



Unitil Energy Systems, Inc.  
Major Storm Cost Reserve Fund Report  
2015

Prepared By: Business Continuity & Compliance and Accounting

February 26, 2016

## **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, 2015. 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, 2015 is (\$2,862,336). 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, 2015 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, 2015* 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, 2015 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>1</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>2</sup>

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<sup>1</sup> The amount was increased to \$800,000 as part of Order No. 25,502 – April 29, 2013

<sup>2</sup> EII levels are indices developed by Unitil’s current 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. This section has been updated from the original agreement which referenced Unitil’s prior weather forecaster.

from the Company's professional weather forecaster reaches an EII level of 3<sup>3</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>3</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, 2015**

Section #	Date	Description	Surplus (Deficit)
	<b>12/31/2014</b>	<b>MSCR BALANCE (As Filed on 2/28/2015)</b>	<b>\$ (1,011,180)</b>
<b>Adjustments to 2014 Filing</b>			
	7/20/2013	Severe Storm adjustment	998
	11/24/2013	Wind Storm adjustment	110
	2/13/2014	Snow Event adjustment	107
	7/2/2014	Thunderstorm adjustment	294
<b>Adjusted Opening Balance 1/1/2015</b>			<b>\$ (1,009,671)</b>
<b>2015 Deferred Charges</b>			
1.6	11/27/2014	Snow Storm <sup>1</sup>	(1,647,877)
2.6	01/23/2015	Snow Storm	(1,968)
3.6	01/26/2015	Nor'easter	(554,444)
4.6	02/15/2015	Wind Event	(285,854)
5.6	06/23/2015	Storm Event	(4,513)
6.6	10/28/2015	Storm Event	(27,329)
<b>2015 Recovery</b>			
<b>2015</b>	<b>Current Recovery Rate</b>		<b>800,000</b>
<b>2015 Carrying Charges</b>			<b>(130,680)</b>
	<b>12/31/2015</b>	<b>MSCR BALANCE</b>	<b>\$ (2,862,336)</b>

<sup>1</sup> Costs related to the November 27, 2014 Snow Event, preliminarily estimated at \$1.5 million, were not available at the time the 2014 Annual Report was prepared and have 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-15	\$8,312,523 (1)	\$0	\$237,922	\$8,074,600	\$8,193,561	4.52%	\$31,454	\$8,106,054
Feb-15	\$8,106,054	\$0	\$235,176	\$7,870,878	\$7,988,466	4.52%	\$27,699	\$7,898,578
Mar-15	\$7,898,578	\$0	\$244,738	\$7,653,839	\$7,776,208	4.52%	\$29,852	\$7,683,692
Apr-15	\$7,683,692	\$0	\$201,339	\$7,482,353	\$7,583,022	4.52%	\$28,171	\$7,510,524
May-15	\$7,510,524	\$0	\$189,716	\$7,320,808	\$7,415,666	4.52%	\$28,468	\$7,349,276
Jun-15	\$7,349,276	\$0	\$226,394	\$7,122,883	\$7,236,079	4.52%	\$26,883	\$7,149,765
Jul-15	\$7,149,765	\$0	\$235,803	\$6,913,962	\$7,031,864	4.52%	\$26,995	\$6,940,957
Aug-15	\$6,940,957	\$0	\$260,882	\$6,680,075	\$6,810,516	4.52%	\$26,145	\$6,706,220
Sep-15	\$6,706,220	\$0	\$253,153	\$6,453,067	\$6,579,643	4.52%	\$24,444	\$6,477,510
Oct-15	\$6,477,510	\$0	\$198,464	\$6,279,046	\$6,378,278	4.52%	\$24,486	\$6,303,532
Nov-15	\$6,303,532	\$0	\$191,086	\$6,112,446	\$6,207,989	4.52%	\$23,063	\$6,135,509
Dec-15	\$6,135,509	\$0	\$207,356	\$5,928,153	\$6,031,831	4.52%	\$23,156	\$5,951,309

(1) As filed in Unitil Energy Systems, Inc.'s Major Storm Cost Reserve Fund Report, February 28, 2015.

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**Attachments**

Attachment A – Estimated Impact Indices (EII) Criteria

## 1.0 Snow Event “Thanksgiving Snow Storm” (November 26, 2014)

### 1.1. Description of the Storm

UES had been tracking a pending storm starting November 22 and on Tuesday, November 25, UES’ weather forecast indicated that a storm system developing in the Carolinas would be tracking up the eastern seaboard. The system was expected to bring abundant amounts of moisture (heavy wet 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 31 mph across the service territory; however, over 12 inches of heavy wet snow fell in the Capital region.

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

UES experienced significant damage in its service territory (specifically the Capital region) 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	111	42	15,637	10,919	24%
Capital	377	175	55,678	23,656	79%

### 1.3. Preparations

Beginning on November 22, the Company began to make preparations including holding internal conference calls, participating on mutual assistance conference calls, retaining contracted line resources, and mobilizing internal personnel. The Company opened all of its Emergency Operations Center (EOCs) at 3:00 PM on Wednesday, November 26 to monitor the weather event and subsequent interruptions.

### 1.4. Restoration

Most outages that occurred were due to broken tree limbs contacting or breaking wires and damaging electrical equipment causing significant damage in certain areas, most prevalent in the Capital region which received the brunt of the storm. Peak outages occurred approximately at 9:00 PM on Wednesday, November 26 with 34,575 (46%) of UES’ customers affected, with many experiencing multiple interruptions throughout the event. The Company was able to restore nearly all customers by the morning of Saturday, November 29 with the remaining 700 (1%) affected customers being restored by the end of 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.

### 1.5. 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 indicating hazardous wind

gusts (EEI of 3) would occur (forecast below). The impact caused to the system qualified under the outage exclusionary criteria of more than 22 concurrent outages in both of UES' regions. Costs recovered through the MSCR are summarized in Section 1.6.

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.

1.6. Costs Charged to the Storm Reserve

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

Payroll	\$ 291,070
Transportation	725
Materials & Supplies	29,420
Applied Overheads	7,336
Contractor Invoices & Other	1,738,834
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Total Expenditures	\$2,067,385
Utility Plant Additions	(419,508)
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Total Charged to MSCR	\$1,647,877

## 2.0 Snow Event (January 23, 2015)

### 2.1. Description of the Storm

On Thursday, January 22, UES' weather forecast indicated a minor coastal storm system would pass by the region with the potential for snow and moderate winds across the service territory on Saturday, January 24. While the snow amounts were limited, the predicted consistency was expected to be wet and heavy accompanied by moderate winds, specifically in the Seacoast region. On Saturday, January 24, 1-4 inches of snow fell across the service territory with average wind speeds between 10-20 mph across UES' service territory and gusts reaching up to 30 mph in the Seacoast region.

