temperatures will range in the 34-35 range during the evening, and then 32-34 range after midnight up through mid-morning Sunday before rising to around 40 in the afternoon. Drier and calmer conditions are expected to develop Sunday afternoon and Sunday night.

## UNITIL SERVICE AREA 3-5 DAY OUTLOOK

Please see above weather for Sunday. High pressure will bring dry weather throughout the extended of Monday into Tuesday.

#### NORTHEASTERN US GENERAL WEATHER OUTLOOK

#### **TODAY**

High pressure will continue to build into the region through tonight, resulting in dry conditions. Breezy condition over coastal Maine and the Cape and Islands with still a few gusts to 30 mph will diminish this afternoon. Temperatures will be 5-15 degrees below normal.

## TODAY'S Forecast Confidence: Medium

Highs today look good. Lows tonight will depend on how quickly clouds begin to develop ahead of the next system. Lows could run 1-4 degrees warmer or cooler over the southern half of the region depending on clouds.

## **TOMORROW**

On Saturday, a low pressure system will develop off of Cape Hatteras and rapidly intensify as it moves northeastward, likely bringing heavy precipitation to the area. Conditions are expected to remain dry through much of the morning. Precipitation will begin to develop near NYC and Long Island by late morning or midday, along the South Shore by the early to mid afternoon hours, and then spreading northward reaching southern Vermont and New Hampshire during the late afternoon or early evening. Precipitation will continue to spread north and eastward during the evening and overnight hours. Precipitation will be heavy at times over southeastern New York during the afternoon and early evening and then over southern and eastern New England from the late afternoon and overnight hours. Temperatures will be cold enough for snow through

much of the event over interior portions of New England and interior New York. However, precipitation may begin as rain over interior southern New England before changing over to snow later in the afternoon. Rain will likely be the primary precipitation type over southeastern New England, Long Island, and the New York City area. At this time, it appears a swath of 5-12 inches of snow is possible from the Lower Hudson Valley through interior portions of southern New England and into eastern parts of northern New England. Higher amounts are possible, especially in the higher elevations of New England. There is the potential for considerable tree damage and downed power lines from this storm. Confidence is on the lower end with regards to snowfall amounts at this time as slight shifts in the track of the low could change accumulations significantly Lighter amounts are expected as you get closer to the coast with little to no accumulation over the Cape and Islands, Long Island, and New York City. Confidence is on the lower end with regards to snowfall amounts at this time as slight shifts in the track of the low could change accumulations significantly. In addition, winds will increase through the day with gusts of 25-35 mph common along the coast. Gusts of 45-55 mph will be possible along the Cape and Islands. Temperatures will be 5-15 degrees below normal.

#### TOMORROW'S Forecast Confidence: Medium-Low

Temperature trends tomorrow will depend on the timing of precipitation. Highs could run several degrees cooler over interior portions of southern New England if precipitation begins earlier than expected.

## 3-5 DAY EXTENDED OUTLOOK

Precipitation will begin to taper off over southern and western New England early Sunday morning with southern New England likely completely dry by midday. Moderate to heavy snow could continue over central and eastern Maine through the morning before tapering off during the early afternoon. The area looks to completely dry out by the mid to late afternoon hours. Winds will remain breezy through the afternoon with gusts of 25-35 mph along the coast from eastern Massachusetts through Maine. High pressure will then bring dry weather to the area Monday and Tuesday. Temperatures will be below normal

#### **Severe Weather Alert Service From Telvent**

## For Unitil Services Corp

Date: October 28, 2011 Time: 6:00 PM EDT

Forecaster: A THUT

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	NONE	NONE	NONE	NONE
Event Begin Time				
Event End Time				
Day 1 EII	1	1	1	1
Event Confidence				
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount				

Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	45/32	44/28	44/30	45/32

EII	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Day 2 Snow	1	2	2	1
Day 2 Ice	1	1	1	1
Day 2 Wind	1	1	1	1
Day 2 Gust	3	2	2	3
Day 2 Confidence	Medium	Medium	Medium	Medium
Day 3 Snow	3	3	2	1
Day 3 Ice	1	1	1	1
Day 3 Wind	1	1	1	1
Day 3 Gust	3	2	2	3
Day 3 Confidence	Medium	Low	Low	Medium

#### UNITIL SERVICE AREA 48 HOUR OUTLOOK

CAPITAL: Dry weather and non-hazard winds are expected through 4pm Saturday. A light mix of rain and snow will develop from 4-6pm. The mix of rain and snow will change to all wet snow by sundown Saturday evening. Heavy wet snow will continue through the evening. The heaviest snow will be between 7PM and midnight, although there may be heavy bursts at times after midnight. Snow will lighten by early Sunday morning with snow ending by mid-morning. Total snow accumulation will range from 6-10 inches. Expected totals are lower than the previous forecast of 8-12 inches. The highest accumulations will be on grassy surfaces, trees and colder surfaces. Pavement temperatures are still in the 40s or 50s. Even grassy surfaces are above freezing so the initial onset of snow may be slow to accumulate. However, if a heavy burst of snow comes it right away, it won't be out of the question to produce some quick accumulations. The snow will be wet and heavy, and is likely to cause major problems with tree limbs and power lines. Wind gusts for this storm may gust as high as 30-40 mph overnight through midday Sunday. Sustained winds are expected to run in from the north at 15-25 mph during this period. Drier and calmer conditions are expected to develop Sunday afternoon and Sunday night. As heavier snow commences Saturday evening, temperatures will run close to 32 degrees before rising above freezing around mid-morning Sunday, peaking to around 40 in the afternoon. Average liquid amounts from this storm are expected to run in the 1.00 to 1.50 inch range.

FITCHBURG: Dry weather and non-hazard winds are expected through 2pm Saturday. A light mix of rain and snow will develop between 2 and 4pm. The mix of rain and snow will change to all wet snow from 4-6pm Saturday evening. Heavy wet snow will continue through the evening. The heaviest snow will be between 7PM and midnight, although there may be heavy bursts at times after midnight. Snow will lighten late Saturday night and end early Sunday morning. Total snow accumulation will range from 7-11 inches. Fitchburg will likely be closer to the higher end of this range than Concord. Higher elevations to the west will likely be closer to 8-12 inches.

The highest accumulations will be on grassy surfaces, trees and colder surfaces. Pavement temperatures are still in the 40s or 50s. Even grassy surfaces are above freezing so the initial onset of snow may be slow to accumulate. However, if a heavy burst of snow comes it right away, it won't be out of the question to produce some quick accumulations. The snow will be wet and heavy, and is likely to cause major problems with tree limbs and power lines. Wind gusts for this storm may gust as high as 30-40 mph overnight through midday Sunday. Sustained winds are expected to run in from the north at 15-25 mph during this period. Drier and calmer conditions are expected to develop Sunday afternoon and Sunday night. As heavier snow commences Saturday evening, temperatures will run close to 32 degrees before rising above freezing around mid-morning Sunday, peaking to around 40 in the afternoon. Average liquid amounts from this storm are expected to run in the 1.00 to 1.75 inch range.

