Unitil Energy Systems, Inc.

Major Storm Cost Reserve Fund Report

2023

Prepared By: Business Resiliency & Compliance and Accounting

February 28, 2024

Introduction

On April 26, 2011, the New Hampshire Public Utilities Commission (the "Commission") approved a Settlement Agreement in Unitil Energy Systems, Inc's ("UES" or the "Company") base distribution rate case (DE 10-055), which provides that UES may recover costs incurred in the preparation for or recovery from qualifying storm events. *Unitil Energy Systems, Inc.*, Order No. 25,214 (April 26, 2011) at 29-30. Specifically, the Settlement Agreement provides as follows:

> 8.1 The rate levels resulting from the distribution revenue changes specified in Section 2 include $400,000 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 Power Disruption Index ("PDI") from the Company's professional weather forecaster reaches a PDI level of 26 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.

Settlement Agreement at §§ 8.1, 8.2 (footnotes omitted).

Later, in Docket DE 11-277, the Commission directed the Company to file annual reports on the Major Storm Cost Reserve ("MSCR") fund and storm recovery updates for those storms where costs are recovered through the Storm Recovery Adjustment Factor ("SRAF"). *Unitil Energy Systems, Inc.*, Order No. 25,351 (April 24, 2012) at 7. Then, in Docket DE 13-065, the Commission approved the Company's request to increase the annual revenue for the MSCR from $400,000 to $800,000 due to the increasing frequency of major storms and the significant deficit that may result without an increase to funding. *Unitil Energy Systems, Inc.*, Order No. 25,502 (April 29, 2013) at 7.

The Company submits this annual MSCR Fund Report for the 12-month period ending December 31, 2023. This filing complies with the requirements set forth in the Settlement Agreement (approved in Docket No. DE 10-055) and the Commission's Order in DE 11-277 requiring UES to file annual reports on the Storm Reserve Fund. 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, 2023 is in a deficit position of ($3,654,362). In conjunction with this Report filing, the Company is seeking recovery of the December 31, 2023 deficit position through its SRAF for the reasons set forth in the testimony and exhibits of Daniel T. Nawazelski.

Please refer to the *UES MSCR Fund Reconciliation as of December 31, 2023* on page 7 for a summary of the costs.

Beginning May 1, 2022, revenue included in the SRAF decreased by $0.00047 per kWh due to the completion of the recovery of the costs of extraordinary storm Winter Storm Quinn, which occurred in March 2018. In accordance with Schedule SRAF, the costs associated with this extraordinary storm were to be recovered at a rate of $0.00047 per kWh over 3 years ending April 30, 2022. As part of its Annual Reconciliation and Rate filing, dated June 17, 2022, in DE 22-038, UES proposed to include the reconciliation balance associated with its SRAF in its External Delivery Charge for effect August 1, 2022. This balance is comprised of the reconciliation associated with Winter Storm Quinn, as well as the balances from the December 2008 Ice Storm and February 2010 Wind Storm which ended recovery in April 2019, and October 2017 Wind Storm which ended recovery in April 2021. The final reconciliation balance was approved in Order No. 26,655 in DE 22-038. The resulting SRAF effective May 1, 2022 was $0.00000 per kWh, as there were no storms being recovered through the SRAF. The proposed change to the SRAF effective May 1, 2024 is an increase of $0.00071 per kWh, factoring in the proposed increase to the SRAF to recover the costs of the December 31, 2023 deficit position.

Unitil Energy Systems, Inc.

Major Storm Cost Reserve Fund – Reconciliation
As of December 31, 2023

Section #	Date	Description	Surplus (Deficit)
	12/31/2022	**MSCR BALANCE (As Filed on 2/28/2023)**	**$ (2,482,939)**
	Adjustments to 2022 Report as Filed		
	12/24/2022	Wind Event Adjustment	**(437,410)**
		Adjusted Opening Balance 1/1/2023	**$ (2,920,349)**
	2023 Deferred Charges		
1.0	01/23/2023	Winter Storm	(342,427)
2.0	03/04/2023	Winter Storm Quest	(149,457)
3.0	03/14/2023	Winter Storm Sage	(552,840)
4.0	09/08/2023	Thunderstorm Event	(1,300)
5.0	09/15/2023	Hurricane Lee	(352,862)
6.0	12/18/2023	Wind Event	(0)
	2023 Recovery		
	2023	**Current Annual Recovery Rate**	**800,000**
	2023	**Interest Rate**	**4.01%**
	2023 Carrying Charges		(135,127)
	12/31/2023	**MSCR BALANCE**	**$ (3,654,362)**

Unitil Energy Systems, Inc.

Storm Recovery Adjustment Factor Reconciliation[1]

	(a) Beginning Balance	(b) Total Costs	(c) Total Revenue	(d) Ending Balance Before Interest (a + b - c)	(e) Average Monthly Balance ((a+d) / 2)	(f) Interest Rate	(g) Computed Interest	(h) Ending Balance with Interest (d + g)
Jan-23	$0	$0	$0	$0	$0	4.01%	$0	$0
Feb-23	$0	$0	$0	$0	$0	4.01%	$0	$0
Mar-23	$0	$0	$0	$0	$0	4.01%	$0	$0
Apr-23	$0	$0	$0	$0	$0	4.01%	$0	$0
May-23	$0	$0	$0	$0	$0	4.01%	$0	$0
Jun-23	$0	$0	$0	$0	$0	4.01%	$0	$0
Jul-23	$0	$0	$0	$0	$0	4.01%	$0	$0
Aug-23	$0	$0	$0	$0	$0	4.01%	$0	$0
Sep-23	$0	$0	$0	$0	$0	4.01%	$0	$0
Oct-23	$0	$0	$0	$0	$0	4.01%	$0	$0
Nov-23	$0	$0	$0	$0	$0	4.01%	$0	$0
Dec-23	$0	$0	$0	$0	$0	4.01%	$0	$0
Total			$0				$0	

[1] Pursuant to Order No. 26,655 in DE 22-038, balances associated with Winter Storm Quinn, the December 2008 Ice Storm and February 2010 Wind Storm, and the October 2017 Wind Storm, totaling ($72,410), were moved for final reconciliation in the External Delivery Charge on August 1, 2023.