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

UES experienced only 1 outage, caused by a motor vehicle accident, 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	.00%
Capital	1	1	578	578	2%

### 2.3. Preparations

Beginning on Thursday, January 22, the Company began to make preparations including holding internal conference calls, inquiring the availability of contractor resources, and mobilizing internal personnel.

### 2.4. Restoration

A single outage occurred due to a motor vehicle accident which impacted 578 customers and was restored in one hour. The Company had access to approximately 15 line crews, its normal compliment of tree crews and supporting staff for 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) was expected to 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.

**Energy Event Index for UNITIL**

Valid Time: January 23, 2015 6:00 AM EST Forecaster: nathan.hamblin

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

**Energy Event Index Definition**

No Leaves (Nov 1 - Mar 31)

	Wind Speed	Wind/Gust	Snow	Ice	Confidence Level
EEI 1	< 26 mph	< 40 mph	< 5 in.	< 1/10 in.	Low < 30% chance
EEI 2	>= 26 mph	>= 40 mph	>= 5 in.	>= 1/10 in.	Medium >= 30% to < 60% chance
EEI 3	>= 30 mph	>= 45 mph	>= 6 in.	>= 3/8 in.	High >= 60% chance
EEI 4	>= 40 mph	>= 50 mph	>= 12 in.	>= 1/2 in.	
EEI 5	>= 45 mph	>= 60 mph	>= 18 in.	>= 1 in.	

Date: January 23, 2015

Time: 6:00 AM EST

Forecaster: N Hamblin

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	SNOW	NONE	SNOW	SNOW
Event Begin Time	7AM SAT		5AM SAT	10AM SAT
Event End Time	8PM SAT		7PM SAT	11PM SAT
Tstrm Wind Gusts				
Ltng				
Storm Mvmt Dir				
Rain Amount				
Snow Amount	5-8		3-7	4-6
Snow Character	WET		WET	WET
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	34/21	33/17	36/19	32/18

**UNITIL SERVICE AREA 48 HOUR OUTLOOK:**

**CAPITAL:** Dry weather and no hazard conditions are expected today through tonight. Snow will be possible from 7am through 6pm Saturday, heaviest later in the morning and during the afternoon. Snow character: Wet/heavy. Snow accumulation: 2-4". There is a low risk of EEI-2 snow. If the storm does not pass close enough to the coast, these totals could be considerably less. Winds will gust to 20-25 mph at times during the afternoon during the snow event. Dry conditions will be likely for the rest of Saturday night. Winds could gust to 20-30 mph during the overnight period. No hazard conditions are expected.

**Confidence:** Confidence is high that no hazard conditions will occur through the next 48 hours. There is a 20% chance of EEI-2 snow on Saturday.

**FITCHBURG:** Dry weather and no hazard conditions are expected today through most of tonight. Precipitation will be possible from 5-6am Saturday through 7pm Saturday, heaviest later in the morning and afternoon. It should be mainly snow, but may mix with freezing rain and rain. Snow character: Wet/heavy. Snow accumulation: 3-5". There could be a band of 5-7" of snow across mainly North/Coastal Boston. This depends on how much the rain and freezing rain and rain mixes in. The highest accumulations will be possible if less of a mix occurs than currently expected. Ice accretion: Up to 0.02" if

temperatures are even cold enough. There is a risk that snow totals could be cut in half or more if there is too much mix. Winds will gust to 20-25 mph at times during the afternoon during the snow event. Dry conditions will be likely for the rest of Saturday night. Winds could gust to 20-30 mph during the overnight period. No hazard conditions are expected.

Confidence: Confidence is high that hazard snow will impact the region later tonight through Saturday. Snow chances: EEI-2 70%. EEI-3: 60%. Otherwise, confidence is high that no hazard conditions will occur through the next 48 hours.

SEACOAST: Dry weather and no hazard conditions are expected today through tonight. Snow will be possible from 7am through 8pm Saturday, heaviest later in the morning and during the afternoon. Snow character: Wet/heavy. Snow accumulation: 4-6". EEI-3 snow is expected. There is a risk of up to 8 inches if a heavier band sets up over the region. On the other hand, if the storm does not pass close enough to the coast, these totals could be considerably less. Winds will gust to 25-30 mph at times during the afternoon during the snow event. Dry conditions will be likely for the rest of Saturday night. Winds could gust to 20-30 mph during the overnight period. No hazard conditions are expected.

Confidence: Confidence is high that hazard snow will impact the region later tonight through Saturday. Snow chances: EEI-2 80%. EEI-3: 60%. Otherwise, confidence is high that no hazard conditions will occur through the next 48 hours.

PORTLAND: Dry weather and no hazard conditions are expected today through early Saturday. Snow will be possible from 10am through 11pm Saturday, heaviest Saturday afternoon and into the evening. Snow character: Wet/heavy. Snow accumulation: 4-6". EEI-2 snow is expected. If the storm does not pass close enough to the coast, these totals could be considerably less. Winds will gust to 25-30 mph at times during the afternoon during the snow event. Dry conditions will be likely for the rest of Saturday night. Winds could gust to 20-30 mph during the overnight period. No hazard conditions are expected.

Confidence: Confidence is high that hazard snow will impact the region later tonight through Saturday. Snow chances: EEI-2 70%. EEI-3: 40%. Otherwise, confidence is high that no hazard conditions will occur through the next 48 hours.

UNITIL SERVICE AREA 3-5 DAY OUTLOOK: Dry weather is expected on Sunday and Sunday night. Winds could gust to 20-30 mph during the day. Light snow showers will be possible later Sunday night and Monday. Snow accumulation: Less than 1 inch, if any. Dry weather is expected on Monday night and Tuesday. Winds could gust to 30-40 mph on Monday in Fitchburg/Seacoast if the system gets close enough. Hazard gusts are not expected.

Confidence: Confidence is high that no hazard conditions will occur during the day 3-5 period. There is a low risk of hazard gusts on Monday in Fitchburg and Seacoast. Wind chance: EEI-2 20%.

#### **NORTHEAST U.S. REGIONAL SUMMARY:**

##### **TODAY**

Light snow showers will arrive in northern Maine later this afternoon and should continue through tonight, eventually into northern New England and northern New York. Light accumulations are expected. Meanwhile, snow will spread across most of southern New England and southeastern New York after midnight tonight as the incoming coastal storm gets its act together. The snow should change to rain by sunrise across Downstate New York. Light accumulations of heavy wet snow are expected prior to sunrise. Temperatures will be near seasonal levels.

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

Highs could end up 2-4 degrees in either direction across central and southern sections. If there is more sun than expected, the warmer values will occur. However, if thicker clouds are in place, it will end up cooler. Highs look okay in the north. Lows generally look okay. The clouds associated with the system should arrive fast enough to preclude cooling associated with clear skies and light winds.

