



Unitil Energy Systems, Inc.
Major Storm Cost Reserve Fund Report
2017

Prepared By: Business Continuity & Compliance and Accounting

March 15, 2018

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, 2017. 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, 2017 is in a deficit position of (\$4,539,995). In a separate filing made this same day, the Company is seeking recovery of the October 30, 2017 Wind Storm through its SRAF and proposing to recover a portion of the remaining MSCR balance through its scheduled step adjustment for effect May 1, 2018, and through a temporary increase in the level of the MSCR amortization.

All costs included in the MSCR through December 31, 2017 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, 2017* on page 3 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, 2017 on page 4. Beginning May 1, 2017, revenue included in the Storm Recovery Adjustment Factor Reconciliation decreased due to the completion of recovery of the costs incurred as result of two extraordinary storms: Tropical Storm Irene, which occurred in August 2011, and the Snow Storm, which occurred in October 2011. In accordance with its tariff Storm Recovery Adjustment Factor, Schedule SRAF, effective May 1, 2012, and for a period of 5 years, the costs associated with these two extraordinary storms were recovered through the SRAF at a rate of \$0.00082 per kWh. UES filed the final disposition of the balance for this cost piece on June 30, 2017. Beginning May 1, 2018, the SRAF will decrease by \$0.00043 per kWh due to the completion of the recovery of the cost of extraordinary storm Hurricane Sandy, which occurred in October 2012. In accordance with its tariff, Schedule SRAF, the cost associated with this extraordinary storm was to be recovered at a rate of \$0.00043 per kWh over 5 years ending April 30, 2018. UES will file the final disposition of the balance for this cost piece by June 30, 2018. The net change to the SRAF effective May 1, 2018 is a decrease of \$0.00020 per kWh, factoring in the proposed increase to the SRAF to recover the costs of the October 30, 2017 Wind Storm.

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 \$400,000¹ 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.

¹ The annual amount was increased to \$800,000 in Docket DE 13-065 in Order No. 25,502, issued on April 29, 2013.

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”) from the Company’s professional weather forecaster reaches an EII level of 3 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.

Unitil Energy Systems, Inc.

**Major Storm Cost Reserve Fund – Reconciliation
As of December 31, 2017**

Section #	Date	Description	Surplus (Deficit)
	12/31/2016	MSCR BALANCE (As Filed on 2/28/2016)	\$ (2,759,544)
Adjustments to 2016 Report as Filed			
	7/23/2016	Tree Trimming Adjustments	825
	12/29/2016	Nor'easter Event	(211,166)
Adjusted Opening Balance 1/1/2017			\$ (2,969,885)
2017 Deferred Charges			
1.0	02/11/2017	Nor'easter Event	(24,780)
2.0	02/15/2017	Snow Event	(63,630)
3.0	03/14/2017	Nor'easter Event	(677,974)
4.0	03/31/2017	Snow Event	(191,611)
5.0	06/19/2017	Storm Event (Thunder/Lightning)	(35,958)
6.0	10/30/2017	Wind Event ¹	(1,233,742)
2017 Recovery			
2017	Current Recovery Rate		800,000
2017	Interest Rate—January 1, 2017 to April 30, 2017		4.53%
2017	Interest Rate—May 1, 2017 to December 31, 2017		4.27%
2017 Carrying Charges			(142,415)
	12/31/2017	MSCR BALANCE	\$ (4,539,995)

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-17	\$3,532,248 (1)	\$0	\$238,461	\$3,293,787	\$3,413,017	4.53%	\$13,131	\$3,306,918
Feb-17	\$3,306,918	\$0	\$216,006	\$3,090,911	\$3,198,915	4.53%	\$11,116	\$3,102,028
Mar-17	\$3,102,028	\$0	\$209,198	\$2,892,830	\$2,997,429	4.53%	\$11,532	\$2,904,363
Apr-17	\$2,904,363	\$0	\$202,220	\$2,702,142	\$2,803,252	4.53%	\$10,437	\$2,712,580
May-17	\$2,712,580	\$0	\$158,169	\$2,554,411	\$2,633,495	4.27%	\$9,551	\$2,563,961
Jun-17	\$2,563,961	\$0	\$133,297	\$2,430,664	\$2,497,313	4.27%	\$8,765	\$2,439,429
Jul-17	\$2,439,429	\$0	\$163,084	\$2,276,345	\$2,357,887	4.27%	\$8,551	\$2,284,896
Aug-17	\$2,284,896	\$0	\$156,220	\$2,128,676	\$2,206,786	4.27%	\$8,003	\$2,136,679
Sep-17	\$2,136,679	\$0	\$140,884	\$1,995,795	\$2,066,237	4.27%	\$7,252	\$2,003,047
Oct-17	\$2,003,047	\$0	\$136,239	\$1,866,808	\$1,934,927	4.27%	\$7,017	\$1,873,825
Nov-17	\$1,873,825	\$0	\$119,624	\$1,754,201	\$1,814,013	4.27%	\$6,366	\$1,760,567
Dec-17	\$1,760,567	\$0	\$140,351	\$1,620,217	\$1,690,392	4.27%	\$6,130	\$1,626,347

(1) As filed in Unitil Energy Systems, Inc.'s Major Storm Cost Reserve Fund Report, February 27, 2017.

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Attachments

[Attachment A - Notification of Change to Weather Provider Services](#)

[Attachment B - Weather Estimated Impact Indices \(EII\)](#)

[Attachment C - Sample DTN Weather Forecast](#)

1. December 29th, 2016 (Nor'Easter)

Note: This event was first reported in the 2016 MSCR Fund Report and is now updated for the final accounting

1.1. Description of the Storm

Beginning on Tuesday, December 27th, Unitil's weather provider began forecasting a high impact nor'easter to impact the region during the early morning hours of Friday the 29th with a mix of heavy precipitation (rain/snow) and strong winds along the coast. Several winter storm warnings were issued for the event overnight on Thursday with snow expected to fall at rates up to 1-2" an hour and frequent wind gusts up to 45 mph. Up to a foot of wet snow was forecasted to fall across the service territories however this amount was dependent on the current temperatures in the area which were favorable (warmer) resulting in more rain than snow in most areas and lower snow totals.

1.2. Summary of the Extent of the Storm Damage

Unitil Energy Systems a limited impact to its service territories as the storm system passed overnight on the 29th as detailed in the table below (revised from previous report).

Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Peak Customers Interrupted	Percentage Affected (Peak)
Seacoast	10	7	2,213	2,362	4%
Capital	3	2	195	167	.6%

1.3. Preparations

Once aware of a potential weather event, Unitil began its preparations by holding a series of storm conference calls beginning on Tuesday to coordinate preparation activities. Based on the forecasted weather and potential for outages, the Company issued a PSA and initiated contact with life support customers, regulators, emergency response, and municipal officials. Both the Seacoast and Capital EOC's were staffed throughout the night of the 29th to monitor the event with additional staff and crews reporting in at 6:00 AM the following morning.

1.4. Restoration

Although the storm was predicted to bring up to 14 inches of wet snow in certain areas of the region, the warmer temperatures diminished these amounts. In the end about 4-6 inches was reported in most areas. Unitil had secured resources in advance of the event based on the predicted weather conditions and had 9 internal line crews, 31 external line crews, 28 tree crews, 8 damage assessors, 20 wires down personnel and additional support staff. Crews were able to quickly restore all affected customer overnight

1.5. Exclusionary Criteria

This event qualified for recovery of preparation costs due to the EEI of 4 for hazardous winds with a high confidence level (see attached forecast). 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 1.6.

Energy Event Index for UNITIL

Valid Time: December 28, 2016 6:00 AM EST

Your forecast administrator: murphyt@unitil.com

Forecaster: cody.fishman

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	3
	Portland	1	1	4
	Seacoast	1	1	4
Snow	Capital	1	4	1
	Fitchburg	1	4	1
	Portland	1	3	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	Medium	High
	Seacoast	High	Medium	High

Energy Event Index Definition

No Leaves (Nov 15 - Mar 31)

EEI	Wind Speed	Wind/Gust	Snow	Ice
1	< 26 mph	< 40 mph	< 18 in.	< 1/10 in.
2	>= 26 mph	>= 40 mph	>= 18 in.	>= 1/10 in.
3	>= 30 mph	>= 45 mph	>= 24 in.	>= 3/8 in.
4	>= 40 mph	>= 50 mph	>= 36 in.	>= 1/2 in.
5	>= 45 mph	>= 60 mph	>= 48 in.	>= 1 in.

Confidence Level	
Low	< 30% chance
Medium	>= 30% to < 60% chance
High	>= 60% chance

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: December 28, 2016

Time: 6:00 AM EST

Forecaster: C Fishman

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event Starting in 30hrs	SNOW	SNOW	SNOW	SNOW
Event Begin Time	10am Thurs	10am Thurs	10am Thurs	11am Thurs
Event End Time	8am Fri	7am Fri	6am Fri	8am Fri
Tstrm Wind Gusts				
Ltng				
Storm Mvmt Dir				
Rain Amount				
Snow Amount	3-10"	6-13"	5-12"	5-10"
Snow Character	WET	NRM-WET	NRM-WET	WET
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	39/19	39/19	40/21	39/19

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

CAPITAL: Dry, non-hazard conditions expected through tonight. Thursday morning a storm system enters the region with hazard snow expected. Snow showers will likely continue into Friday morning. Snow accumulation: see table. Chance of EEI-3 snow: 70%; Chance of EEI-4 snow: 40%. Sustained winds today: 3-15 mph; Gusts: 18-25 mph. Winds will increase late Thursday night through Friday out of the west-northwest. Sustained: 15-30 mph; Common gusts: 30-40 mph; Peak gusts: 40-45 mph. EEI-2 gust chance Thursday night: 60%; EEI-3 gust chance Thursday night: 30%.