Table of Contents (List of Storm Events)

Attachments

1. December 23rd, 2022 (Winter Storm Elliot)

Note: This storm was included in the 2022 MSCR Report, however final costs were not available and are included in Section 1.6.

1.1. Description of the Storm

Figure 1 - Storm Damage NH

Beginning on December 18th, weather services began forecasting a low-pressure system developing into a significant storm system with hazardous snow and winds expected across the entire northeast arriving December 23rd into the 24th. As the storm moved across the Midwest and into the Northeast, wind speed predictions grew increasingly severe and by Tuesday, December 20th multiple weather outlets were reporting the potential for up to 60 mph winds, 1.5 to 2.5 inches of rain, and flooding risks across Unitil's service territory. The weather event was expected to begin around 11:00 PM Thursday night continuing until early Saturday morning with two distinct waves of hazardous winds expected in the morning and evening on Friday (December 23rd). Precipitation started late Thursday evening (Between 7:00 PM and midnight) across the region and continued throughout the day Friday, causing severe coastal and inland flooding. Hazardous winds and gusts occurred across both Regions, with the initial wave being more impactful to UES's Seacoast Region and the stronger, afternoon winds having a significant impact to UES's Capital Region. Frequent hazardous wind gusts, some as high as 71 mph, were recorded throughout the event causing significant damage to trees and utility infrastructure.

1.2. Summary of the Extent of the Storm Damage

UES 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	153	98	9,579	6,039	12.5%
Capital	262	154	26,663	15,857	51.2%

Table 1 – Winter Storm Elliot Outage Impact

1.3. Preparations

The Company began communicating internally on Monday December 19th to coordinate initiation of preparation activities, including public notifications (via press releases) and outreach to life support customers, municipal, regulatory and elected officials, and state emergency

management agencies (via email). Additional preparation activities such as contractor availability outreach and checking inventory, stock levels and fleet vehicles were also completed prior to the storm's arrival. The Company held several internal coordination calls leading up to the event and activated key response employees to staff the Seacoast (Exeter), Capital (Concord) and System (Hampton) Emergency Operations Centers throughout the event to respond to any interruptions and communicate with affected stakeholders.

1.4. Restoration

As noted in Section 1.2, the impacts of this event were widespread and highly impactful to the Company's system. In addition to this event, a large snowstorm the weekend prior had left neighboring utilities with extensive damage that was still being addressed as this storm approached. The large size and widespread impacts of the storm, paired with additional strong weather events occurring simultaneously throughout the country created a resource deficit impacting the Company's ability to acquire additional contractors in the region and the availability of mutual aid resources. UES had its normal contingent of internal crews (10), on system contractors (8) and tree crews (14) and secured an additional (3) contractor line crews to respond to interruptions and activated additional Emergency Operation Center ("EOC") support staff to remain onsite to assist. This storm left Unitil with over 34 broken poles and a significant number of outages affecting at least 40 communities. The Company worked closely with municipal officials to address many public safety issues (wires down, blocked roads, etc.) while performing damage assessment and repairing damaged equipment and poles. The Company restored the majority of customers by 6:00 PM on December 25th (less than 48 hours from peak interruptions) with single customer restorations being completed the following day, December 26th.

1.5. Exclusionary Criteria

The wind conditions, resource constraints, and the significant timing of the event (two days before Christmas) made this a particularly challenging restoration. Forecast confidence for the hazardous winds did not develop until just prior to the system's arrival (see Figure 2 for the forecast) however prudent measures to coordinate operations, acquire resources and prepare for possible impact were taken. Impacts from this event resulted in both Regions (Seacoast and Capital) reaching the outage criteria for recovery. See Table 1 in section 1.2 for outage information.

Energy Event Index for UNITIL
Valid Time: December 22, 2022 5:00 PM EST

Your forecast administrator: ulbanj@unitil.com
Forecaster: jordan.oconnell

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	2	2
	Fitchburg	1	2	1
	Portland	1	3	3
	Seacoast	1	3	3
Snow	Capital	1	1	1
	Fitchburg	1	1	1
	Portland	1	1	1
	Seacoast	1	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	High	High	High
	Seacoast	High	High	High

Energy Event Index Definition
No Leaves (Nov 16 - Apr 30)

EEI	Wind Speed	Wind/Gust	Snow	Ice
1	< 40 mph	< 45 mph	< 6 in.	< 1/10 in.
2	>= 40 mph	>= 45 mph	>= 6 in.	>= 1/10 in.
3	>= 50 mph	>= 55 mph	>= 8 in.	>= 3/8 in.
4	>= 60 mph	>= 70 mph	>= 12 in.	>= 1/2 in.
5	>= 70 mph	>= 85 mph	>= 24 in.	>= 1 in.