**TOMORROW**

The main impacts from the coastal storm will come for portions of New England and southeastern New York on Saturday and into Saturday evening. A stripe of wet snow will be possible across portions of the Lower Hudson Valley in New York through interior Connecticut, a good chunk of Massachusetts, and at least into coastal northern New England. There will be a zone within this stripe where snow accumulations could exceed six inches. The best chances of this will be across eastern Connecticut, eastern Massachusetts, northern Rhode Island, and perhaps into coastal northern New England. Heavy rain will be likely across eastern Long Island, coastal Rhode Island, and southeastern Massachusetts. Rainfall amounts could exceed an inch. Some freezing rain could mix in during the morning across interior Massachusetts and Connecticut, but this should not be a significant part of this storm. If the storm tracks closer to the coast than expected, the heavier snow could extend further into eastern New York and northern New England. Gusty winds will be possible with this system across portions of Downstate New York, southern New England, and at least coastal northern New England. Peak gusts could exceed 50 mph across Cape Cod. Away from this, light snow showers will be possible across northern/western New York and northern New England near the Canadian Border on Saturday and Saturday night. Temperatures will be 5-15 degrees above normal, warmest in the north.

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

Highs could end up 2-4 degrees cooler across portions of southeastern New York and central/southern New England in spots that see persistent precipitation. This should impact afternoon spot temperatures. Highs look okay away from the coastal storm. Lows look reasonable at night.

**3-5 DAY EXTENDED OUTLOOK**

Any remaining light snow showers or flurries across Upstate New York and northern New England should end early Sunday morning. There should be brief break on Sunday. However, light snow will already be encroaching on western New York by day's end. The next storm system will bring light snow to southern New York and southern New England, generally from I-90 southward, on Sunday night and Monday. Snow accumulations look to be light, maybe an inch or two at this time. Most of the snow should miss to the south. Northern areas should be spared from this storm as well. Breezy winds will be possible across Downstate New York and the south coast of New England on Monday. Light snow showers could linger across southeastern New England on Monday night and Tuesday. Otherwise, dry conditions will be likely across the region. Temperatures will be near normal on Sunday, 5-15 degrees below normal on Monday, and 10-18 degrees below normal on Tuesday.

2.6. Costs Charged to Storm Reserve

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

Payroll	\$1,968
<hr/>	
Total Expenditures	1,968
Total Amount Expensed	0
<hr/>	
Total Charged to MSCR	\$1,968

### 3.0 Nor'easter Event (January 26, 2015)

#### 3.1. Description of the Storm

Beginning on Sunday, January 25, UES' weather forecast provider and major media outlets were tracking a nor'easter expected to impact the New England region on Tuesday, January 27, prompting many New England states (including NH) to declare a state of emergency and travel bans in anticipation of the event. The nor'easter was initially predicted to bring snow amounts of 15-20 inches with associated gusty winds (up to 50 mph); however, as the storm approach the region it tracked farther east than predicted resulting in much lighter snow amounts and wind speeds. Throughout the storms' passing, up to 25 inches of snow fell with wind speeds across UES' service territory averaging between 20-35 mph with peak gusts reaching up to 46 mph in the Seacoast region; however, the weather conditions did not contribute to any significant interruptions.

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

UES experienced 1 outage throughout the storm's passing detailed 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	25	25	0.05%
Capital	0	0	0	0	0%

#### 3.3. Preparations

Beginning on Sunday, January 25, the Company began making preparations including holding internal conference calls, participating on mutual assistance conference calls, retaining contracted resources, initiating communication protocols and mobilizing internal personnel. The Company opened all of its Emergency Operations Center (EOCs) at 6:00 AM on Tuesday, January 27 to monitor the weather event and subsequent interruptions.

#### 3.4. Restoration

Only 1 interruption occurred during the weather event which was related to an underground equipment failure that was restored the same day. Initially, the Company had access to approximately 59 line crews, 19 tree crews, 4 damage assessors and supporting staff to respond to the event; however, as the storm approached the forecast impact on UES's service territory diminished and the external crews were released early in the demobilization process.

#### 3.5. Qualifying Criteria

This event qualified for recovery of preparation costs due to the confidence level (greater than 60%) provided by the Company's professional weather forecasters; hazardous wind gusts 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.

**Energy Event Index for UNITIL**

Valid Time: January 25, 2015 6:00 AM EST Forecaster: nathan.hamblin

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

**Energy Event Index Definition**

No Leaves (Nov 1 - Mar 31)

	Wind Speed	Wind/Gust	Snow	Ice	Confidence Level	
EEI 1	< 26 mph	< 40 mph	< 5 in.	< 1/10 in.	Low	< 30% chance
EEI 2	>= 26 mph	>= 40 mph	>= 5 in.	>= 1/10 in.	Medium	>= 30% to < 60% chance
EEI 3	>= 30 mph	>= 45 mph	>= 6 in.	>= 3/8 in.	High	>= 60% chance
EEI 4	>= 40 mph	>= 50 mph	>= 12 in.	>= 1/2 in.		
EEI 5	>= 45 mph	>= 60 mph	>= 18 in.	>= 1 in.		

Date: January 25, 2015

Time: 6:00 AM EST

Forecaster: N Hamblin

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	NONE	NONE	NONE	NONE
Event Begin Time				
Event End Time				
Tstrm Wind Gusts				
Ltng				
Storm Mvmt Dir				
Rain Amount				
Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	30/6	29/1	34/8	29/4

**UNITIL SERVICE AREA 72 HOUR OUTLOOK:**

**CAPITAL:** Dry weather and no hazard conditions are expected today through Monday afternoon. Winds could gust to 20-30 mph today. A major shift in the forecast has taken place. A Nor'easter will impact the region on Monday night and Tuesday. Light snow showers will develop by 5pm Monday and continue through most of Monday night. Timing of heaviest snow: 4am-3pm Tuesday. Light snow will linger through Tuesday night before finally ending early Wednesday morning. Snow character: Dry. Snow accumulation: 15-20", with locally higher totals of up to 25". EEI-2 snow is expected, given the dry nature of the snow. Winds: Sustained northerly at 20-25 mph. Frequent gusts: 30-40 mph. Isolated peak gusts: 40-45 mph. EEI-2 winds are expected. Timing of strongest winds: 5am-8pm Tuesday. There will be a risk of blizzard conditions. The winds will gradually settle down on Tuesday night.

Confidence: Confidence is high that hazard snow will occur later Monday through Tuesday night. Snow chance: EEI-2 80%, EEI-3 30%. Confidence is high that hazard winds will occur on Tuesday. Wind chance: EEI-2 60%.

