

# October 2017 Wind Event After Action Report

Unitil Energy Systems



Emergency Management

February 2018

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## **Executive Summary**

### ***Weather Overview & Preparedness Activities***

On Thursday October 26<sup>th</sup>, weather forecasters began reporting the possibility of a significant storm system expected to impact the northeast late Sunday (Oct 29<sup>th</sup>) into Monday (Oct 30<sup>th</sup>) with heavy rain, lightning and gusty winds. As the storm progressed over the weekend, forecasters increased the severity and likelihood of the event; predicting moderate to heavy amounts of rain (1-3") and frequent gusts between 35-50 mph with isolated gusts up to 60 mph across the service territory. Most at risk for high wind gust was the Company's Seacoast region. High wind watches and warnings were issued for nearly all portions of the northeast especially for coastal parts of RI, MA and NH.

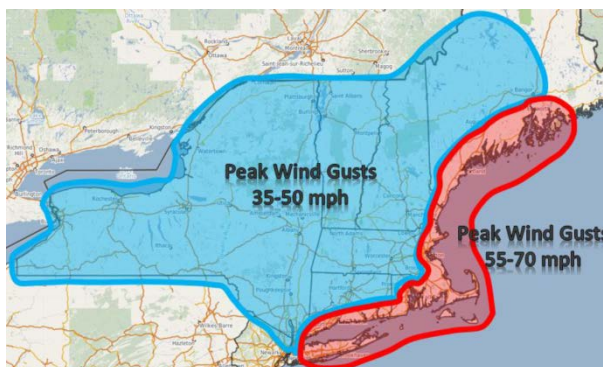


Figure 1 - Wind Advisories

In response to the forecasted winds, Unitil began holding daily coordination conference calls beginning on Friday (the 27<sup>th</sup>) with key logistical internal personnel to coordinate preparation activities in response to the pending wind event. Based on the forecasted weather and potential for outages, the Company began issuing its preparatory communication messages, and initiated contact with life support customers, regulators, emergency response, and municipal officials the following day. The EOCs were outfit prior to the storm and quickly took local control once the amount of outages exceeded the capabilities of the centralized dispatch center. The Seacoast and Capital EOC's were opened in advance of the weather event (Sunday evening) with the System EOC opening at 6 AM on Monday (the 30<sup>th</sup>) to provide essential logistical and communications support for responding resources.

Unitil's resource acquisition begins with confirming the availability of its internal line crews and support staff as well as on system contractor resources. Once the Company confirmed its normal contingent of UES internal crews (10) and on system contractors (11), it secured an additional 55 contractor line crews, 15 external tree crews, 9 damage assessors and 18 wire down guard to be available Monday morning (Oct 30<sup>th</sup>). Additionally, Unitil participated in routine, North Atlantic Mutual Assistance Group (NAMAG) calls beginning on October 30<sup>th</sup> to request additional resources however due to the storms region wide impact, the company was only able to acquire an additional 6 crews through the mutual aid process that could support the restoration in a timely manner. Ultimately, the acquired contracted resources were redirected to another Company as restoration progress was made sooner the resources projected arrival time.

### ***System Impacts & Restoration***

Scattered outages occurred across both of Unitil's NH service territories which were mostly attributed to tree damage and branches on powerlines. Peak interruptions occurred at approximately 5:19 AM on Monday, October 30<sup>th</sup> with 33,354 customers impacted (43% of Unitil's NH customers) with a cumulative total of 53,332 customers being impacted through the event.



The Company was challenged during the early phases of restoration due to ongoing hazardous winds that prevented line crews from safely raising the buckets<sup>1</sup>. There were multiple periods when the wind exceeded the safe threshold preventing line work that delayed the response. This delay can be measured in hours across both DOCs. Once the winds dropped below hazardous levels, crews were capable to respond to outages, with power being restored to 95% of the customers by 5pm on Tuesday (Oct 31<sup>st</sup>) and the majority of customers (99%) by noon on Wednesday (Nov 1<sup>st</sup>) with any remaining customer taking service once electricians completed work.

This storm was the fourth most devastating storm in terms of customer outages to impact NH. With the storms passing nearly 1.4 million customers were without power in the northeast due to severe flash flooding and tree damage (actual damage photos below). Upon completion of its restoration on Wednesday, Nov 1st, Unitil assisted neighboring utilities by releasing the majority of its external line crews, and sending 6 internal crews to Eversource Energy's New Hampshire region to assist in restoration.



Figures 2 - 5 – Damage Photos (Oct Wind Event)

<sup>1</sup> The company guidance is that buckets should not be raised when wind speeds exceed 35MPH unless it's a life threatening situation and then only if the operator feels safe.

### *Challenges & Lessons Learned*

Following the event, the Company held a formal event review with key response personnel to identify any lessons learned or areas for future improvement that were noted throughout the response.

The following strengths were noted throughout this event:

- Pre-staging of resources prior to the impact of the event aided in the ability to mobilize resources to the field quickly and develop work shifts once resources were safely able to respond;
- The collaboration between the Company and the NH State HSEM greatly improved the ability and timing to secure Canadian resources. Specifically, collaboration included the assistance in completion of Border Crossing documents that expedited movement of crews;
- The use of the iRestore application by the municipal responders provided damage pictures and locations which aided in identifying priorities and awareness of actual field conditions. Additionally, these pictures were easily divided by line and tree work and used to send the right type of restoration resources to the exact location while also providing a visual aid to customers on social media; and
- Though subjective the Company believes the Storm Resiliency Trimming Program reduced the number of tree related outages and had an overall positive impact on the time to restore customers.

Although the Company restored power to nearly 99% its impacted customers within 48 hours, several areas for improvement were identified for follow up:

- Logistical Coordination – The process should be evaluated to streamline logistical activities such as storm kit materials, onboard check-in, and meal delivery/setup;
- EOC Setup Documentation – Improve documentation for ensuring all tasks are completed prior to opening an EOC including technology specifications and requirements and the seamless decentralization of all tasks; and
- Outage Management System – Additional training and increasing the pool of staff that can operate OMS for large scale outage would be beneficial including system specific issues/configurations and leveraging additional technology (AMI) to ensure data integrity;

## Weather Forecast Overview

Beginning on October 26<sup>th</sup> (Thu), weather forecasters began reporting a significant storm system expected to impact the northeast late Sunday (Oct 29<sup>th</sup>) into Monday (Oct 30<sup>th</sup>) with heavy rain, lightning and gusty winds. As the storm progressed through the weekend, forecasters increased the severity and likelihood of the storm system predicting moderate to heavy amounts of rain (1-3") and frequent gusts of between 35-50 mph with isolated gusts predicted up to 60 mph across the entire service territory. High wind watches and warnings were issued for nearly all portions of the northeast especially for coastal parts of RI, MA and NH.

On October 29th and 30th, 2017 a strong low pressure system moving in from the Great Lakes region, along with the remnants of Tropical Storm Philippe combined to produce a long duration event of strong wind gusts, significant rain, and thunderstorms. There were two periods of significant wind gusts, the first between 8pm Oct. 29th through 5am Oct. 30th in which wind gusts of 45-70 mph were reported. The second period of wind occurred between 9am-6pm on Oct. 30th where wind gusts of 40-55 mph were reported. Periods of moderate to heavy rain, along with embedded thunderstorms, also occurred from the morning of Oct. 29th through midday of Oct. 30<sup>th</sup>. The timing of these hazardous winds prevented restoration progress immediately following the customer peak however once safe, resources were quickly mobilized to the field.

Unitil has tailored weather forecast through its primary weather vendor (DTN) while also leveraging publicly available weather information channels for additional input. Nearly all weather outlets were forecasting high wind gusts across the service area. In general, the forecast was accurate for the Seacoast area but underestimated the inland expansion of the high winds. A sample of DTN's weather forecast displayed below. As outlined, we had expected level 2 winds in the Capital area which was identified with high confidence as late as the 30<sup>th</sup> but, in reality saw gust that exceeded level 2 and were actually level 3 gusts. See Attachments 1 and 2 for DTNs Weather Event Review and Hourly Wind Data.

Date: October 30, 2017  
 Time: 6:00 AM EDT  
 Forecaster: Nate Hamblin

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event Starting in 30hrs	WIND	WIND	WIND	RAIN/WIND
Event Begin Time	6AM MON	9AM MON	9AM MON	6AM MON
Event End Time	6PM MON	6PM MON	6PM MON	7PM MON
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount				1.50-3.00"
Snow Amount				
Snow Character				
Ice Amount				
Sustained Winds	22-30 mph	18-28 mph	18-28 mph	22-30 mph
Common Gusts	32-45 mph	30-40 mph	30-40 mph	32-45 mph
Peak Gusts	45-60 mph	40-45 mph	40-45 mph	45-60 mph
Chance EEI-2 Gusts	100%	80%	80%	100%
Chance EEI-3 Gusts	100%	-	-	100%
Temp. Extremes	62/40	62/36	64/40	61/38

**Energy Event Index for UNITIL**

Valid Time: October 30, 2017 6:00 AM EDT

Parameter	Region	Day 1	Day 2	Day 3
Wind Speed	Capital	1	1	1
	Fitchburg	1	1	1
	Portland	2	1	1
	Seacoast	2	1	1
Wind/Gust	Capital	2	1	1
	Fitchburg	2	1	1
	Portland	3	1	1
	Seacoast	3	1	1
Confidence Level	Capital	High	High	High
	Fitchburg	High	High	High
	Portland	High	High	High
	Seacoast	High	High	High

**Energy Event Index**

**Definition**

With Leaves (Apr 1 - Nov 14)

EEI	Wind Speed	Wind/Gust
1	< 30 mph	< 35 mph
2	>= 30 mph	>= 35 mph
3	>= 45 mph	>= 50 mph
4	>= 60 mph	>= 65 mph
5	>= 70 mph	>= 75 mph

**UNITIL SERVICE AREA 48 HOUR OUTLOOK:**

**CAPITAL:** Scattered lighter rain showers will swing through later this morning. Additional rainfall: 0.10-0.20". Otherwise, dry weather will be likely through tonight. Hazard winds will be likely, detailed above. Wind direction: Becoming west-southwest. Winds could gust to 20-25 mph tonight at times. Dry weather is expected Tuesday and Tuesday night. Winds could gust to 20-30 mph during the day before going light at night. No hazards.

**Confidence:** Confidence is high that hazard winds will occur today. See table above for EEI gusts chances. Otherwise, confidence is high that no hazard conditions will occur tonight through Tuesday.

**SEACOAST:** Scattered lighter rain showers will swing through later this morning. Additional rainfall: 0.10-0.20". Otherwise, dry weather will be likely through tonight. Hazard winds will be likely, generally detailed above. Peak gusts of 50-60 mph will continue through 7am Monday. After 7am Monday, peak gusts of 45-50 mph will be possible. Wind direction: Becoming west-southwest. Winds could gust to 20-25 mph tonight at times. Dry weather is expected Tuesday and Tuesday night. Winds could gust to 20-30 mph during the day before going light at night. No hazards.

