

Notary Public - New Hampshire  
My Commission Expires April 28, 2015



Unitil Energy Systems, Inc.  
Major Storm Cost Reserve Fund Report  
2014

Prepared By: Business Continuity & Compliance and Accounting

February 28, 2015

## **Introduction**

Unitil Energy Systems, Inc. (“UES” or the “Company”) submits this annual Major Storm Cost Reserve (“MSCR”) Fund Report for the 12 month period ending December 31, 2014. This filing complies with the New Hampshire Public Utilities Commission (“Commission”) requirements set forth in the Company’s Rate Plan Settlement Docket No. DE 10-055 and as ordered in the Commission’s Order in DE 11-277 Order No. 25,351 *Order Granting Increase to Storm Recovery Adjustment Factor* (“SRAF”) issued April 24, 2012 (requiring UES “to file annual reports on the Storm Reserve Fund and storm recovery updates for those storms where costs are recovered through the SRAF”). The rate levels resulting from the distribution revenue changes specified in Section 2 of the Settlement Agreement approved in docket DE 10-055 and revised in Docket No. DE 13-065 (Order No. 25,502, issued April 29, 2013) include \$0.8 million annually for the MSCR, which will be used to recover costs associated with preparing for, responding to and recovering from, qualifying major storms. The MSCR Fund Balance at December 31, 2014 is (\$1,011,180)<sup>1</sup>. The Company is not proposing an adjustment to the level of annual MSCR recovery or seeking cost recovery through its SRAF at this time, but will continue to review the recovery level on a going forward basis as we continue to incur costs for future storm events.

All costs included in the MSCR through December 31, 2014 have been reviewed for accuracy, completeness, and proper classification by Unitil’s Internal Audit group. Please refer to the *UES MSCR Fund Reconciliation as of December 31, 2014* on page 4 for a summary of the costs.

Please refer to the Storm Recovery Adjustment Factor Reconciliation which provides the reconciliation of the SRAF through December 31, 2014 on page 5.

## **Section 8 of the Settlement Agreement approved by the Commission in DE 10-055 provides, in part, that:**

8.1 The rate levels resulting from the distribution revenue changes specified in Section 2 include \$400,000<sup>2</sup> annually for the Major Storm Cost Reserve, which will be used to recover costs associated with responding to and recovering from qualifying major storms. Qualifying major storms shall include severe weather events causing 16 concurrent troubles (interruption events occurring on either primary or secondary lines) and 15 percent of customers interrupted, or 22 concurrent troubles, in either the Capital or Seacoast regions of Unitil, as well as costs associated with planning and preparation activities in advance of severe weather if a qualifying major storm is likely occur.

Planning and preparation activities will include pre-staging of crews, standby arrangements with external contractors, incremental compensation of employees, and other costs that may be incurred to prepare for a qualifying major storm. A qualifying major storm will be considered likely to occur if the Estimate Impact Indices (“EII”)<sup>3</sup>

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<sup>1</sup> Excludes November 27, 2014 Snow Event costs preliminarily estimated at \$2 million.

<sup>2</sup> The amount was increased to \$800,000 as part of Order No. 25,502 – April 29, 2013

<sup>3</sup> EII levels are indices developed by Unitil’s weather forecast provider, Schneider Electric of Burnsville, MN. An EII level is dependent upon various types of weather impacts and is a qualified indicator of both the probability and severity of a particular weather event having the potential for significant customer outages.

from the Company's professional weather forecaster reaches an EII level of 3<sup>4</sup> or greater with a "high" (greater than 60 percent) level of confidence.

8.2 The parties recognize that certain weather events may result in extraordinary expenditures to prepare for, or recover from, storms or natural disasters that do not meet the defined criteria for a qualifying major storm. The Company may petition the Commission to recover the extraordinary costs of such events from the Major Storm Cost Reserve and has the burden to demonstrate the reasonableness of its expenditures.

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<sup>4</sup> EII severity levels were reversed by the weather vendor beginning on July 18, 2013 which results in an EII level 3 or below (2 or 1) with a high confidence to be the exclusionary criteria for a qualifying major storm. Actual weather condition criteria did not change.

**Unitil Energy Systems, Inc.**

**Major Storm Cost Reserve Fund – Reconciliation  
As of December 31, 2014**

Section #	Date	Description	Surplus (Deficit)
	12/31/2013	MSCR BALANCE (As Filed on 3/3/2014)	\$ (1,178,376)
<b>Adjustments to 2013 Filing</b>			
		Miscellaneous Adjustments	6,362
		Carrying Charge Adjustment	8,756
		<b>Adjusted Opening Balance 1/1/2014</b>	<b>\$ (1,163,258)</b>
<b>2014 Deferred Charges</b>			
1.6	12/22/2013	Winter Storm (not included in 2013 MSCR Report)	(179,796)
2.6	02/05/2014	Snow Storm	(85,245)
3.6	02/13/2014	Snow Event	(159,922)
4.6	03/12/2014	Wind Event	(36,405)
5.6	03/25/2014	Wind Event	(64,378)
6.6	07/02/2014	Thunderstorm Event	(48,774)
7.6	11/01/2014	Wind Event	(19,447)
8.5	11/25/2014	Snow Event <sup>1</sup>	---
<b>2014 Recovery</b>			
<b>2014</b>		<b>Current Recovery Rate</b>	<b>800,000</b>
		<b>2014 Carrying Charges</b>	<b>(53,955)</b>
	12/31/2014	<b>MSCR BALANCE</b>	<b>\$ (1,011,180)</b>

<sup>1</sup>Costs related to the November 27, 2014 Snow Event, preliminarily estimated at \$2 million, were not available at the time this filing was prepared. This event will be included in the 2015 MSCR Report; however, an overview of the event has been provided with this filing.

**Unitil Energy Systems, Inc.**

**Storm Recovery Adjustment Factor Reconciliation**

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
	Beginning Balance	Total Costs	Total Revenue	Ending Balance Before Interest (a + b - c)	Average Monthly Balance ((a+d) / 2)	Interest Rate	Computed Interest	Ending Balance with Interest (d + g)
Jan-14	\$10,593,285 (1)	\$0	\$253,383	\$10,339,902	\$10,466,593	4.52%	\$40,180	\$10,380,082
Feb-14	\$10,380,082	\$0	\$244,190	\$10,135,892	\$10,257,987	4.52%	\$35,569	\$10,171,460
Mar-14	\$10,171,460	\$0	\$223,955	\$9,947,506	\$10,059,483	4.52%	\$38,720 (2)	\$9,986,226
Apr-14	\$9,986,226	\$0	\$209,559	\$9,776,666	\$9,881,446	4.52%	\$36,710	\$9,813,377
May-14	\$9,813,377	\$0	\$198,709	\$9,614,667	\$9,714,022	4.52%	\$37,291	\$9,651,959
Jun-14	\$9,651,959	\$0	\$205,727	\$9,446,232	\$9,549,095	4.52%	\$35,476	\$9,481,707
Jul-14	\$9,481,707	\$0	\$252,354	\$9,229,353	\$9,355,530	4.52%	\$35,915	\$9,265,268
Aug-14	\$9,265,268	\$0	\$255,233	\$9,010,035	\$9,137,652	4.52%	\$35,079	\$9,045,114
Sep-14	\$9,045,114	\$0	\$236,721	\$8,808,393	\$8,926,753	4.52%	\$33,163	\$8,841,556
Oct-14	\$8,841,556	\$0	\$200,472	\$8,641,084	\$8,741,320	4.52%	\$33,557	\$8,674,641
Nov-14	\$8,674,641	\$0	\$199,854	\$8,474,787	\$8,574,714	4.52%	\$31,856	\$8,506,643
Dec-14	\$8,506,643	\$0	\$226,342	\$8,280,301	\$8,393,472	4.52%	\$32,222	\$8,312,523

(1) As filed in Unitil Energy Systems, Inc.'s Major Storm Cost Reserve Fund Report, March 3, 2014.

(2) Includes \$102.78 to true up interest for storm costs as they were incurred from Tropical Storm Sandy.

## **Table of Contents**

1.0	Winter Storm (December 22, 2013).....	7
2.0	Snow Storm (February 5, 2014).....	13
3.0	Snow Event (February 13, 2014) .....	17
4.0	Wind Event (March 12, 2014) .....	21
5.0	Wind Event (March 25, 2014) .....	26
6.0	Thunderstorm Event (July 2, 2014) .....	31
7.0	Wind Event (November 1, 2014).....	37
8.0	Thanksgiving Storm “Cato” (November 26, 2014) .....	42

## **Attachments**

Attachment A – Estimated Impact Indices (EII) Criteria

## **1.0 Winter Storm (December 22, 2013)**

### **1.1. Description of the Storm**

On December 18, UES' weather service provider noted the possibility of a precipitation mix with hazardous ice accretions for the following weekend (Saturday night into Sunday night) in the morning weather reports' long-range forecast. The initial weather forecast included periods of heavy rain converting to freezing rain with ice accretion amounts of up to ¼ + inch possible. Given the near freezing temperatures and long duration expected, forecasters predicted the freezing rain would convert back to rain; however, the forecasters were not able to precisely indicate the timing and geographical areas. Over the next few days confidence remained high (60%) that hazardous ice accretions would occur in the service territory on December 22. Although precipitation did occur as forecast, the temperatures across UES' service territory averaged around 33 degrees which resulted in minor ice accretions being reported.

### **1.2. Summary of the Extent of the Storm Damage**

The event resulted in no damage or customer interruptions in either UES' Capital or Seacoast regions.

### **1.3. Preparations**

Beginning on December 19, the Company began to make preparations including holding internal conference calls, retaining contractor resources, notifying customers and public officials, submitting regulatory reports and mobilizing internal personnel. The NH State Emergency Operations Center ('EOC') was also providing weather forecast information (attached below) and activated at 7 AM on Sunday, December 22 to monitor and respond to the event.

### **1.4. Restoration**

Although widespread outages did not occur, the Company had acquired approximately 37 line crews, 26 tree and supporting staff in preparation for the event.

### **1.5. Qualifying Criteria**

The actual experience of this event did not meet the quantitative criteria (a) 16 concurrent troubles and 15 percent of customers interrupted or (b) 22 concurrent troubles in either the Seacoast or Capital Regions. However, based on the confidence level of professional weather forecasters that significant icing would occur, the Company took action to prepare for the restoration of service to customers from this storm event. Since the Company prepared for the most likely scenario based on the predicted icing amounts, the Company hereby petitions the Commission to recover the costs of this storm through the MSCR. Both the NH EOC notification and Unitil weather service provider forecast are included in the following section.



Service From Schneider Electric  
For Unitil Services Corp  
Date: December 21, 2013  
Time: 6:00 PM EST - Correction  
Forecaster: J Wegwerth

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	ICE	ICE	RAIN	ICE
Event Begin Time	10AM SUN	10AM SUN	NOW	3AM SUN
Event End Time	8AM MON	8AM MON	7AM MON	9AM MON
Day 1 EII	4	4	5	3
Event Confidence	HIGH	HIGH	HIGH	HIGH
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount	0.50-1.00	0.50-1.00	0.50-1.00	
Snow Amount				
Snow Character				
Ice Amount	0.10-0.20	0.10-0.25		0.20-0.75
Sustained Wind				
Temp. Extremes	48/32	46/32	47/38	40/31
Day 2 Wind Speed	5	5	5	5
Day 2 Wind Gust	4	4	5	3
Day 2 Snow	5	5	5	5
Day 2 Ice	5	5	5	5
Day 2 Confidence	High	High	High	High
Day 3 Wind Speed	5	5	5	5
Day 3 Wind Gust	5	5	5	5
Day 3 Snow	5	5	5	5
Day 3 Ice	5	5	5	5
Day 3 Confidence	High	High	High	High

#### UNITIL SERVICE AREA 48 HOUR OUTLOOK

**CAPITAL:** Scattered rain showers will continue this evening through tonight. The heaviest rain will occur tonight through Sunday morning. Rainfall amounts of 0.50-1.00" are expected. Rain should switch to freezing rain around 10am-12pm Sunday. Freezing rain should continue for the rest of the day Sunday and even much of Sunday night. It does look like the heaviest precipitation should weaken before the switch to freezing rain occurs. Light freezing rain will be possible through 6-8am Monday. Ice accretion

looks to be 0.10-0.20". There is a low risk of up to 0.30" if the freezing rain begins earlier than expected or lasts slightly longer than expected. Winds should gust to 20 mph or less through the storm.