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

Forecast for Unitil from DTN
For Phone Consulting: 1-800-361-4972
Issued Date: 12/22 1800
Forecaster: Jordan O'Connell

Zones (Forecast for THU/FRI/SAT)	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	RAIN/GUSTS	RAIN/GUSTS	RAIN/GUSTS	RAIN/GUSTS
Event Begin Time	10pm Thu	11pm Thu	9pm Thu	12am Fri
Event End Time	3am Sat	12am Sat	11pm Fri	4am Sat
Event Confidence	HIGH	MEDIUM-HIGH	MEDIUM-HIGH	HIGH
Rain Amount				
Snow Amount				
Snow Ratio/Character				
Radial Ice Amount				
Rain Amount	1.5-2.5"	1.5-2.5"	1.5-2.5"	1.5-2.5"
Sustained Winds	ESE-SSW 20-35	ESE-S 15-30	ESE-SSW 15-30	ESE-SSW 20-36
Wind Gusts	45-60 mph	40-55 mph	40-55 mph	45-65 mph
Temp. Extremes	55/13	52/11	54/11	49/14

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

CAPITAL: Rain and maybe a few brief snow showers continue to build in throughout the overnight as a warm front begins to lift north, any snow should transition to all rain by midnight. Rain will be moderate to heavy at times. Winds will be on the increase throughout the night as well with hazardous winds expected a few hours after the onset of rain. See table above for details. Snowfall: Tr-0.50". Snow Ratio: 8-15:1 (Wet to normal). Friday, rain will likely continue across the region through the afternoon, before gradually coming to an end through the evening. Winds will remain gusty throughout the day, with hazard gusts likely through the evening. See table above for details. A brief snow shower may be seen through the overnight, however little to no snowfall accumulations are expected. Snowfall: Tr-1.0". Snow Ratio: 15-18:1 (Dry).

Confidence: Confidence is high that no winter hazards will be seen. Confidence is high that hazard gusts are seen tonight and lasting through the day Friday. Chance of EEI-2/3 Wind Gusts: 90%/20%

SEACOAST: Rain showers continue to build in throughout the overnight as a warm front begins to lift north, any snow should transition to all rain by midnight. Rain will be moderate to heavy at times. Winds will be on the increase throughout the night as well with hazardous winds expected a few hours after the onset of rain. See table above for details. Friday, rain will likely continue across the region through the afternoon, before gradually coming to an end through the evening. Winds will remain gusty throughout the day, with hazard gusts likely through the evening. See table above for details. A brief snow shower may be seen through the overnight, however little to no snowfall accumulations are expected. Snowfall: Tr-1.0". Snow Ratio: 15-18:1 (Dry).

Confidence: Confidence is high that no winter hazards will be seen. Confidence is high that hazard gusts are seen tonight and lasting through the day Friday, but medium gusts will reach EEI-3. Chance of EEI-2/3 Wind Gusts: 90%/50%.

Figure 2 – Weather Forecast 12/22/2022 at 5:00PM

1.6. Qualifying Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for this event was $437,410 with a breakdown of charges in the following table:

Payroll	$338,600
Materials & Supplies	$66,928
Transportation	$42,343
Contractor Invoices & Other	$608,220
Less Amount Capitalized	($618,681)
Total To Storm Reserve	$437,410

2. January 23rd, 2023 (Winter Storm)

2.1. Description of the Storm

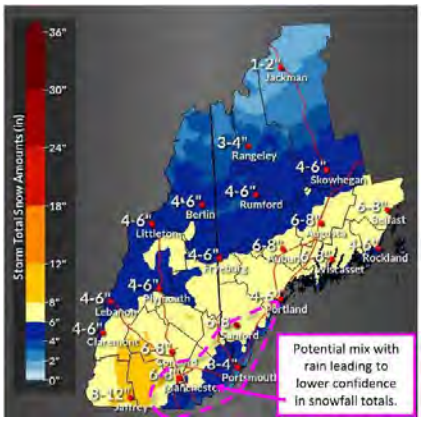

Figure 3 - NWS Snow Predictions

Throughout January, the Company was continuously monitoring a series of winter storm systems expected to impact the region on January 15th, 19th, and 23rd. While the first two storms were moderate and largely unimpactful, the last event (January 23rd) was predicted to have a more significant impact to the region. Winter Storm Watches and Warnings were issued throughout the state (see Figure 3) as weather forecasts indicated the system would bring hazardous amounts of snow and elevated wind gusts into the region. As the system approached, forecasters predicted wet snow amounts up to 10 inches inland with lower amounts along the coast Sunday night into Monday (January 22nd to 23rd). The system moved across UES's service area with snow beginning around 7:00 PM Sunday night and continuing until 9:00 PM on Monday, resulting in over a foot of snow in our Capital Region (15 inches in Concord) and nearly half a foot (4 inches in Portsmouth) of wet snow in coastal areas.

2.2. Summary of the Extent of the Storm Damage

UES experienced the following impacts as detailed in the table below:

Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Peak Customers Interrupted	Percentage Affected (Peak)
Seacoast	136	72	10,529	6,130	12.8%
Capital	41	11	5,439	1,998	6.5%

Table 2 – Winter Storm Outage Impact

2.3. Preparations

The Company began communicating internally the previous week to alert key response personnel and coordinate preparation activities such as contractor availability outreach and checking inventory, stock levels and fleet vehicles. The Company activated its emergency operations centers in Seacoast (Exeter) at 6:00 AM and Capital (Concord) at 7:00 AM on Monday January, 23rd once it was determined that actual snowfall amounts were higher than forecasted and significant damage was beginning to occur. The System EOC also activated on January 24th (6:00 AM) to provide additional assistance.

2.4. Restoration

The Company began to experience outages (listed in Table 2 in Section 2.2) at approximately 12:30 AM on Monday (January 23rd) mostly attributed to downed limbs/tree damage with peak interruptions occurring at approximately 8:18 PM that evening. The Company worked closely

with municipal officials to address many public safety issues (wires down, blocked roads, etc.) while performing damage assessment and repairing damaged equipment and poles. Public notifications and communication outreach protocols were initiated for life support customers, municipal, regulatory and elected officials, and state emergency management agencies beginning at noon on the January 23rd and the Company was able to restore the majority of impacted customer within 48 hours of peak interruptions occurring with all EOC's closed by 1:30 PM on January 25th.