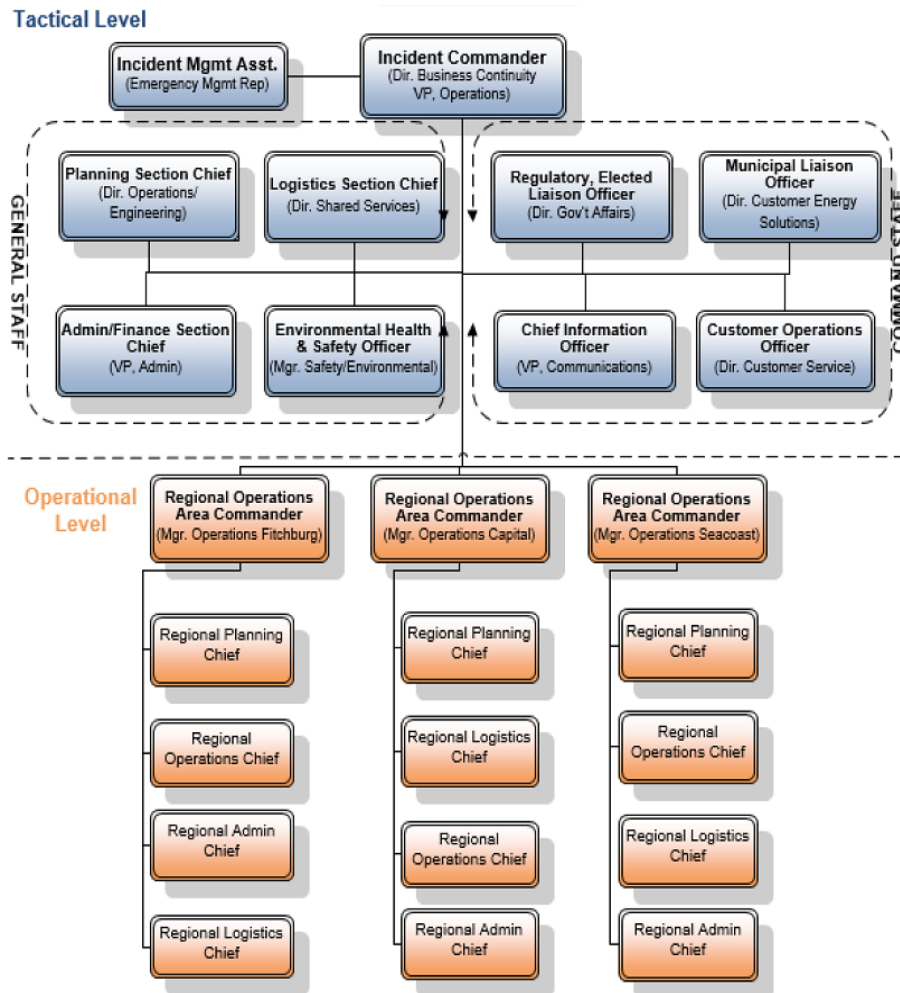
**Confidence:** Confidence is high that hazard winds will occur today. See table above for EEI gusts chances. Otherwise, confidence is high that no hazard conditions will occur tonight through Tuesday.

Additionally, Unitil analyzes a number of forecasts from multiple vendors. In particular, Unitil subscribes to WeatherBELL Analytics, Inc. which provides the actual model runs that most forecasting agencies develop their information. The company uses the European model and American models to compare and contrast and cross reference to the DTN forecast. Please see Attachment 3 to view the model runs.



## Preparedness Activities & Communications

In response to the forecasted winds, Unitil began holding daily coordination conference calls beginning on Friday (the 27th) with key internal personnel to coordinate preparation activities. Based on the forecasted weather and potential for outages, the Company began issuing its preparatory communication messages and initiated contact with life support customers, regulators, emergency response, and municipal officials. The EOCs were setup prior to the storm and quickly took local control. The Seacoast and Capital EOC’s were opened in advance of the weather event (Sunday evening) with the System EOC opening at 6 AM on Monday (the 30th) to provide essential logistical and communications support for responding resources.



Figures 6 – Unitil ICS Structure

The Communication team crafted public service announcements to distribute routinely prior to and throughout the event to provide important safety and contact information and detail restoration progress. These messages began on Saturday, Oct 28<sup>th</sup> with preparation messages and were updated twice daily throughout the event with additional information for a total of 7 PSAs being disseminated through various media channels (news and social media). In addition, the Company leverages its social media channels (Twitter/Facebook) to share additional messages and communicate with customers with over 50 messages being broadcast (examples follow).





Figure 7 - Social Media Posts

Social Media Statistics		
	Facebook	Twitter
Existing Followers/Fans	11,609	
New Followers/Fans	311	276
Messages Posted/Sent	55	325
Messages Received	844	370

Figure 8 - Social Media Statistics

A common theme of major events is an expected growth in followers or “fans” on the Company’s social media account which was also noted throughout this event. Overall, the Company saw a 5.3% increase in its follower and fan base (see Figure 8 above) which allows for more interaction with the affected public and the Company’s messaging to be broadcast to a larger audience. Unitil has a dedicated Communications team to manage the Company’s social media accounts, which has proved very helpful for providing information and communicating with customers during emergency events.

Life Support customers (LSCs) were contacted by the Customer Service Center prior to the expected impact to provide safety and contact information in the event of a service interruption. Nearly 35,000 customer calls were made to the customer call center throughout the event in addition to online outage reporting with the following CSC call statistics provided:

Date	Time	PORCHE IVR			* IVR/CSC Service Level (Combined)	SIEMENS Phone System/CSC					
		Total # of calls in the IVR	# Selecting Outage Option (update or ticket)	% Reporting Outage		# CSR Calls Received	# CSR Calls Answered	% Customers Opting out of IVR	# Abnd	Avg Wait Time	Peak Staffing
30-Oct	12am-12pm	21,022	15,874	76%	99%	5,148	4,591	24%	547	0:35	17
	<b>Daily Total</b>	<b>21,022</b>	<b>15,874</b>	<b>76%</b>	<b>99%</b>	<b>5,148</b>	<b>4,591</b>	<b>24%</b>	<b>547</b>	<b>0:00</b>	<b>17</b>
31-Oct	12am-12pm	3,795	2,134	56%	99%	1,661	1,585	44%	66	0:18	18
	<b>Daily Total</b>	<b>3,795</b>	<b>2,134</b>	<b>56%</b>	<b>99%</b>	<b>1,661</b>	<b>1,585</b>	<b>44%</b>	<b>66</b>	<b>0;</b>	<b>18</b>
1-Nov	12am-12pm	2,041	657	32%	97%	1,384	1,226	68%	139	1:06	17
	<b>Daily Total</b>	<b>2,041</b>	<b>657</b>	<b>32%</b>	<b>97%</b>	<b>1,384</b>	<b>1,226</b>	<b>68%</b>	<b>139</b>	<b>0:07</b>	<b>17</b>
	<b>Storm Total</b>	<b>26,858</b>	<b>18,665</b>	<b>69%</b>	<b>99%</b>	<b>8,193</b>	<b>7,402</b>	<b>45%</b>	<b>752</b>	<b>0:03</b>	<b>52</b>

Figure 9 - Customer Call Center Statistics

Communications with Regulatory, Elected, and State Management Officials also began on Saturday, Oct 28<sup>th</sup> to notify them of Unitil's preparations and provide a point of contact. The Company also worked with NH HSEM staff on securing waivers to expedite border crossing procedures for crews coming from Canada. The Company continued to update these contacts with routine information including the required PUC Crew and Outage report forms until restoration was nearly completed.

The Municipal Rooms in each EOC were activated and staffed with liaisons to provide a 24/7 available contact for municipal responders within its service territory. Pre-event notices were sent to all Municipal Official contacts informing them of the time the Municipal Room would be open and the means to contact the Company. The Municipal Rooms also monitored the iRestore portal to ensure any reports submitted by Municipal Officials via the mobile app were managed appropriately.

Once it was known that customer interruptions could be extended, the Company began hosting Municipal Conference calls to speak one-on-one with the affected towns emergency response personnel to provide restoration and crew information and solicit any issues or concerns. The Capital and Seacoast Region held calls on Oct 30<sup>th</sup> at 3 PM and another at 10 AM the following day (Tues, Oct 31<sup>st</sup>). As restoration was nearing completion, the EOC's were closed that night and no further municipal calls were held however Operations worked closely with municipalities on any outstanding issues or follow up work.

## Event Impact & Restoration Overview

Scattered outages occurred across both of Unitil's NH service territories which were primarily related to tree damage and branches on powerlines. The Company had retained additional resources, however ongoing hazardous winds initially prevented line crews from safely raising buckets to respond. Peak interruptions occurred at approximately 5:19 AM on October 30th with 33,354 customers impacted (43% of Unitil's NH customers) with a cumulative total of 53,332 customers being impacted through the event. Although the Capital Region experienced more outages (locations of damage), the Seacoast Region experienced a larger customer impact. The first outage occurred on Oct. 29<sup>th</sup> at 7:50 PM and the last customer was restored at Nov. 1<sup>st</sup> at 5:54PM; however the majority of impacted customers (95%) were restored by 6 AM on Nov 1<sup>st</sup>.

<b>Table 1 - Regional Impact Summary</b>		
	Seacoast Region	Capital Region
<b># Trouble Locations (Total)</b>	167	237
<b># Cust. Impact (Peak)</b>	21,857	12,479
<b># Cust. Impact (Cumulative)</b>	34,007	19,325
<b># Ft. Wire Replaced</b>	1842	2867
<b># Poles Replaced</b>	9	8
<b># Cross Arms Replaced</b>	13	15
<b># Transformers Replaced</b>	8	32

Reports of wires down or other hazardous electrical equipment were reported to the Company through various means (customer calls, municipal official reports, online reporting, and iRestore) with at least 136 reports received throughout the event. Unitil tracked each reported instance in a SharePoint data base and worked closely with municipal first responders to ensure any Priority 1 calls (life threatening in nature) were responded to immediately. Our goal, as always, is to ensure the public is safe and to free municipal first responders from the task of standing-by a down wire. As usual, many (we estimate 50%) of the wires were not electrical in nature; however all were responded to appropriately.

The Company also utilizes a mobile application (iRestore) that allows approved Municipal Officials to send follow up pictures and locations of damage via their smartphones after they have notified the Company. The Regional Municipal Room monitored the iRestore portal during the event, matching the received reports with municipal calls.

The Company found this process, which it has incorporated into the wire-down response procedure, extremely useful in helping it determine the urgency of response and the right resources to send based on the type of damage. The Company received 30 reports through the iRestore application during the wind event and used some of these pictures on social media as talking points to explain customer damage as shown in the following image.



Figure 10 – iRestore Photo Social Media Use

Though subjective, the Company believes the Storm Resiliency Trimming Program reduced the number of tree related outages and had an overall positive impact on the time to restore customers. Once the winds dropped below hazardous levels, crews responded to outages with power being restored to the majority of customers (95%) by 6 AM on Wednesday (Nov 1st) and the remaining customer restored throughout the remainder of the day. The majority of damage was caused by tree limbs and debris coming into contact with electrical equipment. The first outage occurred on Oct. 29<sup>th</sup> at 7:50 PM and the last customer was restored at Nov. 1<sup>st</sup> at 5:54PM; however the majority of impacted customers (95%) were restored by 6 AM on Nov 1<sup>st</sup>.