SEACOAST / PORTLAND: Dry weather and non-hazard winds are expected through 4pm Saturday with light rain developing between 4 and 7pm. Rain will mix with wet snow after 7pm Saturday and change to mostly all snow toward midnight. The threat for snow will continue through mid to late morning Sunday. It may become heavy at times Saturday night. However, rain may still mix in at times overnight along the immediate coast. Total snow accumulations will run 2-6 inches with the highest amounts on grassy surfaces away from the coast. The previous forecast had 4-8 inches in the forecast but these amounts will be more likely to the west and away from the coast where the lower levels of the atmosphere won't see the influence of maritime air. Snow accumulation confidence is low and could go either way by several inches depending on the exact of the storm and how quickly cold air arrives. The snow will be wet and heavy and could cause some major problems with tree limbs and power lines. Wind gusts for this storm may gust as high as 40-45 mph, possible a peak gust to 50 mph close to the coast Saturday night through late Sunday morning. Sustained winds out of the north to northeast can be expected to run in the 20-30 mph range. Temperatures will range in the 34-35 range during the evening, and then 32-34 range after midnight up through mid-morning Sunday before rising to around 40 in the afternoon. Drier and calmer conditions are expected to develop Sunday afternoon and Sunday night. Average liquid amounts from this storm are expected to run in the 1.25 to 1.75 inch range.

## UNITIL SERVICE AREA 3-5 DAY OUTLOOK

Please see above weather for Sunday. High pressure will bring dry weather throughout the extended of Monday into Tuesday.

## NORTHEASTERN US GENERAL WEATHER OUTLOOK

## **TODAY**

High pressure will continue to build into the region through tonight, resulting in dry conditions. Breezy condition over coastal Maine and the Cape and Islands with still a few gusts to 30 mph will diminish this afternoon. Temperatures will be 5-15 degrees below normal.

#### TODAY'S Forecast Confidence: Medium

Highs today look good. Lows tonight will depend on how quickly clouds begin to develop ahead of the next system. Lows could run 1-4 degrees warmer or cooler over the southern half of the region depending on clouds.

#### **TOMORROW**

On Saturday, a low pressure system will develop off of Cape Hatteras and rapidly intensify as it moves northeastward, likely bringing heavy precipitation to the area. Conditions are expected to remain dry through much of the morning. Precipitation will begin to develop near NYC and Long Island by late morning or midday, along the South Shore by the early to mid afternoon hours,

and then spreading northward reaching southern Vermont and New Hampshire during the late afternoon or early evening. Precipitation will continue to spread north and eastward during the evening and overnight hours. Precipitation will be heavy at times over southeastern New York during the afternoon and early evening and then over southern and eastern New England from the late afternoon and overnight hours. Temperatures will be cold enough for snow through much of the event over interior portions of New England and interior New York. However, precipitation may begin as rain over interior southern New England before changing over to snow later in the afternoon. Rain will likely be the primary precipitation type over southeastern New England, Long Island, and the New York City area. At this time, it appears a swath of 5-12 inches of snow is possible from the Lower Hudson Valley through interior portions of southern New England and into eastern parts of northern New England. Higher amounts are possible, especially in the higher elevations of New England. There is the potential for considerable tree damage and downed power lines from this storm. Confidence is on the lower end with regards to snowfall amounts at this time as slight shifts in the track of the low could change accumulations significantly Lighter amounts are expected as you get closer to the coast with little to no accumulation over the Cape and Islands, Long Island, and New York City. Confidence is on the lower end with regards to snowfall amounts at this time as slight shifts in the track of the low could change accumulations significantly. In addition, winds will increase through the day with gusts of 25-35 mph common along the coast. Gusts of 45-55 mph will be possible along the Cape and Islands. Temperatures will be 5-15 degrees below normal.

#### TOMORROW'S Forecast Confidence: Medium-Low

Temperature trends tomorrow will depend on the timing of precipitation. Highs could run several degrees cooler over interior portions of southern New England if precipitation begins earlier than expected.

#### 3-5 DAY EXTENDED OUTLOOK

Precipitation will begin to taper off over southern and western New England early Sunday morning with southern New England likely completely dry by midday. Moderate to heavy snow could continue over central and eastern Maine through the morning before tapering off during the early afternoon. The area looks to completely dry out by the mid to late afternoon hours. Winds will remain breezy through the afternoon with gusts of 25-35 mph along the coast from eastern Massachusetts through Maine. High pressure will then bring dry weather to the area Monday and Tuesday. Temperatures will be below normal

### **Severe Weather Alert Service From Telvent**

### For Unitil Services Corp

Date: October 29, 2011 Time: 6:00 AM EDT Forecaster: K Faltin

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	SNOW/WIND	SNOW/WIND	SNOW/WIND	SNOW/WIND
Event Begin Time	10PM	6PM	5PM	12AM
Event End Time	ONGOING	ONGOING	ONGOING	ONGOING
Day 1 EII	3	3	3	3
Event Confidence	MED	HIGH	HIGH	MED

Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount	1.50-2.00"		1.00-1.50"	1.25-1.75"
Snow Amount	2-7"	7-11"	7-11"	2-7"
Snow Character	WET	WET	WET	WET
Ice Amount				
Sustained Wind	30-35	12-18	15-20	25-30
Wind Gust	40-50	25-35	25-35	35-45
Temp. Extremes	44/35	42/33	43/32	45/34

EII	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Day 2 Snow	3	3	3	2
Day 2 Ice	1	1	1	1
Day 2 Wind	1	1	1	1
Day 2 Gust	3	2	2	3
Day 2 Confidence	Medium	Medium	Medium	Medium
Day 3 Snow	1	1	1	1
Day 3 Ice	1	1	1	1
Day 3 Wind	1	1	1	1
Day 3 Gust	1	1	1	1
Day 3 Confidence	High	High	High	High

## UNITIL SERVICE AREA 48 HOUR OUTLOOK

CAPITAL: Rainfall will reach the region by 2-3pm this afternoon. The mix to snow should follow shortly after, possibly by 5-6pm. Precipitation will turn to all snow after 8pm throughout tonight. Snowfall will gradually taper off between 9-11am Sunday morning. Storm total snowfall should range between roughly 7-10 inches, locally higher pending the track of the storm. Snow will be wet, heavy, and pose considerable stress to trees and power lines. Snow accumulations on pavements will be considerably less. The winds pick up this evening, and will remain breezy through tonight into Sunday. Winds will be northwest at roughly 12-18 mph during the peak, gusting 25-35 mph. Peak timeframe 1am-1pm Sunday. Rainfall amounts before mixing over to snow may range between 0.25-0.75 inches. Winds come down Sunday afternoon with dry conditions expected through Sunday night. Confidence is higher for this storm event in the Capital area, where all the data does indicate very good chances for snow.

FITCHBURG: Rainfall will reach Fitchburg by Noon-1pm. Rain will continue through the afternoon hours, with a mix to snow beginning near or shortly after 5pm. Precipitation should turn to all snow after 8pm. Snow will last through tonight into tomorrow morning, ending between 8-10am Sunday morning. Storm total snowfall should range between roughly 7-10 inches, locally higher pending the track of the storm. Snow will be wet, heavy, and pose considerable stress to trees and power lines. Snow accumulations on pavements will be considerably less. The winds pick up this evening, and will remain breezy through tonight into

Sunday. Winds will be northwest at roughly 15-20 mph during the peak, gusting 25-35 mph. Peak timeframe 1am-1pm Sunday. Rainfall amounts before mixing over to snow may range between 1.25-1.50 inches. Winds come down Sunday afternoon with dry conditions expected through Sunday night. Confidence is higher for this storm event in the Fitchburg area, where all the data does indicate very good chances for snow.