Confidence: Confidence is high that hazard ice accretions will occur later Sunday and Sunday night. Ice chances: EII-4: 60%. Confidence is medium that one inch rainfall amounts will occur tonight through early Sunday. The chance is 40%. Confidence is medium with regards to timing of the changeover and this may vary slightly.

FITCHBURG: Scattered rain showers will continue this evening through tonight and through Sunday night. The heaviest rain should be tonight into Sunday morning. Rainfall amounts should be 0.50-1.00". Winds should gust to 20 mph or less through the storm.

Confidence: Confidence is medium that one inch rainfall amounts will occur tonight through early Sunday. The chance is 40%.

SEACOAST: Rain will continue this evening, tonight, and Sunday morning. The heaviest rain should be tonight and Sunday morning. Rainfall amounts should be 0.50-1.00". Rain should switch to freezing rain around 10am-12pm Sunday west of I-95 and 12-2pm Sunday east of I-95. Freezing rain should continue for the rest of the day Sunday and most of Sunday night. It does look like the heaviest precipitation should weaken before the switch to freezing rain occurs. Light freezing rain will be possible through 6-8am Monday. Ice accretions look to be 0.10-0.20" west of I-95. Ice accretions should be up to 0.10" east of I-95. There is a low risk of up to 0.30" if the freezing rain begins earlier than expected with the best chances west of I-95. Winds should gust to 20 mph or less through the storm.

Confidence: Confidence is high that hazard ice accretions will occur later Sunday and Sunday night. Ice chances: EII-4: 60%. Confidence is medium that one inch rainfall amounts will occur tonight through early Sunday. The chance is 40%.

PORTLAND: Scattered rain showers will continue through most of tonight. Rainfall amounts should be 0.25-0.50". Rain should switch to freezing rain by 2-4am Sunday across areas west of I-95 and 4-6am Sunday east of I-95. Freezing rain should continue for the rest of the day Sunday and Sunday night. Freezing rain should change back to rain by 9am Monday, the change will occur earliest east of I-95. The heaviest freezing rain accumulation should be from the start time through early Sunday afternoon. Ice accretion should be around 0.20-0.50"; highest west of I-95. However, amounts as high as 0.75" may occur. The best chance for the higher amounts will be in the Lewiston area. Winds should gust to 20 mph or less through the storm.

Confidence: Confidence is high that at least EII-4 hazard ice accretions will occur later Saturday night through Sunday night. Confidence in ice accretions reaching EII-3 east of I-95 is medium. Ice chances: EII-4: 90%, EII-3, 40%, EII-2, 30%, highest in Lewiston.

UNITIL SERVICE AREA 3-5 DAY OUTLOOK: Another surge of moisture will be possible on Monday. It is possible that freezing rain will try to mix in, mainly Monday morning. The highest chances will be across the Lewiston, ME area as temperatures will rise above freezing Monday morning or afternoon for most locations. Snow could mix in before the precipitation tapers off Monday night. Little ice accretion or snow accumulation would result with both remaining below hazard levels. Dry weather will take over Tuesday through Wednesday. Winds could gust to 20-30 mph on Tuesday. No hazard conditions are currently expected.

Confidence: Confidence is high that no hazard conditions will occur through the 3-5 day period.

#### NORTHEASTERN US GENERAL WEATHER OUTLOOK

#### TODAY

At least light precipitation will be likely across Upstate New York and northern New England today. The steadiest precipitation should come this afternoon across a good chunk of Upstate New York. It should be

mainly rain. However, freezing rain will be likely across far northern New York, closer to the St. Lawrence Valley. Ice accretions will begin to become significant here. There should also be a wintry mix of snow, sleet, and freezing rain across northern Vermont, northern New Hampshire, and northern Maine during the day. Ice accretion will tend to be lighter across northern New England. It will be all snow across extreme northern Maine. Light accumulations will be possible. It should be mainly dry across southern New England and Downstate New York. A few light rain showers could sneak into interior southern New England. Temperatures will be 10-20 degrees above normal for most. It will be only somewhat above normal elsewhere.

#### TODAY'S Forecast Confidence: Low

Confidence is much lower than normal due to concerns with frontal placement and clouds/precipitation. Highs and especially spot temperatures could trend 2-6 degrees cooler across portions of Upstate New York and into northern New England if there is more precipitation than expected. On the other hand, highs could end up 1-4 degrees warmer across southern areas if a warm front can sneak further north than expected. Highs look okay to the east with less precipitation expected. Lows could end up 3-8 degrees cooler across portions of northern New York and northern New England if the front gets stuck to the south and more cold air can funnel in from the north than expected. However, lows could end up warmer across southern areas with warmer air surging northward.

#### TOMORROW

Tonight and Sunday: Organized precipitation will spread across most of the region tonight through most of Sunday. The precipitation will become lighter for most later Sunday and Sunday night. However, steady precipitation may take until Sunday evening to diminish across portions of northern New England.

This should start as all snow across northern Maine. Sleet and freezing rain may mix in sometime Sunday night. Heavy snow accumulations are likely, though amounts could trend lighter should the snow mix with sleet and/or freezing rain faster than expected. Meanwhile, a wintry mix of snow, sleet, freezing rain, and rain will be possible across portions of northern New York, Vermont, New Hampshire, and the rest of Maine. It should take until sometime Sunday morning for freezing rain to push southward into southern New Hampshire and the southern tip of Maine. We may see a transition to rain again sometime Sunday night across some of these areas as warmer air tries to come north. Confidence is low on timing. Heavy ice accretions will be possible across extreme northern New York, most of northern New Hampshire, and a majority of central and southern Maine where no change to rain will occur. Peak ice accretions of a half inch or more are possible. This could cause significant impacts to the grid and any travel. To the south, rain will be likely for most. There is a low risk that a period of freezing rain could sneak into portions of extreme northeastern Massachusetts for a period on Sunday. If this occurs, it would be during the lighter precipitation period, so significant ice accumulations are not expected. There could even be a few rumbles of thunder across southern areas. Rainfall amounts could exceed an inch in spots, especially along and north of I-90. Breezy winds will be possible across portions of southern New England and southeastern New York on Sunday. Southern areas should warm well into the 50s and 60s on Sunday.

#### TOMORROW'S Forecast Confidence: Low

Confidence is lower than normal across portions of central New York through central New England where frontal placement will be the key to temperatures. The model guidance disagrees on where this front will wobble. There will be a large temperature gradient on either side of this front. This means spot temperatures could end up 5-10 degrees too warm or too cold, depending on which side of the front you are on. Highs could end up 2-5 degrees warmer across southern areas if there is more sun than expected. Temperatures in the far north are locked in cold. Temperatures at night across portions of central and northern New England could end up 3-8 degrees cooler if the warmer air does not make inroads as fast as expected.

#### 3-5 DAY EXTENDED OUTLOOK

Steady rain will be possible across portions of southern New England and Downstate New York on Monday. Lighter precipitation will be possible across the rest of New England. It should be light snow closer to the Canadian border. There could be spotty light mixed precipitation across portions of Maine away from the immediate Coast. Ice accretions would be minimal from this. This precipitation should finally come to an end sometime Monday night. It may switch to snow across portions of interior New England just before it does. Meanwhile, lake effect snow will be possible across portions of western New York on Monday before ending by late Tuesday. Localized accumulation is expected. Breezy northwest winds will be possible on Tuesday. Dry conditions are expected on Christmas Day. Temperatures will be above normal on Monday, well above normal in spots. Temperatures will drop markedly to several degrees below normal for Christmas Eve and Christmas.

## **[EOC-ESF] CHANGE IN EOC OPENING AND NWS Weather Update**

NHEOC [NHEOC at dos.nh.gov](http://dos.nh.gov)

Sat Dec 21 10:35:20 EST 2013

- Previous message: [\[EOC-ESF\] Latest Weather Briefing from Gray NWS](#)
- Next message: [\[EOC-ESF\] FW: NWS Gray Winter Weather Briefing - Sunday 830 am](#)
- Messages sorted by: [\[ date \]](#) [\[ thread \]](#) [\[ subject \]](#) [\[ author \]](#)

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PLEASE NOTE THIS IS A CHANGE -- The State Emergency Operations Center will activate at 0700 on Sunday morning. We ask that ESFs 1, 2, 3, 6, 7, 8, 12, 13 and the National Guard be in the EOC no later than 0900 and plan to staff their desks through 1600 Monday.

Latest update from National Weather Service Offices as of 0900:

Freezing Rain Advisory: Grafton, Carroll, Merrimack, Belknap, Strafford Counties from 7pm Saturday to 7am Sunday.

Ice Storm Warning: Southern Coos and Northern Carroll from 7pm Saturday to 7am Sunday.

Winter Storm Warning: Northern Coos County now through 0700 Monday.

Rain/Ice: Saturday afternoon rain will blanket the entire State. Rain will change to freezing rain from Saturday tonight into early Sunday morning. Current models indicate 1-2" precipitation; most of which will be rain. Heaviest precipitation will end during the day Sunday with light amounts Sunday night.

Temperatures: Saturday mid 30s to mid 40s statewide. Sunday 20s North to mid 40s South. Southern Hillsborough and Southern Cheshire low 50s. Temperatures will fall Sunday morning and will result in the changeover to freezing rain.

Ice accretion: There is a concern for ice accretion ½" to ¾" in the most affected areas and with possibly of up to 1" higher in the higher elevations. NOTE: As a general rule NWS guidance on this is that ¾" ice will cause some power outages; ½" ice causes more widespread outages and downed limbs; and 2" ice brings trees down and will cause significant outages.

Winds: Generally light statewide.

Flooding: There is not a concern for flooding with this event other than urban street flooding.

HSEM will continue to monitor the weather and provide updates through the weekend as necessary. Contact the HSEM Duty Officer off hours at 800-852-3792 or 271-2231 for assistance or requests for service.

For the latest forecasts and discussions, especially timing and forecast confidence, you can contact Gray and/or Taunton at the following:

Gray National Weather Service:

NEW "Emergency Managers Self Briefing" link: <http://www.weather.gov/gyx/EMhome>

1-800-482-0913

<http://www.weather.gov/gyx>

<https://www.facebook.com/US.NationalWeatherService.Gray.gov>

<https://mobile.twitter.com/nwsgray>

Taunton National Weather Service:

1-800-243-1686

<http://www.weather.gov/box>

<http://www.facebook.com/US.NationalWeatherService.Boston.gov>

<http://www.twitter.com/nwsboston>

ESFs PLEASE FEEL FREE TO JOIN IN ON THIS CALL AS YOU DEEM APPROPRIATE:

EMD CONFERENCE CALL SATURDAY AND SUNDAY 1200

CONFERENCE NAME: DECEMBER ICE STORM UPDATE WITH EMDs

1-800-860-2442

NH Department of Safety  
Homeland Security & Emergency Management  
33 Hazen Drive (mailing)  
110 Smokey Bear Boulevard (physical)  
Concord, NH 03305  
603/271-2231 - Switchboard  
603/223-3663 - Local Liaison  
603/223-3609 - Fax  
[nheoc at dos.nh.gov](mailto:nheoc@dos.nh.gov)

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1.6. Costs Charged to the Storm Reserve

Consistent with the Company's petition, the total amount charged to the storm reserve for this event was:

Payroll	\$ 8,904
Contractor Invoices & Other	170,892
Total Expenditures	\$179,796
Utility Plant Additions	-
Total Charged to MSCR	\$179,796

## **2.0 Snow Storm (February 5, 2014)**

### **2.1. Description of the Storm**

Beginning on February 2, UES' weather forecast indicated a strong storm system bringing heavy snow across the service territory on February 5. Subsequent forecasts also increased the potential and confidence of a significant impact due to the wet consistency of the snow forecasted. Over five inches of snow fell across UES' service territory with wind gusts reaching up to 25 mph; however, temperatures remained low enough that the consistency of the snow was lighter and drier than expected causing few customer interruptions.