FITCHBURG: Dry weather and no hazard conditions are expected today through Monday afternoon. Winds could gust to 20-30 mph today. A major shift in the forecast has taken place. A Nor'easter will impact the region on Monday night and Tuesday. Light snow showers will develop by 2-4pm Monday and continue through most of Monday night. Timing of heaviest snow: 2am-3pm Tuesday. Light snow will linger through Tuesday night before finally ending early Wednesday morning. Snow character: Dry. Snow accumulation: 16-22", with locally higher totals of up to 28". EEI-2 snow is expected, given the dry nature of the snow. Winds: Sustained northerly at 20-25 mph. Frequent gusts: 30-40 mph. Isolated peak gusts: 40-45 mph. EEI-2 winds are expected. Timing of strongest winds: 5am-8pm Tuesday. There will be a risk of blizzard conditions. The winds will gradually settle down on Tuesday night.

Confidence: Confidence is high that hazard snow will occur later Monday through Tuesday night. Snow chance: EEI-2 80%, EEI-3 40%. Confidence is high that hazard winds will occur on Tuesday. Wind chance: EEI-2 60%.

SEACOAST: Dry weather and no hazard conditions are expected today through Monday afternoon. Winds could gust to 20-30 mph today. A major shift in the forecast has taken place. A Nor'easter will impact the region on Monday night and Tuesday. Light snow showers will develop by 5pm Monday and continue through most of Monday night. Timing of heaviest snow: 4am-3pm Tuesday. Light snow will linger through Tuesday night before finally ending early Wednesday morning. Snow character: Dry. Snow accumulation: 15-20", with locally higher totals of up to 25". EEI-2 snow is expected, given the dry nature of the snow. Winds: North-northeast winds sustained at 20-28 mph. Frequent gusts: 35-45 mph. Isolated peak gusts: 45-50 mph. EEI-2 winds are expected. Timing of strongest winds: 1am-8pm Tuesday. There will be a risk of blizzard conditions. The winds will gradually settle down on Tuesday night.

Confidence: Confidence is high that hazard snow will occur later Monday through Tuesday night. Snow chance: EEI-2 80%, EEI-3 30%. Confidence is high that hazard winds will occur on Tuesday. Wind chance: EEI-2 80%, EEI-3 60%.

PORTLAND: Dry weather and no hazard conditions are expected today through Monday evening. Winds could gust to 20-30 mph today. A major shift in the forecast has taken place. A Nor'easter will impact the region on Monday night and Tuesday. Light snow showers will develop by 11pm Monday and continue through most of Monday night. Timing of heaviest snow: 7am-6pm Tuesday. Light snow will linger through Tuesday night before finally ending early Wednesday morning. Snow character: Dry. Snow accumulation: 15-20", with locally higher totals of up to 25". EEI-2 snow is expected, given the dry nature of the snow. Winds: North-northeast winds sustained at 20-28 mph. Frequent gusts: 35-45 mph. Isolated peak gusts: 45-50 mph. EEI-2 winds are expected. Timing of strongest winds: 1am-8pm Tuesday. There will be a risk of blizzard conditions. The winds will gradually settle down on Tuesday night.

Confidence: Confidence is high that hazard snow will occur later Monday through Tuesday night. Snow chance: EEI-2 80%, EEI-3 30%. Confidence is high that hazard winds will occur on Tuesday. Wind chance: EEI-2 80%, EEI-3 60%.

UNITIL SERVICE AREA 4-5 DAY OUTLOOK: After the light snow ends early Wednesday, dry conditions will take over for rest of Wednesday through Thursday. Yet another storm system will bring accumulating snow to the region on Thursday night and Friday. There will be a risk of at least EEI-2 accumulations once again. Winds could approach EEI-2 levels along the coast.

Confidence: Confidence is high that hazard snow will occur on Thursday night and Friday. Snow chance: EEI-2 60%. Confidence is medium that hazard wind will impact Seacoast and Portland on Friday. Wind chance: EEI-2 30%.

## **NORTHEAST U.S. REGIONAL SUMMARY:**

### **TODAY**

Any light snow showers or flurries leftover across Upstate New York and northern New England should end during the morning hours today. Very minor accumulations are expected, if any. Otherwise, dry weather conditions are expected today and tonight. Winds could generally gust to 20-30 mph across the region during the day. Temperatures will be near normal.

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

Highs will generally be early in the day across Upstate New York and northern New England. The highs look okay. Temperatures should drop down during the day. Spot temperatures could end up 2-4 degrees cooler if the colder air bleeds in faster than expected. Highs elsewhere look reasonable and should not rise too much from the morning temperatures. Lows look reasonable at night.

### **TOMORROW**

Light snow showers will develop across southern New England and southern sections of New York during the day Monday. Accumulations will be very minor prior to sunset. Dry weather is expected to the north. A major winter storm looks to unfold on Monday night and Tuesday across eastern New York and New England. Heavy snow will spread across most of New England on Monday night and maximize across the region on Tuesday. Snow accumulations could be in excess of a foot across the hardest hit areas. There is the potential for two feet of snow if the storm unfolds as expected. The best chance of this will be across most of eastern New England, but this could occur even into eastern New York. Rain could mix in across Cape Cod and this would limit accumulations there. Gusty to even damaging wind gusts will be possible with this storm. Winds could gust to 35-50 mph near the eastern New England Coast with maximum wind gusts of over 60 mph possible across Cape Cod. Wind gusts should be 30-40 mph across interior New England and Downstate New York. This should combine with the snow to produce a higher risk for blizzard conditions. This could also produce coastal flooding. This has increasing potential to be a crippling snow storm near the coast. Power outages and significant impacts to travel are threats with this system. To the west, light snow will be possible across central and western New York with minor accumulations. Temperatures will be 7-15 degrees below normal.

### **TOMORROW'S Forecast Confidence: Medium – Low**

Highs could end up 3-6 degrees cooler across southern New York and southern New England if snow builds in faster than expected. Otherwise, highs look okay to the north. The forecast confidence lowers at night. The track of the storm will dictate temperature trends. If the storm tracks away from the coast and slows down, spot temperatures across eastern New York and New England, away from the southeastern New England coast, could end up 3-7 degrees cooler. However, they could also be 3-6 degrees warmer if the storm is closer to the coast and is more progressive. Temperatures to the west look reasonable.

### **3-5 DAY EXTENDED OUTLOOK**

Snow will be possible on Tuesday night and at least into Wednesday across New England and extreme eastern New York as the storm pulls away. The winds will gradually settle down. Additional accumulations will be relatively minor. Dry conditions will be likely to the west. A break in the weather will come on Wednesday night. Another storm system will spread snow across Upstate New York on Thursday. Accumulating snow will be likely across the entire region on Thursday night and at least into Friday. Gusty winds will be possible with this system. Temperatures will be 10-15 degrees below normal

on Tuesday, 6-12 degrees below normal on Wednesday and near to a few degrees below normal on Thursday.