UES had its normal contingent of internal crews (10), on system contractors (5), and tree crews (8) and secured additional contractor line crews (5), tree crews (2), wires down personnel (4) and crew guides (3) for both service areas with available resources being reallocated throughout the event from the Capital Region to assist with the response in the Seacoast Region.

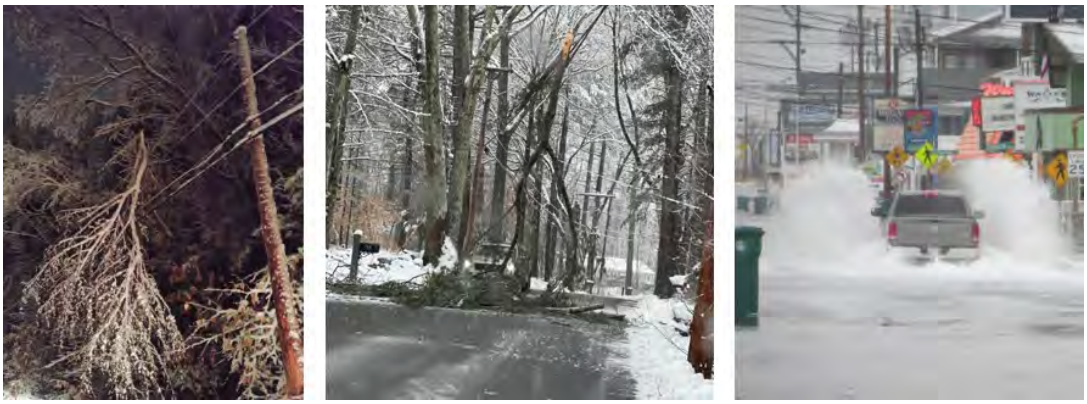

Figure 4 - Storm Damage (Kensington, Stratham, and Hampton Beach, NH)

2.5. Exclusionary Criteria

Although this event did not reach the exclusionary criteria for preparation (weather), the impacts of the event met the exclusionary criteria (see Table 2 in Section 2.2) for restoration recovery in the Seacoast Region. Accordingly, the Company has proposed to recover restoration costs for only the Seacoast Region through the MSCR as summarized in Section 2.6 below.

2.6. Qualifying Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for this event was $342,427 with a breakdown of charges in the following table:

Payroll	$81,810
Materials & Supplies	$7,384
Transportation	$10,868
Contractor Invoices & Other	$276,991
Less Amount Capitalized	($34,626)
Total To Storm Reserve	$342,427

3. March 4th, 2023 (Winter Storm Quest)

3.1. Description of the Storm

As the region was experiencing a moderate winter storm on February 28th, weather services began forecasting a more impactful winter storm with the potential to produce significant amounts of wet snow across the region Friday night (March 3rd) into Saturday (March 4th). The National Weather Service issued Winter Storm Warnings across the area as confidence grew in predictions of snow totals from 8 to 18 inches (see Figure 5).

Snow began to fall across the Company's service territory around 1:00 AM on March 4th and continued for 24 hours with total accumulations between 4 and 9 inches recorded across the service area and peak winds gusts of 31 mph along the coastal areas.

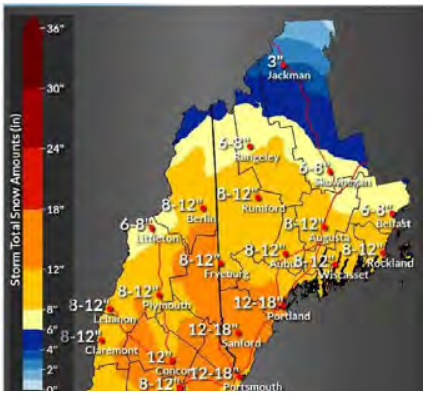

Figure 5 - NWS Snow Totals (Mar 3rd)

3.2. Summary of the Extent of the Storm Damage

UES experienced minimal impacts from this event as detailed in the table below:

Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Peak Customers Interrupted	Percentage Affected (Peak)
Seacoast	7	3	438	325	0%
Capital	0	0	0	0	0%

Table 3 - Winter Storm Quest Outage Impact

3.3. Preparations

The Company began communicating internally on Tuesday, February 28th, to notify key response personnel and coordinate initiation of preparation activities, including public notifications (via press releases) and outreach to life support customers, municipal, regulatory and elected officials, and state emergency management agencies (via email). Additional preparation activities such as contractor availability outreach and checking inventory, stock levels and fleet vehicles were also completed prior to the event. The Company held internal coordination calls leading up to the event to ensure key response employees were prepared to respond to any interruptions and communicate with affected stakeholders.

3.4. Restoration

The Company activated its EOCs in Seacoast (Exeter), Capital (Concord), and System (Hampton) Regions at 6:00 AM Saturday, March 4th to monitor the storm's progression. As noted in Section 3.2, Unitil experienced minimal outages in its New Hampshire service territory during this event as snow amounts remained on the lower ends of predicted totals. UES had its internal crews (9), on system contractors (11) and tree crews (14) and secured additional contractor line

crews (12) and wires down personnel (8) to quickly respond to interruptions. All EOCs were closed and the Company returned to normal operations at 1:30 PM on March 4th.