SEACOAST / PORTLAND: Rainfall reaches Portsmouth area near 2-3pm, spreading into Portland by 5-6pm. The transition to snow will be a more difficult forecast for both these areas due to potential maritime air off the ocean. Regardless, expect a mix to snow to begin by 9-10pm in Portsmouth; closer to Midnight in Portland. Precipitation should be all snow after 2-3am but a lot depends on wind direction. Snowfall will continue to be possible through Sunday morning, ending between 9-11am in the Seacoast areas, lingering perhaps as late as Noon-1pm in Portland areas. There may be a very large gradient in snow accumulations for this storm: ranging from a trace to 2 inches right along the coast, to 5-7 inches along and west of the I-95 corridor most areas. Snow will be wet, heavy, and pose considerable stress to trees and power lines. Snow accumulations on pavements will be considerably less. The winds pick up this evening, and will remain breezy through tonight into Sunday. Winds will be northeast to northwest at roughly 25-35 mph during the peak, gusting 40-50 mph. Peak timeframe 1am-4pm Sunday. Rainfall amounts before mixing over fully to snow may range between 1.25-2.00 inches. Winds come down Sunday afternoon with dry conditions expected through Sunday night. Confidence will be lower in both the Seacoast and Portland area for this storm, especially for the snow accumulations. There is a chance that snow accumulations trend considerably lower if winds were to remain more east-northeast for a longer period of time than the data indicates; wind direction will be determined by the overall track of the low.

#### UNITIL SERVICE AREA 3-5 DAY OUTLOOK

Dry conditions expected for Monday, Tuesday, and Wednesday with non-hazard weather in place.

#### NORTHEASTERN US GENERAL WEATHER OUTLOOK

#### **TODAY**

The stage is set for a major storm system to bring significant weather to the region through the course of today and especially tonight. Expect rain showers to already creep northward into portions of southern New York and southern Connecticut this morning, spreading northward through the rest of today. This will mix with snow in any higher elevations as well, and some elevations above 1800 feet may more or less be snow throughout this event. Otherwise, expect the rain to snow line to gradually transition eastward this afternoon and evening across New England, with most areas including the coasts working over to snowfall past Midnight. The heaviest snowfall will be centered over the higher elevations of south-central and eastern New York, the Berkshires, the southern Green Mountains in Vermont, and through the portions of the southern White Mountains and New Hampshire; amounts in these areas may very well reach or exceed a foot of heavy wet snow. Snow accumulations in the lower valley locations of southern/eastern upstate New York through central/southern New England will range between 4-8 inches, locally up to 10 inches under any intense snowfall bands. Snow accumulations closer to New York City proper may range between 3-6 inches, locally higher over the north metro, with accumulations rapidly diminishing eastward across Long Island. Some snow accumulation is likely in western/northern Boston which will be highly dependent on wind direction; but with snowfall totals diminishing rapidly the closer you work towards the coast southward to Cape Cod and the surrounding Islands. Lesser snowfall totals are expected in central, western, and northern upstate New York up into northern New England. In all cases, the snow will be wet and heavy posing considerable stress on trees and power lines.

Ground/pavement temperatures are fairly warm however, so accumulations will be much lower on all roadways. Winds will pick up through the course this afternoon and especially tonight over New England and Long Island areas. Gusts will be highest over eastern Long Island up into southern Rhode Island and southeastern Massachusetts, where gusts may range between 50-60 mph, locally higher over the outer Cape Cod and Nantucket areas. Gusts over interior New England will tend to hover in the 30-40 mph range, though isolated 45-50 mph gusts cannot be ruled out all the way up the East Coast. Some heavy rainfall is even possible over Long Island and southern New England, where some 1-2 inch plus totals are not out of the question by tonight. Finally, look for a few isolated thunderstorms/rain showers to be possible lee of the Great Lakes in western New York today. Temperatures will be trending well below normal.

#### TODAY'S Forecast Confidence: Low

With the storm system spreading into the region, expect a relatively non-standard temperature day keeping all temperatures of lower confidence. Once the heavier precipitation starts to fall, especially the snow, temperatures will be trending downward the rest of the day.

#### **TOMORROW**

Sunday, expect the storm system to lift northeastward and eventually pushing out of the region, though rain and snow showers are likely to linger well into the afternoon hours over northern New England, and the high winds and heavy rainfall shift across much of Maine. Additional snowfall amounts of 3-8 inches may occur, highest over portions of Maine. Wind gusts of 25-35 mph will be common across much of New England, locally up to 45-50 mph at the East Coast; however, gusts across coastal Maine may be upwards of 50-60 mph. These winds will all diminish Sunday night. Expect all locations to be dry by Sunday night. Temperatures for all areas will be well below normal.

#### TOMORROW'S Forecast Confidence: Low

Areas that have snow on the ground may trend 2-7 below forecast, and the region overall may trend cooler depending on how long it takes for the storm system to exit the region. Low temperatures could then bottom out for some spots Sunday night where skies clear and winds diminish.

#### 3-5 DAY EXTENDED OUTLOOK

There could be a few rain showers mixed with flurries during the night and morning hours near the Great Lakes in western New York Monday into Tuesday; otherwise, a period of dry conditions expected for all areas through Wednesday. Temperatures will average below normal through the period, but will warm a few degrees each day so that the readings will only be slightly below normal on Wednesday.

## **Severe Weather Alert Service From Telvent**

#### For Unitil Services Corp

Date: October 29, 2011 Time: 1:00 PM EDT

Forecaster: J Meikle

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	SNOW/WIND	SNOW/WIND	SNOW/WIND	SNOW/WIND
Event Begin Time	10PM	4PM	ЗРМ	12AM

		TI	Ti .	II I
Event End Time	10AM	10AM	9AM	12PM
Day 1 EII	3	3	3	3
Event Confidence	MED	HIGH	HIGH	MED
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount	1.50-2.00"	1.00-1.50"	1.00-1.50"	1.25-1.75"
Snow Amount	2-7"	8-12"	8-12"	2-7"
Snow Character	WET	WET	WET	WET
Ice Amount				
Sustained Wind	30-35	16-22	18-25	30-35
Wind Gust	45-55	30-40	30-40	45-55
Temp. Extremes	43/32	42/31	42/32	43/32

EII	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Day 2 Snow	3	3	3	2
Day 2 Ice	1	1	1	1
Day 2 Wind	1	1	1	1
Day 2 Gust	3	2	2	3
Day 2 Confidence	Medium	Medium	Medium	Medium
Day 3 Snow	1	1	1	1
Day 3 Ice	1	1	1	1
Day 3 Wind	1	1	1	1
Day 3 Gust	1	1	1	1
Day 3 Confidence	High	High	High	High

## UNITIL SERVICE AREA 48 HOUR OUTLOOK

CAPITAL: Snow or a snow rain mix will start falling over the next 1 to 2 hours, may start out as rain. Snow is expected to become heavy at times and stick after 6pm grassy areas with around an inch expected by 8pm. A heavy wet snow is expected overnight, will gradually taper off and end by 10am Sunday morning. Storm total snowfall should range between roughly 8-12 inches, locally higher pending the track of the storm. A considerable amount of damage is expected to trees along with downed power lines. Snow accumulations on pavements will be considerably less. The winds pick up this evening, and will remain breezy through tonight into Sunday. Winds will be north to northwest at roughly 16-22 mph during the peak, gusting as high as 35-40 mph from around midnight through noon Sunday. Winds will come down Sunday afternoon with dry conditions expected through Sunday night. Gust by 7pm should be no higher than 25-30 mph, becoming light and variable by later at night.