3.6. Costs Charged to the Storm Reserve

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

Payroll	\$19,598
DOC Salary, USC Time & Expenses	23,324
Contractor Invoices & Other	511,522
<hr/>	
Total Expenditures	\$554,444
Total Amount Expensed	0
<hr/>	
Total Charged to MSCR	\$554,444
<hr/>	

#### 4.0 Wind Event (February 15, 2015)

##### 4.1. Description of the Storm

On Friday, February 13, UES' weather forecast provider indicated a strong system would bring heavy snow and strong winds to the New England region over the weekend (Sunday, February 15) with the hazardous winds being the concern. Subsequent forecasts released on Saturday, February 14 indicated the service territories could receive between 8-20 inches of snow with sustained winds of 20-30 mph, frequent gusts up to 45 and peak gusts up to 55 with the Seacoast region being the main concern. Winds throughout the event in the Seacoast region were sustained at an average of 18 mph with gusts reaching up to 46 mph while in the Capital region 6 inches of snow fell with winds averaging 20 mph and gusts reaching up to 47 mph.

##### 4.2. 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	3	2	2,188	1,793	5%
Capital	1	1	48	48	.2%

##### 4.3. Preparations

Beginning on Friday, February 13, the Company began to make preparations including holding internal conference calls, retaining contracted resources, and mobilizing internal personnel. Standby personnel and support staff were onsite and available over the weekend to monitor the weather and subsequent interruptions.

##### 4.4. Restoration

Most outages that occurred were due to broken tree limbs contacting electrical infrastructure and were responded to quickly, with all impacted customers restored within three hours. The Company had access to approximately 34 line crews, 15 tree crews, 7 wires down personnel and supporting staff to respond to this event.

##### 4.5. Qualifying Criteria

This event qualified for recovery of preparation costs due to the EII of 3 for hazardous wind gust with a confidence level greater than 60%. 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.

**Energy Event Index for UNITIL**

Valid Time: February 13, 2015 1:00 PM EST Forecaster: gregory.louis

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

**Energy Event Index Definition**

No Leaves (Nov 1 - Mar 31)

	Wind Speed	Wind/Gust	Snow	Ice	Confidence Level
EEI 1	< 26 mph	< 40 mph	< 18 in.	< 1/10 in.	Low < 30% chance
EEI 2	>= 26 mph	>= 40 mph	>= 18 in.	>= 1/10 in.	Medium >= 30% to < 60% chance
EEI 3	>= 30 mph	>= 45 mph	>= 24 in.	>= 3/8 in.	High >= 60% chance
EEI 4	>= 40 mph	>= 50 mph	>= 36 in.	>= 1/2 in.	
EEI 5	>= 45 mph	>= 60 mph	>= 48 in.	>= 1 in.	

Definition of WET snow(T>=30F)

EEI Value	Wet Snow
EEI 1	<5"
EEI 2	>5"
EEI 3	>6"
EEI 4	>12"
EEI 5	>18"

Date: February 13, 2015

Time: 1:30 PM EST

Forecaster: G Louis

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	NONE	NONE	NONE	NONE
Event Begin Time				
Event End Time				
Tstrm Wind Gusts				
Ltng				
Storm Mvmt Dir				
Rain Amount				
Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	13/(-4)	14/(-9)	17/(-5)	15/(-8)

**UNITIL SERVICE AREA 48 HOUR OUTLOOK:**

**CAPITAL:** It will stay dry and hazard-free this afternoon through Saturday morning. There will be northwest winds sustained at 10-18 mph, with gusts of 20-30 mph from now through 4pm Friday. A strong system will bring heavy snow and strong winds later Saturday and Sunday. Snow starts around 1-2pm Sat, ends 3-4pm Sun afternoon, heaviest from 1-10am Sun. Total snow: 9-12", dry consistency. Winds will be at hazard levels from 7am Sun to 2am Mon. Sustained winds: 18-25 mph. Frequent gusts: 35-45 mph. Peak gusts of 50-55 mph are possible from 1-7pm Sun.

Confidence: Confidence is high that hazard wind gusts will occur on Sunday. EEI-2 wind gust chance: 100%. EEI-3 wind gust chance: 60%. EEI-4 gust chance: 20%. Confidence is high that snow accumulations will remain EEI-1.

**FITCHBURG:** It will stay dry and hazard-free this afternoon through Saturday morning. There will be northwest winds sustained at 10-18 mph, with gusts of 20-30 mph from now through 4pm Friday. A strong system will bring heavy snow and strong winds later Saturday and Sunday. Snow starts around 1-2pm Sat, ends 3-4pm Sun afternoon, heaviest from 1-10am Sun. Total snow: 11-14", dry consistency. Winds will be at hazard levels from 7am Sun to 10pm Sun. Sustained winds: 18-25 mph. Frequent gusts: 35-45

mph. Peak gusts of 50 mph are possible from 3-7pm Sun.

Confidence: Confidence is high that hazard wind gusts will occur on Sunday. EEI-2 wind gust chance: 90%. EEI-3 wind gust chance: 20%. Confidence is high that snow accumulations will remain EEI-1.

SEACOAST: It will stay dry and hazard-free this afternoon through Saturday morning. There will be west-northwest winds sustained at 12-20 mph, with gusts of 25-35 mph from now through 4pm Friday. A strong system will bring heavy snow and strong winds later Saturday and Sunday. Snow starts around 4-5pm Sat, ends 5-6pm Sun, heaviest from 12am-2pm Sun. Total snow: 15-20", dry consistency. Winds will reach hazard levels at 5-6am Sun and stay at hazard levels through 2am Mon. Strongest winds will be 9am-5pm Sun. Sustained winds: 25-35 mph. Frequent gusts: 45-55 mph, peak gusts 60-65 mph. The 60-65 mph gusts should be confined to the 9am-1pm Sun timeframe.

Confidence: Confidence is high that hazard wind gusts will occur on Sunday. EEI-2 wind gust chance: 100%. EEI-3 wind gust chance: 70%. EEI-4 wind gust chance: 40%. EEI-5 wind gust chance: 20%. Confidence is high that sustained winds will reach EEI-2, with a 60% chance. Confidence is high for EEI-2 snow, with a 60% chance.

PORTLAND: It will be dry and hazard-free this afternoon through Saturday morning. West-northwest winds will be sustained at 10-18 mph, with gusts of 20-30 mph from now through 4pm Friday. A strong system will bring heavy snow and strong winds later Saturday and Sunday. Snow starts around 4-5pm Sat, ends 6-7pm Sun, heaviest snow 12am-2pm Sun. Total snow: 20-25", dry consistency. Winds will be hazardous from 6am Sun to 2am Mon, strongest from 9am-5pm Sun. Sustained winds: 22-35 mph. Frequent gusts: 45-55 mph. Peak gusts: 60-65 mph. Best chances of the 60-65 mph gusts are from 9am-1pm Sun.

Confidence: Confidence is high that hazard wind gusts will occur on Sunday and Sunday night. EEI-2 wind gust chance: 100%. EEI-3 wind gust chance: 80%. EEI-4 wind gust chance: 50%. EEI-5 gust chance: 20%. Confidence is high that snow accumulations will reach EEI-2. EEI-2 snow chance: 70%. EEI-3 snow chance: 10%.