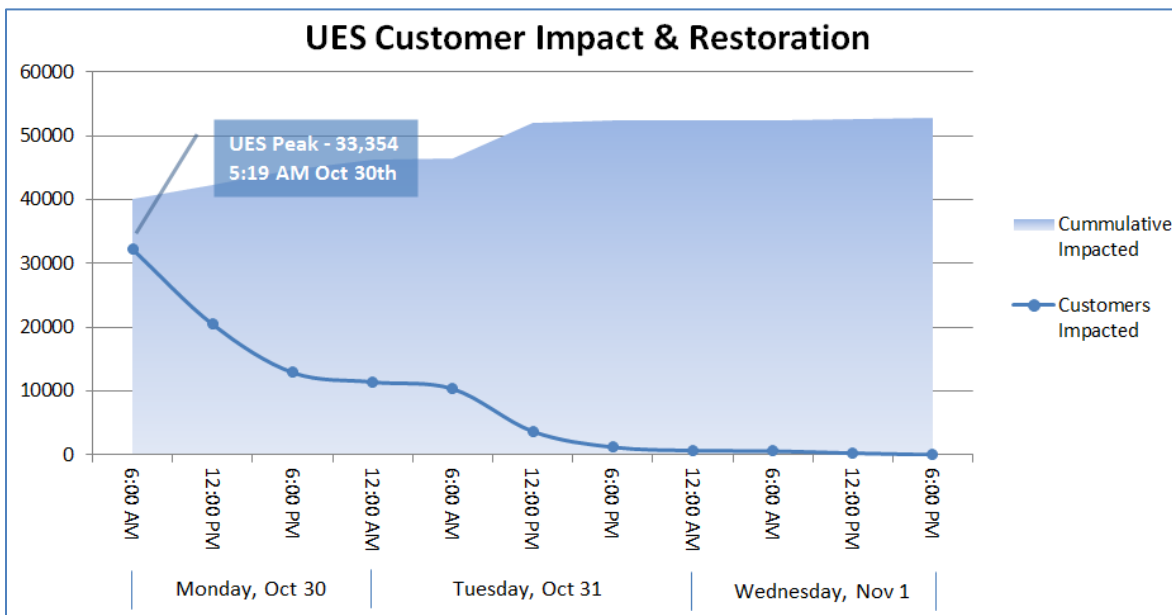


Figure 11 - UES Restoration Curve

### Resource Availability

Once Unitil was aware of the escalating weather conditions it began securing additional local crews to be on property prior to impact. As outages began to spread across the Region, and resources became scarce, the North Atlantic Mutual Assistance Group (NAMAG) was activated (which also quickly notified neighboring RMAGs) as several impacted member Companies were in need of additional resources. NAMAG calls were held at the following times: Oct 30<sup>th</sup> 8 AM and 1 PM; Oct 31<sup>st</sup> 9 AM and 7 PM; Nov 1<sup>st</sup> 9:30 AM. However, resource requests could not be fulfilled through NAMAG as all member utilities were either requesting or holding and it was necessary to acquire resources from neighboring RMAGs (Great Lakes Mutual Aid and Southeast Exchange Mutual Aid Groups); this required further travel and increased response times. The Company was able to retain resources from Canada to ensure it had an adequate amount for restoration and coordinated with the NH HSEM to initiate border crossing procedures.

Table 2 details the amount of resources at peak (max) for the event while Figure 12 displays the availability of resources over the event.

Table 2 – Peak Resource Numbers		
Crew Type	# Crews	# FTEs
Internal Line	12	24
External Line	55	110
Tree	15	30
Damage Assessor	9	9
Wires Down	18	18
Support Personnel	≈80	≈80

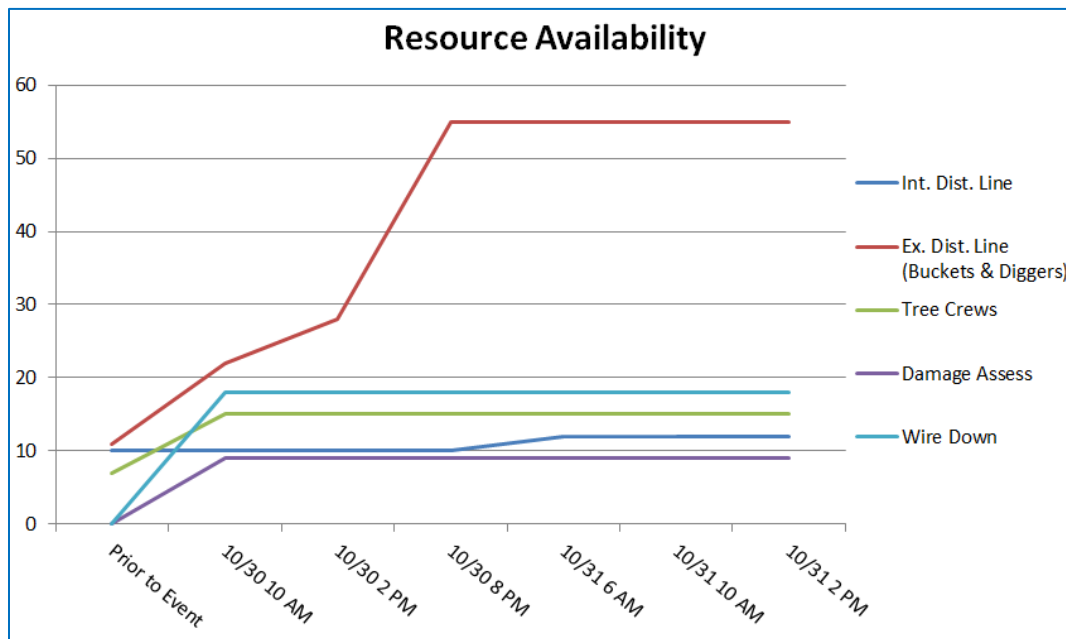


Figure 12 – Resource Availability Overview





Additionally, once The Company was near the end of its restoration, it redeployed the majority of its additional contractor line crews through NAMAG to support neighboring utilities still requiring resources. The Company was able to ensure crews released were redeployed to nearby utilities and also sent 6 internal crews to assist Eversource NH in its restoration. After review of submitted resource reports issued during the event, minor adjustments were made with updated crew reports found in [Attachment 6](#) to this report.

## **Event Costs**

The Company's Administration/Finance Section Chief began tracking the cost of this event from the onset. The primary driver is the number of outside restoration resources acquired and related logistics such as food and lodging. The total expense cost associated with this storm is \$1,233,742.

## **Challenges & Lessons Learned**

Following the event, the Company held a formal event review with key response personnel to identify any lessons learned or areas for future improvement that were noted throughout the response. The following strengths and challenges were identified with resulting action items also listed.

### ***Strengths***

The following strengths were noted throughout this event:

- The use of the iRestore application by the municipal responders provided damage pictures and locations which aided in identifying priorities and awareness of actual field conditions. Additionally, these pictures were used to send the right type of restoration resources to the location and provided a visual aide to customers on social media.
- The collaboration between the Company and the NH State HSEM greatly improved the ability and timing to secure Canadian resources. Specifically, collaboration included the assistance in completion of Border Crossing documents that expedited movement of crews.
- Pre-staging of resources prior to the impact of the event aided in the ability to mobilize resources to the field quickly and develop work shifts once resources were safely able to respond.
- The company's Storm Resiliency Trimming Program reduced the number of tree related outages and clearly had a positive impact on the time to restore customers.

### ***Challenges***

Several areas for improvement were identified throughout the Company's response for follow up which are detailed below with resulting recommendation for improvement:

- Logistical Coordination – The process should be evaluated to streamline logistical activities such as storm kit materials, onboard check-in, and meal delivery/setup
  - Additional review and updating of logistical processes to incorporate changes and lessons learned/best practices
- Outage Management System – Additional training and increasing the pool of staff that can operate OMS for large scale outage would be beneficial including system specific issues/configurations and leveraging additional technology (AMI) to ensure data integrity
  - Additional staff identified and higher frequency of training to be provided to non-traditional OMS users
- EOC Setup Documentation – Improve documentation for ensuring all tasks are completed prior to opening an EOC including technology specifications and requirements and the seamless decentralization of all tasks
  - Review and update decentralization and EOC activation procedures to ensure additions or updates to technology and equipment are noted

## Attachment 1 – DTN Weather Event Report

**Analysis of the October 2017 Northeast Wind Event**

Prepared by: Kris Haugen – Energy Team Lead, DTN Meteorological Operations

**Summary of Events**

On October 29<sup>th</sup> and 30<sup>th</sup>, 2017 a strong low pressure system moving in from the Great Lakes region, along with the remnants of Tropical Storm Philippe combined to produce a long duration event of strong wind gusts, significant rain, and thunderstorms. See Figure 1. There were two periods of significant wind gusts, the first between 8pm ET Oct. 29<sup>th</sup> through 5am ET Oct. 30<sup>th</sup> in which wind gusts of 45-70 mph were reported. The second period of wind occurred between 9am-6pm Oct. 30<sup>th</sup> where wind gusts of 40-55 mph were reported. Periods of moderate to heavy rain, along with embedded thunderstorms, also occurred from the morning of Oct. 29<sup>th</sup> through midday of Oct. 30<sup>th</sup>. Rainfall amounts of 1.50-5.00" were recorded. Another culminating factor to this event was the fact that many of the trees across the Northeast still had leaves on trees, along with a fairly saturated ground from a rain storm days prior to this event.

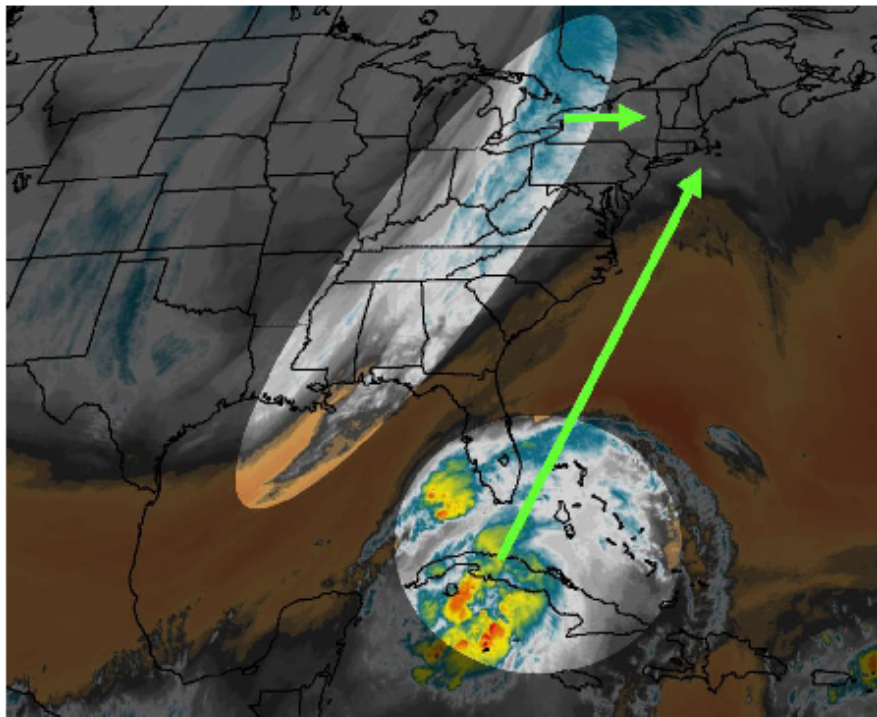


Figure 1: Infrared satellite image from October 29, 2017





**DTN Forecast**

Thursday, October 26, 2017

As early as Oct. 26<sup>th</sup> the weather models were indicating a possible hazard wind gust event for the Northeast. However, there was disagreement regarding the timing and position of the low that was expected to develop as a result of the two weather systems combining. If the low were to develop along the Eastern Coast of the United States then a shorter duration and lessened wind gust impact would occur. However, if the low were to develop in the Hudson Valley of New York, as some models were indicating, then a longer duration and much higher wind gust impact would affect a much broader area of the Northeast. At this time DTN was reflecting a possible hazard wind gusts event, both inside and outside of thunderstorm activity, Sunday into Sunday night; and another period of gusty winds through the day on Monday.