FITCHBURG: Rain or a snow rain mix will start falling over the next hour, going over to all snow after 4pm. Snow is expected to become heavy at times and stick after 5pm grassy areas with 1 to 3 inches expected by 8pm. A heavy wet snow is expected overnight, will gradually taper off

and end by 9am Sunday morning. Storm total snowfall should range between roughly 8-12 inches, locally higher pending the track of the storm. A considerable amount of damage is expected to trees along with downed power lines. Snow accumulations on pavements will be considerably less. The winds pick up this evening, and will remain breezy through tonight into Sunday. Winds will be north to northwest at roughly 18-25 mph during the peak, gusting as high as 35-40 mph from around midnight through 11am Sunday. Winds will come down Sunday afternoon with dry conditions expected through Sunday night. Gust by 7pm should be no higher than 25mph, becoming light and variable by later at night.

SEACOAST / PORTLAND: Rain will develop after 3pm Portsmouth area, spreading into Portland by 5-6pm. The transition to snow will remain a more difficult forecast for both these areas due to potential maritime air off the ocean. Regardless, expect a mix to snow to begin by 9-10pm in Portsmouth; closer to midnight in Portland. Precipitation should be all snow vicinity midnight to 2am but a lot depends on wind direction. Snowfall will continue to be possible through Sunday morning, heavy and wet through 9am, tapering off and ending 10am to noon from south to north. There still may be a very large gradient in snow accumulations for this storm ranging from a 1 to 2 inches immediate coast to 5-7 inches along and west of the I-95 corridor most areas. Heavy wet snow will pose considerable stress to trees and power lines. Snow accumulations on pavements will be considerably less. The winds pick up this evening, and will remain windy through tonight into Sunday. Winds will be northeast to northwest at roughly 30-35 mph during the peak, gusting 40-50 mph with peak gust as high as 55 mph near the coast. Peak timeframe 1am-noon Sunday, Rainfall amounts before mixing over fully to snow may range between 1.00-1.50 inches. Winds will come down Sunday afternoon with dry conditions and by early evening gust to no higher than 35 mph are expected, diminishing through the night. Confidence will be lower in both the Seacoast and Portland area for this storm, especially for the snow accumulations. There is a chance that snow accumulations will vary by several inches in either direction and will depend on the exact track of the storm.

#### UNITIL SERVICE AREA 3-5 DAY OUTLOOK

Dry conditions are expected for Monday, Tuesday, and Wednesday with non-hazard weather in place.

#### NORTHEASTERN US GENERAL WEATHER OUTLOOK

## **TODAY**

A major winter type coastal storm is organizing off the Virginia Capes and will wind up east of Cape Cod by later tonight as it bombs out. Rain mixed with snow at the lower elevations and all snow likely above 1500 feet will continue to fill in northeastward through the Catskills and Hudson Valley by early this afternoon. This will advance northeastward up through central New York and eastward through the western half of both Connecticut and Massachusetts as well as the southern portions of Vermont, southwest New Hampshire. By dark all of these portions of the region will have transitioned to all snow. By dark accumulations as high as 2-4 inches are expected through the higher elevations with generally 1 to 2 inches elsewhere, most of which will be on gassy surfaces. Even down through the New York City area rail filling in will mix with snow mid to late afternoon with some minor accumulations of under an inch on grassy areas by dark. Elsewhere through the daylight hours precipitation will fill in through the remainder of Vermont and New Hampshire and all of southern New England with rain at the coast and mix elsewhere below 1500 feet and all snow above this level. Precipitation will become heavy at times through eastern and southeastern New York and through all of southern New England mid to late afternoon. For the evening hours precipitation will continue to advance northeastward with most areas away from the coast to transition to all heavy wet snow with even coastal areas other than the Cape and Islands changing to a heavy wet snow past

midnight. The heaviest snowfall will be centered over the higher elevations of south-central and eastern New York, the Berkshires, the southern Green Mountains in Vermont, and through the portions of the southern White Mountains and New Hampshire; amounts in these areas may very well reach or exceed a foot of heavy wet snow. Snow accumulations in the lower valley locations of southern/eastern upstate New York through central/southern New England will range between 4-8 inches, locally up to 10 inches under any intense snowfall bands. Snow accumulations closer to New York City proper may range between 3-6 inches, locally higher over the north metro, with accumulations rapidly diminishing eastward across Long Island. Some snow accumulation is likely in western/northern Boston which will be highly dependent on wind direction; but with snowfall totals diminishing rapidly the closer you work towards the coast southward to Cape Cod and the surrounding Islands. Lesser snowfall totals are expected in central, western, and northern upstate New York up into northern New England. In all cases, the snow will be wet and heavy posing considerable stress on trees and power lines. Ground/pavement temperatures are fairly warm however, so accumulations will be much lower on all roadways. Winds will pick up through the course this afternoon and especially tonight over New England and Long Island areas. Gusts will be highest over eastern Long Island up into southern Rhode Island and southeastern Massachusetts, where gusts may range between 50-60 mph, locally higher with gust to 70 mph and possibly a bit higher over outer Cape Cod and Nantucket areas. These high winds will work northward up along the coast, reaching the Maine coast after midnight. Gusts over interior New England will tend to hover in the 30-40 mph range, though isolated 45-50 mph gusts cannot be ruled out all the way up the East Coast into Maine. Some heavy rainfall is even possible over Long Island and southern New England, where some 1-2 inch plus totals are not out of the question by tonight. Considerable tree damage and downed power line are expected over areas that receive heavy snow. Finally, look for a few isolated thunderstorms/rain showers to be possible lee of the Great Lakes in western New York today. Temperatures will be trending well below normal.

## TODAY'S Forecast Confidence: Low

With the storm system spreading into the region, expect a relatively non-standard temperature day keeping all temperatures of lower confidence. Once the heavier precipitation starts to fall, especially the snow, temperatures will be trending downward the rest of the day.

## **TOMORROW**

On Sunday, expect the storm system to lift northeastward and eventually end up in Nova Scotia by late afternoon. Snow is likely to linger well into the afternoon hours over northern New England, and the high winds shifting up into Downeast Maine where over 60 mph gust can be expected, diminishing elsewhere late morning and afternoon. Additional snowfall amounts of 3-8 inches may occur, highest over portions of Maine. Wind gusts of 25-40 mph will be common across much of New England, locally up to 45-55 mph at the coast; however, gusts across coastal Maine and down through the Cape and Islands will continue into the morning, upwards of 50-60 mph. These winds will all diminish Sunday afternoon and evening. Expect all locations to be dry by Sunday night. Temperatures for all areas will be well below normal.

## TOMORROW'S Forecast Confidence: Low

Areas that have snow on the ground may trend 2-7 below forecast, and the region overall may trend cooler depending on how long it takes for the storm system to exit the region. Low temperatures could then bottom out for some spots Sunday night where skies clear and winds diminish.

### 3-5 DAY EXTENDED OUTLOOK

2011 October Nor'easter - After Action Report

There could be a few rain showers mixed with flurries during the night and morning hours near the Great Lakes in western New York Monday into Tuesday; otherwise, a period of dry conditions expected for all areas through Wednesday. Temperatures will average below normal through the period, but will warm a few degrees each day so that the readings will only be slightly below normal on Wednesday.