Confidence: High that hazard snow will occur over the next 48 hours. Confidence is also high that hazard winds/gusts will occur Thursday night through Friday.

FITCHBURG: Dry, non-hazard conditions expected through tonight. Thursday morning a storm system enters the region with hazard snow expected. Snow showers will likely continue into Friday morning. Snow accumulation: see table. Chance of EEI-3 snow: 70%; Chance of EEI-4 snow: 30% Sustained winds today: 3-12 mph; Gusts: 15-25 mph. Winds will increase late Thursday night through Friday out of the west-northwest. Sustained: 15-30 mph. Common gusts: 30-40 mph. Peak gusts: 40-45 mph. EEI-2 gust chance Thursday night: 60%; EEI-3 gust chance Thursday night: 30%.

Confidence: High that hazard snow will occur over the next 48 hours. Confidence is also high that hazard winds/gusts will occur Thursday night through Friday.

SEACOAST: Dry, non-hazard conditions expected through tonight. Thursday morning a storm system enters the region with hazard snow possible. Snow showers will likely continue into Friday morning. The event will likely begin as rain and hazard snow will be possible if a transition to snow occurs earlier than anticipated. Snow accumulation: see table. Chance of EEI-3 snow: 70%. Sustained winds today: 3-15 mph; Gusts: 18-28 mph. Winds will increase late Thursday night through Friday out of the west-northwest. Sustained: 15-30 mph; Common gusts: 30-40 mph; Peak gusts: 45-50. EEI-2 gust chance Thursday night: 70%; EEI-3 gust chance Thursday night: 40%; EEI-4 gust chance Thursday night: 20%

Confidence: High that hazard snow will occur over the next 48 hours. Confidence is also high that hazard winds/gusts will occur Thursday night through Friday.

PORTLAND: Dry, non-hazard conditions expected through tonight. Thursday morning a storm system enters the region with hazard snow possible. Snow showers will likely continue into Friday morning. The event will likely begin as snow and transition to rain briefly Thursday night before returning to snow overnight. Hazard snow will be possible if a transition to snow occurs earlier than anticipated. Snow accumulation: see table. Chance of EEI-3 snow: 60%; Chance of EEI-4 snow: 30%. Sustained winds today: 3-15 mph; Gusts: 18-25 mph. Winds will increase late Thursday night through Friday out of the west-northwest. Sustained: 15-30 mph; Common gusts: 30-40 mph; Peak gusts: 45-50. EEI-2 gust chance Thursday night: 70%; EEI-3 gust chance Thursday night: 40%; EEI-4 gust chance Thursday night: 20%

Confidence: High that hazard snow will occur over the next 48 hours. Confidence is also high that hazard winds/gusts will occur Thursday night through Friday.

UNITIL SERVICE AREA 3-5 DAY OUTLOOK: Moderate to heavy snow continues into Friday morning, mainly in Portland. Elsewhere, light snow showers/flurries will be possible for the remainder of the day and night. Additional accumulations: 1-4". Dry, non-hazard conditions expected during the day Saturday with light snow showers becoming possible Saturday evening and night. Additional accumulations: Trace-2". Non-hazard winds are expected Saturday with gusts to 20-30 mph. Isolated flurries are possible Sunday morning, however mainly dry and non-hazard conditions are expected Sunday.

Confidence: High that hazard snow event will continue from Thursday through Friday morning. Confidence is also high that hazard wind gusts will continue from Thursday night through Friday. EEI-2 gust chance: 60% Capital/Fitchburg; 70% Seacoast/Portland. EEI-3 gust chance: 30% Capital/Fitchburg; 40% Seacoast/Portland. EEI-4 gust chance: 20% Seacoast/Portland. Confidence is high that no other hazards will occur during the 3-5 day period.

1.6. Qualifying Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for pre-planning activities was \$211,166 with a breakdown of charges as follows:

Payroll	\$ 7,846
Transportation	15,698
Contractor Invoices & Other	187,622
Total To Storm Reserve	\$ 211,166

2. **February 12th, 2017 (Winter Storm)**

2.1. Description of the Storm

Beginning on Friday February 10th, Unitil's weather service provider began forecasting a moderately wet snow event to impact the region Sunday (12th) into Monday (13th) with a total snow amount of around 12 inches expected. Additional warnings were given for the southern and coastal areas in the region where warmer temperatures were predicted to cause some of the snow to be wet in nature. Overall the temperatures remained favorable (cooler) resulting in about 10-12 inches of snow to fall across the region with a dryer consistency which caused only minor interruptions.



1 - Expected Snow Totals



2 - Expected Wind Gusts

2.2. Summary of the Extent of the Storm Damage

Unitil Energy Systems experienced the following impact as detailed in the table below.

Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Peak Customers Interrupted	Percentage Affected (Peak)
Seacoast	5	2	348	262	0.5%
Capital	0	0	0	0	0%

2.3. Preparations

Once aware of a potential weather event, Unitil held an internal coordination conference call on Saturday (11th) to initiate preparation activities. Based on the forecasted weather and potential for outages, the Company issued a PSA and contacted life support customers, regulators, emergency response, and municipal officials on Sunday. Due to the timing of the weather event Unitil's emergency response staff was in place at each location to monitor the event with additional staff and contract crews on standby throughout the day Monday if needed.

2.4. Restoration

Only minor interruptions (listed in Section 2.2) resulted from this event which were promptly responded to and restored by crews that afternoon. Unitil had its normal contingent of internal crews (10) and on system contractors (5) while also retaining additional contractor line crews (5) on standby if needed.

2.5. Exclusionary Criteria

This event qualified for recovery of preparation costs due to the EEI of 3 for hazardous wind gusts with a high confidence level (see attached forecast). 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: February 12, 2017 5:00 PM EST

Your forecast administrator: murphyt@unitil.com

Forecaster: scott.dumblauskas

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

Energy Event Index Definition

No Leaves (Nov 15 - Mar 31)

EI	Wind Speed	Wind/Gust	Snow	Ice
1	< 26 mph	< 40 mph	< 18 in.	< 1/10 in.
2	>= 26 mph	>= 40 mph	>= 18 in.	>= 1/10 in.
3	>= 30 mph	>= 45 mph	>= 24 in.	>= 3/8 in.
4	>= 40 mph	>= 50 mph	>= 36 in.	>= 1/2 in.
5	>= 45 mph	>= 60 mph	>= 48 in.	>= 1 in.

Confidence Level	
Low	
Medium	30-60% chance the most likely EEI level remains at that level through the event
High	>=60% chance the most likely EEI level remains at that level through the event

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"

*Note: Confidence is NOT a measure of probability of an event occurring; That information can be found in the text product. Confidence is a measure of how likely the forecast EEI level will stay at that level from now through the event, or a way to measure the potential for variability in the forecast. So for example, if it is Monday and there are EEI-2 gusts forecast on Wednesday with high confidence it means the following: There is a >=60% chance the most likely forecasted gusts will remain EEI-2 with all updates from now through Wednesday.

Date: February 12, 2017

Time: 6:00 PM EST

Forecaster: Scott Dumblauskas

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event Starting in 30hrs	SNOW/WIND	SNOW/WIND	SNOW/WIND	SNOW/WIND
Event Begin Time	IN AREA	IN AREA	IN AREA	IN AREA
Event End Time	10PM MON	7PM MON	7PM MON	10PM MON
Tstrm Wind Gusts				
Ltng				
Storm Mvmt Dir				
Rain Amount				
Snow Amount	10-16"	12-16"	10-13"	16-22"
Snow Character	NORMAL/WET	NORMAL	NORMAL	NORMAL
Ice Amount				
Sustained Wind	20-30	20-28	20-28	20-30
Wind Gust	40-50	40-45	40-45	40-50
Temp. Extremes	47/31	46/25	47/26	47/32

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

CAPITAL: Periods of snow continue through 4pm Monday. Heaviest snow: Through 3am Monday. Event snow accumulation: See table. Since the snow is forecast to be Normal consistency, EEI-1 snow is the most likely scenario. Hazard winds are expected on Monday. Hazard wind timing: 8am-7pm Monday. Northwest winds sustained: 20-28 mph. Gusts: 30-40 mph. Peak gusts: 40-45 mph. Dry weather and decreasing winds are expected on Monday night.

Confidence: High that hazard winds will occur on Monday. Wind chance: EEI-2/3/4 60%/30%/10%. Confidence is high that sustained winds will reach hazard levels on Monday. Sustained wind chance: EEI-

2 60%. Confidence is high that EEI-1 snow will occur because the snow should be Normal consistency. Snow chance: EEI-2 30%.

FITCHBURG: Periods of snow continue through 4pm Monday. Heaviest snow: Through 3am Monday. Event snow accumulation: See table. Since the snow is forecast to be Normal consistency, EEI-1 snow is the most likely scenario. Hazard winds are expected on Monday. Hazard wind timing: 9am-7pm Monday. Northwest winds sustained: 20-28 mph. Gusts: 30-40 mph. Peak gusts: 40-45 mph.