### **2.2. Summary of the Extent of the Storm Damage**

UES experienced limited impact in its service territory as the storm system passed through the region as detailed in the table below.

<b>UES Region</b>	<b>Total # Outages</b>	<b>Peak # Outages</b>	<b>Total Customers Interrupted</b>	<b>Customer Interrupted (Peak)</b>	<b>Percentage Affected (Peak)</b>
Seacoast	1	1	14	14	.03%
Capital	0	0	0	0	0%

### **2.3. Preparations**

Beginning on February 3, the Company began to make preparations including holding internal conference calls, retaining contractor resources, notifying customers and public officials, submitting regulatory reports and mobilizing internal personnel.

### **2.4. Restoration**

The outage that occurred in the Seacoast region was due to a broken tree limb and was restored within an hour. The Company had acquired approximately 26 line crews, 13 tree crews and supporting staff to respond to this event.

### **2.5. Qualifying Criteria**

This event qualified for recovery of preparation costs due to the confidence level (greater than 60%) of the Company's professional weather forecasters that hazardous snow amounts (EEI of 3) would occur. The actual experience of this event did not meet the concurrent trouble requirement in either the Seacoast or Capital Regions; therefore restoration costs do not qualify for recovery. Preparation only costs recovered through the MSCR are summarized in Section 2.6.

Schneider Electric Forecast for Unitil Services Corp

Date: February 3, 2014

Time: 1:00 PM EST

Forecaster: B

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	NONE	NONE	NONE	NONE
Event Begin Time				
Event End Time				
Day 1 EII	5	5	5	5
Event Confidence				
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount				
Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind				
Temp. Extremes	34/22	31/15	33/19	32/19
Day 2 Wind Speed	5	5	5	5
Day 2 Wind Gust	5	5	5	5
Day 2 Snow	5	5	5	5
Day 2 Ice	5	5	5	5
Day 2 Confidence	High	High	High	High
Day 3 Wind Speed	5	5	5	5
Day 3 Wind Gust	5	5	5	5
Day 3 Snow	3	5	3	5
Day 3 Ice	5	5	5	5
Day 3 Confidence	High	High	High	High

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

**CAPITAL:** There is a risk of flurries or light snow showers from now-4pm. Snow accumulations will be less than a quarter inch, if any. Otherwise, dry weather and no hazard conditions will be likely through Tuesday evening. A major winter storm will impact the region later Tuesday night and Wednesday. The storm is broken down below:

Snow accumulation: 5-10 inches. Timing: 2am-10pm Wednesday. Heaviest: 6am-2pm Wednesday.  
Consistency: Normal. Temperatures during storm: 23-27F. Wind gusts: 20-30 mph.

Confidence: Confidence is high that no hazard conditions will occur over the next 48 hours.

FITCHBURG: Light snow will be possible from now-4pm. Snow accumulations will be a half inch to one inch. Otherwise, dry weather and no hazard conditions will be likely through Tuesday evening. A major winter storm will impact the region later Tuesday night and Wednesday. The storm is broken down below:

Snow accumulation: 5-10 inches. Timing: 2am-11pm Wednesday. Heaviest: 7am-2pm Wednesday. Consistency: Wet. Temperatures during storm: 27-31F. Wind gusts: Less than 25 mph.

Confidence: Confidence is high that hazard snow accumulations will occur on Wednesday. Snow chances: EII-4 80%, EII-3, 70%, EII-2, 10%.

SEACOAST: There is a risk of flurries or light snow showers from now-5pm. Snow accumulations will be less than a quarter inch, if any. Otherwise, dry weather and no hazard conditions will be likely through Tuesday evening. A major winter storm will impact the region later Tuesday night and Wednesday. The storm is broken down below:

Snow accumulation: 5-10 inches. Timing: 2am-11pm Wednesday. Heaviest: 8am-3pm Wednesday. Consistency: Wet. Temperatures during storm: 26-30F. Wind gusts: 20-30 mph.

Confidence is high that hazard snow accumulations will occur on Wednesday. Snow chances: EII-4 80%, EII-3, 70%, EII-2, 10%.

PORTLAND: There is a risk of flurries or light snow showers from now-5pm. Snow accumulations will be less than a quarter inch, if any. Otherwise, dry weather and no hazard conditions will be likely through Tuesday evening. A major winter storm will impact the region later Tuesday night and Wednesday. The storm is broken down below:

Snow accumulation: 5-10 inches. Timing: 4am-10pm Wednesday. Heaviest: 7am-2pm Wednesday. Consistency: Normal. Temperatures during storm: 25-28F. Wind gusts: 15-25 mph.

Confidence: Confidence is high that no hazard conditions will occur over the next 48 hours.

UNITIL SERVICE AREA 3-5 DAY OUTLOOK: Dry weather and no hazard conditions are expected Wednesday night through Friday night.

Confidence: Confidence is high that no hazard conditions will occur on Wednesday night through Friday.

#### NORTHEASTERN US GENERAL WEATHER OUTLOOK

##### TODAY

Snow will be likely across southeastern New York and southern New England today. It should end across the region by sunset for most, although it could last into the evening across portions of southern New England. Snow could come down heavy at times, especially later this morning and into the afternoon. Peak snow accumulations should be across Downstate New York where 5-10 inches of accumulation will be possible. Snow accumulations of 3-7 inches will be possible across portions of the South Coast of New England. Snow accumulations should drop off steadily as you get away from the South Coast of New England. Winds should be relatively light through the event. Otherwise, dry conditions will be likely across the region through tonight. Temperatures won't stray far from normal.

TODAY'S Forecast Confidence: Medium

Spot temperatures across southeastern New York and southern New England could trend 1-3 degrees cooler during times of steady/heavy precipitation during the day. Highs in these areas should occur early before the snow develops. Highs could even trend 1-3 degrees cooler across central New York through central New England if the snow trends even further north than expected. Highs look okay closer to the



Canadian Border. Lows could end up 2-5 degrees cooler across areas that see clear skies and light winds. This is especially true in areas that have fresh snow cover.

#### TOMORROW

Dry and quiet conditions will be likely on Tuesday as we enter the calm before the next storm. The next storm system will impact the region on Tuesday night and Wednesday. This time, everybody should get in on the action. Snow should fill in across the region on Tuesday night. The peak of the storm should be Tuesday night and early Wednesday. We'll see a wintry mix of snow, sleet, freezing rain and rain across portions of southeastern New York and most of Connecticut and Rhode Island later Tuesday night and into Wednesday. Significant ice accretions will be possible, especially away from the immediate coast. Snow should change to rain across portions of southeastern Massachusetts, limiting snow accumulations there. To the north, this system should remain all snow. This system will gradually wind down later Wednesday and Wednesday evening. Peak snow accumulations should be across the southern two thirds of Upstate New York through central New England where 6-12 inches of accumulation will be possible. Snow accumulations will drop off to the south where mixed precipitation will limit accumulations. Snow accumulations should also drop off a bit to the north, but still could be 3-6 inches. Strong winds are not expected with this system. Temperatures will be near to slightly below normal in the south and near to above normal in the north.

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

Highs should generally verify well across the region with fair model agreement. Lows look okay. Spot temperatures could drop 2-3 degrees upon the arrival of organized precipitation across the region.

#### 3-5 DAY EXTENDED OUTLOOK

After the storm system ends on Wednesday evening, dry conditions should take over for Wednesday night. Mostly dry conditions are expected on Thursday and Friday. Lake effect snow will be possible across portions of northern New York during this period. Localized accumulations will be possible. Temperatures will be near normal on Wednesday and 3-8 degrees below normal on Thursday and Friday.

#### 2.6. Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for this event was:

Payroll	\$ 1,045
Contractor Invoices & Other	84,200
Total Expenditures	\$85,245
Total Utility Plant Additions	-
Total Charged to MSRC	\$85,245

### **3.0 Snow Event (February 13, 2014)**

#### **3.1. Description of the Storm**

Beginning on February 11, UES' weather forecast indicated a strong winter storm system bringing a mixture of heavy snow and rain across the service territory on February 13. Subsequent forecasts also increased the potential and confidence of a significant impact due to the wet consistency of the snow forecasted. Over eight inches of snow fell across the Capital region with wind gusts in the Seacoast region reaching up to 37 mph; however, the event caused minor damage and few customer interruptions, mainly in the Capital region.

#### **3.2. Summary of the Extent of the Storm Damage**

UES experienced limited impact in its service territory as the storm system passed through the region as detailed in the table below.

<b>UES Region</b>	<b>Total # Outages</b>	<b>Peak # Outages</b>	<b>Total Customers Interrupted</b>	<b>Customer Interrupted (Peak)</b>	<b>Percentage Affected (Peak)</b>
Seacoast	0	0	0	0	0
Capital	1	1	3,056	3,056	10%

#### **3.3. Preparations**

Beginning on February 11, the Company began to make preparations including holding internal conference calls, retaining contractor resources, and notifying regulatory and public officials, submitting regulatory reports and mobilizing internal personnel.

#### **3.4. Restoration**

The Company acquired approximately 27 line crews, 19 tree crews and supporting staff to respond to this event and the outage that occurred in the Capital region was restored within two hours.

#### **3.5. Qualifying Criteria**

This event qualified for recovery of preparation costs due to the confidence level (greater than 60%) of the Company's professional weather forecasters that hazardous snow amounts (EEI of 3) would occur. The actual experience of this event did not meet the concurrent trouble requirement in either the Seacoast or Capital Regions; therefore restoration costs do not qualify for recovery. Preparation only costs recovered through the MSCR are summarized in Section 3.6.

Schneider Electric Forecast for Unitil Services Corp

Date: February 11, 2014

Time: 1:00 PM EST

Forecaster: Buck

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	NONE	NONE	NONE	NONE
Event Begin Time				
Event End Time				
Day 1 EII	5	5	5	5
Event Confidence				
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount				
Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind				
Temp. Extremes	24/2	22/-3	24/0	22/-3
Day 2 Wind Speed	5	5	5	5
Day 2 Wind Gust	5	5	5	5
Day 2 Snow	5	5	5	5
Day 2 Ice	5	5	5	5
Day 2 Confidence	High	High	High	High
Day 3 Wind Speed	5	5	5	5
Day 3 Wind Gust	5	5	5	5
Day 3 Snow	3	3	3	3
Day 3 Ice	5	5	5	5
Day 3 Confidence	High	High	High	High

NORTHEASTERN US GENERAL WEATHER OUTLOOK

TODAY

Mostly dry, quiet, and cold conditions are expected today through tonight. Stubborn lake effect snow will be possible southeast of Lake Ontario across western/central New York today and into tonight before coming to an end. Additional localized accumulations of several inches are expected. Temperatures will be 12-22 degrees below normal.

TODAY'S Forecast Confidence: Medium

Highs could end up 1-4 degrees cooler across central/western New York if lake effect cloud cover is thicker than expected. Otherwise, highs look okay. Lows could end up 2-4 degrees colder than expected across portions of northern New York and northern New England where clear skies and light winds exist. This may be tougher to do across northern New England as winds may stray strong enough to prevent this cooling.

#### TOMORROW

The calm before the next winter storm will occur on Wednesday. Dry and chilly conditions will occur during the day. Snow will develop across southeastern New York and southern New England on Wednesday night as the storm approaches. Light accumulations are expected before sunrise. Breezy easterly winds will develop later Wednesday night across Long Island and New York City. However, gusts should be below 35 mph through sunrise. Temperatures will be 3-8 degrees below normal, with most of the anomalies coming from cool daytime highs.