## **Severe Weather Alert Service From Telvent**

## For Unitil Services Corp

Date: October 29, 2011 Time: 6:00 PM EDT Forecaster: A Thut

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	SNOW/WIND	SNOW/WIND	SNOW/WIND	SNOW/WIND
Event Begin Time	NOW	NOW	NOW	8PM
Event End Time	10AM	10AM	9AM	12PM
Day 1 EII	3	3	3	3
Event Confidence	MED	HIGH	HIGH	MED
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount	1.00-2.00"	1.00-1.50"	1.00-1.50"	1.00-1.75"
Snow Amount	2-8"	8-12"	8-12"	2-8"
Snow Character	WET	WET	WET	WET
Ice Amount				
Sustained Wind	30-35	16-22	18-25	30-35
Wind Gust	45-55	30-40	30-40	45-55
Temp. Extremes	45/32	43/28	45/31	45/32

EII	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Day 2 Snow	3	3	3	2
Day 2 Ice	1	1	1	1
Day 2 Wind	1	1	1	1
Day 2 Gust	3	2	2	3
Day 2 Confidence	Medium	Medium	Medium	Medium
Day 3 Snow	1	1	1	1
Day 3 Ice	1	1	1	1
Day 3 Wind	1	1	1	1
Day 3 Gust	1	1	1	1

Day 3 Confidence	High	High	High

#### UNITIL SERVICE AREA 48 HOUR OUTLOOK

CAPITAL: Snow will continue between now and 10AM Sunday morning. The heaviest snow will be between now and midnight. However, moderate bands of snow will continue through daybreak. Lighter snow is anticipated tomorrow morning. Storm total snowfall should range between roughly 8-12 inches, locally higher pending the track of the storm. A considerable amount of damage is expected to trees along with downed power lines. Snow accumulations on pavements will be considerably less. It should also be noted that as snow is accumulating, mild ground temperatures may continue to melt away the snowpack. The winds pick up this evening, and will remain breezy through tonight into Sunday. Winds will be north to northwest at roughly 16-22 mph during the peak, gusting as high as 35-40 mph from around midnight through at least noon Sunday. There is a good chance gusts will still top 30 mph at times during the afternoon. Winds will tend to trail off by sunset, becoming light and variable overnight.

FITCHBURG: A heavy wet snow will continue overnight and will gradually taper off and end by 9am Sunday morning. The heaviest snow will be between now and midnight. However, moderate bands of snow will continue through daybreak. Lighter snow is anticipated tomorrow morning. Storm total snowfall should range between roughly 8-12 inches, locally higher pending the track of the storm. A considerable amount of damage is expected to trees along with downed power lines. Snow accumulations on pavements will be considerably less. It should also be noted that as snow is accumulating, mild ground temperatures may continue to melt away the snowpack. The winds pick up this evening, and will remain breezy through tonight into Sunday. Winds will be north to northwest at roughly 18-25 mph during the peak, gusting as high as 35-40 mph from around midnight through at least noon Sunday. There is a good chance gusts will still top 30 mph at times during the afternoon. Areas with the most elevation will have the best chance for the higher winds. Winds will tend to trail off by sunset, becoming light and variable overnight.

SEACOAST / PORTLAND: Showers have began to reach the area. The last observation in Portsmouth was 33 degrees with snow already being reported. They may toggle back and forth between rain and snow during the next few hours. It is looking more likely that Portsmouth may convert to all snow around sundown. The change over will take a bit longer in Portland where a full switch to snow may hold off until 8PM. Snowfall will continue to be possible through Sunday morning, heavy and wet through 9am, tapering off and ending 10am to noon from south to north. There still may be a very large gradient in snow accumulations for this storm: ranging from a 1 to 3 inches immediate coast to 5-8 inches along and west of the I-95 corridor most areas. Heavy wet snow will pose considerable stress to trees and power lines. Snow accumulations on pavements will be considerably less. It should also be noted that as snow is accumulating, mild ground temperatures may continue to melt away the snowpack. The winds pick up this evening, and will remain windy through tonight into Sunday. Winds will be northeast to northwest at roughly 30-35 mph during the peak, gusting 40-50 mph with peak gust as high as 55 mph near the coast. Peak timeframe 1am-noon Sunday. Winds will slightly come down Sunday afternoon with dry conditions and by early evening gust to no higher than 35 mph are expected, diminishing through the night. Confidence will be lower in both the Seacoast and Portland area for this storm, especially for the snow accumulations.

#### UNITIL SERVICE AREA 3-5 DAY OUTLOOK

Dry conditions are expected for Monday, Tuesday, and Wednesday with non-hazard weather in place.

NORTHEASTERN US GENERAL WEATHER OUTLOOK

#### **TODAY**

A major winter type coastal storm is organizing off the Virginia Capes and will wind up east of Cape Cod by later tonight as it bombs out. Rain mixed with snow at the lower elevations and all snow likely above 1500 feet will continue to fill in northeastward through the Catskills and Hudson Valley by early this afternoon. This will advance northeastward up through central New York and eastward through the western half of both Connecticut and Massachusetts as well as the southern portions of Vermont, southwest New Hampshire. By dark all of these portions of the region will have transitioned to all snow. By dark accumulations as high as 2-4 inches are expected through the higher elevations with generally 1 to 2 inches elsewhere, most of which will be on gassy surfaces. Even down through the New York City area rail filling in will mix with snow mid to late afternoon with some minor accumulations of under an inch on grassy areas by dark. Elsewhere through the daylight hours precipitation will fill in through the remainder of Vermont and New Hampshire and all of southern New England with rain at the coast and mix elsewhere below 1500 feet and all snow above this level. Precipitation will become heavy at times through eastern and southeastern New York and through all of southern New England mid to late afternoon. For the evening hours precipitation will continue to advance northeastward with most areas away from the coast to transition to all heavy wet snow with even coastal areas other than the Cape and Islands changing to a heavy wet snow past midnight. The heaviest snowfall will be centered over the higher elevations of south-central and eastern New York, the Berkshires, the southern Green Mountains in Vermont, and through the portions of the southern White Mountains and New Hampshire; amounts in these areas may very well reach or exceed a foot of heavy wet snow. Snow accumulations in the lower valley locations of southern/eastern upstate New York through central/southern New England will range between 4-8 inches, locally up to 10 inches under any intense snowfall bands. Snow accumulations closer to New York City proper may range between 3-6 inches, locally higher over the north metro, with accumulations rapidly diminishing eastward across Long Island. Some snow accumulation is likely in western/northern Boston which will be highly dependent on wind direction; but with snowfall totals diminishing rapidly the closer you work towards the coast southward to Cape Cod and the surrounding Islands. Lesser snowfall totals are expected in central, western, and northern upstate New York up into northern New England. In all cases, the snow will be wet and heavy posing considerable stress on trees and power lines. Ground/pavement temperatures are fairly warm however, so accumulations will be much lower on all roadways. Winds will pick up through the course this afternoon and especially tonight over New England and Long Island areas. Gusts will be highest over eastern Long Island up into southern Rhode Island and southeastern Massachusetts, where gusts may range between 50-60 mph, locally higher with gust to 70 mph and possibly a bit higher over outer Cape Cod and Nantucket areas. These high winds will work northward up along the coast, reaching the Maine coast after midnight. Gusts over interior New England will tend to hover in the 30-40 mph range, though isolated 45-50 mph gusts cannot be ruled out all the way up the East Coast into Maine. Some heavy rainfall is even possible over Long Island and southern New England, where some 1-2 inch plus totals are not out of the question by tonight. Considerable tree damage and downed power line are expected over areas that receive heavy snow. Finally, look for a few isolated thunderstorms/rain showers to be possible lee of the Great Lakes in western New York today. Temperatures will be trending well below normal.

#### TODAY'S Forecast Confidence: Low

With the storm system spreading into the region, expect a relatively non-standard temperature day keeping all temperatures of lower confidence. Once the heavier precipitation starts to fall, especially the snow, temperatures will be trending downward the rest of the day.