Confidence: High that hazard winds will occur on Monday. Wind chance: EEI-2/3/4 60%/30%/10%. Confidence is high that sustained winds will reach hazard levels on Monday. Sustained wind chance: EEI-2 60%. Confidence is high that EEI-1 snow will occur because almost all the snow should be Normal in character. Snow chance: EEI-2 20%.

SEACOAST: Periods of snow will continue through 5pm Monday. Heaviest snow: Through 6am Monday. Event snow accumulation: See table; most west of I-95. Snow character: At least 60% Normal and 40% Wet. Since most of the snow is forecast to be Normal, EEI-2 snow is the most likely scenario, with 4-8" possibly accumulating as a Wet consistency. Hazard winds are expected on Monday. Hazard wind timing: 7am-10pm Monday. Northwest winds sustained: 20-30 mph. Gusts: 35-45 mph. Peak gusts: 45-50 mph.

Confidence: High that hazard winds will occur on Monday. Wind chance: EEI-2/3/4 80%/60%/20%. Confidence is high that sustained winds will reach hazard levels on Monday. Sustained wind chance: EEI-2/3 70%/20%. Confidence is high that hazard snow will occur. Snow chance: EEI-2 80%; EEI-3 60%; EEI-4 10%. EEI-2 snow is expected because almost all the snow should be Normal in character.

PORTLAND: Periods of snow continue through 6pm Monday. Heaviest snow: Through 6am Monday. Event snow accumulation: See table. Snow character: At least 90% Normal and 10% Wet at most, meaning 1-3" of accumulation may occur as a Wet consistency snow. Since most of the snow is forecast to be Normal, EEI-2 snow is the most likely scenario. Hazard winds are expected on Monday. Hazard wind timing: 8am-10pm Monday. Northwest winds sustained: 20-30 mph. Gusts: 35-45 mph. Peak gusts: 45-50 mph.

Confidence: High that hazard winds will occur on Monday. Wind chance: EEI-2/3/4 80%/60%/20%. Confidence is high that sustained winds will reach hazard levels on Monday. Sustained wind chance: EEI-2/3 70%/20%. Confidence is high that hazard snow will occur. Snow chance: EEI-2/3 80%/20%. EEI-2 snow is expected because almost all the snow should be Normal in character.

2.6. Qualifying Costs Charged to the Storm Reserve

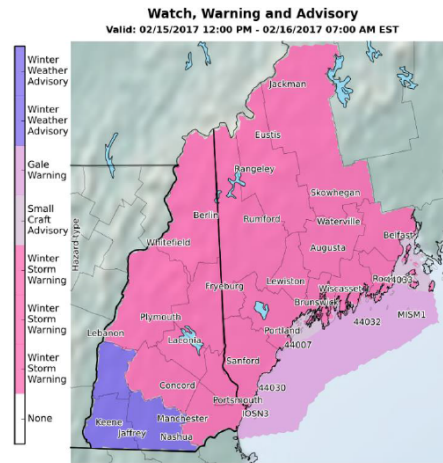
The total amount charged to the storm reserve for preparation activities was \$24,780 with a breakdown of charges as follows:

Contractor Invoices & Other	24,780
Total To Storm Reserve	\$ 24,780

3. February 15th, 2017 (Wet Snow Event)

3.1. Description of the Storm

Immediately following the snow event earlier in the week, weather forecasters began reporting another significant winter storm approaching the northeast expected to occur overnight Wednesday (Feb 15th) into Thursday (Feb 16th). Winter weather advisories and bulletins were issued for most of the northeast which called for additional snow amounts between 4-10 inches across the UES service territory (weather forecast provided in Section 3.5). Given the warmer temperatures, most of the snow was predicted to be a mixed rain/snow, specifically in the Seacoast region and coastal areas.



3 - Winter Storm Advisories

3.2. Summary of the Extent of the Storm Damage

Unitil Energy Systems experienced the following impact as detailed in the table below.

Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Peak Customers Interrupted	Percentage Affected (Peak)
Seacoast	7	2	342	195	.4%
Capital	4	2	852	646	2.1%

3.3. Preparations

Unitil held an internal coordination conference call on Wednesday morning (the 15th) with key internal personnel to begin initiating preparation activities. Based on the forecasted weather and potential for outages, the Company issued a PSA and initiated contact with life support customers, regulators, emergency response, and municipal officials on Wednesday afternoon. Although the EOCs did not formally open, additional Unitil staff was in place overnight at each location and the call center to monitor the event with additional staff and crews on arriving Thursday morning if needed.

3.4. Restoration

Minor interruptions (listed in Section 3.2) in the early hours of Thursday morning (16th) were promptly handled with all impacted customers being restored by 1:40 PM that afternoon. Unitil had its normal contingent of internal crews (10) and on system contractors (5) while also retaining additional contractor line crews (12) on standby if needed.

3.5. Exclusionary Criteria

This event qualified for recovery of preparation costs due to the EEI of 3 for hazardous snow with a high confidence level (see attached forecast). 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: February 15, 2017 1:00 PM EST

Your forecast administrator: murphyt@unitil.com

Forecaster: kyle.koval

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	2	2	1
	Fitchburg	1	1	1
	Portland	4	4	1
	Seacoast	3	3	1
Ice	Capital	1	1	1
	Fitchburg	1	1	1
	Portland	1	1	1
	Seacoast	1	1	1
Confidence Level	Capital	Medium	Medium	High
	Fitchburg	High	High	High
	Portland	Medium	Medium	High
	Seacoast	High	High	High

Energy Event Index Definition

No Leaves (Nov 15 - Mar 31)

EEI	Wind Speed	Wind/Gust	Snow	Ice
1	< 26 mph	< 40 mph	< 18 in.	< 1/10 in.
2	>= 26 mph	>= 40 mph	>= 18 in.	>= 1/10 in.
3	>= 30 mph	>= 45 mph	>= 24 in.	>= 3/8 in.
4	>= 40 mph	>= 50 mph	>= 36 in.	>= 1/2 in.
5	>= 45 mph	>= 60 mph	>= 48 in.	>= 1 in.

Confidence Level	
Low	
Medium	30-60% chance the most likely EEI level remains at that level through the event
High	>=60% chance the most likely EEI level remains at that level through the event

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"

*Note: Confidence is NOT a measure of probability of an event occurring; That information can be found in the text product. Confidence is a measure of how likely the forecast EEI level will stay at that level from now through the event, or a way to measure the potential for variability in the forecast. So for example, if it is Monday and there are EEI-2 gusts forecast on Wednesday with high confidence it means the following: There is a >=60% chance the most likely forecasted gusts will remain EEI-2 with all updates from now through Wednesday.

Date: February 15, 2017

Time: 1:00 PM EST

Forecaster: K Koval

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event Starting in 30hrs	SNOW	SNOW	NONE	SNOW
Event Begin Time	ONGOING	ONGOING		2PM WED
Event End Time	6PM THU	6PM THU		6PM THU
Tstrm Wind Gusts				
Ltng				
Storm Mvmt Dir				
Rain Amount				
Snow Amount	5-11"	5-7"		8-13"
Snow Character	WET	WET		WET
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	39/22	38/24	41/22	37/18

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

CAPITAL: Rain showers will be possible through 7pm Wednesday. A little snow could mix in, but accumulations will be minor. A change to snow should occur after 7pm. Snow should gradually pick up through the evening. The heaviest snow period should be 10pm Wednesday to 6am Thursday. This is when 90% of the snow should fall. Spotty light snow showers or flurries will be possible on Thursday with minor, if any, additional snow accumulation. Snow character: 75% Wet; 25% Normal. Winds will be well below hazard levels through tonight. Winds Thursday: West-northwest at 10-18 mph, with gusts of 20-30 mph. This could create areas of blowing snow. Dry weather and decreasing winds are expected on Thursday night through Friday morning.

Confidence: Confidence is high that hazard snow will occur tonight into Thursday. Confidence remains medium that only EE-2 snow will occur. Snow chance: EEI-2/3 60%/40%.

FITCHBURG: Light rain showers will be possible this afternoon. Rainfall: Up to 0.05". Snow will be possible from 8pm Wednesday through later Thursday afternoon. Snow accumulation: 1-3". Most of the snow should fall from 12am-6am Thursday. Spotty light snow showers or flurries will be possible on Thursday with minor, if any, additional snow accumulation. Snow character: Wet. Winds will be well below hazard levels through Wednesday night. Winds Thursday: West-northwest at 10-18 mph, with gusts of 20-30 mph. Dry weather and decreasing winds are expected on Thursday night through Friday morning.

Confidence: Confidence is high that no hazards will occur through Thursday afternoon.

SEACOAST: A mix of rain and snow will impact the region through 8pm Wednesday, with the best chance of snow west of I-95. Snow should take over for the rest of tonight and Thursday. Timing of heaviest snow: 10pm Wednesday to 6am Thursday, when 80-90% of snow should fall. Snow accumulation: 5-8" for most but 8-11" along/north of Highway 110. Spotty light snow showers or flurries will be possible on Thursday with minor, if any, additional snow accumulation. Snow character: 80% Wet; 20% Normal. Winds will be well below hazard levels through Wednesday night. Winds Thursday: West-northwest at 10-18 mph, with gusts of 20-30 mph. This could create areas of blowing snow. Dry weather and decreasing winds are expected on Thursday night through Friday morning.

Confidence: Confidence is high that hazard snow will occur tonight into Thursday. Confidence is also increasing that most of the area will see EEI-3 snow. Snow chance: EEI-2/3/4 20%/70%/10%.