3.5. Exclusionary Criteria

This event qualified for recovery of preparation costs due to the EEI levels in the Seacoast Region (3) and Capital Region (4) with a high confidence level (see Figure 6 for the forecast). However, the actual experience of this event did not meet the concurrent trouble requirement in either the Seacoast or Capital Regions and therefore, restoration costs do not qualify for recovery. The preparation-only costs proposed for recovery through the MSCR are summarized in Section 3.6 below.

Energy Event Index for UNITIL Your forecast administrator: ulbanj@unitil.com
Valid Time: March 3, 2023 1:00 PM EST Forecaster: tony.dello

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	4	4	1
	Fitchburg	3	3	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	High	High
	Seacoast	High	High	High

Energy Event Index Definition
No Leaves (Nov 16 - Apr 30)

EEI	Wind Speed	Wind/Gust	Snow	Ice
1	< 40 mph	<45 mph	< 6 in.	< 1/10 in.
2	>= 40 mph	>= 45 mph	>= 6 in.	>= 1/10 in.
3	>= 50 mph	>= 55 mph	>= 8 in.	>= 3/8 in.
4	>= 60 mph	>= 70 mph	>= 12 in.	>= 1/2 in.
5	>= 70 mph	>= 85 mph	>= 24 in.	>= 1 in.

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

Forecast for Unitil from DTN
For Phone Consulting: 1-800-361-4972
Issued Date: 03/03 1300
Forecaster: Tony Dello

Zones (Forecast for next 48 hrs)	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	SNOW	SNOW	SNOW	SNOW
Event Begin Time	12am Sat	11pm Fri	10pm Fri	2am Sat
Event End Time	8pm Sat	6pm Sat	6pm Sat	12am Sat
Event Confidence	High	High	Medium	High
Rain Amount				
Snow Amount	6-10" lso 12"	8-14"	6-12"	8-13"
Snow Ratio/Character	7-11:1(wet-nml)	8-12:1(wet-nml)	6-10:1(wet-nml)	8-12:1(wet-nml)
Radial Ice Amount				
Sustained Winds				
Wind Gusts				
Temp. Extremes	42/28	40/26	43/27	41/24

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

CAPITAL: Dry through today and much of the evening. A strong storm system looks to move into the region during the late evening/overnight with heavy snow developing and lasting into Saturday. See event table above for more details. Saturday, snow will continue through the day and end during the late afternoon/early evening. Snowfall: See event table above for details. Wind gusts of 25-35 mph are also expected late tonight and into the day on Saturday. Peak gusts of 40 mph could be possible mid to late morning and early to mid-afternoon Saturday.

Confidence: Confidence is high that no hazards will occur through Friday evening. Confidence is high that hazard snow will begin Friday night and last into Saturday. Chance of EEI-2/3/4 Snow: 100%/90%/50%.

SEACOAST: Dry today through the evening. A strong storm system looks to move into the region during the late night with heavy snow developing and lasting into Saturday. See event table above for more details. Saturday, snow will continue through the day and end during the early to mid-evening. Snowfall: See event table above for details. Wind gusts of 30-40 mph are also expected late tonight and into the day on Saturday. Peak gusts of 45 mph could be possible mid to late morning and early to mid-afternoon Saturday for coastal areas.

Confidence: Confidence is high that no hazards will occur through Friday evening. Confidence is high that hazard snow will begin Friday night and last into Saturday. Chance of EEI-2/3/4 Snow: 90%/70%/10%. Confidence is high that hazard gusts will not occur Saturday. Chance of EEI-2 Gusts: 10%.

Figure 6 – Weather Forecast 3/3/2023 at 1:00PM

3.6. Qualifying Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for this event was $149,457 with a breakdown of charges in the following table:

Payroll	$20,154
Materials & Supplies	$0
Transportation	$0
Contractor Invoices & Other	$129,303
Less Amount Capitalized	($0)
Total To Storm Reserve	$149,457

4. March 14th, 2023 (Nor'easter)

4.1. Description of the Storm

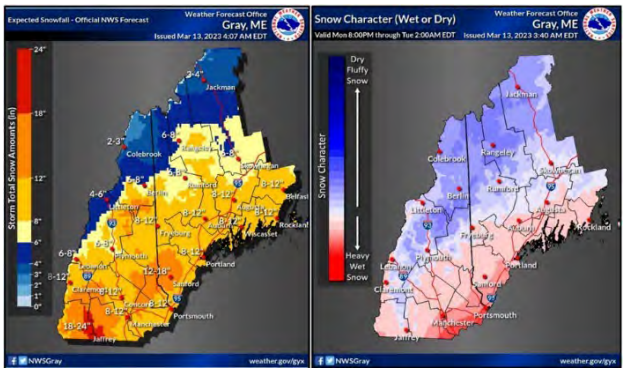

Figure 7 - NWS Snow Forecast (Amounts and Consistency)

Immediately following the previous event (March 4th), weather forecasters began to indicate that a significant nor'easter was expected to move across the Northeast beginning on Monday (March 13th) through Wednesday (March 15th). As the storm approached the region, it became clear the nor'easter would produce significant amounts of snow/mixed precipitation and hazardous winds creating blizzard conditions and flooding risks. The National Weather Service issued Winter storm warnings for the entire state with snow totals across the Company's service territory expected to be between 6 to 12 inches with peak wind gusts of 40 to55 mph, particularly in the coastal areas. Throughout the duration of the event, it was predicted that the precipitation was likely to transition from rain to wet snow with snowfall rates up to 2 inches per hour possible and peak gusts occurring late Tuesday (March 14th).

The storm developed as an atmospheric river moving across the western United States before transitioning to a powerful winter storm across the United States, eventually becoming a nor'easter impacting the entire Northeast. The event started as rain on Monday night before transitioning to snow with over 20 inches accumulating across UES's service area, greatly exceeding initial predictions. The size of the weather system, combined with extreme conditions and the extended duration of the event, caused significant impacts across the Northeast including major road closures, hundreds of vehicle accidents, and infrastructure damage ultimately impacting over 284,000 electric customers throughout the Northeast.