UNITIL SERVICE AREA 3-5 DAY OUTLOOK: The details for the Sunday event can be seen in the 48-hour discussion above. Dry and quiet conditions will be in place throughout Monday and into Tuesday. The next system will impact the area from early Wednesday morning through Wednesday night. Latest model guidance has about 3-6" of snow accumulation but amounts could still vary with future updates. Right now, temperatures should be under 30 degrees so this would make it a normal to dry consistency snow rather than wet. No ice is expected at this time. Winds will turn breezy Wednesday night behind the departing system and could reach hazard levels.

Confidence: Confidence for the Saturday/Sunday event is detailed above. Confidence is high that no hazards will be seen on Monday. Confidence is high that the Tuesday/Wednesday evening event will be EEI-1 snow. Confidence is medium for EEI-2 gusts Wednesday night with a 40% chance.

## **TODAY**

Dry conditions will occur the rest of today. However, another frontal system will begin to approach the region late tonight, bringing the chance of light snow showers to western Upstate New York, predominantly after midnight. Coverage will gradually increase across the state as the night progresses. Snowfall amounts before daybreak Saturday will be less than 2 inches, with highest totals in western New York. Wind gusts of 30-35 mph will remain possible across coastal and southern New England, as well as southeastern New York, along with an isolated peak gust of up to 40 mph during the morning hours. Temperatures will be 15-30 degrees below normal across the region, coolest in northern New York and northern New England away from the coast.

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

*Non-standard temperatures are expected in eastern New England, with highs occurring shortly after midnight and turning colder during the day. With the cold air mass settling in, highs could trend 2-4 degrees cooler during the day. Lows in northern New England may be a few degrees cooler in spots, with*

*clearing skies and winds becoming lighter overnight.*

### **TOMORROW**

Snow will spread across the region on Saturday, as the frontal system progresses towards the coast during the day. Daytime snow will predominantly be focused on Upstate New York, with heavier snow expected to reach much of New England by Saturday night. This system will strengthen rapidly overnight off the southern coast of New England, bringing more widespread snow and developing strong wind gusts overnight across New England and into eastern New York. The heaviest of the snow will develop during the overnight hours in southern Maine and towards southern/eastern New Hampshire as well as eastern Massachusetts. Amounts of 4-8 inches will be common through Saturday night, with some higher amounts in eastern New England. Wind gusts will increase throughout the overnight hours across the region, especially in New England, where gusts of 50 mph or more will be possible going towards daybreak. Temperatures will be 7-15 degrees below normal for most, but will be as much as 12-25 degrees below normal in northern New England and northern New York.

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

*The advancing cold front may cause hourly temperatures errors, particularly in Upstate New York. This may also cause daytime highs to be 3-6 degrees cooler in Upstate New York. Low may trend a few degrees cooler across the region, as a very cold air mass begins to settle in going through the overnight hours.*

### **3-5 DAY EXTENDED OUTLOOK**

The coastal storm will continue to batter New England on Sunday, especially from Maine to eastern Massachusetts. Snow will gradually wind down during the afternoon in Massachusetts and New Hampshire, but heavy snow will continue to be seen in much of Maine going into Monday night before beginning to taper off southwest to northeast. Additional snowfall totals of over a foot will be expected in portions of Maine, with highest totals on Sunday being seen along the southeastern coast of Maine. Snowfall totals won't be quite as high in the rest of Maine as well as in New Hampshire and eastern Massachusetts, but several inches of additional snow can still be expected to occur during the day. Meanwhile, on the back end of the system, lake-effect snow will develop south and east of Lake Ontario during the day and into Sunday night, with generally dry conditions expected to develop during the overnight hours. Very strong wind gusts are expected to occur across much of New England, with gusts of 45-60 mph common throughout Sunday, while peak gusts exceeding 65 mph can't be ruled out near Cape Cod and along the coast of Maine. Winds will be strongest in southeastern New England during the morning and afternoon hours, while strongest winds in Maine are most likely to occur heading towards Sunday night. High pressure will begin to push in on Monday, bringing a brief dry period that will last into Tuesday morning. Gusty winds will remain in place over much of New England during the day on Monday, but these are expected to be much weaker than those seen on Sunday. On Tuesday, however, light snow will begin to spread into New York during the day, while a developing system will push in by Tuesday night, bringing the potential for heavier snow going towards Wednesday. Temperatures will be bitter cold, falling to 18-35 degrees below normal by the afternoon on Sunday, coldest across Upstate New York. Temperatures on Monday will be 15-25 degrees below normal. Temperatures on Tuesday will be 8-16 degrees below normal.

4.6. Costs Charged to the Storm Reserve

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

Payroll	\$ 12,889
DOC Salary, USC Time & Expenses	1,527
Contractor Invoices & Other	271,438
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Total Expenditures	\$285,854
Total Amount Expensed	-
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Total Charged to MSCR	\$285,854

## 5.0 Thunderstorm Event (June 23, 2015)

### 5.1. Description of the Storm

On Monday, June 22, UES' weather forecast provider indicated a series of scattered showers and thunderstorms developing and passing by New England the following day with the hazardous wind gusts 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 thunderstorm gusts. Winds throughout the event in the Seacoast region were sustained at an average of 10 mph with gusts reaching up to 21 mph while in the Capital region winds averaged 10 mph with gusts reaching up to 31 mph.

### 5.2. 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	2	2	888	888	2%
Capital	1	1	23	23	.07%

### 5.3. Preparations

On Monday, June 22, the Company began to make preparations including holding internal conference calls, retaining additional contractor resources, and mobilizing internal personnel.

### 5.4. Restoration

The outages that occurred were due to broken tree limb contact and a lightning strike and were responded to as quickly as possible with the impacted customers restored within two hours of the interruption. The Company had access to approximately 19 line crews, its normal compliment of tree crews and supporting staff for 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.