PORTLAND: A mix of rain and snow will impact Portland from 2pm-8pm Wednesday. Snow should take over for the rest of tonight and Thursday. All snow is expected in Lewiston. Timing of heaviest snow: Portland: 9pm Wednesday to 6am Thursday. Lewiston: 6pm Wednesday to 3am Thursday. This is when 80-90% of the snow should fall. Snow accumulation: Portland/Sanford 8-13", highest west of I-95. Lewiston: 8-11". Spotty light snow showers or flurries will be possible on Thursday with minor, if any, additional snow accumulation. Snow character: Wet. Winds will be well below hazard levels through Wednesday night. Winds Thursday: West-northwest at 10-18 mph, with gusts of 20-30 mph. This could create areas of blowing snow. Dry weather and decreasing winds are expected on Thursday night.

Confidence: Confidence is high that hazard snow will occur on Wednesday into Thursday, but it's medium in which EEI level will occur. Confidence is also increasing that the heaviest snow band will occur between Portland and the NH/ME border. Snow chance: Portland: EEI-2/3/4 0%/50%/50%. Lewiston: 0%/80%/20%.

3.6. Qualifying Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for preparation activities was \$63,630 with a breakdown of charges as follows:

Payroll	\$ 378
Transportation	1,097
Contractor Invoices & Other	62,155
<hr/>	
Total To Storm Reserve	\$ 63,630

4. March 14th, 2017 (Nor'easter Event "Stella")

4.1. Description of the Storm

Beginning over the weekend of March 11th, weather forecasters began reporting a significant nor'easter expected to move across and impact the northeast Tuesday (Mar 14th) with heavy snow amounts (12-18+ inches), strong wind gusts (50-60+ mph) and a wintry mix expected for coastal areas. Winter weather advisories and warnings were issued and updated in the days leading up to the storm for most of the Mid-Atlantic and Northeast. Initial weather forecasts called for up to 22 inches of snow with wind gusts up to 55 mph (and higher along the coast) which were later decreased although only slightly (weather forecast provided in Section 4.5). Stella broke snowfall records in the City of Concord and also caused hazardous travel conditions and widespread customer interruptions due to fallen trees and limbs.



4 - Stella Expected Snow Amounts

4.2. Summary of the Extent of the Storm Damage

Unitil Energy Systems experienced the following impact as detailed in the table below. The majority of the outages in the Seacoast region were attributed to the loss of two sub transmission lines running through the salt march which feeds most of the Hampton Beach area.

Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Peak Customers Interrupted	Percentage Affected (Peak)
Seacoast	105	80	26,760	22,081	46.8%
Capital	11	7	1,284	1,077	3.5%

4.3. Preparations

Unitil began holding daily internal coordination conference calls Sunday (the 12th) with key internal personnel to coordinate preparation activities in response to the pending nor'easter. Based on the forecasted weather and potential for outages, the Company began issuing its preparatory communication messages and initiated contact with life support customers, regulators, emergency response, and municipal officials. Although the EOCs were not initially fully staffed, the amount of scattered outages and impact prompted the Seacoast EOC to activate with the System (Hampton) EOC also opening to aid operations by providing essential logistical support for responding resources.

4.4. Restoration

As noted (in Section 4.2) scattered outages occurred across the service territory with the major interruptions in Seacoast being attributed to the loss of the sub-transmission lines located in the salt marsh area of Hampton. Although the Company had retained additional resources, some customers experienced extended outages due to the ongoing winds preventing line crews from safely responding and the extensive repairs needed to the impacted sub-transmission lines.

Ultimately, new sub-transmission lines had to be built across the salt marshes to supply the impacted customers until permanent repairs could be made. Unitil had its normal contingent of UES internal crews (10) and on system contractors (8) while also retaining additional contractor line crews (8). Crews responded to outages throughout the night Tuesday as possible (given the ongoing hazardous working conditions) and restored power to all impacted customers in the Seacoast region by 4:45 PM on Wednesday (the 15th).

4.5. Exclusionary Criteria

This event qualified for recovery of both preparation and restoration costs due to the events predicted EEI levels (see attached forecast) and the impact exceeding the outage criteria as noted in Section 4.2. All costs associated with the event recovered through the MSCR are summarized in Section 4.6.

Energy Event Index for UNITIL Your forecast administrator: murphyt@unitil.com
Valid Time: March 14, 2017 6:00 AM EDT Forecaster: nathan.hamblin

Parameter	Region	Day 1	Day 2	Day 3
Wind Speed	Capital	1	1	1
	Fitchburg	1	1	1
	Portland	2	1	1
	Seacoast	2	1	1
Wind/Gust	Capital	2	1	1
	Fitchburg	2	1	1
	Portland	3	1	1
	Seacoast	3	1	1
Snow	Capital	2	1	1
	Fitchburg	5	1	1
	Portland	5	1	1
	Seacoast	5	1	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	Medium	High	High
	Seacoast	High	High	High

Energy Event Index Definition

No Leaves (Nov 15 - Mar 31)

EEI	Wind Speed	Wind/Gust	Snow	Ice
1	< 26 mph	< 40 mph	< 18 in.	< 1/10 in.
2	>= 26 mph	>= 40 mph	>= 18 in.	>= 1/10 in.
3	>= 30 mph	>= 45 mph	>= 24 in.	>= 3/8 in.
4	>= 40 mph	>= 50 mph	>= 36 in.	>= 1/2 in.
5	>= 45 mph	>= 60 mph	>= 48 in.	>= 1 in.

Confidence Level	
Low	
Medium	30-60% chance the most likely EEI level remains at that level through the event
High	>=60% chance the most likely EEI level remains at that level through the event

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"

*Note: Confidence is NOT a measure of probability of an event occurring; That information can be found in the text product. Confidence is a measure of how likely the forecast EEI level will stay at that level from now through the event, or a way to measure the potential for variability in the forecast. So for example, if it is Monday and there are EEI-2 gusts forecast on Wednesday with high confidence it means the following: There is a >=60% chance the most likely forecasted gusts will remain EEI-2 with all updates from now through Wednesday.

Date: March 14, 2017

Time: 6:00 AM EDT

Forecaster: N Hamblin

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event Starting in 30hrs	WIND/SNOW	WIND/SNOW	WIND/SNOW	WIND/SNOW
Event Begin Time	6AM TUE	6AM TUE	6AM TUE	7AM TUE
Event End Time	1AM WED	1AM WED	12AM WED	3AM WED
Tstrm Wind Gusts				
Ltng				
Storm Mvmt Dir				
Rain Amount				
Snow Amount	16-22"	18-24"	16-22"	16-22"
Snow Character	NRM/WET	NORMAL	NRM/WET	NRM/WET
Ice Amount				
Sustained Wind	22-30 MPH	20-28 MPH	20-28 MPH	22-30 MPH
Wind Gust	45-55 MPH	35-45 MPH	35-45 MPH	45-55 MPH
Temp. Extremes	34/22	30/18	32/20	33/20

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

CAPITAL: Heavy snow and strong winds are expected today and into tonight. Snowfall to 20-22" is expected to be localized. Heaviest snow: 9am-8pm Tue. Snow should gradually wind down Tuesday night. Hazard winds are expected with the snow, which could produce blizzard conditions. Hazard wind timing: 1pm-10pm Tue. East, becoming northwest. Frequent gusts: 30-40 mph. See table for details. Winds will drop off markedly for the rest of tonight.

Confidence: Confidence is high in heavy snowfall occurring Tuesday and Tuesday night; however, since the snow is forecast to be normal, the "dry" EEI snow scale is used. EEI-2 snowfall chance: 70%. Confidence is high that hazard wind gusts will occur on Tuesday. Wind chance: EEI-2 60%. Confidence is medium that hazard sustained winds will occur on Tuesday. Sustained wind chance: EEI-2 40%.

FITCHBURG: Heavy snow and strong winds are expected today and into tonight. Snowfall to 20-22" is expected to be localized. Heaviest snow: 7am-7pm Tue. Snow should gradually wind down tonight. Snow character: 50% Normal/50% Wet. Hazard winds are expected with the snow, which could produce blizzard conditions. Hazard wind timing: 1pm-10pm Tue. East, becoming northwest. Frequent gusts: 30-40 mph. Winds will drop off markedly for the rest of tonight.

Confidence: Confidence is high in heavy snowfall occurring Tuesday and Tuesday night. Since wet snow will be at least half of the snow accumulation, the "wet" EEI snow scale will be used. Snow chance: EEI-2/3/4/5: 100%/80%/80%/60%. Confidence is high that hazard wind gusts will occur on Tuesday. Wind chance: EEI-2 60%. Confidence is medium that hazard sustained winds will occur on Tuesday. Sustained wind chance: EEI-2 40%.

SEACOAST: Heavy snow and strong winds are expected today and into tonight. Snowfall to 20-22" is expected to be localized. Heaviest snow: 9am-8pm Tue. Snow should gradually wind down tonight. Snow character: 25% Normal, 75% Wet for East of I-95 and 50% Normal, 50% Wet Inland. Hazard winds are expected with the snow, which could produce blizzard conditions. Hazard wind timing: 11am-11pm Tue. East, becoming northwest. Frequent gusts: 35-45 mph. Winds will drop off markedly for the rest of Tuesday night.