**TOMORROW** 

On Sunday, expect the storm system to lift northeastward and eventually end up in Nova Scotia by late afternoon. Snow is likely to linger well into the afternoon hours over northern New England, and the high winds shifting up into Downeast Maine where over 60 mph gust can be expected, diminishing elsewhere late morning and afternoon. Additional snowfall amounts of 3-8 inches may occur, highest over portions of Maine. Wind gusts of 25-40 mph will be common across much of New England, locally up to 45-55 mph at the coast; however, gusts across coastal Maine and down through the Cape and Islands will continue into the morning, upwards of 50-60 mph. These winds will all diminish Sunday afternoon and evening. Expect all locations to be dry by Sunday night. Temperatures for all areas will be well below normal.

## TOMORROW'S Forecast Confidence: Low

Areas that have snow on the ground may trend 2-7 below forecast, and the region overall may trend cooler depending on how long it takes for the storm system to exit the region. Low temperatures could then bottom out for some spots Sunday night where skies clear and winds diminish.

#### 3-5 DAY EXTENDED OUTLOOK

There could be a few rain showers mixed with flurries during the night and morning hours near the Great Lakes in western New York Monday into Tuesday; otherwise, a period of dry conditions expected for all areas through Wednesday. Temperatures will average below normal through the period, but will warm a few degrees each day so that the readings will only be slightly below normal on Wednesday.

# **Attachment 2 – Customer Impact Data**

SEACOAST OUTAGE DATA - OCTOBER NOR'EASTER										
	HOURLY		HOURLY	HOURLY % INTERRUPTED	CUMULATIVE	CUMULATIVE	CUMULATIVE % INTERRUPTED	TOTAL		
DATE	OUTAGES		AFFECTED	PEAK	OUTAGES	AFFECTED	PEAK	CUSTOMERS		
0/29/2011 15:0		0	0	0.00%	0	0	0.00% 2.22%	450 450		
0/29/2011 16:0 0/29/2011 17:0		9	998 10651	2.22% 23.64%	1 9	998	2.22%	450		
0/29/2011 17:0 0/29/2011 18:0		22		45.98%	22	20715				
0/29/2011 18:0 0/29/2011 19:0		34	20715 23815	52.86%	35	24813	45.98% 55.08%	450 450		
0/29/2011 19:0 0/29/2011 20:0		53	37436	83.09%	54	38434	85.31%	450		
0/29/2011 20:0 0/29/2011 21:0		57	37775	83.85%	58	38773	86.06%	450		
0/29/2011 21:0 0/29/2011 22:0		62	39495	87.66%	64	40921	90.83%	450		
0/29/2011 22:0 0/29/2011 23:0		64	39766	88.26%	66	41192	91.43%	450		
10/30/2011 23:0		66	39857	88.47%	68	41283	91.63%	450		
					69					
10/30/2011 1:0 10/30/2011 2:0		67 67	40435 40435	89.75%	69	41861 41861	92.92% 92.92%	450 450		
				89.75%						
10/30/2011 3:0 10/30/2011 4:0		67 69	39917 40064	88.60% 88.93%	69 71	41861 42008	92.92% 93.24%	450 450		
10/30/2011 4:0		68	39379	87.41%	71	42008	93.24%	450		
10/30/2011 5:0		69	37482	83.20%	72	42008	93.26%	450		
10/30/2011 0:0		69		82.07%	73	42013	93.30%	450		
10/30/2011 7:0		69	36974 34136	75.77%	74	42033	93.37%	450		
		73			78	42267				
10/30/2011 9:0		73	34337	76.21%	79	42462	93.82%	450		
0/30/2011 10:0		78	33938	75.33%		42462	94.25%	450		
0/30/2011 11:0			33997	75.46%	86		95.35%	450		
0/30/2011 12:0		80	32486	72.11%	90	43469	96.48%	450		
0/30/2011 13:0		84	31102	69.03%	95	45010	99.90%	450		
0/30/2011 14:0		87	30096	66.80%	99	46248	102.65%	450		
0/30/2011 15:0		91	28636	63.56%	105	47792	106.08%	450		
0/30/2011 16:0		89	25699	57.04%	106	47798	106.09%	450		
0/30/2011 17:0		88	25125	55.77%	108	47942	106.41%	450		
0/30/2011 18:0		92	24190	53.69%	114	48797	108.31%	45		
0/30/2011 19:0		95	22898	50.82%	118	49844	110.63%	45		
/30/2011 20:0		96	21623	47.99%	120	49854	110.66%	45		
/30/2011 21:0		97	21705	48.18%	121	49936	110.84%	45		
/30/2011 22:0		97	20761	46.08%	122	49959	110.89%	45		
/30/2011 23:0		97	20404	45.29%	123	49986	110.95%	45		
0/31/2011 0:0		99	20187	44.81%	126	50011	111.00%	45		
0/31/2011 1:0	0:00	97	18129	40.24%	126	50011	111.00%	45		
0/31/2011 2:0		95	17793	39.49%	126	50011	111.00%	45		
0/31/2011 3:0	0:00	98	17983	39.92%	129	50201	111.43%	45		
0/31/2011 4:0	0:00	97	16800	37.29%	129	50201	111.43%	45		
0/31/2011 5:0	0:00	95	16554	36.74%	129	50201	111.43%	45		
0/31/2011 6:0	0:00	95	16554	36.74%	129	50201	111.43%	45		
0/31/2011 7:0	0:00	94	16348	36.29%	130	50202	111.43%	45		
0/31/2011 8:0	0:00	94	16255	36.08%	132	50240	111.51%	45		
0/31/2011 9:0	0:00	95	16156	35.86%	133	50379	111.82%	45		
)/31/2011 10:0	0:00	98	16055	35.64%	136	50570	112.25%	45		
/31/2011 11:0	0:00	102	15137	33.60%	142	50577	112.26%	45		
/31/2011 12:0	0:00	91	14558	32.31%	142	50577	112.26%	45		
/31/2011 13:0	0:00	89	14305	31.75%	144	50657	112.44%	45		
/31/2011 14:0	0:00	87	13451	29.86%	145	50661	112.45%	45		
/31/2011 15:0	0:00	89	12100	26.86%	150	50738	112.62%	45		
/31/2011 16:0	0:00	89	10679	23.70%	153	50886	112.95%	45		
/31/2011 17:0		90	10407	23.10%	156	51395	114.08%	45		
/31/2011 18:0		89	9031	20.05%	158	51405	114.10%	45		
/31/2011 19:0	0:00	87	7545	16.75%	164	52055	115.54%	45		
/31/2011 20:0	0:00	77	6266	13.91%	164	52055	115.54%	45		
/31/2011 21:0		75	5901	13.10%	166	52181	115.82%	45		
/31/2011 22:0		78	5126	11.38%	169	52348	116.19%	45		
/31/2011 23:0		74	4974	11.04%	169	52348	116.19%	45		
11/1/2011 0:0		75	4896	10.87%	170	52349	116.19%	45		
11/1/2011 1:0		71	4588	10.18%	170	52349	116.19%	45		
11/1/2011 2:0		69	4487	9.96%	170	52349	116.19%	45		
11/1/2011 3:0		69	4487	9.96%	170	52349	116.19%	45		
11/1/2011 4:0		66	3905	8.67%	171	52395	116.30%	45		
11/1/2011 5:0		65	3548	7.88%	171	52395	116.30%	45		
11/1/2011 6:0		67	3447	7.65%	174	52498	116.52%	45		
11/1/2011 7:0		68	3346	7.43%	176	52503	116.54%	45		
11/1/2011 7:0		66	2692	5.98%	177	52504	116.54%	45		
11/1/2011 9:0		67	2632	5.84%	179	52517	116.57%	45		
1/1/2011 10:0		61	2435	5.40%	180	52584	116.72%	45		
1/1/2011 10:0		60	2131	4.73%	182	52621	116.80%	45		
1/1/2011 11:0 1/1/2011 12:0		55	1404	3.12%	184	52637	116.83%	45		
1/1/2011 12:0 1/1/2011 13:0		54	1377	3.06%	184	52637	116.83%	45		
1/1/2011 13:0 1/1/2011 14:0		48	1132	2.51%	184	52637	116.83%	45		
1/1/2011 14:0 1/1/2011 15:0		48	1121	2.49%	188	52645	116.85%	45		
1/1/2011 15:0 1/1/2011 16:0		37	806	1.79%	189	52649	116.86%	45		
1/1/2011 16:0 1/1/2011 17:0		39	818	1.82%	191	52661	116.89%	45		
1/1/2011 17:0 1/1/2011 18:0		32	323	0.72%	192	52671	116.91%	45		
1/1/2011 18:0 1/1/2011 19:0		25	281	0.62%	193	52672	116.91%	45		
1/1/2011 19:0 1/1/2011 20:0		27	92	0.62%	195	52674	116.91%	45		
1/1/2011 21:0		22	79	0.18%	195	52674	116.92%	45		
1/1/2011 22:0		11	52	0.12%	195	52674	116.92%	45		
1/1/2011 23:0		7	25	0.06%	196	52676	116.92%	45		
11/2/2011 0:0		5	17	0.04%	196	52676	116.92%	45		
11/2/2011 1:0		5	17	0.04%	196	52676	116.92%	45		
11/2/2011 2:0		3	5	0.01%	196	52676	116.92%	45		
11/2/2011 3:0		3	5	0.01%	196	52676	116.92%	45		
	0:00	2	4	0.01%	196	52676	116.92%	45		
11/2/2011 4:0 11/2/2011 5:0		2	4	0.01%	196	52676	116.92%	45		