**Energy Event Index for UNITIL**

Valid Time: June 23, 2015 6:00 AM EDT Forecaster: justin.wegwerth

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

**Energy Event Index Definition**

With Leaves (Apr 1 - Oct 31)

	Wind Speed	Wind/Gust	Confidence Level
EEI 1	< 20 mph	< 30 mph	Low < 30% chance
EEI 2	>= 20 mph	>= 30 mph	Medium >= 30% to < 60% chance
EEI 3	>= 25 mph	>= 40 mph	High >= 60% chance
EEI 4	>= 40 mph	>= 50 mph	
EEI 5	>= 45 mph	>= 60 mph	

Date: June 23, 2015  
Time: 6:00 AM EDT  
Forecaster: J Wegwerth

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	TSTORMS	TSTORMS	TSTORMS	TSTORMS
Event Begin Time	10AM TUE	8AM TUE	1PM TUE	11AM TUE
Event End Time	8PM TUE	8PM TUE	8PM TUE	8PM TUE
Tstrm Wind Gusts	30-55	45-60	45-60	35-50
Ltng	MED-HIGH	MED-HIGH	MED-HIGH	MED
Storm Mvmt Dir	E-NE	E-NE	E-NE	E-NE
Rain Amount				
Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind	12-18	12-18	12-18	
Wind Gust	25-33	25-33	25-33	
Temp. Extremes	80/61	82/57	84/59	72/59

**CAPITAL:** Showers and thunderstorms will be possible after 8am. There will likely be a morning wave between 7am-12pm, with additional development between 12pm-8pm. The highest chances will exist between 2pm-7pm. Lightning amounts: Medium-High. Thunderstorm wind gusts: 45-55 mph, isolated 50-60 mph. Chance for thunderstorms gusts: 70% EEI-2, 60% EEI-3, 30% EEI-4. Rainfall: 0.40-0.70", isolated 1" possible. After 8pm, dry and non-hazard conditions are expected through Wednesday night. Winds could gust between 25-30 mph this afternoon with isolated peak gusts to 33 mph possible.

**Confidence:** Confidence is high that thunderstorms will occur today. Thunderstorm chance: 90%. Confidence is high that hazard wind gusts will occur within thunderstorms on Tuesday (EEI chances listed above). Confidence is high that no other hazards will occur on Tuesday evening through Wednesday night.

**FITCHBURG:** Showers will be possible after 7am. Thunderstorms will become possible between 1pm and 8pm. The highest chances will exist between 3pm and 7pm. Lightning amounts: Medium-High. Thunderstorm wind gusts: 45-55 mph, isolated 50-60 mph. Chance for thunderstorms gusts: 70% EEI-2, 60% EEI-3, 30% EEI-4. Rainfall: 0.40-0.70", isolated 1" possible. After 8pm, dry and non-hazard conditions are expected through Wednesday night. Winds could gust between 25-30 mph this afternoon with isolated peak gusts to 33 mph possible.

**Confidence:** Confidence is high that thunderstorms will occur today. Thunderstorm chance: 90%. Confidence is high that hazard wind gusts will occur within thunderstorms on Tuesday (EEI chances listed above). Confidence is high that no other hazards will occur on Tuesday evening through Wednesday night.

SEACOAST: Showers and thunderstorms will be possible after 10am. There will likely be an early wave between 10am-2pm, with additional development between 2pm-8pm. The highest chances will exist between 3pm-7pm. Lightning amounts: Medium-High. Thunderstorm wind gusts: 45-55 mph, isolated 50-60 mph. Chance for thunderstorms gusts: 70% EEI-2, 60% EEI-3, 30% EEI-4. Rainfall: 0.40-0.70", isolated 1" possible. After 8pm, dry and non-hazard conditions are expected through Wednesday night. Winds could gust between 25-30 mph this afternoon with isolated peak gusts to 33 mph possible.

Confidence: Confidence is high that thunderstorms will occur today. Thunderstorm chance: 90%. Confidence is high that hazard wind gusts will occur within thunderstorms on Tuesday (EEI chances listed above). Confidence is high that no other hazards will occur on Tuesday evening through Wednesday night.

PORTLAND: Showers and thunderstorms will be possible after 10am. There will likely be an early wave between 11am-2pm, with additional development between 2pm-8pm. The highest chances will exist between 3pm-7pm. Lightning amounts: Medium. Thunderstorm wind gusts: 40-50 mph. Chance for thunderstorms gusts: 60% EEI-2, 40% EEI-3, 20% EEI-4. Rainfall: 0.40-0.70", isolated 1" possible. After 8pm, dry and non-hazard conditions are expected through Wednesday night. Winds could gust between 20-30 mph this afternoon.

Confidence: Confidence is high that thunderstorms will occur today. Thunderstorm chance: 70%. Confidence is high that hazard wind gusts will occur within thunderstorms on Tuesday (EEI chances listed above). Confidence is high that no other hazards will occur on Tuesday evening through Wednesday night.

UNITIL SERVICE AREA 3-5 DAY OUTLOOK: On Thursday, dry and non-hazard conditions are expected. A few showers will become possible Thursday night. On Friday, showers will remain possible through the day. Dry conditions will return Friday evening and overnight. On Saturday, dry conditions will start the day, but the chance for a few showers will develop in the evening and overnight. No hazards are expected at this time.

Confidence: Confidence is high that no hazard will occur through the period. Any thunderstorm chances on Thursday and Friday are only 10%.

#### **NORTHEAST U.S. REGIONAL SUMMARY:**

##### **TODAY**

Showers and thunderstorms will track across parts of New York and New England this morning. Some could be on the strong side with gusty winds and hail possible. Additional showers and thunderstorms will develop along and ahead of a cold front in parts of central and eastern New York and New England this afternoon and into the evening. Showers and thunderstorms will spread from west to east. Rain and thunderstorms will end in Upstate New York in the early evening and Downstate New York and much of New England by the mid to late evening. However, some showers and storms could linger until around or soon after midnight in parts of Maine. Thunderstorms could be strong or severe, mainly from central and eastern New York through much of New England and into western Maine. The main threats will be damaging wind gusts and large hail. Isolated tornadoes cannot be ruled out. Periods of heavy rain are likely. Outside of thunderstorms, southwesterly winds will gust between 25-35 mph. Dry conditions are expected tonight. Temperatures will be 7-12 degrees below normal in much of Maine, near normal in western Maine, and near to 8 degrees above normal elsewhere.

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

Highs could be 2-5 degrees warmer or cooler across eastern New York and New England depending on the extent of clouds and storms and the timing of the cold front itself. Highs look reasonable elsewhere but could still vary by 1-3 degrees depending on storm impacts. Overnight lows look reasonable, but could trend a couple degrees cooler under clear skies and light winds, mainly in Upstate New York.

## **TOMORROW**

On Wednesday, mostly dry and quiet conditions are expected across the region. However, a few showers could pop up in the afternoon and evening in northern New York, northern New England. A few thunderstorms could occur, but no strong storms are expected. Temperatures will be near to 5 degrees below normal in northern areas and near to 5 degrees above normal in southern New England.

### **TOMORROW'S Forecast Confidence: High**

Both highs and lows should verify well with mostly dry and quiet weather.

### **3-5 DAY EXTENDED OUTLOOK**

On Thursday, a slight chance for showers and isolated thunderstorms will return to parts of western and southern New York and into Long Island in the afternoon and evening. A few showers could also rotate through parts of northern and eastern Maine. No strong storms will occur. Dry weather is expected elsewhere. On Friday, a few showers or storms could linger in parts of Downstate New York and possibly southern New England. No strong storms will occur. Dry weather is expected elsewhere. On Saturday, isolated showers and storms could linger across southern areas. These rain and some storms chances could spread northward overnight. Temperatures will be near to 10 degrees below normal on Thursday and 4-10 degrees below normal on Friday and Saturday.