New England (CT, RI, MA, NH & ME)	COMMON GUSTS	PEAK WIND GUSTS
Sunday & Sunday Night	35-45 mph	45-50 mph
Monday	40-50 mph	

New York	COMMON GUSTS
Sunday & Sunday Night	30-40 mph
Monday	40-50 mph

Friday, October 27, 2017

Moving into Oct 27<sup>th</sup> the weather models were starting to come into better agreement of a low developing in the Hudson Valley of New York, which increased DTN's confidence that this would be a longer duration and more widespread hazard wind event for the Northeast. There was also a slight shift in timing with the models showing the peak wind event occurring Sunday night into early Monday morning; and then another round of winds spiking during the daytime hours Monday. Subsequently, wind gusts were increased Sunday night into Monday morning across New England; while the forecast remained generally the same in New York with an adjustment to timing.

New England (CT, RI, MA, NH & ME)	COMMON GUSTS	PEAK WIND GUSTS
Sunday Night/Early Monday	40-50 mph	55-65 mph
Daytime Monday	40-50 mph	

New York	COMMON GUSTS
Sunday Night/Early Monday	30-40 mph
Daytime Monday	40-50 mph



Saturday & Sunday, October 28-29, 2017

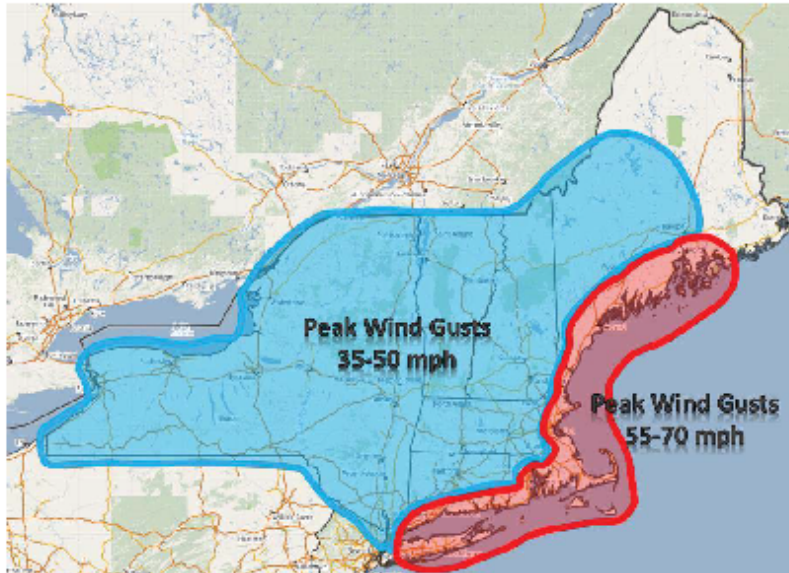
By Oct. 28<sup>th</sup> & 29<sup>th</sup>, the models were in good agreement on the timing, strength, and the Hudson Valley position of the developing low. This led to higher confidence in the overall forecast for the Northeast. The strongest winds were expected Sunday night into early Monday morning, with the highest gusts expected across coastal areas.

New England (CT, RI, MA, NH & ME)	COMMON GUSTS	PEAK WIND GUSTS
Sunday Night/Early Monday	40-50 mph	50-65 mph
Daytime Monday	40-50 mph	

New York	COMMON GUSTS	PEAK WIND GUSTS
Sunday Night - Monday	30-40 mph	45-55 mph

**Event Impact**

Strong, hazardous wind gusts affected the majority of the Northeast Sunday night, Oct. 29<sup>th</sup> through Monday, Oct. 30<sup>th</sup>. The strongest wind gusts were recorded between 8pm ET Oct. 29<sup>th</sup> and 5am ET Oct. 30<sup>th</sup>, with gusts of 55-70 mph experienced along the Eastern Atlantic Seaboard from Long Island, NY and coastal Connecticut and up through coastal Maine. Wind gusts of 35-50 mph were experienced over the rest of the Northeast. A second period of wind gusts continued through the day on Monday making this a prolonged hazardous wind event, which downed trees and branches and caused numerous power outages. See images and tables below areas of peak wind gusts and timing.



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CONNECTICUT	PEAK GUST	TIME (Oct. 29)
Groton	65 mph	11:31 PM (Oct. 29)
Stamford	65 mph	1:36 AM
Bridgeport	58 mph	11:30 PM (Oct. 29)
Meriden	56 mph	1:06 AM
New Haven	51 mph	11:02 PM (Oct. 29)
New London	47 mph	12:36 AM

RHODE ISLAND	PEAK GUST	TIME (Oct. 29)
Block Island	71 mph	12:00 AM (Oct. 30)
Warwick	63 mph	11:29 PM
Barrington	62 mph	11:40 PM
Providence	61 mph	12:06 AM (Oct. 30)
Bristol	59 mph	10:00 PM
Newport	55 mph	10:35 PM

MASSACHUSETTS	PEAK GUST	TIME (Oct. 30)
Mashpee	93 mph	3:49 AM
Fairhaven	76 mph	2:50 AM
Wellfleet	72 mph	3:39 AM
Nantucket	70 mph	3:34 AM
Plymouth	68 mph	2:48 AM
Chatham	67 mph	3:29 AM
Taunton	67 mph	11:50 AM (Oct. 29)
Milford	67 mph	6:17 AM
East Falmouth	65 mph	1:29 AM
Barnstable	64 mph	3:12 AM
Milton	63 mph	12:38 AM
Boston	53 mph	12:43 AM
Hyannis	52 mph	3:46 AM
New Bedford	51 mph	12:05 AM
Williamstown	42 mph	4:52 AM
Pittsfield	41 mph	4:29 AM

NEW HAMPSHIRE	PEAK GUST	TIME (Oct. 30)
Meredith	68 mph	2:07 AM
Manchester	59 mph	1:47 AM
ML Washington Airport	58 mph	2:57 AM
Portsmouth	56 mph	5:45 AM
Skyhaven Airport	56 mph	5:05 AM
Berlin	51 mph	2:41 AM
Concord	51 mph	12:09 AM
Laconia	43 mph	12:07 AM
Lebanon	39 mph	3:44 AM

MAINE	PEAK GUST	TIME (Oct. 30)
South Bristol	71 mph	6:00 AM
Augusta	70 mph	8:05 AM
Portland	69 mph	6:09 AM
Denmark	64 mph	6:02 AM
Camden	54 mph	7:20 AM
Wells	54 mph	6:06 AM
Rangely	51 mph	6:40 AM
Jackson	50 mph	7:46 AM
Auburn	47 mph	5:56 AM
Senford	47 mph	4:53 AM
Knox Co. Airport	44 mph	5:53 AM
Eastern Slopes Airport	40 mph	2:25 AM
Waterville	39 mph	6:08 AM

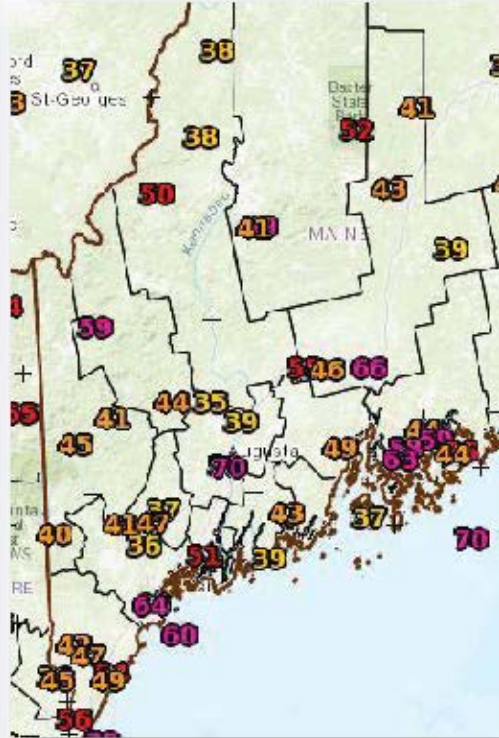
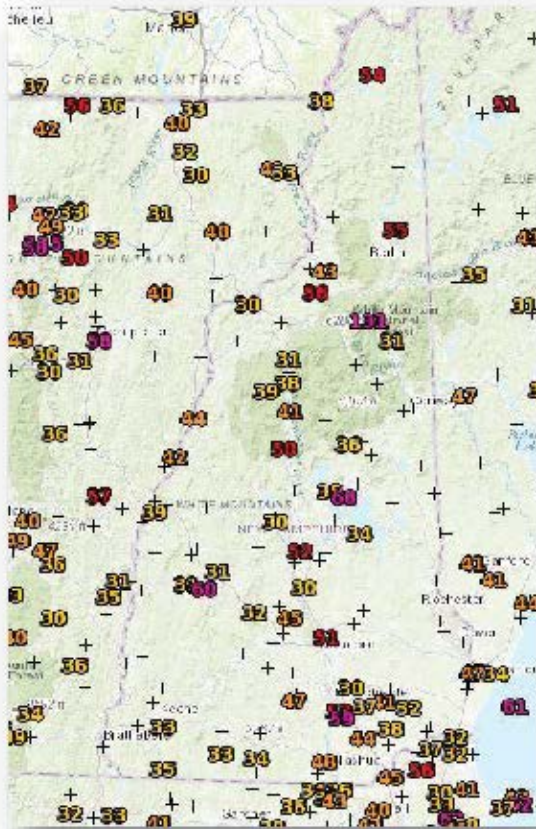
NEW YORK	PEAK GUST	TIME (Oct. 30)
Watertown	52 mph	4:35 AM
Orwigo	52 mph	7:47 AM
Wellsville	49 mph	5:55 AM
Schenectady	48 mph	11:30 AM
Albany	46 mph	4:51 AM
Batavia	46 mph	5:30 AM
Fredonia	45 mph	8:10 AM
Rochester	45 mph	7:47 AM
Watertown	43 mph	9:07 AM
Edinburg	41 mph	4:30 AM
Buffalo	38 mph	7:54 AM
Herkimer	37 mph	4:30 AM
Olean	35 mph	5:55 AM