HOURLY % CUMULATIVE %										
DATE	HOURLY OUTAGES	HOURLY AFFECTED	INTERRUPTED PEAK	CUMULATIVE OUTAGES	CUMULATIVE AFFECTED	INTERRUPTED PEAK	TOTAL CUSTOMERS			
10/29/2011 15:00:00	0	0	0.00%	0	0	0.00%	2944			
10/29/2011 16:00:00	0	0	0.00%	0	0	0.00%	2944			
10/29/2011 17:00:00	0	0	0.00%	0	0	0.00%	2944			
10/29/2011 18:00:00	0	0	0.00%	0	0	0.00%	2944			
10/29/2011 19:00:00	3	148	0.50%	3	148	0.50%	2944			
10/29/2011 20:00:00	5	210	0.71%	5	210	0.71%	2944			
10/29/2011 21:00:00	8	1791	6.08%	9	1815	6.16%	2944			
10/29/2011 22:00:00	10	1828	6.21%	14	2027	6.88%	2944			
10/29/2011 23:00:00	15	2870	9.75%	22	4397	14.93%	2944			
10/30/2011 0:00:00	25	8995	30.55%	35	10683	36.28%	2944			
10/30/2011 1:00:00	34	10001	33.97%	47	12289	41.74%	2944			
10/30/2011 2:00:00	39	10827	36.77%	54	13141	44.63%	2944			
10/30/2011 3:00:00	35	7728	26.25%	58	14094	47.87%	2944			
10/30/2011 4:00:00	44	8437	28.65%	68	15776	53.58%	2944			
10/30/2011 5:00:00	41	5176	17.58%	72	16109	54.71%	2944			
10/30/2011 6:00:00	45	5402	18.35%	76	16335	55.48%	2944			
10/30/2011 7:00:00	44	4749	16.13%	79	17186	58.37%	2944			
10/30/2011 8:00:00	51	4815	16.35%	87	17350	58.92%	2944			
10/30/2011 9:00:00	53	4188	14.22%	94	17983	61.07%	2944			
10/30/2011 10:00:00	58	3823	12.98%	102	18039	61.26%	2944			
10/30/2011 11:00:00	61	3520	11.95%	107	18133	61.58%	2944			
10/30/2011 12:00:00	64	2805	9.53%	116	18228	61.91%	2944			
10/30/2011 13:00:00	69	2741	9.31%	124	18357	62.34%	2944			
10/30/2011 14:00:00	70	2379	8.08%	129	18553	63.01%	2944			
10/30/2011 15:00:00	69	1317	4.47%	136	18661	63.38%	2944			
10/30/2011 16:00:00	75	1273	4.32%	143	18738	63.64%	2944			
10/30/2011 17:00:00	74	920	3.12%	148	18796	63.83%	2944			
10/30/2011 18:00:00	70	582	1.98%	150	18799	63.84%	2944			
10/30/2011 19:00:00	55	549	1.86%	152	18854	64.03%	2944			
10/30/2011 20:00:00	38	298	1.01%	153	18855	64.03%	2944			
10/30/2011 21:00:00	34	250	0.85%	155	18857	64.04%	2944			
10/30/2011 22:00:00	19	200	0.68%	157	18859	64.05%	2944			
10/30/2011 23:00:00	7	124	0.42%	158	18861	64.06%	2944			
10/31/2011 0:00:00	7	20	0.07%	159	18867	64.08%	2944			
10/31/2011 1:00:00	3	4	0.01%	159	18867	64.08%	2944			
10/31/2011 2:00:00	2	2	0.01%	159	18867	64.08%	2944			
10/31/2011 3:00:00	2	2	0.01%	159	18867	64.08%	2944			
10/31/2011 4:00:00	0	0	0.00%	159	18867	64.08%	2944			
10/31/2011 5:00:00	0	0	0.00%	159	18867	64.08%	2944			
10/31/2011 6:00:00	1	1	0.00%	160	18868	64.08%	2944			
10/31/2011 7:00:00	1	1	0.00%	160	18868	64.08%	2944			
10/31/2011 7:00:00	2	72	0.24%	161	18939	64.32%	2944			
10/31/2011 9:00:00	4	80	0.24%	163	18947	64.35%	2944			
10/31/2011 9:00:00	4	80	0.27%	163	18947	64.35%	2944			
10/31/2011 10:00:00	4	80	0.27%	163	18947	64.35%	2944			
10/31/2011 11:00:00	2	8	0.27%	163	18947	64.35%	2944			
10/31/2011 12:00:00	2	2	0.03%	164	18948	64.35%	2944			
		53					2944			
10/31/2011 14:00:00	3		0.18%	166	19000	64.53%				
10/31/2011 15:00:00	3	53	0.18%	166	19000	64.53%	2944			
10/31/2011 16:00:00	2	52	0.18%	166	19000	64.53%	2944			
10/31/2011 17:00:00	1	3	0.01%	166	19000	64.53%	2944			
10/31/2011 18:00:00	0	0	0.00%	166	19000	64.53%	2944			