Confidence: Confidence is high in heavy snowfall occurring Tuesday and Tuesday night. Since wet snow will be at least half of the snow accumulation, the "wet" EEI snow scale will be used. Snow chance: EEI-2/3/4/5: 100%/90%/80%/60%. Confidence is high that hazard wind gusts will occur on Tuesday. Wind chance: EEI-2/3/4 70%/60%/40%. Confidence is high that hazard sustained winds will occur on Tuesday. Sustained wind chance: EEI-2/3 70%/40%.

PORTLAND: Heavy snow and strong winds are expected Tuesday and Tuesday night. Snowfall to 20-22" is expected to be localized. Heaviest snow: 10am-10pm Tue. Snow should gradually wind down for the rest of Tuesday night. Snow character: 25% Normal, 75% Wet. Hazard winds are expected with the snow, which could produce blizzard conditions. Hazard wind timing: 12pm-11pm Tue. East, becoming northwest. Frequent gusts: 35-45 mph. Winds will drop off markedly for the rest of Tuesday night.

Confidence: Confidence is high in heavy snowfall occurring Tuesday and Tuesday night. Since wet snow will be at least half of the snow accumulation, the "wet" EEI snow scale will be used. Snow chance: EEI-2/3/4/5: 100%/90%/80%/60%. Confidence is high that hazard wind gusts will occur on Tuesday. Wind chance: EEI-2/3/4 90%/70%/55%. Confidence is high that hazard sustained winds will occur on Tuesday. Sustained wind chance: EEI-2/3 70%/40%.

4.6. Qualifying Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for this event was \$677,974 with a breakdown of charges on the following page:

Unitil Energy Systems, Inc. d/b/a Unitil Corp
Major Storm Cost Reserve Fund Report 2017

Payroll	\$ 86,860
Materials & Supplies	31,482
Transportation	86,472
Contractor Invoices & Other	541,115
Less Amount Capitalized	(67,955)
Total To Storm Reserve	\$ 677,974

5. March 31st, 2017 (Snow Event)

5.1. Description of the Storm

Beginning on March 29th, weather forecasters indicated the possibility for a late season wintery snow mix expected to impact the northeast starting late Friday (Mar 31st) and lingering into Saturday (Apr 1st). Snow amounts of between 4-10 inches were predicted across the service territory and expected to be heavy and wet in nature due to the warming temperatures. Although the winds were not expected to be hazardous, winter weather warnings were issued due to the expected heavy, wet nature of the snow.

5.2. Summary of the Extent of the Storm Damage

Unitil Energy Systems experienced the following impact as detailed in the table below.

Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Peak Customers Interrupted	Percentage Affected (Peak)
Seacoast	31	16	11,672	7,622	16.2%
Capital	29	8	1,918	919	3%

5.3. Preparations

Unitil began holding daily internal coordination conference calls Thursday (the 30th) with key internal personnel to coordinate preparation activities in response to the expected snow amounts. Based on the forecasted weather and potential for outages, the Company began issuing its preparatory communication messages and initiated contact with life support customers, regulators, emergency response, and municipal officials. All Unitil EOCs and call center were staffed with key response personnel at 6 AM on Saturday (Apr 1st), to monitor and respond to customer interruptions while providing updated communication messaging and logistical support for the responding resources.

5.4. Restoration

As noted (in Section 5.2) scattered outages occurred across the service territory (mostly in the Seacoast Region) and were promptly repaired and/or restored. Unitil had its normal contingent of UES internal crews (10) and on system contractors (8) and retained additional contractor line (24) and tree (16) crews with power being restored to all impacted customers by the end of the same day (Apr 1st).

5.5. Exclusionary Criteria

This event qualified for recovery of both preparation and restoration costs due to the events predicted EEI levels (see attached forecast) and the impact exceeding the outage criteria as noted in Section 5.2. All costs associated with the event recovered through the MSCR are summarized in Section 5.6.

Energy Event Index for UNITIL

Your forecast administrator: murphyt@unitil.com

Valid Time: March 31, 2017 10:00 AM EDT

Forecaster: tanner.verstegen

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	3	3	1
	Fitchburg	3	3	1
	Portland	3	3	1
	Seacoast	3	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 15 - Mar 31)

EEI	Wind Speed	Wind/Gust	Snow	Ice
1	< 26 mph	< 40 mph	< 18 in.	< 1/10 in.
2	>= 26 mph	>= 40 mph	>= 18 in.	>= 1/10 in.
3	>= 30 mph	>= 45 mph	>= 24 in.	>= 3/8 in.
4	>= 40 mph	>= 50 mph	>= 36 in.	>= 1/2 in.
5	>= 45 mph	>= 60 mph	>= 48 in.	>= 1 in.

Confidence Level	
Low	
Medium	30-60% chance the most likely EEI level remains at that level through the event
High	>=60% chance the most likely EEI level remains at that level through the event

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"

*Note: Confidence is NOT a measure of probability of an event occurring; That information can be found in the text product. Confidence is a measure of how likely the forecast EEI level will stay at that level from now through the event, or a way to measure the potential for variability in the forecast. So for example, if it is Monday and there are EEI-2 gusts forecast on Wednesday with high confidence it means the following: There is a >=60% chance the most likely forecasted gusts will remain EEI-2 with all updates from now through Wednesday.

Date: March 31, 2017
Time: 10:15 AM EDT
Forecaster: T Verstegen

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event Starting in 30hrs	SNOW	SNOW	SNOW	SNOW
Event Begin Time	12PM FRI	8AM FRI	8AM FRI	4PM FRI
Event End Time	10PM SAT	8PM SAT	8PM SAT	11PM SAT
Tstrm Wind Gusts				
Ltng				
Storm Mvmt Dir				
Rain Amount				
Snow Amount	5-9"	8-11"	6-9"	5-8"
Snow Character	WET	WET	WET	WET
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	37/31	34/31	40/32	40/31

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

CAPITAL: Snow will develop after 8-10am Friday and will end around 6-8pm Saturday. Snow will be moderate to heavy at times. Snow character: Wet. This could mix with sleet at times Friday night and Saturday afternoon. Snowfall: 8-11". Winds could gust 25-35 mph on Saturday, strongest in the morning and afternoon.

Confidence: Confidence is high in hazard snow occurring Friday and Saturday. Hazard snow chance: 90% EEI-2; 70% EEI-3; 10% EEI-4. Hazard gust chance on Saturday: 20%.

FITCHBURG: Snow will develop after 8-9am Friday and will end around 6-8pm Saturday. Snow will be moderate to heavy at times. Snow character: Wet. This could mix with sleet or rain at times Friday evening/night and into Saturday afternoon. Snowfall: 6-9". Winds could gust 25-35 mph on Saturday, strongest in the afternoon.

Confidence: Confidence is high in hazard snow occurring Friday and Saturday. Hazard snow chance: 80% EEI-2; 70% EEI-3; 10% EEI-4. Hazard gust chance on Saturday: 20%.

SEACOAST: Snow will develop after 12-2pm Friday and will end around 8-10pm Saturday. Snow will be moderate to heavy at times. Snow character: Wet. This could mix with or change to sleet or rain at times Friday evening/night and into Saturday afternoon. Snowfall: 5-9" west of I-95 and 5-6" east of I-95. Winds could gust 25-35 mph on Saturday, strongest in the afternoon.

Confidence: Confidence is high in hazard snow occurring Friday and Saturday. Hazard snow chance: 80% EEI-2; 70% EEI-3; 10% EEI-4. Hazard gust chance on Saturday: 20%.

PORTLAND: Dry and hazard-free today and tonight. Snow will develop after 4-6pm Friday and will end around 9-11pm Saturday. Snow will be moderate to heavy at times. Snow character: Wet. This could mix with sleet times Saturday morning into Saturday afternoon. Snowfall: 7-8" northwest of I-95 and 5-7" east of I-95. Winds could gust 25-35 mph on Saturday, strongest in the afternoon.

Confidence: Confidence is high in hazard snow occurring Friday and Saturday. Hazard snow chance: 80% EEI-2; 70% EEI-3; 10% EEI-4. Hazard gust chance on Saturday: 20%.

5.6. Qualifying Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for this event was \$191,611 with a breakdown of charges as follows:

Payroll	\$ 20,083
Materials & Supplies	209
Transportation	42,294
Contractor Invoices & Other	135,345
Less Amount Capitalized	(6,320)
Total To Storm Reserve	\$ 191,611

6. June 19th, 2017 (T-Storm Event)

6.1. Description of the Storm

On Saturday June 17th, Unitil's weather service provider began forecasting the possibility for thunderstorms to develop in the region late afternoon Monday (19th). The following day (18th) forecasters increased the likelihood of rain and severe thunderstorms with wind gusts up to 60 mph and moderate amounts of lightning. Thunderstorm, lightning and flash flood warnings were given for several counties in the state as the system moved quickly northeast across the state.

6.2. Summary of the Extent of the Storm Damage

Unitil Energy Systems experienced the following impact as detailed in the table below.

Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Peak Customers Interrupted	Percentage Affected (Peak)
Seacoast	5	2	191	90	0.2%
Capital	4	2	80	61	0.2%

6.3. Preparations

Unitil began its preparations by engaging several key logistical and planning personnel over the weekend; Unitil then held an internal coordination conference call on Monday (19th) to formalize the preparation activities taking place. Although the Company did not issue a formal PSA, preparatory information was delivered through social media channels and contact with initiated with regulators, emergency response, and municipal officials. Due to the timing of the weather event Unitil held much of its staff throughout the evening in each location to monitor the event with additional crews on standby if needed.