#### TOMORROW'S Forecast Confidence: Medium – High

Highs look reasonable with fair model agreement. Lows could trend 1-4 degrees cooler across portions of northern New York and northern New England if clouds take longer than expected to push into the region. Otherwise, lows should verify well.

#### 3-5 DAY EXTENDED OUTLOOK

Confidence is now high that a high impact coastal storm will impact the region on Thursday and Thursday night. It will take until sometime Friday morning before the snow leaves Maine. Widespread precipitation will impact eastern New York and New England during this period. It will start out as snow for everybody. Snow should mix with and change to rain across most of Long Island and southeastern Massachusetts during the morning hours. Snow accumulations should be light for most of these areas, especially the further east one goes. Rain may eventually make it to the immediate eastern shores of Massachusetts, the Seacoast of New Hampshire, and immediate coastal Maine. If this occurs, then snow accumulations will be at least somewhat limited in these areas. Even so, several inches of snow are not out of the question. It should be mostly snow away from the coast. The heaviest snow should occur across the Hudson Valley south of Albany in New York through interior New England. Max totals could be 6-12 inches, with locally higher amounts not out of the question. There is a risk that freezing rain could mix in across portions of interior southeastern Massachusetts, northern Rhode Island, and Connecticut. Ice accretions should be light and isolated, if they occur. Peak wind gusts could reach 35-45 mph across portions of the region with this system, especially closer to the coast. The storm should largely miss central and western New York. Only light snow should make it as far west as I-81. There won't be much of a break behind this system. The next weather system will bring light snow to portions of Upstate New York on Friday. This should spread across the rest of the region on Friday night and Saturday. This should generally be a 1-3 inch type event. There is a risk that somewhat heavier accumulations could occur across northern New England if the system is stronger than expected. This will be monitored. Breezy winds are expected on Saturday. Lake effect snow will be possible across portions of central New York behind the system on Saturday. Temperatures will be near normal on Thursday and Friday before cooling to below normal on Saturday.

3.6. Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for this event was:

Payroll	\$ 15,429
Transportation	876
Contractor Invoices & Other	143,617
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Total Expenditures	\$159,922
Utility Plant Additions	-
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Total Charged to MSCR	\$159,922
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#### **4.0 Wind Event (March 12, 2014)**

##### **4.1. Description of the Storm**

Beginning on March 11, UES' weather forecast indicated a winter storm system bringing heavy snow and high winds across the service territory on March 13. Subsequent forecasts also increased the potential and confidence of a significant impact due to the high winds and potentially wet snow. While only a little snow fell across the Capital region, the winds were moderate (15-20 mph) and gusts in the area reached up to 37 mph; however, the event caused minor damage and few customer interruptions.

##### **4.2. Summary of the Extent of the Storm Damage**

UES experienced limited impact in its service territory as the storm system passed through the region as detailed in the table below.

<b>UES Region</b>	<b>Total # Outages</b>	<b>Peak # Outages</b>	<b>Total Customers Interrupted</b>	<b>Customer Interrupted (Peak)</b>	<b>Percentage Affected (Peak)</b>
Seacoast	3	2	13	11	.02%
Capital	1	1	15	15	.05%

##### **4.3. Preparations**

Beginning on March 11, the Company began to make preparations including holding internal conference calls, retaining contractor resources, and mobilizing internal personnel.

##### **4.4. Restoration**

Minor outages that occurred were due to broken tree limb contact and were restored within two hours. The Company acquired approximately 16 line crews, 12 tree crews and supporting staff to respond to this event.

##### **4.5. Qualifying Criteria**

This event qualified for recovery of preparation costs due to the confidence level (greater than 60%) of the Company's professional weather forecasters that hazardous wind gusts (EEI of 3) would occur. The actual experience of this event did not meet the concurrent trouble requirement in either the Seacoast or Capital Regions; therefore restoration costs do not qualify for recovery. Preparation only costs recovered through the MSCR are summarized in Section 4.6.

Schneider Electric Forecast for Unitil Services Corp

Date: March 12, 2014

Time: 6:00 AM EDT

Forecaster: TRUMBLE

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	WIND	SNOW/WIND	WIND	SNOW/WIND
Event Begin Time	3AM THU	6PM WED	5AM THU	9PM WED
Event End Time	12AM FRI	12AM FRI	12AM FRI	12AM FRI
Day 1 EII	4	3	4	4
Event Confidence	HIGH	HIGH	HIGH	HIGH
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount	0.50-1.0	0.40-1.00	0.50-1.25	0.25-0.50
Snow Amount	1-4	6-10	1-3	4-10
Snow Character	WET	WET	WET	WET
Ice Amount	TRC-0.05"	TRC-0.03"		Trace-0.05"
Sustained Wind	15-20	15-20	15-20	15-22
Temp. Extremes	35-40	35-40	35-40	35-42
Day 2 Wind Speed	5	5	5	5
Day 2 Wind Gust	4	4	4	4
Day 2 Snow	5	3	5	3
Day 2 Ice	5	5	5	5
Day 2 Confidence	High	High	High	High
Day 3 Wind Speed	5	5	5	5
Day 3 Wind Gust	5	5	5	5
Day 3 Snow	5	5	5	5
Day 3 Ice	5	5	5	5
Day 3 Confidence	High	High	High	High

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

CAPITAL: Periods of rain today may occasionally mix with snow but accumulations will be minor as most will likely melt on contact or shortly after. Things will begin to change in the evening as precipitation turns to a rain/snow/sleet mix after 6pm Wednesday. There may be even be an hour or two of freezing rain but ice amounts will be minor. Precipitation should turn to all snow after 3am Thursday morning with periods of snow through the late morning into Thursday afternoon. Gusty winds should also be expected beginning early Thursday morning and lasting through Thursday afternoon. Snow will end by sunset but winds may remain gusty through the evening hours before subsiding. Accumulations of 6-7

inches of wet snow is likely with a slight chance for amounts in the 8-10 inch range, the bulk of which will fall Thursday morning. Snow will be wet initially then turn average late Thursday morning.

Confidence: There is high confidence for 6-7 inches of snow some of which will be wet. There is medium confidence that snow amounts will reach 8-10 inches. There is high confidence for wind gusts of 35-40 mph Thursday.

FITCHBURG: Periods of rain expected throughout Wednesday with rainfall amounts up to an inch and a quarter. Rain will begin mixing with snow after midnight and should turn to all snow by 3am. There could be a few ice pellets during the change-over but not in significant amounts. Snow will continue through late Thursday morning, gradually diminish Thursday afternoon, and should end by 5pm Thursday evening. Winds will be strong on Thursday with peak gusts of 40 mph possible through the late morning hours, into the afternoon. Winds should subside by midnight Thursday night/Friday morning.

Confidence: Confidence is high that snowfall will remain below hazard levels. Confidence is high that there will be a few peak gusts of 40 mph in the area Thursday.

SEACOAST: Rain this morning may occasionally mix with snow but no accumulation is expected. Rain will continue through the afternoon and evening and will be changing to a wintery mix after midnight. There may be an hour or two of freezing rain and sleet before precipitation turns to all snow by 3am. Ice amounts will be minor. Rainfall amounts up to an inch are possible. Snow will continue through late Thursday morning with winds occasionally gusting 35-40 mph. Snow will diminish late Thursday afternoon with conditions turning dry for the evening but winds may remain gusty through midnight Thursday night/Friday morning. Snowfall totals will likely range from near an inch right along the coast to up to 4 inches areas slightly inland.

Confidence: Confidence is high that snowfall and ice amounts will occur but remain below hazard levels. Confidence is high for wind gusts of 35-40 Thursday.

PORTLAND: Periods of rain throughout the day today with a few stray wet snowflakes mixing in at times. No accumulation is expected during the day as any snow will melt on contact. Things will change in the late evening as rain turns to a rain/sleet/snow mix after 9pm. Brief periods of freezing rain also possible. Precipitation will change to all snow by 1am Thursday. Snow will continue through the late morning and afternoon, ending Thursday evening. Strong winds are also possible on Thursday with gusts up to 42 mph possible at times. Strong winds may linger through the evening on Thursday but should subside for early Friday morning. 4-6 inches of accumulation expected from this system in the Portland area. Further inland in the Lewistown area amounts could be higher with up to 10 inches possible.

Confidence: Confidence is high for 4-6 inches of snow in all areas. Confidence is medium for amounts of 6-10 inches in the Lewistown area. Confidence is high for wind gusts up to 42 mph.

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

Quiet and colder conditions expected for Friday across the region. Slightly warmer air will arrive for Saturday with a chance for a rain snow mix in the afternoon and evening. Minor accumulations, if any expected. Dry and colder again on Sunday.

Confidence: Confidence is high that no other hazard conditions will occur for the 3-5 day period.

#### NORTHEASTERN US GENERAL WEATHER OUTLOOK

##### TODAY

Strong low pressure will bring another winter storm to the northeast US today with precipitation spreading into all areas during the late morning hours. This storm will be rather tricky in some locations as there will likely be a changeover line between rain and snow setting up across New England. This line is most likely to form from northwestern Massachusetts, to southern New Hampshire into southeastern



Maine. To the west of this line will be heavy wet snow. To the east there may be a narrow band of wintery mix but most areas will see mostly rain at least in the initial portions of the storm. It is possible these areas seeing rain throughout the day on Wednesday could see a few hours of snow on the tail end of the storm Wednesday night but accumulations will likely be minor. Any ice accretions will be limited to a narrow band of northwestern Massachusetts to southern New Hampshire. Snow accumulations on the western end of this system could be very heavy. Wide spread amounts of 8-10 inches are likely for northern New York into northern New England. Localized 10-14 inch amounts are also expected and there is a slight chance for a few areas to see amounts in the 14-20 inch range. Amounts will taper off quickly to the southeast going from 5-8 inches in far northwestern Massachusetts, to an inch or less along the coast of Connecticut, Rhode Island, and southeastern Massachusetts. Snow will taper off to scattered snow showers near or shortly after daybreak on Thursday morning. Lastly expect strong winds to accompany this system as well. Gusts of 30-35 mph will be common with brief peak gusts of 40-45 mph. The highest gusts will be most likely along the coast and in the higher elevations. Temperatures will be 4-10 degrees below normal for Wednesday.

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

Precipitation and cloudy skies may affect high temperatures for the day keeping them a few degrees cooler. Also on the back side of the system as winds turn to the northwest colder air will push into the region and overnight lows will depend on the speed of the cold air mass. I could see lows staying a few degrees warmer should this be slowed.

#### TOMORROW

Snow will be in progress as the day begins for most areas however it will be winding down and most areas will just see scattered snow showers for the late morning hours. This activity will continue to diminish with conditions turning dry during the afternoon hours on Thursday. Winds will remain strong through mid-day on Thursday with gusts of 30-35 mph common and brief peak gusts of 40-45 mph. This will likely cause issues with blowing snow in areas of heavy snowfall. Dry conditions and decreasing clouds and winds expected for Thursday evening and overnight into Friday morning. Temperatures for Thursday will be 8-12 degrees below normal.

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

High temperatures could end up 2-4 degrees cooler in areas with significant snowfall. Overnight lows should verify well for most areas but may end up 1-2 degrees warmer for northern New England should clouds linger in the wake of the storm.

#### 3-5 DAY EXTENDED OUTLOOK

Dry conditions expected for Friday with colder air in place. Expect temperatures to be running 10-15 degrees below normal for the day. Conditions will warm to near normal on Saturday but a weak cold front will bring light snow showers or a wintery mix Saturday evening. Dry, cooler conditions expected for Sunday with temperatures 5-10 degrees below normal.

4.6. Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for this event was:

Contractor Invoices & Other	\$36,405
<hr/>	
Total Expenditures	\$36,405
Utility Plant Additions	-
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Total Charged to MSCR	\$36,405

## 5.0 Wind Event (March 25, 2014)

### 5.1. Description of the Storm

On March 24, UES' weather forecast indicated a winter storm system bringing moderate snow and hazardous winds into the service territory on March 25 into the following day. While the snow was not concerning, the predicted wind gusts were expected to reach up to 50 mph on March 26, specifically in the Seacoast region. Through most of the day on March 26, average wind speeds were between 17-20 mph across UES' service territory with gusts reaching up to 49 mph in the Capital region but causing few customer interruptions.