Figure 8 - Travel Conditions (I-93 Londonderry)

4.2. Summary of the Extent of the Storm Damage

UES experienced moderate outages from this event as detailed in the table below:

Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Peak Customers Interrupted	Percentage Affected (Peak)
Seacoast	55	26	2,492	1,804	3.8%
Capital	105	37	6,318	2,808	9.1%

Table 4 - Nor'easter Outage Impact

4.3. Preparations

The Company had been communicating internally the previous week to alert key response personnel and coordinate preparation activities such as contractor availability outreach and checking inventory, stock levels and fleet vehicles. The Company held its first coordination call on Saturday, March 11th to ensure preparation activities were adequate as the forecasted weather conditions continued to worsen and initiated its public notification and communication outreach protocols to life support customers, municipal, regulatory and elected officials, and state emergency management agencies Monday, March 13th. At 6:00 AM on Tuesday, March 14th, the Company opened all of its EOCs (Capital, Seacoast, and System) to monitor the storm's progression and assembled additional internal support and external contractor resources.

4.4. Restoration

As noted in Section 4.2 above, Unitil's New Hampshire territory experienced moderate outages throughout the duration of the event, most of which were attributed to the heavy snow taking down trees, tree limbs and wires. The hazardous travel and road conditions also presented challenges for storm response efforts.

Figure 9 - Tree on Wire (Kingston, NH)

The duration of the event resulted in additional or recurring outages throughout the restoration as snow continued to weigh down branches and wires. Customer interruptions began early (6:00 AM) Tuesday, March 14th with most attributed to downed trees, wires or motor vehicle accidents. The Company worked closely with municipal officials to address public safety issues (wires down, blocked roads, etc.) as crews responded and restored the majority of impacted customers by 5:30 PM the following day (Mar 15th). UES had its normal contingent of internal crews (11), on system contractors (13) and tree crews (11) and secured additional contractor line crews (8) and wires down personnel (20) to respond to interruptions.

4.5. Exclusionary Criteria

This event qualified for recovery of preparation costs due to the EEI levels in Seacoast (3) and Capital (3) with a high confidence level (see Figure 10 for the forecast). The actual experience of this event also met the concurrent trouble requirement in both the Seacoast and Capital Regions. Therefore, the restoration costs also qualify for recovery. The Storm Event costs proposed for recovery through the MSCR are summarized in Section 4.6.

Energy Event Index for UNITIL
Valid Time: March 14, 2023 6:00 AM EDT

Your forecast administrator: ulbanj@unitil.com
Forecaster: tony.dello

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	2	1	1
	Fitchburg	2	1	1
	Portland	2	1	1
	Seacoast	2	1	1
Snow	Capital	3	3	1
	Fitchburg	4	4	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 16 - Apr 30)

EEI	Wind Speed	Wind/Gust	Snow	Ice
1	< 40 mph	< 45 mph	< 6 in.	< 1/10 in.
2	>= 40 mph	>= 45 mph	>= 6 in.	>= 1/10 in.
3	>= 50 mph	>= 55 mph	>= 8 in.	>= 3/8 in.
4	>= 60 mph	>= 70 mph	>= 12 in.	>= 1/2 in.
5	>= 70 mph	>= 85 mph	>= 24 in.	>= 1 in.

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

Forecast for Unitil from DTN
For Phone Consulting: 1-800-361-4972
Issued Date: 03/14 0600
Forecaster: Tony Dello

Zones (Forecast for Tue-Wed)	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event	SNOW/WIND	SNOW/WIND	SNOW/WIND	SNOW/WIND
Event Begin Time	Ongoing	Ongoing	Ongoing	9am Tue
Event End Time	12pm Wed	12pm Wed	12pm Wed	12pm Wed
Event Confidence	High	High	High	High
Rain Amount				
Snow Amount	5-11"	8-12"	10-16", iso. 17-19"	6-11"
Snow Ratio/Character	6-9:1 (Wet)	6-10:1 (Wet-Nrm)	8-11:1 (Wet-Nrm)	6-10:1 (Wet-Nrm)
Radial Ice Amount				
Sustained Winds	NE-NW 20-35 mph	NE-NW 15-30 mph	NE-NW 15-30 mph	NE-NW 20-35 mph
Wind Gusts	40-58 mph	35-48 mph	35-48 mph	40-58 mph
Temp. Extremes	43/29	39/28	41/29	41/28

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

CAPITAL: Moderate to heavy snow will remain likely across the region today, lessening in coverage and intensity by mid to late evening. Light snow however will continue through the overnight and end by midday on Wednesday. Snowfall: See main table above. Wind will increase across the region today and into the overnight with some hazard gusts possible this afternoon and evening. See table above for wind details. Gusts late tonight and into Wednesday will mostly remain around 25-35 mph with maybe some peak gusts to around 40 mph still possible.

Confidence: Confidence is high that hazard snowfall will occur today and into Wednesday morning. Chance of EEI-2/3/4 Snowfall: 100%/80%/20%. Confidence is medium that hazard gusts will occur this afternoon and evening. Chance of EEI-2 Wind Gusts Tue: 50%.

SEACOAST: Moderate to heavy snow will remain likely across the region today, lessening in coverage and intensity by mid to late evening. Light snow however will continue through the overnight and end by midday on Wednesday. Snowfall: See main table above. Wind will increase across the region this morning and afternoon with hazard gusts expected by late morning through the evening. See table above for wind details. Gusts late tonight and into Wednesday will mostly remain around 25-35 mph with some peak gusts to around 40 mph still possible throughout the day.