6.4. Restoration

Only minor interruptions (listed in Section 6.2) resulted from this event which were promptly responded to and restored by crews that afternoon. Unitil had its normal contingent of internal crews (10) and on system contractors (11) while also retaining additional contractor line crews (6) on standby if needed.

6.5. Exclusionary Criteria

This event qualified for recovery of preparation costs due to the EEI of 3 for hazardous wind gusts with a high confidence level (see attached forecast). 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

Your forecast administrator: murphyt@unitil.com

Valid Time: June 19, 2017 1:00 PM EDT

Forecaster: kristin.haugen

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	3	1	1
	Seacoast	3	1	1
Confidence Level	Capital	High	High	High
	Fitchburg	High	High	High
	Portland	High	High	High
	Seacoast	High	High	High

Energy Event Index

Definition

With Leaves (Apr 1 - Nov 14)

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

*Note: Confidence is NOT a measure of probability of an event occurring; if you have an accompanying forecast discussion, that information can be found there. Confidence is a measure of how likely the forecasted index level will stay at that level from now through the event, or a way to measure the potential for variability in the forecast. So for example, if it is Monday and there are level 2 gusts forecasted on Wednesday with high confidence, and if your customizable threshold for high confidence is set at 60%, it means the following: There is a >=60% chance the most likely forecasted gusts will remain at level 2 with all updates from now through Wednesday.

Date: June 19, 2017

Time: 1:00 PM EDT

Forecaster: Kris Haugen

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event Starting in 30hrs	TSTORM/RAIN	TSTORM/RAIN	TSTORM/RAIN	TSTORM/RAIN
Event Begin Time	3PM MON	NOW	3PM MON	3PM MON
Event End Time	5AM TUE	5AM TUE	5AM TUE	5AM TUE
Tstrm Wind Gusts	40-55 MPH	45-60 MPH	45-60 MPH	35-50 MPH
Ltng Intensity	MEDIUM	MEDIUM	MEDIUM	MEDIUM
Storm Mvmt Dir	NE	NE	NE	NE
Rain Amount	0.50-1.25"	0.75-2.00"	0.50-1.50"	0.50-1.25"
Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	85/67	87/64	87/67	80/63

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

CAPITAL: Rain and thunderstorms will become likely in the afternoon/evening. T-storm timing: Now-5am Tue. Strongest storm timing: 5pm-10pm Mon. Lightning amounts: Medium afternoon/evening; low after 10pm. T-storm gusts: 45-60 mph afternoon/evening; 25-35 mph after 10pm. Rainfall: 0.75-1.50", isolated 1.50-2.00" possible. Southwest winds could gust to 25-30 mph Monday afternoon and evening. On Tuesday, isolated showers possible in the morning and afternoon. Dry in the evening and night. Rainfall: Up to 0.15". Winds could gust 20-30 mph Tuesday afternoon.

Confidence: Confidence is high in thunderstorms occurring Monday afternoon/evening and medium in them lingering overnight. T-storm chance: 70% afternoon/evening; 30% after 10pm. Confidence is high in hazard gusts occurring in thunderstorms. Hazard t-storm gust chance: 65% EEI-2; 60% EEI-3; 30% EEI-4. Confidence is high that rainfall amounts will exceed 1". Hazard rainfall chance: 60%. Confidence is high in no hazards occurring Tuesday and Tuesday night. Confidence is medium in low-end EEI-2 gusts occurring today and Tuesday. Hazard gust chance: 30% EEI-2.

FITCHBURG: Rain and thunderstorms will become likely in the afternoon/evening. T-storm timing: 3pm Mon-5am Tue. Strongest storm timing: 6pm-11pm Mon. Lightning amounts: Medium afternoon/evening; low after 11pm. T-storm gusts: 45-60 mph afternoon/evening; 25-35 mph after 11pm. Rainfall: 0.50-1.00", isolated 1.00-1.50" possible. Southwest winds could gust to 25-30 mph Monday afternoon and evening.

On Tuesday, isolated showers possible in the morning and afternoon. Dry in the evening and night. Rainfall: Up to 0.15". Winds could gust 20-30 mph Tuesday afternoon.

Confidence: Confidence is medium in thunderstorms occurring Monday afternoon, high in thunderstorms occurring in the evening, and medium in them lingering overnight. T-storm chance: 40% afternoon; 60% evening; 30% after 11pm. Confidence is high in hazard gusts occurring in thunderstorms. Hazard t-storm gust chance: 60% EEI-2; 55% EEI-3; 20% EEI-4. Confidence is high that rainfall amounts will exceed 1". Hazard rainfall chance: 60%. Confidence is high in no hazards occurring Tuesday and Tuesday night. Confidence is medium in low-end EEI-2 gusts occurring today and Tuesday. Hazard gust chance: 30% EEI-2.

SEACOAST: Rain and thunderstorms will become likely in the afternoon/evening. T-storm timing: 3pm Mon-5am Tue. Strongest storm timing: 6pm-11pm Mon. Lightning amounts: Medium afternoon/evening; low after 11pm. T-storm gusts: 40-55 mph afternoon/evening; 25-35 mph after 11pm. Rainfall: 0.50-1.00", isolated 1.00-1.25" possible. Southwest winds could gust to 25-30 mph Monday afternoon and evening. On Tuesday, isolated showers possible in the morning and afternoon. Dry in the evening and night. Rainfall: Up to 0.15". Winds could gust 20-30 mph Tuesday afternoon.

Confidence: Confidence is medium in thunderstorms occurring Monday afternoon, high in thunderstorms occurring in the evening, and medium in them lingering overnight. T-storm chance: 30% afternoon; 60% evening; 30% after 11pm. Confidence is high in hazard gusts occurring in thunderstorms. Hazard t-storm gust chance: 60% EEI-2; 55% EEI-3; 20% EEI-4. Confidence is medium that rainfall amounts will exceed 1". Hazard rainfall chance: 40%. Confidence is high in no hazards occurring Tuesday and Tuesday night. Confidence is medium in low-end EEI-2 gusts occurring today and Tuesday. Hazard gust chance: 30% EEI-2.

PORTLAND: Rain and thunderstorms will become likely in the afternoon/evening. T-storm timing: 3pm Mon-5am Tue. Strongest storm timing: 6pm-11pm Mon. Lightning amounts: Medium afternoon/evening; low after 11pm. T-storm gusts: 40-55 mph afternoon/evening; 25-35 mph after 11pm. Rainfall: 0.50-1.00", isolated 1.00-1.25" possible. Southwest winds could gust to 25-30 mph Monday afternoon and evening. On Tuesday, isolated showers possible in the morning and afternoon. Dry in the evening and night. Rainfall: Up to 0.15". Winds could gust 20-30 mph Tuesday afternoon.

Confidence: Confidence is medium in thunderstorms occurring Monday afternoon, high in thunderstorms occurring in the evening, and medium in them lingering overnight. T-storm chance: 30% afternoon; 60% evening; 30% after 11pm. Confidence is high in hazard gusts occurring in thunderstorms. Hazard t-storm gust chance: 60% EEI-2; 55% EEI-3; 20% EEI-4. Confidence is medium that rainfall amounts will exceed 1". Hazard rainfall chance: 40%. Confidence is high in no hazards occurring Tuesday and Tuesday night. Confidence is medium in low-end EEI-2 gusts occurring today and Tuesday. Hazard gust chance: 30% EEI-2.

6.6. Qualifying Costs Charged to the Storm Reserve

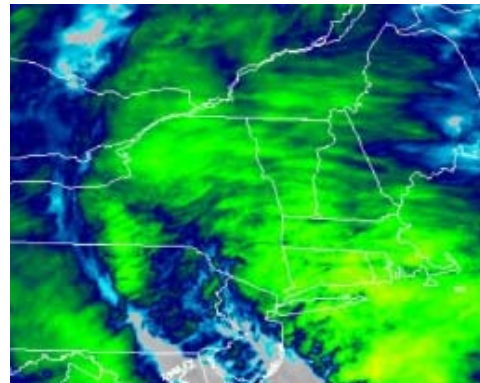
The total amount charged to the storm reserve for preparation activities was \$35,958 with a breakdown of charges as follows:

Payroll	\$ 3,134
Contractor Invoices & Other	32,824
Total To Storm Reserve	\$ 35,958

7. October 30th, 2017 (Wind Event)

7.1. Description of the Storm

Beginning on October 26th (Thu), weather forecasters began reporting a significant storm system expected to impact the northeast late Sunday (Oct 29th) into Monday (Oct 30th) with heavy rain, lightning and gusty winds. Over the weekend, forecasters increased the severity and likelihood of the storm system predicting moderate to heavy amounts of rain and frequent gusts between 35-50 mph with isolated gusts predicted up to 60 mph. High wind watches and warnings were issued for nearly all portions of the northeast especially for coastal parts of RI, MA and NH. Following the storms passing nearly 1.4 million customers were without power in the northeast due to severe flash flooding and tree damage and debris.



5 - Event Peak Radar

7.2. Summary of the Extent of the Storm Damage

Unitil Energy Systems experienced significant impact as detailed in the table below.

Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Peak Customers Interrupted	Percentage Affected (Peak)
Seacoast	167	104	34,007	21,857	46.4%
Capital	237	180	19,325	12,479	41.1%

7.3. Preparations

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

7.4. Restoration

As noted (in Section 7.2) scattered outages occurred across both of Unitil's NH service territories which were mostly attributed to tree damage and branches on powerlines. The Company had retained additional resources, however ongoing hazardous winds initially prevented line crews from safely responding². Unitil had its normal contingent of UES internal crews (10) and on system contractors (11) while also retaining additional contractor line crews (55), tree crews (15), wire down guards and damage assessors (18). At peak Unitil had

² Line and tree crews cannot safely raise the bucket if winds are gusting over 35 MPH.

approximately 33,354 customers interrupted (43% of total customers) with crews responding to outages as possible (given ongoing hazardous working conditions) power was restored to the majority of customers by 6:00 AM Wednesday (Nov 1st) with isolated outages and single services completed the following day.

7.5. Exclusionary Criteria

This event qualified for recovery of both preparation and restoration costs due to the events predicted EEI levels (see attached forecast) and the impact exceeding the outage criteria as noted in Section 7.2. All costs associated with the event recovered through the MSCR are summarized in Section 7.6.

Energy Event Index for UNITIL

Your forecast administrator: murphyt@unitil.com

Valid Time: October 29, 2017 6:00 PM EDT

Forecaster: tony.dello

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

Energy Event Index

Definition

With Leaves (Apr 1 - Nov 14)

EEI	Wind Speed	Wind/Gust
1	< 20 mph	< 30 mph
2	>= 20 mph	>= 30 mph
3	>= 25 mph	>= 40 mph
4	>= 40 mph	>= 50 mph
5	>= 45 mph	>= 60 mph

Confidence Level	
Low	
Medium	30-60% chance the most likely EEI level remains at that level through the event
High	>=60% chance the most likely EEI level remains at that level through the event

*Note: Confidence is NOT a measure of probability of an event occurring; if you have an accompanying forecast discussion, that information can be found there. Confidence is a measure of how likely the forecasted index level will stay at that level from now through the event, or a way to measure the potential for variability in the forecast. So for example, if it is Monday and there are level 2 gusts forecasted on Wednesday with high confidence, and if your customizable threshold for high confidence is set at 60%, it means the following: There is a >=60% chance the most likely forecasted gusts will remain at level 2 with all updates from now through Wednesday.

Date: October 29, 2017

Time: 6:00 PM EDT

Forecaster: Tony Dello

Video briefing covering high impact weather: <https://vimeo.com/240362451>

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event Starting in 30hrs	RAIN/WIND	RAIN/WIND	RAIN/WIND	RAIN/WIND
Event Begin Time	10PM SUN	10PM SUN	9PM SUN	11PM SUN
Event End Time	6PM MON	5PM MON	8PM MON	7PM MON
Tstrm Wind Gusts	25-40 mph	25-40 mph	25-40 mph	25-40 mph
Ltng Intensity	Low	Low	Low	Low
Storm Mvmt Dir	NNE	NNE	NNE	NNE
Rain Amount	1.5-3"	1.5-3"	1.5-3"	1.5-3"
Snow Amount				
Snow Character				
Ice Amount				
Sustained Winds	25-35 mph	20-30 mph	20-30 mph	30-40 mph
Common Gusts	40-50 mph	35-45 mph	35-45 mph	45-55 mph
Peak Gusts	50-60 mph	45-50 mph	45-50 mph	55-65 mph
Timing of Peak Gusts	2AM-9AM MON	2AM-9AM MON	1AM-9AM MON	2AM-10AM MON
Chance EEI-2 Gusts	90%	80%	80%	100%
Chance EEI-3 Gusts	60%	60%	50%	70%
Chance EEI-4 Gusts	-	-	-	10%
Temp. Extremes	64/57	65/55	66/58	61/55

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

CAPITAL: Isolated to scattered showers into this evening. Moderate to heavy rain likely between 10pm tonight to 7am Mon. Embedded thunderstorms also possible now to 2am Mon. Best t-storm timing: after 8pm tonight. Rain tapering to showers on Monday morning and ending by 6pm Mon. Rainfall Sun-Mon: 1.5-3". Dry for the remainder of Monday. Hazard gusts will be likely between 9pm today to 5pm Mon. See table above for wind details. After 9am Mon, winds will be sustained 12-22 mph, gusting 30-40 mph, isolated peak gusts 40-45 mph possible into the early afternoon. Wind direction: East-southeast this evening/tonight; becoming west-southwest Mon.

Confidence: Confidence is high in wind and rain impacts tonight and Monday. See table above for EEI gusts chances. Confidence is low in t-storms occurring tonight. T-storm chance: 20%.

FITCHBURG: Isolated to scattered showers into this evening. Moderate to heavy rain likely between 9pm tonight to 5am Mon. Embedded thunderstorms also possible now to 2am Mon. Best t-storm timing: after 8pm tonight. Rain tapering to showers on Monday morning and ending by 3pm Mon. Rainfall Sun-Mon: 1.5-3". Dry for the remainder of Monday. Hazard gusts will be likely between 10pm tonight to 8pm Mon. See table above for wind details. After 9am Mon, winds will be sustained 12-22 mph, gusting 30-40 mph, isolated peak gusts 40-45 mph possible into the early afternoon. Wind direction: East-southeast this evening/tonight; becoming west-southwest Mon.

Confidence: Confidence is high in wind and rain impacts tonight and Monday. See table above for EEI gusts chances. Confidence is low in t-storms occurring tonight. T-storm chance: 20%.

SEACOAST: Isolated to scattered showers into this evening. Moderate to heavy rain likely between 10pm tonight to 7am Mon. Embedded thunderstorms also possible from 7pm tonight to 5am Mon. Best t-storm timing: after 10pm tonight. Rain tapering to showers on Monday morning and ending by 3pm Mon. Rainfall Sun-Mon: 1.5-3". Dry for the remainder of Monday. Hazard gusts will be likely between 11pm tonight to 6pm Mon. See table above for wind details. After 9am Mon, winds will be sustained 12-22 mph, gusting 30-40 mph, isolated peak gusts 40-45 mph possible into the early afternoon. Wind direction: East-southeast this evening/tonight; becoming west-southwest Mon.

Confidence: Confidence is high in wind and rain impacts tonight and Monday. See table above for EEI gusts chances. Confidence is low in t-storms occurring this evening/tonight. T-storm chance: 20%.

PORTLAND: Isolated to scattered showers possible this evening. Moderate to heavy rain likely between 12am-7am Mon. Embedded thunderstorms also possible from 12am-6am Mon. Rain tapering to showers on Monday morning and ending by 3pm Mon. Rainfall Sun-Mon: 1.5-3". Dry for the remainder of Monday. Hazard gusts will be likely between 11pm tonight to 7pm Mon. See table above for wind details. After 10am Mon, winds will be sustained 15-25 mph, gusting 35-45 mph, isolated peak gusts 45-50 mph possible through the afternoon. Wind direction: East-southeast this evening/tonight; becoming west-southwest Mon.

Confidence: Confidence is high in wind and rain impacts tonight and Monday. See table above for EEI gusts chances. Confidence is low in t-storms occurring tonight. T-storm chance: 20%.

UNITIL SERVICE AREA 3-5 DAY OUTLOOK: On Tuesday, dry and hazard-free. Winds could gust 25-35 mph during the day. On Wednesday, dry and hazard-free during the day and evening. Rain showers possible after 11pm Wednesday. No hazards. Rain showers linger Thursday morning and early afternoon.

Confidence: On Tuesday, Wednesday and Thursday confidence is high that no hazards will occur.

7.6. Qualifying Costs Charged to the Storm Reserve

The amount charged to the storm reserve for this event to date is \$1,233,742 with a breakdown of charges on the following page:

Unitil Energy Systems, Inc. d/b/a Unitil Corp
Major Storm Cost Reserve Fund Report 2017

Payroll	\$ 138,946
Materials & Supplies	22,707
Transportation	129,615
Contractor Invoices & Other	1,174,250
Less Amount Capitalized	(231,776)
Total To Storm Reserve	\$ 1,233,742

Attachment A

To: NH PUC

Topic: Change in Weather Provider Services at Unitil Service Corp

During the technical sessions of UES' most recent rate case, the Company asserted that it had worked with its weather provider, Weather Systems Inc. (WSI), to develop a Power Disruption Index (PDI) that better reflects the potential impact of adverse weather conditions. As an outcome of that discussion and for conditions with a PDI of 2 with a high confidence level, the Company may recover its preparation cost.

Following this, WSI abruptly notified its electric utility clients that it would no longer offer weather services as of April 1, 2011. As a result, the Company reviewed several, alternate weather providers and selected Telvent DTN (DTN).

Unitil worked with DTN to perfect a methodology for delivering the same level of service we enjoyed with WSI. DTN has created an Estimated Impact Indices (EII) similar to the PDI (see Attachment A for the criteria composing the EII). The Company worked closely to ensure the same criteria discussed at the technical sessions continue to apply to the DTN equivalent.

Below are the specific levels associated with the EII; however, to better align the EII levels with the operational levels in Unitil's Emergency Response Plan (ERP), we began the EII at Level 1, which differs from the former PDI that began at Level 0. Therefore, an EII Level 3 is equivalent to the PDI Level 2.

The Estimated Impact Indices or EII is summarized by day as a table within a typical weather forecast (see Attachment B).