### 5.2. Summary of the Extent of the Storm Damage

UES experienced limited impact in its service territory as the storm system passed through the region as detailed in the table below.

UES Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Customer Interrupted (Peak)	Percentage Affected (Peak)
Seacoast	1	1	1	1	.00%
Capital	1	1	4	4	.01%

### 5.3. Preparations

Beginning on March 24, the Company began to make preparations including holding internal conference calls, retaining contractor resources, notifying regulatory and municipal officials and mobilizing internal personnel.

### 5.4. Restoration

Minor outages that occurred were due to broken tree limb contact and were restored within one hour. The Company acquired approximately 23 line crews, 16 tree crews and supporting staff to respond to this event.

### 5.5. Qualifying Criteria

This event qualified for recovery of preparation costs due to the confidence level (greater than 60%) of the Company's professional weather forecasters that hazardous wind gusts (EEI of 3) would occur. The actual experience of this event did not meet the concurrent trouble requirement in either the Seacoast or Capital Regions; therefore restoration costs do not qualify for recovery. Preparation only costs recovered through the MSCR are summarized in Section 5.6.

Schneider Electric Forecast for Unitil Services Corp

Date: March 25, 2014

Time: 11:00 AM EDT

Forecaster: NELSON

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	WIND/GUSTS	GUSTS	GUSTS	WINDS/GUSTS
Event Begin Time	2pm Wed	3pm Wed	3pm Wed	4pm Wed
Event End Time	10pm Wed	9pm Wed	9pm Wed	12am Thu
Day 1 EII	3	4	4	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	25-32			25-32
Wind Gust	45-50	40-45	40-45	45-50
Temp. Extremes	37/25	36/6	38/16	35/8
Day 2 Wind Speed	4	5	5	4
Day 2 Wind Gust	3	4	4	3
Day 2 Snow	5	5	5	5
Day 2 Ice	5	5	5	5
Day 2 Confidence	High	High	High	High
Day 3 Wind Speed	5	5	5	5
Day 3 Wind Gust	5	5	5	5
Day 3 Snow	5	5	5	5
Day 3 Ice	5	5	5	5
Day 3 Confidence	High	High	High	High

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

**CAPITAL:** Quiet and non-hazard weather will be in place through at least this evening. A coastal storm will begin impacting the area late tonight. Snow showers will begin around 6am Wednesday morning with periods of light off and on snow through midday, ending during the afternoon. Total snowfall of less than 1/2" is expected. Winds will be the main concern, increasing out of the north-northeast to 15-20 mph with gusts near 30 mph by midday Wednesday. Winds will continue to increase out of the north and peak

between 3-9pm, sustained at 22-28 mph with frequent gusts of 35-40 mph and isolated gusts near 45 mph expected. Winds will start to weaken after 9pm Wednesday, but still gusting 25-30 mph through the night.

Confidence: Confidence is high that no hazard weather conditions will occur through midday Wednesday. Confidence is high that hazard level wind gusts to EII-4 will occur from 3-9pm on Wednesday, chances for this to occur are at 60%. Confidence is high that snow accumulation will remain below hazard.

FITCHBURG: Quiet and non-hazard weather will be in place through at least this evening. A coastal storm will begin impacting the area late tonight. Snow showers will begin around 4am Wednesday morning with periods of light off and on snow through midday, ending during the afternoon. Total snowfall of 1/2-1" is expected. Winds will be the main concern, increasing out of the north-northeast to 15-20 mph with gusts near 30-35 mph by midday Wednesday. Winds will continue to increase out of the north and peak between 3-9pm, sustained at 22-28 mph with frequent gusts of 35-45 mph and isolated gusts of 45-50 mph possible. Winds will start to weaken after 9pm Wednesday, but still gusting 30-35 mph through the night.

Confidence: Confidence is high that no hazard weather conditions will occur through midday Wednesday. Confidence is high that hazard level wind gusts to EII-4 will occur from 3-9pm on Wednesday, chances for this to occur are at 70%. Confidence is high that snow accumulation will remain below hazard.

SEACOAST: Quiet and non-hazard weather will be in place through at least this evening. A coastal storm will begin impacting the area late tonight. Snow showers will begin around 6am Wednesday morning with periods of light to moderate off and on snow through the day, ending by around 6pm. Total snowfall of 1-3" is expected, heaviest near the coast. Winds will be the main concern, increasing out of the north-northeast to 15-20 mph with gusts near 30-35 mph by midday Wednesday. Winds will continue to increase out of the north and peak between 2-10pm, sustained at 25-32 mph with frequent gusts of 40-45 mph and isolated gusts of 45-50 mph possible. A few gusts near the coast to the east of I-95 may reach 55 mph. Winds will start to weaken after 10pm Wednesday, but still gusting 30-35 mph through the night.

Confidence: Confidence is high that no hazard weather conditions will occur through midday Wednesday. Confidence is high that hazard level wind gusts to EII-4 will occur from 2-10pm on Wednesday, chances for this to occur are at 90%. Confidence is high in the potential for isolated, peak gusts of 50-55 mph (EII-3) to occur closer to the coast with chances at 40% to occur. Confidence is high that snow accumulation will remain below hazard.

PORTLAND: Quiet and non-hazard weather will be in place through at least tonight. A coastal storm will begin impacting the area Wednesday morning. Snow showers will begin around 8am Wednesday morning with periods of light to moderate off and on snow through the day, ending by around 8pm. Total snowfall of 1-3" is expected, heaviest near the coast. Winds will be the main concern, increasing out of the north-northeast to 15-20 mph with gusts near 30-35 mph by midday Wednesday. Winds will continue to increase out of the north and peak between 4pm Wednesday and 12am Thursday, sustained at 25-32 mph with frequent gusts of 40-45 mph and isolated gusts of 45-50 mph possible. A few gusts near the coast along the I-295 corridor may reach 55 mph. Winds will start to weaken after midnight, but still gusting 30-35 mph through the night.

Confidence: Confidence is high that no hazard weather conditions will occur through early afternoon Wednesday. Confidence is high that hazard level wind gusts to EII-4 will occur from 4pm Wednesday to 12am Thursday, chances for this to occur are at 90%. Confidence is high in the potential for isolated, peak gusts of 50-55 mph (EII-3) to occur closer to the coast with chances at 40% to occur. Confidence is high that snow accumulation will remain below hazard.

UNITIL SERVICE AREA 3-5 DAY OUTLOOK: Dry conditions and lighter winds are expected Thursday and Thursday night. Friday, rain showers will move through the area, but may start as a wintry mix in Concord and Portland areas if it comes in early enough Friday morning. Rain showers will then be possible through the day on Friday, coming to an end and possibly ending as some light snow. Snow and

ice accumulations are expected to be minimal since most of the precipitation will fall as rain. Some gusty winds will also be possible with this system Friday, but peak gusts will remain below hazard levels. On Saturday, another system should impact the area but again looks to stay mainly a rain event.

Confidence: Confidence is high that no hazard conditions will occur through the extended period.

## NORTHEASTERN US GENERAL WEATHER OUTLOOK

### TODAY

Today will be mainly dry outside of scattered snow showers across far northern New England and upstate New York. Accumulation will be minimal. Meanwhile, as a coastal system starts to organize from the south, flurries could move over southeastern New York in the afternoon. That system will move up the coast tonight. The main impacts will be across southeastern Massachusetts, where heavy snow and gusty winds will develop later overnight. Wind gusts of 50-60 mph are expected near and over Cape Cod/Nantucket/Martha's Vineyard during the pre-dawn hours. The combination of heavy snow and strong winds will create blizzard conditions over these areas. Further inland, light to moderate snow and wind gusts of about 30-45 mph will occur in northeastern Massachusetts (including Boston) and Rhode Island. Light snow will also occur over Long Island, Connecticut, western Massachusetts, central/southern New Hampshire, and southern Maine. Further west, scattered snow showers are possible across Upstate New York overnight. Temperatures will be about 10-18 degrees below normal.

TODAY'S Forecast Confidence: Medium – High

Highs could be 1-3 degrees cooler than forecasted due to expected light precipitation and cloud cover over most the region today. Lows tonight look okay, but could trend either warmer or cooler a few degrees depending on the extent of cloud cover and amount of precipitation in the region.

### TOMORROW

On Wednesday, heavy snow and gusty winds will continue to impact southeastern Massachusetts during the morning hours. Gusts of 50-60 mph will be common and there may be isolated gusts that end up a little higher than that. Heavy snow and gusty winds will also impact eastern Maine in the late morning and afternoon hours with gusts of 50-60 mph. Blizzard conditions are likely for both of these areas on Wednesday. Elsewhere, lighter snow will fall in Vermont, New Hampshire, central/northeastern Massachusetts, Rhode Island, and eastern Connecticut. Wind gusts of 30-45 mph will be common in these areas. Snow totals for this event (from tonight through tomorrow) will likely exceed 6 inches in southeastern Massachusetts and far eastern Maine, with amounts dropping sharply west of there (3 inches or less for most areas outside of southeast Massachusetts/eastern Maine). Scattered flurries will occur in upstate New York on Wednesday. Wednesday night, nearly all of the snow will end but light snow showers could occur from northern Vermont through northwestern Maine. Wind gusts of 30-40 mph will be common Wednesday night across Long Island and most of New England. Temperatures will be 12-25 degrees below normal. Unseasonably cold low temperatures in the single digits and teens will cause energy demand to ramp up Wednesday night across many areas.

TOMORROW'S Forecast Confidence: Medium

Overall, temperatures look alright but hourly temperature trends could be a bit problematic during the day with the powerful system moving by. The risk will be for temperatures to fall faster than expected. Low temperatures in eastern New England could be 2-4 degrees colder than expected due to the snow cover if winds subside.

### 3-5 DAY EXTENDED OUTLOOK

On Thursday, light snow is possible across northern and western New York State during the day ahead of an approaching system. Thursday night, the system will start moving through and there could freezing rain and sleet occurring from eastern New York through the Berkshires, as well as northern New England.

Further south and west, rain will occur. Precipitation will still be possible during the day Friday, but it should be warm enough for just rain to fall. Another system could move through on Saturday. A wintry mix is possible north of I-90 during the pre-dawn hours, changing to rain during the day. Rain will occur further south. Confidence is low for the forecast on Friday and Saturday due to model disagreement with timing, location, and intensity of each of these systems. Forecast confidence should improve later in the week. Temperatures will be below normal on Thursday and near to slightly above normal on Friday and Saturday

5.6. Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for this event was:

Payroll	\$ 5,741
Transportation	437
Contractor Invoices & Other	58,200
Total Expenditures	\$64,378
Total Amount Expensed	-
Total Charged to MSCR	\$64,378

## 6.0 Thunderstorm Event (July 2, 2014)

### 6.1. Description of the Storm

On July 1, UES' weather forecast provider stated the chance for scattered thunderstorms with hazardous wind gusts (40 mph) were going to develop and pass through the region as remnants of Hurricane Arthur. The confidence of thunderstorm development was high, with moderate lightning; the associated hazardous wind initially had a low confidence of reaching over 45mph but was elevated to EII level 3 the afternoon of July 2. Throughout the day on July 2, rain and gusty winds affected UES' service territory reaching up to 38 mph in the Capital region which caused several interruptions attributed to tree damage due to the full foliage.



Figure 1 - July 2nd 2014 Radar

### 6.2. Summary of the Extent of the Storm Damage

UES experienced minor damage in its service territory as the storm system passed through the region as detailed in the table below.

UES Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Customer Interrupted (Peak)	Percentage Affected (Peak)
Seacoast	5	4	145	144	0.3%
Capital	41	25	7030	3,894	13%

### 6.3. Preparations

Given that the forecast did not predict hazardous level winds until the morning of the event, the Company had to prepare quickly and began contacting key internal personnel and acquiring additional contractors to respond.