Confidence: Confidence is high that hazard snowfall will occur today and into Wednesday morning. Chance of EEI-2/3 Snowfall: 80%/50%. Confidence is high that hazard gusts will occur today and this evening. Chance of EEI-2/3 Wind Gusts Tue: 80%/30%.

Figure 10 – Weather Forecast 3/14/2023 at 6:00AM

4.6. Qualifying Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for this event was $552,840 with a breakdown of charges in the following table:

Payroll	$176,747
Materials & Supplies	$19,744
Transportation	$20,127
Contractor Invoices & Other	$481,705
Less Amount Capitalized	($145,483)
Total To Storm Reserve	$552,840

5. September 8th, 2023 (Thunderstorm)

5.1. Description of the Storm

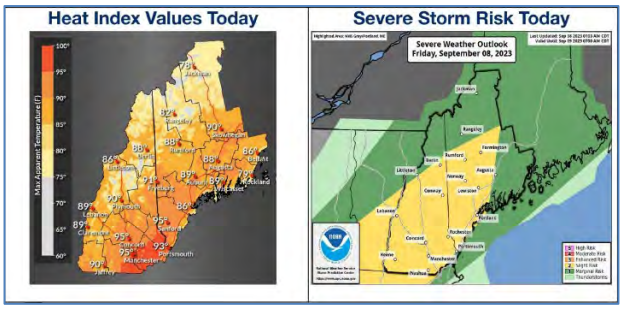

Figure 11 - NWS Heat & Storm Risk Advisories (Sept 8th)

Throughout the week of September 4th, the National Weather Service issued heat advisories for much of the Northeast as an unseasonably hot air mass settled over the region. Peak heat index values for most of the area were in the low and mid 90°s through the week with chances of potential thunderstorm activity occurring towards the end of the week. Weather forecasters predicted scattered to isolated showers and thunderstorm activity beginning late Thursday (September 7th) and continuing through early Saturday morning (September 9th) with potential wind gusts between 35 to 55 mph and lighting possible.

Thunderstorm activity began to impact UES's service area at approximately 3:00 PM on Friday, September 8th bringing rain, lightning and elevated winds with gusts up to 46 mph experienced in Seacoast Region and 31 mph in the Capital Region.

5.2. Summary of the Extent of the Storm Damage

UES experienced moderate impacts from this event, mostly in the Seacoast Region as detailed in the table below:

Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Peak Customers Interrupted	Percentage Affected (Peak)
Seacoast	30	20	7,881	6,666	13.8%
Capital	4	3	272	269	0.0%

Table 5 - Thunderstorm Outage Impact

5.3. Preparations

The Company had been communicating internally throughout the week regarding the extreme heat and thunderstorm activity as well as tracking the potential impacts of Hurricane Lee expected the following week. Key response personnel were alerted to coordinate preparation activities such as contractor availability outreach and checking inventory, stock levels and fleet vehicles. The Company made sure additional crews and staff were available to monitor weather/system conditions and respond to any interruptions throughout the event.

5.4. Restoration

As noted in Section 5.2, UES's Capital Region received minimal interruptions throughout the day on Friday (September 8th) most of which were attributed to downed trees and limb contact. Unitil held its internal crews (10), on system line contractors (10), tree crews (8), and additional

support staff to respond with the majority of customers being restored by the end of the same day.

5.5. Exclusionary Criteria

Although this event did not reach the exclusionary criteria for preparation (weather), the impacts of the event met the exclusionary criteria (see Table 5 in Section 5.2) for restoration recovery in the Seacoast Region. Accordingly, only the restoration costs for Seacoast Region are proposed for recovery through the MSCR as summarized in Section 5.6.

5.6. Qualifying Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for this event was $1,300 with a breakdown of charges in the following table:

Payroll	$11,278
Materials & Supplies	$5,197
Transportation	$6,548
Contractor Invoices & Other	$29,665
Less Amount Capitalized	($51,388)
Total To Storm Reserve	$1,300

6. September 15th, 2023 (Hurricane Lee)

6.1. Description of the Storm

Figure 12 - NWS Hurricane Lee Impacts

The Company began monitoring the development and progression of Invest 95L (Hurricane Lee) on September 5th. The third major hurricane of the 2023 Atlantic hurricane season, Lee formed from a tropical wave offshore of West Africa on September 5th and quickly intensified to a Category 5 hurricane by September 7th. As Lee moved across the Atlantic, model guidance predicted the storm to pass north of the Leeward Islands and Puerto Rico before pivoting northward well off of the southeastern coast with possible impacts to Bermuda, the northeastern United States and eastern Canada. As Lee slowly tracked northwest, it weakened into a Category 3 hurricane (September 9th) and then a Category 2 (September 10th) but continued to grow in size with hurricane and tropical storm force winds extending outward up to 240 miles from its center.

The National Weather Service issued hurricane and tropical storm watches for the entire New England coastline from Rhode Island to Maine on September 13th and the New Hampshire Department of Safety issued a news release urging residents to prepare for strong winds and power outages (provided below in Figure 4). As the storm progressed northward, models began to indicate landfall near the Gulf of Maine and Nova Scotia on Saturday, September 16th. Weather forecasts predicted gusty winds (common gusts up to 30 to 45 mph and peak gusts up to 50 mph) for Unitil's New Hampshire service territory as Lee passed by late Saturday. Hazardous winds began impacting Unitil's service territory late Friday night (September 15th) and continued throughout Sunday morning with sustained wind gusts reaching up to 24 mph and frequent peak gusts up to 39 mph for an extended period of time. Lee departed the region late Sunday before eventually making landfall in Nova Scotia on September 17th.