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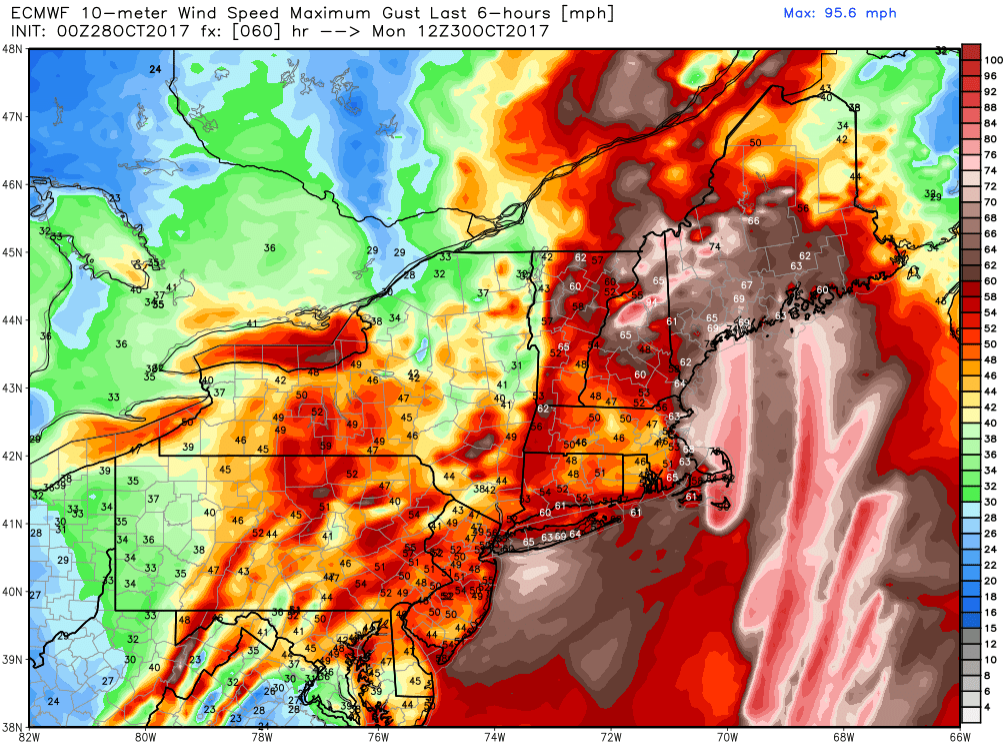
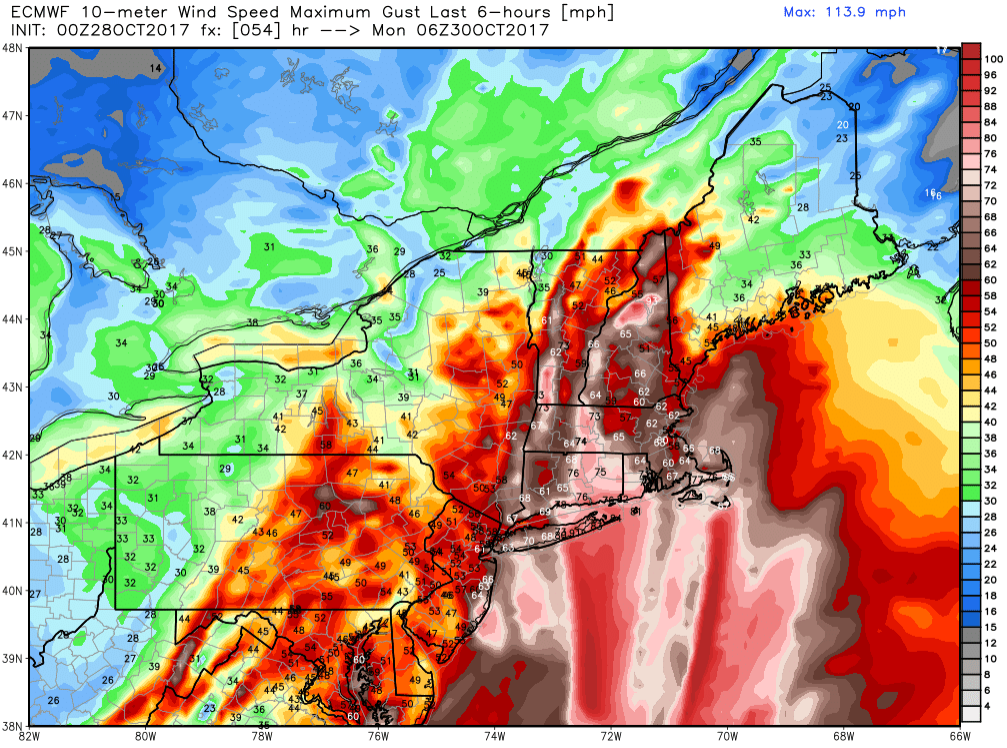


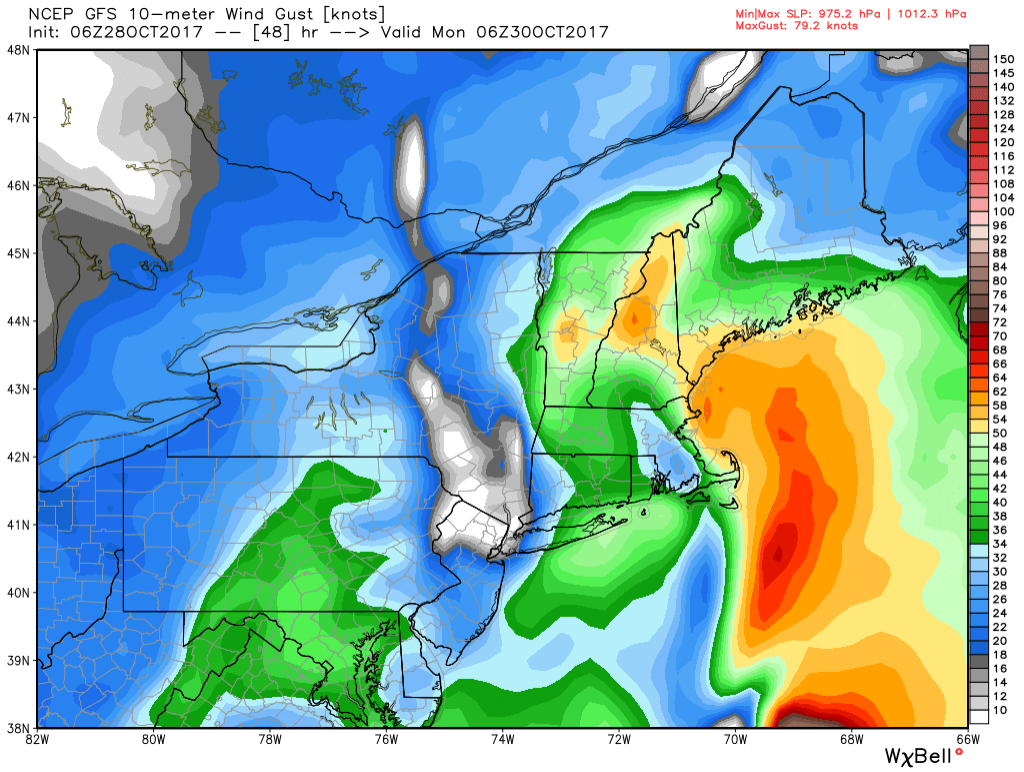
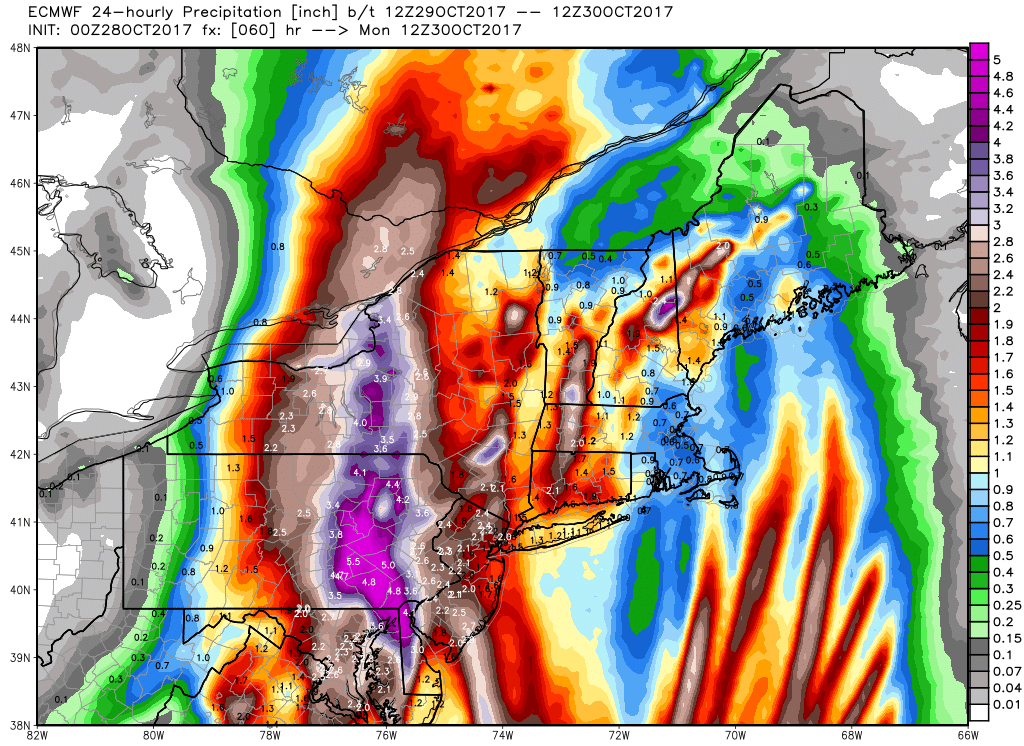
Attachment 2 – Hourly Wind Speeds (DTN)