#### 6.4. Restoration

Most outages that occurred were due to broken tree limb contact or lightning and were responded to as quickly as possible given the ongoing hazardous conditions. With the peak occurring around 6 pm on July 2 most customers were restored by the end of the day with a few outages being restored in the early morning hours on July 3. The Company had access to approximately 26 line crews, 5 tree crews and supporting staff to respond to the event.

#### 6.5. Qualifying Criteria

The weather forecasts leading up to this event did not predict significant damage to UES' customers until the day of the event (attached), however, the significant impact caused to the system qualified the event under the qualifying major storm criteria of more than 22 concurrent outages in the Capital region. Restoration costs recovered through the MSCR are summarized in Section 6.6.

Schneider Electric Forecast for Unitil Services Corp

Date: July 2, 2014

Time: 1:00 PM EDT

Forecaster: Wegwerth

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	TSTORM	TSTORM	TSTORM	TSTORM
Event Begin Time	4PM	2PM	3PM	5PM
Event End Time	4AM	3AM	3AM	4AM
Day 1 EII	3	3	3	3
Event Confidence	HIGH	HIGH	HIGH	HIGH
Tstrm Wind Gusts	40-50	45-55	45-55	35-45
Ltng Intensity	MED	MED	MED	MED
Storm Mvmt Dir	NE	NE	NE	NE
Rain Amount				
Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	92/69	94/68	93/72	85/67
Day 2 Wind Speed	5	5	5	5
Day 2 Wind Gust	5	5	5	5
Day 2 Snow	5	5	5	5

Day 2 Ice	5	5	5	5
Day 2 Confidence	High	High	High	High
Day 3 Wind Speed	5	5	5	5
Day 3 Wind Gust	5	5	5	5
Day 3 Snow	5	5	5	5
Day 3 Ice	5	5	5	5
Day 3 Confidence	High	High	High	High

**UNITIL SERVICE AREA 48 HOUR OUTLOOK:**

**CAPITAL:** Scattered showers and thunderstorms will become possible after 2pm and until 3am. The best chances and strongest activity will be possible between 3pm and 9pm. Between 2pm and 9pm, thunderstorms could produce wind gusts to 45-55 mph, moderate amounts of lightning, hail to 1" in diameter, and moderate to heavy rain. Rainfall amounts: 0.25-0.50, isolated 1.00" possible. Between 10pm and 3am, thunderstorms could produce low amounts of lightning and wind gusts to 25 mph. On Thursday, dry conditions will start the day. Showers and thunderstorms will become possible after 2-3pm. Thunderstorm chances will continue off and on Thursday night and through 1pm Friday, but the best chances will exist until 12am Thursday night. Thunderstorms could produce low to medium amounts of lightning, wind gusts to 35 mph, and periods of moderate rain. Rainfall amounts: 0.25-0.50", isolated 1.00" possible. Rainfall amounts Friday through 1pm: 0.10-0.25, isolated 0.50". Winds outside of thunderstorms will stay below hazard levels.

**Confidence:** Confidence is high that thunderstorms will occur this afternoon into tonight. Thunder chance: 70%. Thunderstorm gusts and chances: 50% EEI-4, 20% EEI-3, 10% EEI-2. Confidence is medium in thunderstorms occurring tonight. Thunder chance: 30%. Confidence is medium that thunderstorms will occur on Thursday. Thunder chance: 50%. Confidence is medium that thunderstorms will occur after 10pm Thursday through 1pm Friday. Thunder chance: 40%. Confidence is medium that rainfall amounts will stay below hazard levels each day. The chance for hazard rainfall amounts each day is 20%. Isolated strong storms could produce heavy rain that could exceed 1" isolated locations.

**FITCHBURG:** Scattered showers and thunderstorms will become possible after 3pm and until 3am. The best chances and strongest activity will be possible between 3pm and 9pm. Between 3pm and 9pm; thunderstorms could produce wind gusts to 40-50 mph, moderate amounts of lightning, hail to 1" in diameter, and moderate to heavy rain. Rainfall amounts: 0.25-0.50, isolated 1.00" possible. Between 10pm and 3am, thunderstorms could produce low amounts of lightning and wind gusts to 25 mph. On Thursday, dry conditions will start the day. Showers and thunderstorms will become possible after 2-3pm. Thunderstorm chances will continue off and on Thursday night and through 1pm Friday, but the best chances will exist until 12am Thursday night. Thunderstorms could produce low to medium amounts of lightning, wind gusts to 35 mph, and periods of moderate rain. Rainfall amounts: 0.25-0.50", isolated 1.00" possible. Rainfall amounts Friday through 1pm: 0.10-0.25, isolated 0.50". Winds outside of thunderstorms will stay below hazard levels.

**Confidence:** Confidence is high that thunderstorms will occur this afternoon into tonight. Thunder chance: 60%. Thunderstorm gusts and chances: 50% EEI-4, 20% EEI-3, 10% EEI-2. Confidence is medium in thunderstorms occurring tonight. Thunder chance: 30%. Confidence is medium that thunderstorms will occur on Thursday. Thunder chance: 50%. Confidence is medium that thunderstorms will occur after 10pm Thursday through 1pm Friday. Thunder chance: 40%. Confidence is high that rainfall amounts will stay below hazard levels each day. The chance for hazard rainfall amounts each day is 20%. Isolated strong storms could produce heavy rain that could exceed 1" isolated locations.

SEACOAST: Scattered showers and thunderstorms will become possible after 4pm and until 4am. The best chances and strongest activity will be possible between 4pm and 9pm. Between 4pm and 9pm, thunderstorms could produce wind gusts to 40-50 mph, moderate amounts of lightning, hail to 1" in diameter, and moderate to heavy rain. Rainfall amounts: 0.25-0.50, isolated 1.00" possible. Between 10pm and 3am, thunderstorms could produce low amounts of lightning and wind gusts to 25 mph. On Thursday, dry conditions will start the day. Showers and thunderstorms will become possible after 3-4pm. Thunderstorm chances will continue off and on Thursday night and through 1pm Friday, but the best chances will exist until 12am Thursday night. Thunderstorms could produce low to medium amounts of lightning, wind gusts to 35 mph, and periods of moderate rain. Rainfall amounts: 0.25-0.50", isolated 1.00" possible. Rainfall amounts Friday through 1pm: 0.10-0.25, isolated 0.50". Winds outside of thunderstorms will stay below hazard levels.

Confidence: Confidence is high that thunderstorms will occur this afternoon into tonight. Thunder chance: 60%. Thunderstorm gusts and chances: 50% EEI-4, 15% EEI-3, 5% EEI-2. Confidence is medium in thunderstorms occurring tonight. Thunder chance: 30%. Confidence is medium that thunderstorms will occur on Thursday. Thunder chance: 50%. Confidence is medium that thunderstorms will occur after 10pm Thursday through 1pm Friday. Thunder chance: 40%. Confidence is high that rainfall amounts will stay below hazard levels each day. The chance for hazard rainfall amounts each day is 10%. Isolated strong storms could produce heavy rain that could exceed 1" isolated locations.

PORTLAND: Scattered showers and thunderstorms will become possible after 5pm and until 4am. The best chances and strongest activity will be possible between 5pm and 9pm. Between 4pm and 9pm, thunderstorms could produce wind gusts to 35-45 mph (except 40-50 mph in Lewiston), moderate amounts of lightning, hail to 1" in diameter, and moderate to heavy rain. Rainfall amounts: 0.25-0.50, isolated 1.00" possible. Between 10pm and 3am, thunderstorms could produce low amounts of lightning and wind gusts to 25 mph. On Thursday, dry conditions will start the day. Showers and thunderstorms will become possible after 4-5pm. Thunderstorm chances will continue off and on Thursday night and through 1pm Friday, but the best chances will exist until 12am Thursday night. Thunderstorms could produce low to medium amounts of lightning, wind gusts to 35 mph, and periods of moderate rain. Rainfall amounts: 0.25-0.50", isolated 1.00" possible. Rainfall amounts Friday through 1pm: 0.10-0.25, isolated 0.50". Winds outside of thunderstorms will stay below hazard levels.

Confidence: Confidence is high that thunderstorms will occur this afternoon into tonight. Thunder chance: 60%. Thunderstorm gusts and chances: 50% EEI-4, 15% EEI-3, 5% EEI-2. Confidence is medium in thunderstorms occurring tonight. Thunder chance: 30%. Confidence is medium that thunderstorms will occur on Thursday. Thunder chance: 50%. Confidence is medium that thunderstorms will occur after 10pm Thursday through 1pm Friday. Thunder chance: 40%. Confidence is high that rainfall amounts will stay below hazard levels each day. The chance for hazard rainfall amounts each day is 10%. Isolated strong storms could produce heavy rain that could exceed 1" isolated locations.

UNITIL SERVICE AREA 3-5 DAY OUTLOOK: Friday, showers and a few thunderstorms will be possible throughout the day. Tropical Storm Arthur is forecasted to move southeast of the region on Friday night and will likely stay off the coast. No hazard conditions are currently expected with TS Arthur for the region. However, a few showers and thunderstorms will be possible along an outer band on Friday night which could produce heavy rain. Chances for showers from this system will diminish by sunrise Saturday morning. Dry and hazard free conditions are expected on Saturday and Sunday.

Confidence: Confidence is medium that thunderstorms will occur on Friday. Thunder chance: 40%. Confidence is medium that rainfall amounts will stay below hazard levels Friday into Saturday in the Seacoast and Portland.

#### NORTHEASTERN US GENERAL WEATHER OUTLOOK

TODAY

Coverage of showers and thunderstorms will expand across western New York and western and northern New England this afternoon. Showers and thunderstorms will progress eastward through this afternoon and evening. A few thunderstorms could be strong or severe in central and eastern New York and western and northern New England. The main threats will be moderate to frequent amounts of lightning, wind gusts to 60 mph, sizeable hail, and periods of heavy rain that could cause flash flooding. Most of this activity will weaken and diminish tonight, but a few showers or thunderstorms could linger in southern and eastern New England and mainly downstate New York tonight. Temperatures will be hot and will be 5-15 degrees above normal.

TODAY'S Forecast Confidence: Medium – High

Highs and hourly temperatures could be knocked down 2-5 degrees with scattered cloud cover, rain, and thunderstorms this afternoon. Areas with fewer clouds and storms could be 1-3 degrees warmer. Lows tonight could be 1-3 degrees warmer with lingering clouds.

TOMORROW

On Thursday, isolated, light showers will be possible across southern New York and southern New England in the morning, mainly near the coast. By Thursday afternoon showers and thunderstorms will pop-up across much of New York and New England around an area of low pressure and a cold front. Activity will push eastward during the afternoon and evening, especially in New England. A few storms could be strong Thursday afternoon and evening across southern New York, Massachusetts, Connecticut, and Rhode Island. The main threats will periods of heavy rain and strong, damaging wind gusts. Thursday night, the strong storm threat will end, but showers and isolated thunderstorms could linger across New England. Temperatures will cool but will be 3-10 degrees above normal.

TOMORROW'S Forecast Confidence: Medium

Highs and hourly temperatures could be knocked down 2-4 degrees with afternoon thunderstorms and clouds. Overnight lows should verify well, but lows could be 1-3 degrees cooler in western New York with clearing skies.