		UES SYS	STEM OUTAGE D	ATA - OCTOBER	NOR'EASTER		
	HOURLY	HOURLY	HOURLY % INTERRUPTED	CUMULATIVE	CUMULATIVE	CUMULATIVE % INTERRUPTED	TOTAL
DATE 10/29/2011 15:00:00	OUTAGES 0	AFFECTED 0	PEAK 0.0%	OUTAGES 0	AFFECTED 0	PEAK 0.0%	CUSTOMERS 74095
10/29/2011 16:00:00	1	998	1.3%	1	998	1.3%	74095
10/29/2011 17:00:00	9	10651	14.4%	9	10651	14.4%	74095
10/29/2011 18:00:00 10/29/2011 19:00:00	22	20715	28.0%	22	20715	28.0% 33.7%	74095
10/29/2011 19:00:00	37 28	23963 37646	32.3% 50.8%	38 59	24961 38644	52.2%	74095 74095
10/29/2011 21:00:00	65	39566	53.4%	67	40588	54.8%	74095
10/29/2011 22:00:00	72	41323	55.8%	78	42948	58.0%	74095
10/29/2011 23:00:00	79	42636	57.5%	88	45589	61.5%	74095
10/30/2011 0:00:00 10/30/2011 1:00:00	91 101	48852 50436	65.9% 68.1%	103 116	51966 54150	70.1% 73.1%	74095 74095
10/30/2011 2:00:00	106	51262	69.2%	123	55002	74.2%	74095
10/30/2011 3:00:00	102	47645	64.3%	127	55955	75.5%	74095
10/30/2011 4:00:00	113	48501	65.5%	139	57784	78.0%	74095
10/30/2011 5:00:00 10/30/2011 6:00:00	109 114	44555 42884	60.1% 57.9%	143 148	58117 58353	78.4% 78.8%	74095 74095
10/30/2011 7:00:00	113	41723	56.3%	152	59219	79.9%	74095
10/30/2011 8:00:00	120	38951	52.6%	161	59416	80.2%	74095
10/30/2011 9:00:00 10/30/2011 10:00:00	126 129	38525 37761	52.0% 51.0%	172 181	60250 60501	81.3% 81.7%	74095 74095
10/30/2011 10:00:00	139	37517	50.6%	193	61090	82.4%	74095
10/30/2011 12:00:00	144	35291	47.6%	206	61697	83.3%	74095
10/30/2011 13:00:00	153	33843	45.7%	219	63367	85.5%	74095
10/30/2011 14:00:00 10/30/2011 15:00:00	157 160	32475 29953	43.8% 40.4%	228 241	64801 66453	87.5% 89.7%	74095 74095
10/30/2011 15:00:00	164	29953 26972	40.4% 36.4%	241	66536	89.7%	74095
10/30/2011 17:00:00	162	26045	35.2%	256	66738	90.1%	74095
10/30/2011 18:00:00	162	24772	33.4%	264	67596	91.2%	74095
10/30/2011 19:00:00 10/30/2011 20:00:00	150 134	23447 21921	31.6% 29.6%	270 273	68698 68709	92.7% 92.7%	74095 74095
10/30/2011 20:00:00	131	21955	29.6%	276	68793	92.7%	74095
10/30/2011 22:00:00	116	20961	28.3%	279	68818	92.9%	74095
10/30/2011 23:00:00	104	20528	27.7%	281	68847	92.9%	74095
10/31/2011 0:00:00 10/31/2011 1:00:00	106 100	20207 18133	27.3% 24.5%	285 285	68878 68878	93.0% 93.0%	74095 74095
10/31/2011 1:00:00	97	17795	24.0%	285	68878	93.0%	74095
10/31/2011 3:00:00	100	17985	24.3%	288	69068	93.2%	74095
10/31/2011 4:00:00	97	16800	22.7%	288	69068	93.2%	74095
10/31/2011 5:00:00 10/31/2011 6:00:00	95 96	16554 16555	22.3% 22.3%	288 289	69068 69069	93.2% 93.2%	74095 74095
10/31/2011 0:00:00	95	16349	22.1%	290	69070	93.2%	74095
10/31/2011 8:00:00	96	16327	22.0%	293	69179	93.4%	74095
10/31/2011 9:00:00	99	16236	21.9%	296	69326	93.6%	74095
10/31/2011 10:00:00 10/31/2011 11:00:00	102 106	16135 15217	21.8% 20.5%	299 305	69517 69524	93.8% 93.8%	74095 74095
10/31/2011 12:00:00	93	14566	19.7%	305	69524	93.8%	74095
10/31/2011 13:00:00	91	14307	19.3%	308	69605	93.9%	74095
10/31/2011 14:00:00	90 92	13504 12153	18.2% 16.4%	311 316	69661 69738	94.0% 94.1%	74095 74095
10/31/2011 15:00:00 10/31/2011 16:00:00	91	10731	14.5%	319	69886	94.1%	74095
10/31/2011 17:00:00	91	10410	14.0%	322	70395	95.0%	74095
10/31/2011 18:00:00	89	9031	12.2%	324	70405	95.0%	74095
10/31/2011 19:00:00 10/31/2011 20:00:00	87 77	7545 6266	10.2% 8.5%	330 330	71055 71055	95.9% 95.9%	74095 74095
10/31/2011 21:00:00	75	5901	8.0%	332	71181	96.1%	74095
10/31/2011 22:00:00	78	5126	6.9%	335	71348	96.3%	74095
10/31/2011 23:00:00 11/1/2011 0:00:00	74 75	4974 4896	6.7% 6.6%	335 336	71348 71349	96.3% 96.3%	74095 74095
11/1/2011 0:00:00	75	4588	6.2%	336	71349	96.3%	74095
11/1/2011 2:00:00	69	4487	6.1%	336	71349	96.3%	74095
11/1/2011 3:00:00	69	4487	6.1%	336	71349	96.3%	74095
11/1/2011 4:00:00 11/1/2011 5:00:00	66 65	3905 3548	5.3% 4.8%	337 337	71395 71395	96.4% 96.4%	74095 74095
11/1/2011 6:00:00	67	3447	4.7%	340	71498	96.5%	74095
11/1/2011 7:00:00	68	3346	4.5%	342	71503	96.5%	74095
11/1/2011 8:00:00 11/1/2011 9:00:00	66 67	2692 2632	3.6% 3.6%	343 345	71504 71517	96.5% 96.5%	74095 74095
11/1/2011 9:00:00	62	2632 2505	3.6%	345 347	71517 71654	96.5%	74095
11/1/2011 11:00:00	61	2201	3.0%	349	71691	96.8%	74095
11/1/2011 12:00:00	55	1404	1.9%	351	71707	96.8%	74095
11/1/2011 13:00:00 11/1/2011 14:00:00	55 49	1388 1143	1.9% 1.5%	352 352	71718 71718	96.8% 96.8%	74095 74095
11/1/2011 14:00:00	48	1121	1.5%	356	71716	96.8%	74095
11/1/2011 16:00:00	37	806	1.1%	357	71730	96.8%	74095
11/1/2011 17:00:00	39	818	1.1%	359	71742	96.8%	74095
11/1/2011 18:00:00 11/1/2011 19:00:00	32 25	323 281	0.4% 0.4%	360 361	71752 71753	96.8% 96.8%	74095 74095
11/1/2011 19:00:00	27	92	0.4%	363	71755	96.8%	74095
11/1/2011 21:00:00	22	79	0.1%	363	71755	96.8%	74095
11/1/2011 22:00:00	11	52	0.1%	363	71755	96.8%	74095
11/1/2011 23:00:00 11/2/2011 0:00:00	7 5	25 17	0.0% 0.0%	364 364	71757 71757	96.8% 96.8%	74095 74095
11/2/2011 0:00:00	5	17	0.0%	364	71757	96.8%	74095
11/2/2011 2:00:00	3	5	0.0%	364	71757	96.8%	74095
11/2/2011 3:00:00	2	5	0.0%	364	71757	96.8%	74095
11/2/2011 4:00:00 11/2/2011 5:00:00	2	4	0.0% 0.0%	364 368	71757 71757	96.8% 96.8%	74095 74095
11/2/2011 0.00.00	0	0	0.0%	368	71757	96.8%	74095