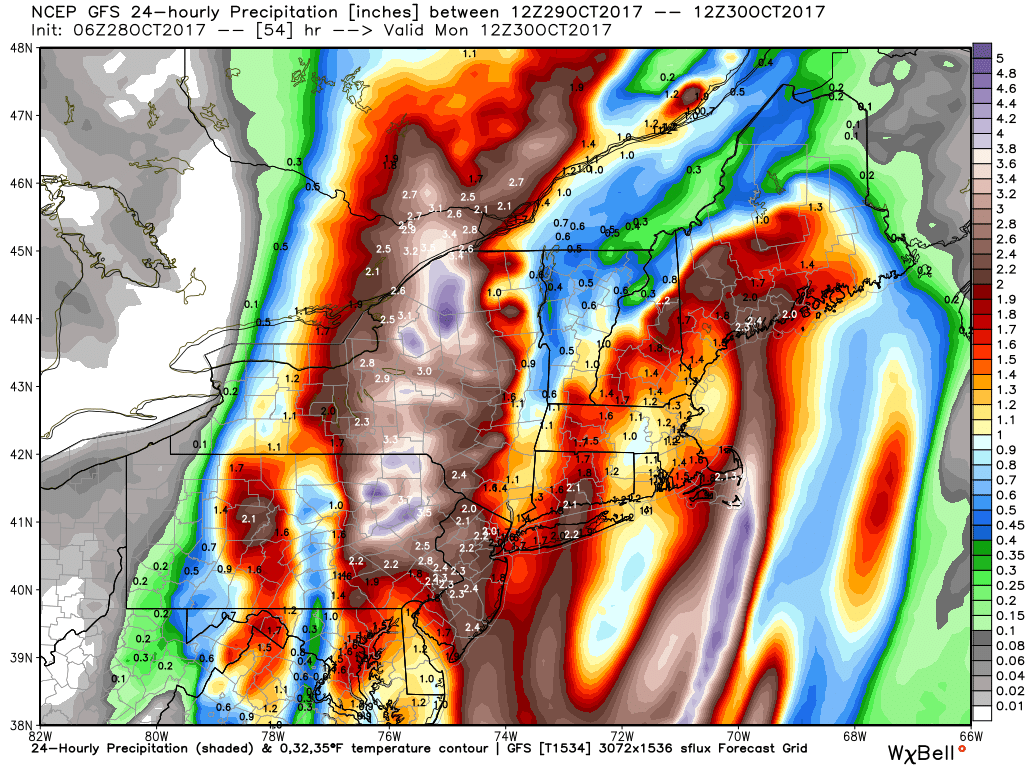
<b>PORTSMOUTH (KPSM) for October 30, 2017</b>						
Hour	Temperature (°F)	Dew Point (°F)	Relative Humidity (%)	Precipitation (in.)	Wind (mph)	Conditions
12:00 AM EDT	60.1	58.6	97	0.13	E at 26 G 39	Rain
1:00 AM EDT	60.4	59.4	97	0.13	E at 29 G 40	Rain
2:00 AM EDT	61.5	59.7	93	0.37	ESE at 30 G 51	Rain
3:00 AM EDT	61.3	60.1	97	0.31	ESE at 31 G 48	Rain
4:00 AM EDT	61.5	60.1	93	0.62	E at 28 G 45	Rain
5:00 AM EDT	61.7	60.3	93	0.09	ESE at 36 G 53	Windy
6:00 AM EDT	61.9	60.4	93	0.00	SE at 36 G 56	Rain
7:00 AM EDT	62.1	60.3	93	0.00	SSE at 14 G 53	Mostly Cloudy
8:00 AM EDT	62.2	60.4	93	0.00	S at 10	Mostly Cloudy
9:00 AM EDT	62.8	59.2	87	0.00	SSE at 14 G 24	Cloudy
10:00 AM EDT	62.4	56.5	81	0.00	SSE at 20 G 30	Mostly Cloudy
11:00 AM EDT	62.2	51.1	67	0.00	S at 13 G 32	Mostly Cloudy
12:00 PM EDT	60.3	49.3	67	0.01	S at 17 G 36	Cloudy
1:00 PM EDT	54.5	51.3	86	0.00	WSW at 13 G 31	Showers
2:00 PM EDT	54.9	43.3	64	0.00	WSW at 21 G 38	Mostly Cloudy
3:00 PM EDT	55.6	41.0	57	0.00	WSW at 22 G 45	Mostly Cloudy
4:00 PM EDT	53.8	38.8	57	0.00	WSW at 22 G 36	Mostly Cloudy
5:00 PM EDT	53.6	36.0	51	0.00	WSW at 20 G 38	Mostly Sunny
6:00 PM EDT	51.3	34.2	52	0.00	SW at 10 G 30	Clear
7:00 PM EDT	50.5	33.6	52	0.00	WSW at 12 G 20	Clear
8:00 PM EDT	48.7	33.3	54	0.00	SW at 8	Clear
9:00 PM EDT	47.1	34.0	61	0.00	S at 7	Clear
10:00 PM EDT	47.3	34.9	63	0.00	SSW at 6	Clear
11:00 PM EDT	45.5	35.6	68	0.00	SSW at 3	Clear

<b>CONCORD (KCON) for October 30, 2017</b>						
Hour	Temperature (°F)	Dew Point (°F)	Relative Humidity (%)	Precipitation (in.)	Wind (mph)	Conditions
12:00 AM EDT	63.0	60.1	90	0.29	ESE at 17 G 40	Rain
1:00 AM EDT	63.0	61.0	93	0.40	ESE at 16 G 51	Rain
2:00 AM EDT	63.0	60.1	90	0.20	ESE at 28 G 45	Rain
3:00 AM EDT	63.0	60.1	90	0.32	ESE at 24 G 49	Rain
4:00 AM EDT	63.0	61.0	93	0.23	ESE at 18 G 49	Rain
5:00 AM EDT	63.0	61.0	93	0.05	ESE at 18 G 40	Rain
6:00 AM EDT	63.0	61.0	93	0.00	SSE at 17 G 24	Rain
7:00 AM EDT	62.1	60.1	93	0.00	SSE at 17 G 29	Rain
8:00 AM EDT	61.0	59.0	93	0.00	SSE at 16 G 28	Rain
9:00 AM EDT	61.0	57.0	87	0.00	SSE at 14 G 23	Rain
10:00 AM EDT	63.0	55.0	75	0.00	S at 18 G 31	Rain
11:00 AM EDT	62.1	53.1	73	0.00	S at 17 G 29	Rain
12:00 PM EDT	61.0	51.1	70	0.00	SSW at 14 G 23	Rain
1:00 PM EDT	54.0	48.0	80	0.00	WSW at 9	Rain
2:00 PM EDT	53.1	45.0	74	0.00	W at 10	Rain
3:00 PM EDT	53.1	39.9	62	0.00	W at 17 G 37	Mostly Sunny
4:00 PM EDT	53.1	39.0	59	0.00	W at 12 G 38	Mostly Cloudy
5:00 PM EDT	52.0	35.1	52	0.00	SW at 13 G 35	Sunny
6:00 PM EDT	50.0	34.0	54	0.00	WSW at 15 G 20	Clear
7:00 PM EDT	48.0	34.0	59	0.00	SW at 5	Clear
8:00 PM EDT	44.1	35.1	71	0.00	SSE at 6	Clear
9:00 PM EDT	43.0	35.1	73	0.00	SSE at 7	Clear
10:00 PM EDT	43.0	36.0	76	0.00	SSE at 7	Clear
11:00 PM EDT	43.0	36.0	76	0.00	S at 7	Clear

Attachment 3 – WeatherBell Analytic Models









Attachment 4 – UES Customer Hourly Interruptions By Town (Capital Region)

	Allenstown	Boscawen	Bow	Canterbury	Chichester	Concord	Dunbarton	Epsom	Hooksett	Hopkinton	Loudon	Pembroke	Salisbury	Webster
10/29/17 8:00 PM	0	0	128	0	0	0	0	0	0	0	0	0	0	0
10/29/17 9:00 PM	8	0	128	0	127	0	0	6	0	0	23	0	0	0
10/29/17 10:00 PM	8	0	0	0	127	0	0	6	0	0	23	0	0	0
10/29/17 11:00 PM	8	0	1	0	127	0	0	68	0	0	23	0	0	0
10/30/17 12:00 AM	8	117	951	72	71	164	0	6	1	0	0	0	0	0
10/30/17 1:00 AM	8	270	989	484	1037	2051	1	1351	1	18	74	31	19	414
10/30/17 2:00 AM	13	398	1279	484	1037	3934	1	1480	1	18	134	31	34	414
10/30/17 3:00 AM	13	398	1631	487	1074	4478	1	1480	1	18	134	31	34	414
10/30/17 4:00 AM	13	398	1631	507	1074	4514	1	1480	1	18	134	31	34	414
10/30/17 5:00 AM	13	398	1631	507	1074	5734	1	1480	1	18	134	31	34	414
10/30/17 6:00 AM	13	398	1605	530	1074	5037	1	1480	1	18	134	31	34	414
10/30/17 7:00 AM	13	398	1605	530	1074	5053	1	1480	1	18	134	31	34	414
10/30/17 8:00 AM	13	398	1606	530	430	3656	1	567	1	18	131	0	34	414
10/30/17 9:00 AM	13	398	1607	507	480	2251	1	598	1	18	131	15	41	414
10/30/17 10:00 AM	13	398	1607	507	480	3094	1	598	1	18	131	15	41	414
10/30/17 11:00 AM	13	398	1608	507	480	2558	1	615	1	18	131	0	41	414
10/30/17 12:00 PM	13	399	1608	507	481	2641	1	619	1	18	131	0	41	414
10/30/17 1:00 PM	13	399	1000	498	504	2673	1	619	1	18	131	0	41	414
10/30/17 2:00 PM	13	399	1000	499	504	2525	1	620	1	18	131	0	41	414
10/30/17 3:00 PM	13	255	1000	499	541	2603	1	636	1	18	131	0	36	414
10/30/17 4:00 PM	8	252	674	438	541	2317	1	572	0	18	131	0	29	414
10/30/17 5:00 PM	8	252	326	438	542	2346	2	572	0	18	131	0	29	414
10/30/17 6:00 PM	8	248	247	438	542	2403	2	572	0	18	131	0	29	373
10/30/17 7:00 PM	8	4	274	438	482	2069	2	572	0	18	131	0	15	104
10/30/17 8:00 PM	8	4	111	438	467	2143	2	591	0	18	131	0	15	115
10/30/17 9:00 PM	0	4	136	281	467	1921	2	585	0	18	131	0	16	115
10/30/17 10:00 PM	0	5	136	281	467	1843	2	585	0	18	131	0	16	116
10/30/17 11:00 PM	0	5	136	281	467	1844	2	585	0	18	131	0	16	116
10/31/17 12:00 AM	0	5	136	281	467	1844	2	585	0	18	131	0	16	116
10/31/17 1:00 AM	0	5	136	281	467	1838	2	585	0	18	131	0	16	116
10/31/17 2:00 AM	0	5	136	281	467	1838	2	585	0	18	131	0	16	116
10/31/17 3:00 AM	0	5	136	281	467	1838	2	585	0	18	131	0	16	116
10/31/17 4:00 AM	0	5	136	281	467	1838	2	585	0	18	131	0	16	116
10/31/17 5:00 AM	0	5	136	281	467	1838	2	585	0	18	131	0	16	116
10/31/17 6:00 AM	0	5	136	281	467	1838	2	585	0	18	131	0	16	116
10/31/17 7:00 AM	0	5	136	281	467	1823	2	585	0	18	131	0	16	116
10/31/17 8:00 AM	0	5	136	281	467	1823	2	585	0	18	131	0	16	116
10/31/17 9:00 AM	0	5	136	281	467	1823	2	585	0	18	131	0	16	116
10/31/17 10:00 AM	0	5	136	273	467	983	2	585	0	18	131	0	16	116
10/31/17 11:00 AM	0	5	136	273	467	983	2	561	0	18	131	0	16	116
10/31/17 12:00 PM	0	5	136	273	467	900	2	433	0	18	107	0	16	116
10/31/17 1:00 PM	0	5	136	273	467	730	2	369	0	18	107	0	16	116