3-5 DAY EXTENDED OUTLOOK

On Friday, scattered showers and thunderstorms will likely linger across parts of eastern New York and New England with the most organized showers and storms focusing over southern New England. Strong storms are not expected at this time, but periods of moderate to heavy rain could occur in spots. Friday night and into Saturday, tropical storm Arthur will pass south of New England but will bring a continued threat for moderate to heavy rain and some gusty winds to southeastern New England. The strongest winds will focus over the Cape and Islands of Massachusetts, but the heavier rain could impact much of eastern Massachusetts, Connecticut, and Rhode Island. Rainfall amounts over 1 inch will be possible. Dry weather is expected elsewhere. Impacts from Arthur will decrease later Saturday morning and Saturday afternoon for most, but wind and rain impacts could linger in southeastern Maine Saturday night. Mostly dry conditions are expected on Sunday, but a few showers or storms could move into far northern reaches of the region Sunday night. Temperatures will be near to below normal on Friday and Saturday and closer to normal on Sunday

6.6. Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for this event was:

Payroll	\$13,427
Materials & Supplies	1,907
Transportation	2,610
Contractor Invoices & Other	43,238
<hr/>	
Total Expenditures	\$61,182
Utility Plant Additions	(12,408)
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Total Charged to MSCR	\$48,774

## **7.0 Wind Event (November 1, 2014)**

### **7.1. Description of the Storm**

On October 30, UES' weather forecast provider indicated a storm system developing and passing by New England over the weekend (Saturday) with the hazardous winds being a concern. Widespread showers were forecasted to occur with medium confidence that hazardous wind gusts (40 mph) could impact the area. Over the next two days, subsequent forecasts increased wind speeds and the confidence levels of hazardous winds (although mostly for the Seacoast region). Winds throughout the event in the Seacoast region were sustained at an average of 20 mph with gusts reaching up to 41 mph while in the Capital region winds averaged 17 mph with gusts reaching up to 40 mph.

### **7.2. Summary of the Extent of the Storm Damage**

UES experienced minor damage in its service territory as the storm system passed through the region as detailed in the table below.

<b>UES Region</b>	<b>Total # Outages</b>	<b>Peak # Outages</b>	<b>Total Customers Interrupted</b>	<b>Customer Interrupted (Peak)</b>	<b>Percentage Affected (Peak)</b>
Seacoast	5	2	111	99	0.2%
Capital	14	6	575	498	2%

### **7.3. Preparations**

Beginning on October 30, the Company began to make preparations including holding internal conference calls, retaining contractor resources, and mobilizing internal personnel.

### **7.4. Restoration**

Most outages that occurred were due to broken tree limb contact which caused significant damage in certain areas and were responded to as quickly as possible. Most impacted customers were restored within two hours with a few outages taking approximately eight hours to repair due to the extensive damage at those locations. The Company had access to approximately 23 line crews, 18 tree crews and supporting staff to respond to this event.

### **7.5. Qualifying Criteria**

This event qualified for recovery of preparation costs due to the confidence level (greater than 60%) of the Company's professional weather forecasters that hazardous wind gusts (EEI of 3) would occur. The actual experience of this event did not meet the concurrent trouble requirement in either the Seacoast or Capital Regions; therefore restoration costs do not qualify for recovery. Preparation only costs recovered through the MSCR are summarized in section 7.6.

Schneider Electric Forecast for Unitil Services Corp

Date: October 31, 2014

Time: 6:00 AM EDT

Forecaster: Hamblin

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	NONE	NONE	NONE	NONE
Event Begin Time				
Event End Time				
Day 1 EII	5	5	5	5
Event Confidence				
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount				
Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	52/38	53/36	54/40	53/35
Day 2 Wind Speed	5	5	5	5
Day 2 Wind Gust	4	4	4	4
Day 2 Snow	5	5	5	5
Day 2 Ice	5	5	5	5
Day 2 Confidence	High	High	High	High
Day 3 Wind Speed	5	5	5	5
Day 3 Wind Gust	3	4	4	3
Day 3 Snow	5	5	5	5
Day 3 Ice	5	5	5	5
Day 3 Confidence	High	High	High	High

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

CAPITAL: Dry weather and no hazard conditions are expected today through early Saturday morning. Winds will be comfortably below hazard levels through this time. Rain showers will develop on Saturday morning and should last through Saturday evening. The heaviest rain should occur during the afternoon

and into the evening. Rainfall amounts: 0.25-0.50". There is a risk that light precipitation could linger through Saturday night. If this occurs, rain could change to snow, but little accumulation would result. Dry conditions are expected on Sunday. Winds could gust to 25-30 mph later Saturday morning and Saturday afternoon. Hazard winds should develop by 7pm Saturday and should last through Sunday. Winds from 7pm Saturday to 9am Sunday should be sustained at 18-23 mph, with isolated peak gusts of 30-35 mph. EEI-4 wind gusts are expected. Winds should increase from 9am-7pm Sunday. Peak sustained winds: 23-28 mph. Frequent gusts: 30-40 mph. isolated peak gusts: 40-45 mph.

Confidence: Confidence is high that hazard winds will occur later Saturday through later Sunday. Wind chances: EEI-4 80%, EEI-3 40%.

FITCHBURG: Dry weather and no hazard conditions are expected today through tonight. Winds will be comfortably below hazard levels through this time. Rain showers will develop very early Saturday morning and should last through Saturday evening. The heaviest rain should occur during the afternoon and into the evening. Rainfall amounts: 0.25-0.50". There is a risk that light precipitation could linger through Saturday night. If this occurs, rain could change to snow, but little accumulation would result. Dry conditions are expected on Sunday. Winds could gust to 25-30 mph later Saturday morning and Saturday afternoon. Hazard winds should develop by 7pm Saturday and should last through Sunday. Winds from 7pm Saturday to 9am Sunday should be sustained at 18-23 mph, with isolated peak gusts of 30-35 mph. EEI-4 wind gusts are expected. Winds should increase from 9am-7pm Sunday. Peak sustained winds: 23-28 mph. Frequent gusts: 30-40 mph. Isolated peak gusts: 40-45 mph.

Confidence: Confidence is high that hazard winds will occur later Saturday through later Sunday. Wind chances: EEI-4 80%, EEI-3 40%.

SEACOAST: Dry weather and no hazard conditions are expected today through tonight. Winds will be comfortably below hazard levels through this time. Rain showers will develop very early Saturday morning and should last through most of Saturday evening. The heaviest rain should occur during the afternoon and into the evening. Rainfall amounts: 0.30-0.60". There is a risk that light precipitation could linger through the rest of Saturday night and into Sunday morning. If this occurs, rain could change to snow, but little accumulation would result. Dry conditions are expected for the rest of Sunday. Winds could gust to 25-30 mph later Saturday morning. Hazard winds should develop by 1pm Saturday and should last through Sunday. Winds from 1pm Saturday to 9am Sunday should be sustained at 20-25 mph. Frequent gusts: 25-35 mph. Isolated peak gusts: 35-40 mph. EEI-4 wind gusts are expected. Winds should increase from 9am-7pm Sunday. Peak sustained winds: 23-30 mph. Frequent gusts: 35-45 mph. Isolated peak gusts: 45-50 mph.

Confidence: Confidence is high that hazard winds will occur later Saturday through later Sunday. Wind chances: EEI-4 90%, EEI-3 60%.

PORTLAND: Dry weather and no hazard conditions are expected today through tonight. Winds will be comfortably below hazard levels through this time. Rain showers will develop very early Saturday morning and should last through most of Saturday evening. The heaviest rain should occur during the afternoon and through a chunk of Saturday night. Rainfall amounts: 0.30-0.60". Light precipitation should linger through the rest of Saturday night and into Sunday. Rain should change to snow across Lewiston. There is a risk of hazard wet snow accumulations if the storm tracks close enough. The forecast will be around an inch of wet snow for now. Dry conditions are expected by later Sunday. Winds could gust to 25-30 mph later Saturday morning. Hazard



winds should develop by 1pm Saturday and should last through Sunday. Winds from 1pm Saturday to 9am Sunday should be sustained at 20-25 mph. Frequent gusts: 25-35 mph. Isolated peak gusts: 35-40 mph. EEI-4 wind gusts are expected. Winds should increase from 9am-7pm Sunday. Peak sustained winds: 23-30 mph. Frequent gusts: 35-45 mph. Isolated peak gusts: 45-50 mph.

Confidence: Confidence is high that hazard winds will occur later Saturday through later Sunday. Wind chances: EEI-4 90%, EEI-3 60%. Confidence is low that hazard snow will occur in Lewiston later Saturday night and Sunday. Snow chance: EEI-4 20%.

UNITIL SERVICE AREA 3-5 DAY OUTLOOK: Dry conditions will be likely on Sunday night and Monday. Hazard winds should continue. Winds should be sustained at 20-25 mph, with isolated peak gusts of 35-40 mph through this period, strongest before noon Monday. Winds should go below EEI-4 levels by late Monday. Dry weather and no hazard conditions are expected on Monday night through Tuesday night.

Confidence: Confidence is high that hazard winds will occur on Sunday night and Monday. Wind chance: EEI-4 70%. Confidence is high that no other hazard conditions will occur through the day 3-5 period.

#### NORTHEASTERN US GENERAL WEATHER OUTLOOK

##### TODAY

Scattered light rain showers will develop across western New York today, especially during the afternoon hours. Dry weather is expected to the east. Light rain showers will develop tonight across Downstate New York and southern New England. Nothing significant is expected. Light precipitation will continue across western and central New York tonight. Some of this could expand into northern New York. It should generally be rain, but light snow will be possible across the Adirondacks. Little accumulation is expected. Winds could gust to 20-30 mph across coastal southern New England and Downstate New York tonight, especially after midnight. Temperatures will be near normal.

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

Cooler air, along with the increased cloud cover and showers, could allow highs to trend 1-3 degrees cooler across western and central New York. Otherwise, temperatures look reasonable across the region through tonight.

##### TOMORROW

Organized rain will develop across eastern Long Island through southeastern New England during the day Saturday, especially during the afternoon hours. Rainfall amounts could exceed a half inch with this wave alone. Otherwise, we'll have spotty light precipitation around, especially in western New York. Rain could mix with snow across higher terrain in southwestern New York with only minor accumulations expected, if any. The main slug of precipitation will impact portions of eastern New England on Saturday night and Sunday. It could come in a couple of waves. This should be rain across coastal southern New England. Rain should change to snow across portions of interior New Hampshire and interior Maine, especially eastern sections. Accumulating snow is likely across portions of Downeast Maine, away from the coast. There is the potential of several inches of wet snow if the storm tracks close enough to the coast. To the west, light precipitation will be likely across portions of western and central New York on

Saturday night and into Sunday. Rain should change to snow during the overnight period. Most accumulations should be minor and restricted to higher terrain. There could be a thin band in western New York where localized accumulations could exceed an inch. Winds will become an issue later Saturday through Sunday. The strongest winds should be sometime Saturday night and Sunday. Winds could gust to 45-50 mph along the coast, with peak gusts of 50-60 mph across the southeastern New England Coast. Winds could gust to 30-45 mph across inland areas, strongest east of I-81. Temperatures will be 3-8 degrees below normal.

**TOMORROW'S Forecast Confidence: Medium**

Highs and spot temperatures could trend 2-4 degrees cooler across southern New England and eastern Long Island if rain is heavier or lasts longer than expected. Highs look okay elsewhere, but could trend 1-3 degrees cooler in isolated cases if there is more precipitation than expected. Lows look reasonable at night for the most part. Spot temperatures across New Hampshire and Maine could drop 2-5 degrees here and there if the heavy precipitation is further west than expected.

**3-5 DAY EXTENDED OUTLOOK**

Dry conditions will take over across the region on Sunday night and Monday. Gusty winds will continue across eastern areas, especially near the coast. However, the winds will gradually diminish on Monday. Mostly dry conditions are expected on Monday night through Tuesday night. Rain showers will be possible across portions of northern New England and northern/western New York on Tuesday and Tuesday night. Temperatures will be 6-12 degrees below normal on Sunday. Readings should stay 6-12 degrees below normal near the coast on Monday, but should warm to near normal across western/central New York. Temperatures should be near to a few degrees above normal on Tuesday across the region on Tuesday.