For Thursday, the next system will return the threat for scattered showers and storms to New York and southern New England during the day. After sunset, heavier activity is likely to move into these same areas for the overnight hours. This activity will linger through the day on Friday across southern New England and southern New York, exiting the region by sunset. Dry conditions are expected for Friday night. Temperatures will be near to within a few degrees of normal Wednesday, near to 5 degrees below normal Thursday, and 2-10 degrees below normal Friday.

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

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

Payroll	\$ 166
Contractor Invoices & Other	4,347
<hr/>	
Total Expenditures	\$4,513
Total Amount Expensed	-
<hr/>	
Total Charged to MSCR	\$4,513

## 6.0 Storm Event (October 28, 2015)

### 6.1. Description of the Storm

Beginning on Monday, October 26, UES' weather forecast provider indicated a storm system developing and passing through New England on Wednesday, October 28 with hazardous winds being the concern. Widespread showers were forecasted to occur with high confidence that hazardous wind gusts exceeding 45mph could impact the service territory. Over the next two days, subsequent forecasts asserted the same wind speeds reflecting a high confidence level of hazardous wind for the entire service territory. Winds throughout the event in the Seacoast region were sustained at an average of 26 mph with gusts reaching up to 36 mph while in the Capital region winds averaged 15 mph with gusts reaching up to 33 mph.

### 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.

<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	1,865	902	2%
Capital	4	2	62	49	.2%

### 6.3. Preparations

Beginning on Monday, October 26, the Company began to make preparations including holding internal conference calls, retaining contractor resources, and mobilizing internal personnel.

### 6.4. Restoration

Most outages that occurred were due to broken tree limb contact and were responded to as quickly as possible with all impacted customers being restored within three hours. The Company had access to approximately 22 line crews, 18 tree crews and supporting staff to respond to this event.

### 6.5. Qualifying Criteria

This event qualified for recovery of preparation costs due to a high confidence level (greater than 60%) and EII of 3 for hazardous wind gusts. 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 6.6.

**Energy Event Index for UNITIL**

Valid Time: October 26, 2015 1:00 PM EDT Forecaster: jeremy.rossow

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

**Energy Event Index Definition**

With Leaves (Apr 1 - Oct 31)

EI	Wind Speed	Wind/Gust	Confidence Level
1	< 20 mph	< 30 mph	Low < 30% chance
2	>= 20 mph	>= 30 mph	Medium >= 30% to < 60% chance
3	>= 25 mph	>= 40 mph	High >= 60% chance
4	>= 40 mph	>= 50 mph	
5	>= 45 mph	>= 60 mph	

Date: October 26, 2015

Time: 1:00 PM EDT

Forecaster: J Rossow

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	NONE	NONE	NONE	NONE
Event Begin Time				
Event End Time				
Tstrm Wind Gusts				
Ltng				
Storm Mvmt Dir				
Rain Amount				
Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	54/30	53/25	55/28	52/29

CAPITAL: Dry, non-hazardous conditions will be seen the next 48 hours.

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

FITCHBURG: Dry, non-hazardous conditions will be seen the next 48 hours.

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

SEACOAST: Dry, non-hazardous conditions will be seen the next 48 hours.

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

PORTLAND: Dry, non-hazardous conditions will be seen the next 48 hours.

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

UNITIL SERVICE AREA 3-5 DAY OUTLOOK: Wednesday will start out dry, but a storm system will bring areas of rain to the service area beginning Wednesday afternoon, and continuing through the evening before turning dry during the day on Thursday. Rainfall amounts through Thursday could exceed 2.00 inches in some spots, with the heaviest of the rain occurring before daybreak Thursday. Winds will become breezy on Wednesday night and continue into Thursday morning, with a risk of hazard level wind gusts of 30-40 mph, along with a peak gust of up to 45 mph possible in Portland and Seacoast. Dry conditions are expected on Friday. Wind gusts will become breezy again during the day on Friday, with

gusts of 25-30 mph expected and a peak gust of up to 35 mph possible during the morning and afternoon hours.

Confidence: Confidence is high that EEI-2 wind gusts will occur on Wednesday night and Thursday. EEI-2 chance in Portland and Seacoast: 70%. EEI-2 chance in Fitchburg and Capital: 60%. Confidence is Medium that EEI-3 wind gusts will occur on Wednesday night and Thursday morning in Portland and Seacoast. EEI-3 chance in Portland and Seacoast: 50%. Confidence is medium that EEI-2 wind gusts will occur Friday morning and afternoon. EEI-2 chance: 30%.

#### **NORTHEAST U.S. REGIONAL SUMMARY:**

##### **TODAY**

High pressure will become entrenched over the region today, keeping conditions dry and quiet. Temperatures will be 2-6 degrees below normal.

##### **TODAY'S Forecast Confidence: High**

Highs should verify well during the day. Clear skies and light winds during the overnight hours could allow lows to be 1-3 degrees cooler in spots, mainly across Upstate New York.

##### **TOMORROW**

Dry conditions will continue through most of Tuesday across the region. However, a few rain showers will begin to push into western New York late Tuesday night on the leading edge of an approaching storm system. The heaviest of the rain with this system is not expected to move into the region until Wednesday. Temperatures will be within a few degrees of normal.

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

Lows across western/southern New York may be 2-4 degrees warmer with clouds moving in during the overnight hours. Highs look reasonable.

#### **3-5 DAY EXTENDED OUTLOOK**

On Wednesday, widespread rain will spread across New York throughout the day, as the storm system pushes into the region, and will push into New England by Wednesday night. Rain will be moderate to heavy at times, with rainfall amounts of 1-2" possible across the region. Gusty winds will also develop on Wednesday across New York, with wind gusts of 35-45 mph likely to develop, and these will spread into New England by late Wednesday night/Thursday morning and will continue throughout Thursday. Isolated wind gusts of over 50 mph will be possible across Upstate New York, particularly near the Great Lakes. Isolated gusts of 50-55 mph cannot be ruled out over Long island, and also the Cape of Massachusetts southward to Nantucket. On Thursday, most of the heavy rain will push off shore across New England, but a few showers are expected to develop on the back end of the system across Upstate New York and northern New England during the day. For Friday, a few isolated showers will remain possible across Upstate New York and northern New England, but otherwise should remain mostly dry. Winds will remain breezy across New England, but should not be as strong as seen on Wednesday or Thursday. Temperatures on Wednesday will be near to slightly above normal across northern New England/northern New York and will be 4-10 degrees above normal elsewhere. Temperatures on Thursday will be 5-10 degrees above normal for most, but will be near to slightly above normal across western New York. Temperatures on Friday will be near to 5 degrees below normal.

6.6. Costs Charged to the Storm Reserve

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

Contractor Invoices & Other	\$27,329
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Total Expenditures	\$27,329
Total Amount Expensed	-
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Total Charged to MSCR	\$27,329