	Allenstown	Boscawen	Bow	Canterbury	Chichester	Concord	Dunbarton	Epsom	Hooksett	Hopkinton	Loudon	Pembroke	Salisbury	Webster
10/31/17 2:00 PM	0	5	136	219	445	490	2	126	0	18	107	0	16	116
10/31/17 3:00 PM	0	5	136	219	445	448	2	59	0	0	107	0	16	19
10/31/17 4:00 PM	0	5	136	219	445	365	2	59	0	0	107	0	16	19
10/31/17 5:00 PM	0	5	110	219	305	363	2	49	0	0	96	0	15	18
10/31/17 6:00 PM	0	5	73	184	197	363	2	33	0	0	85	0	0	12
10/31/17 7:00 PM	0	5	71	184	196	336	2	32	0	0	85	0	0	11
10/31/17 8:00 PM	0	4	41	95	153	333	2	18	0	0	85	0	0	0
10/31/17 9:00 PM	0	4	41	88	141	294	1	18	0	0	85	0	0	0
10/31/17 10:00 PM	0	4	29	88	141	294	1	18	0	0	85	0	0	0
10/31/17 11:00 PM	0	4	29	74	141	293	1	18	0	0	85	0	0	0
11/1/17 12:00 AM	0	4	29	74	141	293	1	18	0	0	85	0	0	0
11/1/17 1:00 AM	0	4	29	74	141	293	1	18	0	0	85	0	0	0
11/1/17 2:00 AM	0	4	29	74	141	239	1	18	0	0	85	0	0	0
11/1/17 3:00 AM	0	4	29	74	141	239	1	18	0	0	85	0	0	0
11/1/17 4:00 AM	0	4	29	74	141	238	1	18	0	0	85	0	0	0
11/1/17 5:00 AM	0	4	29	74	141	238	1	18	0	0	85	0	0	0
11/1/17 6:00 AM	0	4	29	74	141	219	1	18	0	0	85	0	0	0
11/1/17 7:00 AM	0	4	29	74	141	218	1	18	0	0	85	0	0	0
11/1/17 8:00 AM	0	4	29	74	141	218	1	18	0	0	85	0	0	0
11/1/17 9:00 AM	0	4	29	74	140	187	1	18	0	0	85	0	0	0
11/1/17 10:00 AM	0	4	13	41	139	166	1	18	0	0	85	0	0	0
11/1/17 11:00 AM	0	4	10	30	139	164	1	18	0	0	85	0	0	0
11/1/17 12:00 PM	0	4	7	28	135	13	1	5	0	0	53	0	0	0
11/1/17 1:00 PM	0	4	6	22	135	13	0	5	0	0	29	0	0	0
11/1/17 2:00 PM	0	4	1	21	135	13	0	5	0	0	29	0	0	0
11/1/17 3:00 PM	0	2	1	21	133	8	0	4	0	0	29	0	0	0
11/1/17 4:00 PM	0	1	1	21	132	6	0	3	0	0	29	0	0	0
11/1/17 5:00 PM	0	1	1	1	130	5	0	3	0	0	25	0	0	0
11/1/17 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Attachment 5 – UES Customer Hourly Interruptions By Town (Seacoast Region)

	Atkinson	Brentwood	Danville	Derry	East Kingston	Exeter	Greenland	Hampstead	Hampton	Hampton Falls	Kensington	Kingston	Newton	North Hampton	Plaistow	Sandown	Seabrook	South Hampton	Stratham
10/30/2017 0:00	0	0	0	0	0	0	0	0	0	0	0	26	1529	0	86	0	0	188	6
10/30/2017 1:00	240	0	0	0	20	6	0	0	0	294	350	482	1531	0	86	0	2191	319	6
10/30/2017 2:00	1476	35	1133	3	110	2788	0	0	2809	333	350	726	1676	4	952	2	2191	355	1707
10/30/2017 3:00	1567	35	1159	3	165	1269	0	0	2809	333	350	1011	1676	4	999	2	2191	355	656
10/30/2017 4:00	1568	35	1159	3	165	1528	0	0	4631	333	350	1013	1676	4	1006	2	1205	355	88
10/30/2017 5:00	1600	35	1192	3	165	1528	0	0	5498	380	350	1013	1676	4	1058	2	4089	355	296
10/30/2017 6:00	1669	35	1192	3	167	1528	0	0	7487	412	383	1061	1676	4	1058	2	4089	355	332
10/30/2017 7:00	1671	35	1192	3	197	1528	0	0	7365	416	383	1075	1676	4	1058	2	1205	355	562
10/30/2017 8:00	1702	0	1192	3	177	563	0	0	6543	416	384	1003	1684	4	1058	2	1205	355	587
10/30/2017 9:00	1671	0	33	3	233	386	0	0	6543	416	384	980	1684	4	1058	0	1213	355	587
10/30/2017 10:00	1789	0	33	3	245	386	0	0	5376	420	384	980	1753	4	1058	2	1213	371	587
10/30/2017 11:00	1790	0	59	3	245	386	0	0	5376	420	384	980	1700	4	1058	2	1213	355	587
10/30/2017 12:00	1790	0	59	3	190	638	0	0	3430	420	384	980	1703	0	1058	2	1213	355	1333
10/30/2017 13:00	1790	0	59	3	190	638	0	0	3430	420	384	980	1703	0	1058	2	1213	355	1333
10/30/2017 14:00	1790	0	59	3	190	639	0	0	3430	420	351	980	1703	0	1208	2	1213	355	1333
10/30/2017 15:00	1790	0	59	3	173	639	0	0	3037	420	351	980	1703	0	1208	2	1213	355	1333
10/30/2017 16:00	1793	0	67	3	173	639	0	0	447	420	351	981	1689	0	1209	2	1213	355	1333
10/30/2017 17:00	1793	0	67	3	173	639	0	0	447	159	351	867	1587	0	596	2	446	355	1333
10/30/2017 18:00	1793	0	67	3	173	639	0	0	447	146	1	867	1587	0	596	2	8	225	1333
10/30/2017 19:00	1793	0	67	3	173	639	0	0	447	146	1	867	1587	0	596	2	8	225	1333
10/30/2017 20:00	1769	0	67	3	386	639	0	0	702	146	30	728	1587	0	596	2	8	61	1333
10/30/2017 21:00	1769	0	67	3	386	639	0	0	702	148	30	549	1570	0	596	2	8	134	1333
10/30/2017 22:00	1769	0	67	3	386	639	0	0	703	101	30	549	1584	0	596	2	8	134	1333
10/30/2017 23:00	1769	0	67	3	386	639	0	0	703	148	30	549	1584	0	596	2	8	134	1333
10/31/2017 0:00	1769	0	67	3	386	639	0	0	703	148	30	398	1584	0	596	2	8	134	1333
10/31/2017 1:00	1769	0	67	3	386	639	0	0	613	148	30	398	1584	0	596	2	8	134	1333
10/31/2017 2:00	1720	0	67	3	173	639	0	0	449	148	10	177	1584	0	596	2	8	132	1333
10/31/2017 3:00	1720	0	67	3	173	639	0	0	322	109	10	138	1584	0	596	2	8	132	1333
10/31/2017 4:00	1720	0	67	3	173	639	0	0	322	109	10	138	1584	0	596	2	8	132	1293
10/31/2017 5:00	1720	0	67	3	173	639	0	0	267	109	10	138	1584	0	596	2	8	132	1293
10/31/2017 6:00	1720	0	67	3	173	639	0	0	267	109	10	135	1584	0	596	2	8	132	1293
10/31/2017 7:00	1720	0	67	3	173	619	0	0	267	109	10	135	1584	0	596	2	8	103	1293
10/31/2017 8:00	1720	0	67	3	173	619	0	0	140	109	10	135	1584	0	596	2	8	103	1213
10/31/2017 9:00	1720	0	67	3	173	619	0	0	36	109	10	87	1584	0	596	2	8	103	1085
10/31/2017 10:00	1719	0	39	3	161	605	0	0	36	109	10	30	1584	0	596	2	8	103	1085
10/31/2017 11:00	1719	0	39	3	141	513	0	0	2	78	10	30	1571	0	596	2	8	103	1085
10/31/2017 12:00	483	0	39	3	88	2	0	0	2	78	10	16	56	0	279	2	8	102	27
10/31/2017 13:00	483	0	39	3	34	2	0	0	2	57	10	16	56	0	232	2	8	102	27
10/31/2017 14:00	411	0	39	0	32	2	0	0	2	10	10	16	26	0	81	2	8	22	27
10/31/2017 15:00	365	0	39	0	32	1	0	0	2	10	1	16	11	0	81	2	8	22	27

	Atkinson	Brentwood	Danville	Derry	East Kingston	Exeter	Greenland	Hampstead	Hampton	Hampton Falls	Kensington	Kingston	Newton	North Hampton	Plaistow	Sandown	Seabrook	South Hampton	Stratham
10/31/2017 16:00	365	0	39	0	5	1	0	0	2	10	1	16	9	0	74	0	8	22	27
10/31/2017 17:00	330	0	39	0	5	1	0	0	2	4	1	16	9	0	22	0	8	22	6
10/31/2017 18:00	144	0	13	0	5	1	0	0	2	1	1	16	9	0	15	0	8	22	3
10/31/2017 19:00	144	0	13	0	5	1	0	0	1	1	1	2	2	0	1	0	8	22	3
10/31/2017 20:00	8	0	13	0	5	1	0	0	1	1	0	2	2	0	1	0	8	22	3
10/31/2017 21:00	5	0	13	0	5	0	0	0	1	1	0	2	2	0	1	0	8	22	3
10/31/2017 22:00	5	0	13	0	5	0	0	0	1	1	0	2	0	0	1	0	8	22	3
10/31/2017 23:00	0	0	0	0	5	0	0	0	0	1	0	1	0	0	1	0	8	0	3
11/1/2017 0:00	0	0	0	0	1	0	0	0	0	1	0	1	0	0	1	0	8	0	3
11/1/2017 1:00	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	8	0	3
11/1/2017 2:00	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	8	0	3
11/1/2017 3:00	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	8	0	3
11/1/2017 4:00	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	8	0	3
11/1/2017 5:00	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	8	0	0
11/1/2017 6:00	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	8	0	0
11/1/2017 7:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	8	0	0
11/1/2017 8:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	8	0	0
11/1/2017 9:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/1/2017 10:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/1/2017 11:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/1/2017 12:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/1/2017 13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Attachment 6 – Revised PUC Crew Reports

NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION  
 DISTRIBUTION CREW REPORT  
 (In compliance with Puc 308.14)

EVENT NAME	Wind Event	TIME - DATA EXTRACTED:	10:00 AM
DATE REPORT SUBMITTED:	Oct 30 2017		
Submitted by:	B. LaBelle		
Company:	Unitil Energy Systems		