**7.6. Costs Charged to the Storm Reserve**

The total amount charged to the storm reserve for this event was:

Payroll	\$ 6,546
Contractor Invoices & Other	12,901
<hr/>	
Total Expenditures	\$19,447
Utility Plant Additions	-
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Total Charged to MSCR	\$19,447

## 8.0 Thanksgiving Storm “Cato” (November 26, 2014)

### 8.1. Description of the Storm

UES had been tracking a pending storm since November 22 and on Tuesday November 25, UES’ weather forecast provider indicated a storm system developing in the Carolinas and tracking up the eastern seaboard. The system was expected to bring abundant amounts of moisture (heavy snow up to 11”) with elevated winds impacting the service territory. Over the next 24 hours, subsequent forecasts increased the confidence levels and amounts of snow. Winds throughout the event remained under hazardous levels with gusts reaching up to 31 mph across the service territory; however, over 12 inches of heavy snow fell in the Capital region.

### 8.2. Summary of the Extent of the Storm Damage

UES experienced significant damage in its service territory (specifically Capital) as the storm system passed through the region as detailed in the table below.

UES Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Customer Interrupted (Peak)	Percentage Affected (Peak)
Seacoast	111	37	15,637	10,775	23%
Capital	377	112	55,678	23,438	78%

### 8.3. Preparations

Beginning on November 22, the Company began to make preparations including holding internal conference calls, retaining contractor resources, and mobilizing internal personnel.

### 8.4. Restoration

Most outages that occurred were due to broken tree limb contact which caused significant damage in certain areas and were responded to as quickly as possible. Peak outages occurred approximately at 9:00 PM on November 26 with 46% of UES’ customers affected. The Company was able to restore nearly all customers by the afternoon of November 29 with the remaining affected customers being restored throughout the day. The Company had access to approximately 89 line crews, 18 tree crews, 9 service crews and supporting staff to respond to this event.

### 8.5. Qualifying Criteria

This event qualified for recovery of preparation costs due to the confidence level (greater than 60%) of the Company’s professional weather forecasters that hazardous wind gusts (EEI of 3) would occur. The impact caused to the system qualified under the outage exclusionary criteria of more than 22 concurrent outages in both of UES’ regions. Final costs for this event were not available at the time of this report and will be included in the 2015 MSCR Report.

Schneider Electric Forecast for Unitil Services Corp

Date: November 25, 2014

Time: 6:00 AM EDT

Forecaster: Trumble

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	NONE	NONE	NONE	NONE
Event Begin Time				
Event End Time				
Day 1 EII	5	5	5	5
Event Confidence				
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount				
Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	52/38	53/36	54/40	53/35
Day 2 Wind Speed	5	5	5	5
Day 2 Wind Gust	4	4	4	4
Day 2 Snow	5	5	5	5
Day 2 Ice	5	5	5	5
Day 2 Confidence	High	High	High	High
Day 3 Wind Speed	5	5	5	5
Day 3 Wind Gust	3	4	4	3
Day 3 Snow	5	5	5	5
Day 3 Ice	5	5	5	5
Day 3 Confidence	High	High	High	High

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

**CAPITAL:** Dry today with southwest winds of 8-12 mph occasionally gusting 20-25 mph during the late morning and afternoon. A mixture of rain/snow beginning 8am-10am on Wednesday. Turning to all snow after 12pm. Snow likely through the afternoon into the evening with periods of heavy snow possible. Diminishing gradually after midnight, becoming insignificant flurries by 6am Thursday. Flurries ending

by 11am. 6-8" of snowfall expected from this system. Gusty winds also possible on Wednesday with occasional gusts 30-35 mph possible between 10am Wednesday and 6am Thursday.

Confidence: Confidence is high that no hazards will occur on Tuesday. Confidence is high that wet snow will occur on Wednesday. Chance for EEI-4 level snow is 80%. Chance for EEI-3 level snow is 60%. Chance for EEI-4 level wind gust is 10%.

FITCHBURG: Dry today with southwest winds of 8-12 mph occasionally gusting 20-25 mph during the late morning and afternoon. A mixture of rain/snow beginning 6am-8am on Wednesday. Turning to all snow after 11am. Snow likely through the afternoon into the evening with periods of heavy snow possible. Diminishing gradually after midnight, becoming insignificant flurries by 6am Thursday. Flurries ending by 11am. 5-8" of snowfall expected from this system. Gusty winds also possible on Wednesday with occasional gusts 30-35 mph possible between 10am Wednesday and 6am Thursday.

Confidence: Confidence is high that no hazards will occur on Tuesday. Confidence is high that wet snow will occur on Wednesday. Chance for EEI-4 level snow is 70%. Chance for EEI-3 level snow is 50%. Chance for EEI-4 level wind gust is 10%.

SEACOAST: Dry today with southwest winds of 8-12 mph occasionally gusting 20-25 mph during the late morning and afternoon. Rain showers beginning 9am-11am on Wednesday. Turning to rain/snow mix after 3pm and all snow after 6pm. Snow likely through the evening with periods of heavy snow possible. Diminishing gradually after 1am, becoming insignificant flurries by 7am Thursday. Flurries ending by 11am. 4-7" of snowfall expected from this system. Gusty winds also possible on Wednesday with occasional gusts 30-35 mph possible between 10am Wednesday and 6am Thursday.

Confidence: Confidence is high that no hazards will occur on Tuesday. Confidence is high that wet snow will occur on Wednesday. Chance for EEI-4 level snow is 60%. Chance for EEI-3 level snow is 40%. Chance for EEI-4 level wind gust is 10%.

PORTLAND: Dry today with southwest winds of 8-12 mph occasionally gusting 20-25 mph during the late morning and afternoon. Rain showers beginning 9am-11am on Wednesday. Turning to rain/snow mix after 3pm and all snow after 6pm. Snow likely through the evening with periods of heavy snow possible. Diminishing gradually after 3am, becoming insignificant flurries by 8am Thursday. Flurries ending by 11am. 4-6" of snowfall expected from this system. Gusty winds also possible on Wednesday with occasional gusts 30-35 mph possible between 10am Wednesday and 6am Thursday.

Confidence: Confidence is high that no hazards will occur on Tuesday. Confidence is high that wet snow will occur on Wednesday. Chance for EEI-4 level snow is 50%. Chance for EEI-3 level snow is 30%. Chance for EEI-4 level wind gust is 10%.

UNITIL SERVICE AREA 3-5 DAY OUTLOOK: Lingering flurries throughout the late morning on Thursday may produce an additional dusting or so but significant snowfall should end with the timing above. Winds may remain a bit on the breezy side but peak gusts should be 30mph or less throughout the day. Dry, hazard free weather expected for Friday. There will be a small chance for a very isolated snow shower or two on Saturday mainly over the Capital area however accumulations will be very minor, if any.

Confidence: Confidence is high that no additional hazards will occur on Thursday after the system detailed above comes to an end. Confidence is high that no hazards will occur on Friday and Saturday.

#### NORTHEASTERN US GENERAL WEATHER OUTLOOK

##### TODAY

Generally quiet weather expected today with a few wind gusts of 25-35 mph possible near the Great Lakes. There may be a stray isolated rain shower or two over far northern New York but this activity will be very spotty and light. Temperatures are expected to average 5-10 degrees above normal but it should

be noted that most locations have likely already seen their high temperature for the day. Afternoon temperatures will recover a degree or two but are not expected to return to levels present during the early morning hours. Temperatures will continue to fall overnight reaching near or slightly below normal levels for the Tuesday night lows.

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

Daily high temperatures have already occurred but afternoon highs may end up a degree or two warmer than the low this morning. Tonight low temperatures will return to normal or slightly below but otherwise should verify well.

#### TOMORROW

A major storm is expected to hit the Northeast US on Wednesday. Eastern New York and all of New England will be at risk with just lighter activity expected for Western New York. Snow will begin across southeastern New York and southern New England in the late morning. Some coastal areas, especially most of southeastern Massachusetts will likely begin as rain. A band of heavy wet snow is expected to develop from northeastern Pennsylvania across the Hudson Valley into northwestern Connecticut, western Massachusetts into southern New Hampshire and southern Vermont. Several inches of wet snow is expected in this area with a chance for up to 10 inches in portions of central Massachusetts and southern New Hampshire. Snow will continue overnight with the heavier activity shifting into Maine before gradually diminishing from southwest to northeast in the pre-dawn hours. Southeastern Massachusetts into southern Rhode Island may dodge the worst of this storm, remaining rain until late evening and just seeing light snow amounts in the overnight hours. There will likely be a sharp cut off from minor amounts to heavy amounts over eastern/Central Massachusetts into eastern Connecticut. Gusty winds should also be expected from this storm with gusts of 35-40 mph expected across areas impacted by the snow. Wednesday will average out to be near or slightly below normal but in reality most areas will likely see temperatures either steady or gradually falling throughout the day.

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

With almost steady temperatures throughout the day most areas should verify well but there is a concern that some warmer air could be pulled into southeastern Massachusetts causing highs to come in a few degrees warmer for the day.

#### 3-5 DAY EXTENDED OUTLOOK

Snow showers will linger over northern New England Thursday morning but gradually decrease throughout the late morning and afternoon. Elsewhere a few flurries may develop but additional accumulations should be insignificant. Dry conditions will settle in Thursday night but a few Lake Effect bands could develop off the Great Lakes in Western New York. Light snow showers will be possible over western New York on Friday with this risk gradually spreading into eastern New York and New England late Friday into Saturday. A slight warm up is expected Saturday night with a chance for a few light rain/snow showers across the region. Temperatures will be near or slightly below normal for Thursday, 3-8 degrees below normal on Friday and near or slightly below normal on Friday.

Attachment A

**Estimated Impact Indices (effective July 2013 – Dec 17 2014)**

Forecasted Wind Speed/Wind Gusts \*WITH LEAVES\*(April 1 - October 31)

Level	Wind (Sustained)	Wind Gusts <sup>1</sup>	Frequency of Wind Gusts $\geq 50$ mph <sup>2</sup>
EII = 4	N/A	> 30 and < 50 mph	No
EII = 3	$\geq 30$ and $\leq 40$ mph	>40 and <50 mph	Yes
EII = 2	N/A	>50 mph	Yes
EII = 1	N/A	> 75 mph	Yes

Forecasted Wind Speed/Wind Gusts \*WITHOUT LEAVES\* (November 1 - March 31)<sup>3</sup>

Level	Wind (Sustained)	Wind Gusts	Frequency of Wind Gusts $\geq 50$ mph <sup>2</sup>
EII = 4	N/A	> 40 mph	No
EII = 3	$\geq 30$ and $\leq 40$ mph	>45 mph	Yes
EII = 2	N/A	> 60 mph	Yes
EII = 1	N/A	>75 mph	Yes

Forecasted Ice Accretion (assumes “normal” wind speed)

Level	Ice Accretion
EII = 4	> 1/10 inch
EII = 3	> 3/8 inch
EII = 2	> 1/2 inch
EII = 1	> 1 inch

Forecasted Snow Amounts (assumes dry snow consistency). These amounts are factored with wind speed more so than actual accumulation.

Level	Snow
EII = 5	> 6 inches
EII = 4	> 12 inches
EII = 3	> 18 inches
EII = 1-2	> 24 inches

Forecasted Snow Amounts (assumes wet snow consistency). Season will modify amount within level – A fall storm (with leaves) will have a significantly increased impact.

Level	Snow (Without Leaves)	Level	Snow (With Leaves)
EII = 4	> 6 inches	EII = 4	> 4 inches
EII = 3	> 8 inches	EII = 3	> 6 inches
EII = 2	> 12 inches	EII = 2	> 12 inches
EII = 1	> 24 inches	EII = 1	> 24 inches

<sup>1</sup> At Medium or High confidence level

<sup>2</sup> Note frequency of gust regardless of confidence level

<sup>3</sup> For Operations planning purposes only

Forecast Confidence Levels

Low	Medium	High
< 30% Chance	$\geq 30 \leq 60\%$ Chance	> 60% Chance

Temperature	Snow/Water Ratio	Character
> 30 F	6:1	Wet
25-29 F	10:1	Average
15-24 F	15:1	Dry
5-14 F	20:1	Very Dry
< 5 F	30:1	Extremely Dry