- Five levels starting at 1. Estimates the impact for forecasted Wind Speeds, Wind Gusts, Ice Accretions, and Snow Amounts and the forecast's Confidence Level (Low, Medium, or High) to calculate the EEI:
 - Level 1 (Normal Operations/Blue Sky Day, None or Few Outages)
 - Level 2 (Moderate Weather, Isolated Outages)
 - Level 3 (Moderate-Severe Weather, Scattered Outages)
 - Level 4 (Moderate-Severe Weather, Widespread Outages)
 - Level 5 (Severe Weather, Extensive Outages)

Attachment B

Estimated Impact Indices (EII)

Forecasted Wind Speed/Wind Gusts ***WITH LEAVES*** (April 1 - November 14)

Level	Wind Speed	Wind Gusts
EII = 2	> 30 mph	> 35 mph
EII = 3	> 45 mph	> 50 mph
EII = 4	> 60 mph	> 65 mph
EII = 5	> 70 mph	> 75 mph

Forecasted Wind Speed/Wind Gusts ***WITHOUT LEAVES*** (November 15 - March 31)

Level	Wind Speed	Wind Gusts
EII = 2	> 40 mph	> 45 mph
EII = 3	> 50 mph	> 55 mph
EII = 4	> 60 mph	> 70 mph
EII = 5	> 70 mph	> 85 mph

Forecasted Ice Accretion (assumes “normal” wind speed)

Level	Ice Accretion
EII = 2	> 1/10 inch
EII = 3	> 3/8 inch
EII = 4	> 1/2 inch
EII = 5	> 1 inch

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

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

Forecast Confidence Levels

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

Attachment C

Sample Weather Forecast with EEI Table

Energy Event Index for UNITIL

Your forecast administrator: murphyt@unitil.com

Valid Time: January 17, 2017 6:00 AM EST

Forecaster: kyle.koval

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	2	2	1
	Fitchburg	2	2	1
	Portland	2	2	1
	Seacoast	2	2	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	Medium	Medium	High
	Portland	High	High	High
	Seacoast	High	High	High

Energy Event Index Definition

No Leaves (Nov 15 - Mar 31)

EEI	Wind Speed	Wind/Gust	Snow	Ice
1	< 26 mph	< 40 mph	< 18 in.	< 1/10 in.
2	>= 26 mph	>= 40 mph	>= 18 in.	>= 1/10 in.
3	>= 30 mph	>= 45 mph	>= 24 in.	>= 3/8 in.
4	>= 40 mph	>= 50 mph	>= 36 in.	>= 1/2 in.
5	>= 45 mph	>= 60 mph	>= 48 in.	>= 1 in.

Confidence Level	
Low	< 30% chance
Medium	>= 30% to < 60% chance
High	>= 60% chance

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: January 17, 2017

Time: 6:00 AM EST

Forecaster: K Koval

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event Starting in 30hrs	SNOW	SNOW	SNOW/ICE	SNOW
Event Begin Time	7PM Tue	6PM Tue	6PM Tue	7PM Tue
Event End Time	6PM Wed	6PM Wed	6PM Wed	6PM Wed
Tstrm Wind Gusts				
Ltng				
Storm Mvmt Dir				
Rain Amount				
Snow Amount	1-6"(SEE TEXT)	4-7"	2-5"	4-7"
Snow Character	WET	WET	WET	WET
Ice Amount			0.02-0.05"	
Sustained Wind				
Wind Gust				
Temp. Extremes	41/29	41/15	44/31	39/22

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

CAPITAL: Snow developing after 6-8pm this evening and continuing through the overnight hours. Snow character: Wet, could be briefly normal overnight as temps fall to near 30F. Most of the snow will fall prior to 7am Wednesday; however spotty light snow showers will be possible through Wednesday afternoon. Snow accumulation: 4-7". Sleet may mix in at times Tuesday night and keep snow totals down a bit. Little to no additional accumulation is expected after 7am Wednesday. A few light snow showers could work into the area after midnight Thursday, otherwise dry and hazard free conditions are expected Wednesday night. Winds will be below hazard levels through the event, easterly and averaging 8-14 mph.

Confidence: High that hazard snow will occur tonight. Snow chance: EEI-2 80%, EEI-3 50%. Otherwise, confidence is high that no hazards will occur over the next 48 hours.

FITCHBURG: Snow developing after 6-8pm this evening and continuing through the overnight hours. Sleet and freezing rain could mix in at times, especially after 11pm. Most of the snow will fall prior to 7am Wednesday; however spotty rain/snow showers will be possible through Wednesday afternoon. Snow character: Wet. Snow accumulation: 2-5". Ice accretion: Up to 0.05". Little to no additional accumulation is expected after 7am Wednesday. The temperature profile will be marginal, so confidence is not as high on precipitation type overnight. Dry and hazard free conditions are expected Wednesday night. Winds will be below hazard levels through the event, east-southeast at 8-14 mph.

Confidence: Medium that hazard snow will occur tonight. The forecast is leaning towards a colder/snowier scenario, however a slightly deviation in storm track could easily bring in warmer air and a greater potential for freezing rain and sleet. This would cut back on snow amounts. Snow chance: EEI-2 40%. Otherwise, confidence is high that no hazards will occur over the next 48 hours.

SEACOAST: Snow developing after 7-9pm this evening. Snow should change to rain east of I-95 after 11pm-1am with the rain/snow line possibly reaching Highway 125 by 3-4am Wednesday. Most of the snow will fall prior to 7am Wednesday; however spotty rain/snow showers will be possible through Wednesday afternoon. Snow character: Wet. Snow accumulation: 1-3" east of I-95 and 3-6" inland. Sleet may mix in tonight west of I-95 and could cut into totals slightly. Higher snow amounts could reach the coast if a colder solution unfolds. Little to no additional accumulation is expected after 7am Wednesday. Dry and hazard free conditions are expected Wednesday night. Winds will be below hazard levels through the event, averaging east-southeast at 9-15 mph with gusts near 20 mph along the coast.

Confidence: High that hazard snow will occur tonight west of I-95. Snow chance: EEI-2 60%, EEI-3 30%. Low confidence in hazard snow east of I-95. Given marginal temperatures, a slight deviation in storm track could allow places near the immediate coast to remain snow. Snow chance east of I-95: EEI-2 20%. Otherwise, confidence is high that no hazards will occur over the next 48 hours.

PORTLAND: Snow developing after 7-9pm this evening. Snow could change to rain/sleet east of I-95 after 2-3am Wednesday. Most of the snow will fall prior to 8am Wednesday; however spotty rain/snow showers will be possible through Wednesday afternoon. Snow character: Wet. Snow accumulation: 4-7", lowest amounts east of I-95. Higher snow amounts could reach the coast if a colder solution unfolds. Little to no additional accumulation is expected after 8am Wednesday. Dry and hazard free conditions are expected Wednesday night. Winds will be below hazard levels through the event, averaging east-southeast at 9-15 mph with gusts near 20 mph along the coast.

Confidence: High that hazard snow will occur tonight west of I-95. Snow chance: EEI-2 70%, EEI-3 40%. Medium confidence in hazard snow east of I-95. Given marginal temperatures, a slight deviation in storm track could allow places near the immediate coast to remain snow. Snow chance east of I-95: EEI-2 50%, EEI-3 30%. Otherwise, confidence is high that no hazards will occur over the next 48 hours.

UNITIL SERVICE AREA 3-5 DAY OUTLOOK: Light rain showers could brush the Fitchburg area Friday night, otherwise dry and no hazard conditions are expected through the period.

Confidence: High that no hazards will occur through the day 3-5 period.

NORTHEAST U.S. REGIONAL SUMMARY:

Today's Weather Highlights:

- Precipitation will overspread Upstate New York today before spreading into Downstate New York and New England late this afternoon into tonight.

- A brief wintry mix will quickly change to rain across western and central New York with very minor ice accretions.

- A wintry mix of snow, sleet, freezing rain, and rain will impact eastern sections of Upstate New York through interior southern New England. Ice accretions will be highest over the Adirondacks and the Berkshires.

- Snow will be more likely at night across northern New England with a few inches of snow accumulation likely. Heavy, wet snow, in excess of 6 inches will be possible over southern New Hampshire.

- Rain will be likely across Downstate New York and the south coast of New England.

- Temperatures: Highs will be 4-12 degrees above normal. Lows will be 8-22 degrees above normal for most but more seasonable in northern Maine.

TODAY'S Forecast Confidence: Medium

Highs could end up 1-4 degrees cooler across eastern New York and western New England if thicker clouds and precipitation advance faster than expected. Otherwise, highs look okay. Lows and spot temperatures could be 1-3 degrees cooler here and there across eastern sections of Upstate New York and away from coastal New England late in the day and at night in spots that see consistent precipitation and a stubborn north or northeast wind.

Tomorrow's Weather Highlights:

- Steady precipitation will taper to scattered light areas across eastern New York and New England on Tuesday before tapering off at night.

- Mainly snow is expected across northern New England with a little wintry mix for southern sections. Light additional accumulations should occur. Ice accretions will be minor.

- A wintry mix is expected across eastern sections of Upstate New York and portions of interior southern New England, mostly in the morning. Rain will take over eventually. Light additional ice accretions are possible.

- Otherwise, rain will be possible.

- Light snow showers will be possible close to the Canadian Border sometime Wednesday night with minor accumulations.

- Temperatures: Highs will be near to 10 degrees above normal. Lows will be 12-24 degrees above normal.

TOMORROW'S Forecast Confidence: Medium

Lingering light precipitation and thick cloud cover could keep highs 1-4 degrees cooler in spots. Otherwise, highs should verify well. With light winds in place, if pockets of clearing can occur overnight, lows could end up 2-4 degrees cooler for some. Areas with fresh snow would be most susceptible to temperature issues.