Quantity of Field Personnel

				Prior to Event <sup>A</sup>	During Event	Incremental
<b>FRONT LINE</b>						
1	Distribution 69 KV and Less includes Subtransmission 46kv, 34.5kv, 22kv, 13kv, 7.5 kv, 4kv, 2kv and below	Line	Company Line Crews restoring Distribution Circuits	10	10	0
			Affiliate Co Line Crews restoring Distribution Circuits	0	0	0
			Contractor Line Crews restoring Distribution Circuits	9	19	10
			Foreign Utility Line Crews restoring Distribution Circuits	0	0	0
		Service	Company Line Crews restoring Service	0	0	0
			Contractors restoring Service includes Electricians	0	0	0
		Pole <sup>B</sup>	Pole Setting/Digging Operations includes Co, Foreign Utility, Contractor	2	3	1
			Tree	Contractor Tree Clearing - Working on Distribution Circuits	7	15
				Foreign Utility Tree Clearing - Working on Distribution Circuits	0	0
		<b>SUBTOTAL</b>				<b>28</b>
<b>FIELD ASSESSMENT</b>						
2	Distribution <i>see above</i>	Line <sup>C</sup>	Company Damage Assessment Personnel	0	9	9
<b>SUBTOTAL</b>				<b>0</b>	<b>9</b>	<b>9</b>
<b>PUBLIC SAFETY</b>						
3	Wires Down Appraiser Field Guides Other Support	Line	Company Personnel	0	18	18
			Bird Dogs, Location Guides	0	0	0
			<i>includes contractors</i>		0	0
<b>SUBTOTAL</b>				<b>0</b>	<b>18</b>	<b>18</b>

**NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION  
DISTRIBUTION CREW REPORT  
(In compliance with Puc 308.14)**

EVENT NAME	Wind Event	TIME - DATA EXTRACTED:	2:00 PM
DATE REPORT SUBMITTED:	Oct 30 2017		
Submitted by:	M. Gamble		
Company:	Unitil Energy Systems		

**Quantity of Field Personnel**

				Prior to Event <sup>A</sup>	During Event	Incremental
<b>FRONT LINE</b>						
1	Distribution 69 KV and Less includes Subtransmission 46kv, 34.5kv, 22kv, 13kv, 7.5 kv, 4kv, 2kv and below	Line	Company Line Crews restoring Distribution Circuits	10	10	0
			Affiliate Co Line Crews restoring Distribution Circuits	0	0	0
			Contractor Line Crews restoring Distribution Circuits	9	25	16
			Foreign Utility Line Crews restoring Distribution Circuits	0	0	0
		Service	Company Line Crews restoring Service	0	0	0
			Contractors restoring Service includes Electricians	0	0	0
		Pole <sup>B</sup>	Pole Setting/Digging Operations includes Co, Foreign Utility, Contractor	2	3	1
		Tree	Contractor Tree Clearing - Working on Distribution Circuits	7	15	8
			Foreign Utility Tree Clearing - Working on Distribution Circuits	0	0	0
		<b>SUBTOTAL</b>				<b>28</b>
<b>FIELD ASSESSMENT</b>						
2	Distribution <i>see above</i>	Line <sup>C</sup>	Company Damage Assessment Personnel	0	9	9
<b>SUBTOTAL</b>				<b>0</b>	<b>9</b>	<b>9</b>
<b>PUBLIC SAFETY</b>						
3	Wires Down Appraiser Field Guides Other Support	Line	Company Personnel	0	18	18
			Bird Dogs, Location Guides	0	0	0
			<i>includes contractors</i>	0	0	0
<b>SUBTOTAL</b>				<b>0</b>	<b>18</b>	<b>18</b>

**NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION  
DISTRIBUTION CREW REPORT  
(In compliance with Puc 308.14)**

<b>EVENT NAME</b>	Wind Event	<b>TIME - DATA EXTRACTED:</b>	8:00 PM
<b>DATE REPORT SUBMITTED:</b>	Oct 30 2017		
<b>Submitted by:</b>	B. LaBelle		
<b>Company:</b>	Unitil Energy Systems		

**Quantity of Field Personnel**

				Prior to Event <sup>A</sup>	During Event	Incremental
<b>FRONT LINE</b>						
1	Distribution 69 KV and Less includes Subtransmission 46kv, 34.5kv,22kv, 13kv, 7.5 kv, 4kv, 2kv and below	Line	Company Line Crews restoring Distribution Circuits	10	10	0
			Affiliate Co Line Crews restoring Distribution Circuits	0	0	0
			Contractor Line Crews restoring Distribution Circuits	9	50	41
			Foreign Utility Line Crews restoring Distribution Circuits	0	0	0
		Service	Company Line Crews restoring Service	0	0	0
			Contractors restoring Service <i>includes Electricians</i>	0	0	0
		Pole <sup>B</sup>	Pole Setting/Digging Operations <i>includes Co, Foreign Utility, Contractor</i>	2	5	3
		Tree	Contractor Tree Clearing - Working on Distribution Circuits	7	15	8
			Foreign Utility Tree Clearing - Working on Distribution Circuits	0	0	0
		<b>SUBTOTAL</b>				<b>28</b>
<b>FIELD ASSESSMENT</b>						
2	Distribution <i>see above</i>	Line <sup>C</sup>	Company Damage Assessment Personnel	0	9	9
<b>SUBTOTAL</b>				<b>0</b>	<b>9</b>	<b>9</b>
<b>PUBLIC SAFETY</b>						
3	Wires Down Appraiser Field Guides Other Support	Line	Company Personnel	0	18	18
			Bird Dogs, Location Guides	0	0	0
			<i>includes contractors</i>	0	0	0
<b>SUBTOTAL</b>				<b>0</b>	<b>18</b>	<b>18</b>



**NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION  
DISTRIBUTION CREW REPORT  
(In compliance with Puc 308.14)**

<b>EVENT NAME</b>	Wind Event	<b>TIME - DATA EXTRACTED:</b>	6:00 AM
<b>DATE REPORT SUBMITTED:</b>	Oct 31 2017		
<b>Submitted by:</b>	B. LaBelle		
<b>Company:</b>	Unitil Energy Systems		

**Quantity of Field Personnel**

				Prior to Event <sup>A</sup>	During Event	Incremental
<b>FRONT LINE</b>						
1	Distribution 69 KV and Less includes Subtransmission 46kv, 34.5kv,22kv, 13kv, 7.5 kv, 4kv, 2kv and below	Line	Company Line Crews restoring Distribution Circuits	10	12	2
			Affiliate Co Line Crews restoring Distribution Circuits	0	0	0
			Contractor Line Crews restoring Distribution Circuits	9	50	41
			Foreign Utility Line Crews restoring Distribution Circuits	0	0	0
		Service	Company Line Crews restoring Service	0	0	0
			Contractors restoring Service includes Electricians	0	0	0
		Pole <sup>B</sup>	Pole Setting/Digging Operations includes Co, Foreign Utility, Contractor	2	5	3
			Contractor Tree Clearing - Working on Distribution Circuits	7	15	8
		Tree	Foreign Utility Tree Clearing - Working on Distribution Circuits	0	0	0
<b>SUBTOTAL</b>				<b>28</b>	<b>82</b>	<b>54</b>
<b>FIELD ASSESSMENT</b>						
2	Distribution <i>see above</i>	Line <sup>C</sup>	Company Damage Assessment Personnel	0	9	9
<b>SUBTOTAL</b>				<b>0</b>	<b>9</b>	<b>9</b>
<b>PUBLIC SAFETY</b>						
3	Wires Down Appraiser Field Guides Other Support	Line	Company Personnel	0	18	18
			Bird Dogs, Location Guides	0	0	0
			<i>includes contractors</i>	0	0	0
<b>SUBTOTAL</b>				<b>0</b>	<b>18</b>	<b>18</b>

**NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION  
DISTRIBUTION CREW REPORT  
(In compliance with Puc 308.14)**

EVENT NAME	Wind Event	TIME - DATA EXTRACTED:	10:00 AM
DATE REPORT SUBMITTED:	Oct 31 2017		
Submitted by:	B. LaBelle/M. Gamble		
Company:	Unitil Energy Systems		

**Quantity of Field Personnel**

			Prior to Event <sup>A</sup>	During Event	Incremental	
<b>FRONT LINE</b>						
1	Distribution 69 KV and Less includes Subtransmission 46kv, 34.5kv,22kv, 13kv, 7.5 kv, 4kv, 2kv and below	Line	Company Line Crews restoring Distribution Circuits	10	12	2
			Affiliate Co Line Crews restoring Distribution Circuits	0	0	0
			Contractor Line Crews restoring Distribution Circuits	9	50	41
			Foreign Utility Line Crews restoring Distribution Circuits	0	0	0
		Service	Company Line Crews restoring Service	0	0	0
			Contractors restoring Service includes Electricians	0	0	0
		Pole <sup>B</sup>	Pole Setting/Digging Operations includes Co, Foreign Utility, Contractor	2	5	3
		Tree	Contractor Tree Clearing - Working on Distribution Circuits	7	15	8
			Foreign Utility Tree Clearing - Working on Distribution Circuits	0	0	0
		SUBTOTAL			28	82
<b>FIELD ASSESSMENT</b>						
2	Distribution <i>see above</i>	Line <sup>C</sup>	Company Damage Assessment Personnel	0	9	9
SUBTOTAL			0	9	9	
<b>PUBLIC SAFETY</b>						
3	Wires Down Appraiser Field Guides Other Support	Line	Company Personnel	0	18	18
			Bird Dogs, Location Guides	0	0	0
			includes contractors	0	0	0
			SUBTOTAL	0	18	18

**NEW HAMPSHIRE PUBLIC UTILITIES COMMISSION  
DISTRIBUTION CREW REPORT  
(In compliance with Puc 308.14)**

<b>EVENT NAME</b>	Wind Event	<b>TIME - DATA EXTRACTED:</b>	2:00 PM
<b>DATE REPORT SUBMITTED:</b>	Oct 31 2017		
<b>Submitted by:</b>	C. Brinson		
<b>Company:</b>	Unitil Energy Systems		

**Quantity of Field Personnel**

			Prior to Event <sup>A</sup>	During Event	Incremental	
<b>FRONT LINE</b>						
1	Distribution 69 KV and Less includes Subtransmission 46kv, 34.5kv, 22kv, 13kv, 7.5 kv, 4kv, 2kv and below	Line	Company Line Crews restoring Distribution Circuits	10	12	2
			Affiliate Co Line Crews restoring Distribution Circuits	0	0	0
			Contractor Line Crews restoring Distribution Circuits	9	50	41
			Foreign Utility Line Crews restoring Distribution Circuits	0	0	0
		Service	Company Line Crews restoring Service	0	0	0
			Contractors restoring Service includes Electricians	0	0	0
		Pole <sup>B</sup>	Pole Setting/Digging Operations includes Co, Foreign Utility, Contractor	2	5	3
		Tree	Contractor Tree Clearing - Working on Distribution Circuits	7	15	8
			Foreign Utility Tree Clearing - Working on Distribution Circuits	0	0	0
		<b>SUBTOTAL</b>			<b>28</b>	<b>82</b>
<b>FIELD ASSESSMENT</b>						
2	Distribution <i>see above</i>	Line <sup>C</sup>	Company Damage Assessment Personnel	0	9	9
<b>SUBTOTAL</b>			<b>0</b>	<b>9</b>	<b>9</b>	
<b>PUBLIC SAFETY</b>						
3	Wires Down Appraiser Field Guides Other Support	Line	Company Personnel	0	18	18
			Bird Dogs, Location Guides	0	0	0
			includes contractors	0	0	0
			<b>SUBTOTAL</b>	<b>0</b>	<b>18</b>	<b>18</b>