6.2. Summary of the Extent of the Storm Damage

UES experienced minimal impacts from this event as detailed in the table below:

Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Peak Customers Interrupted	Percentage Affected (Peak)
Seacoast	9	4	137	39	0.0%
Capital	23	11	6,983	3,984	12.8%

Table 6 - Hurricane Lee Outage Impact

6.3. Preparations

The Company began communicating internally on September 5th to alert key response personnel and begin routine discussions of preparedness activities based on the most recent weather predictions. Preparation activities such as contractor availability outreach and checking

inventory, stock levels and fleet vehicles were completed several days prior to Lee's expected arrival. The Company held routine coordination calls beginning on September 11th until the system's arrival to ensure preparation activities were completed and initiated public notification and communication outreach protocols to life support customers, municipal, regulatory and elected officials, and state emergency management agencies Thursday, September 14th. The Company opened its Capital (Concord) and Seacoast (Exeter) EOCs beginning at 6:00 AM Saturday, September 16th to monitor the storms progression, bringing in additional internal support and external contractor resources.

6.4. Restoration

As noted in Section 6.2, the moderate impacts on the Company's system occurred throughout the day on Saturday (September 16th) of which most were attributed to downed trees and limb contact. The Regional EOCs worked closely with municipal officials to address public safety issues and re-allocate/dispatch repair crews to outage locations. Unitil held its internal crews (10), on system line contractors (11), tree crews (8) and secured additional external contractors (31) for the event. Crews responded to interruptions throughout the day with the majority of customers being restored by the end of the same day and the EOCs closing on Saturday (September 16th) at 7:00 PM.

6.5. Exclusionary Criteria

As demonstrated by the forecasted weather data and information (described in Section 6.1 above and shown in Figure 13 below), there was a high probability that Hurricane Lee was going to be a severe and hazardous weather event with the potential to adversely impact the Company's electric distribution system. Accordingly, the Company prudently planned and prepared for that impact, including the acquisition of resources to assist with system restoration efforts. Although this event did not ultimately result in a storm that meets exclusionary criteria, the projected weather-related impacts indicated that a qualifying major storm was likely to occur. Therefore, it was incumbent upon the Company to take all reasonable steps to prepare for a qualifying storm based on data and information provided by professional weather forecasters. Because it was reasonable and prudent for the Company to undertake these planning and preparation activities, the associated costs that were incurred to prepare for this storm should be recoverable through the MSCR and the Company respectfully requests approval for recovery of these costs.

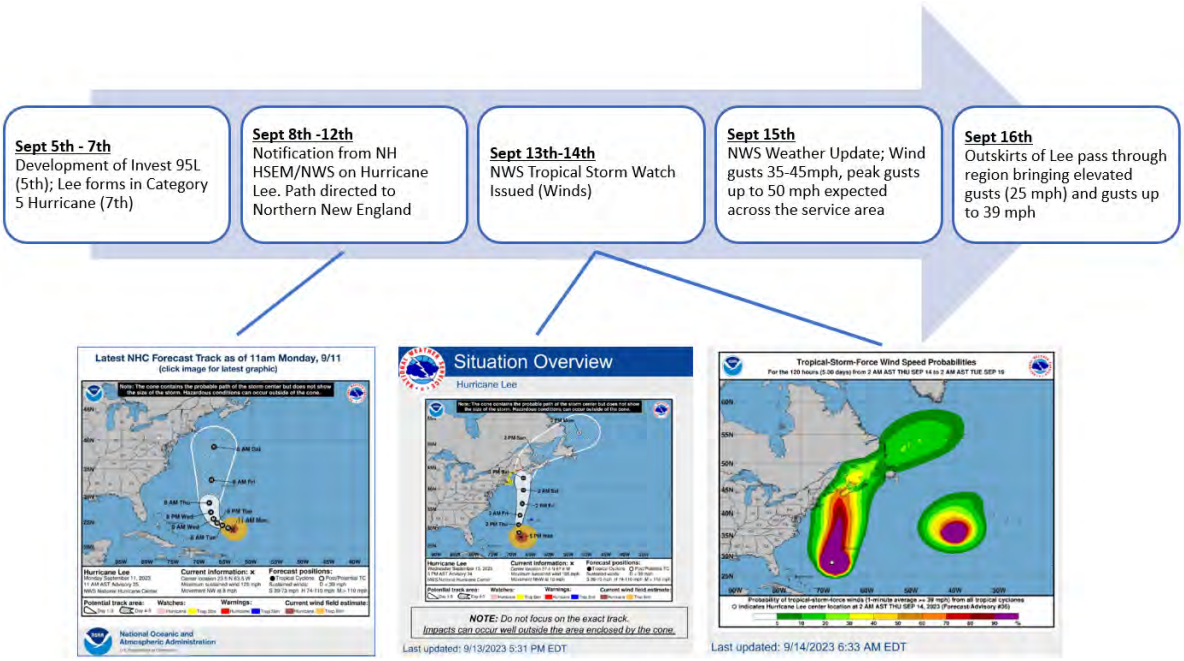

Figure 13 - Hurricane Lee Weather Forecast Development

Robert L. Quinn
Commissioner

State of New Hampshire

DEPARTMENT OF SAFETY
Division of Homeland Security and Emergency Management
www.nh.gov/nsem

HOMELAND SECURITY EMERGENCY MANAGEMENT
NEW HAMPSHIRE DEPARTMENT OF SAFETY

Robert M. Buxton
Director
Megan A. Hoskins
Assistant Director

FOR IMMEDIATE RELEASE
Wednesday, September 13, 2023
Vanessa Palange
Community Outreach Coordinator
C: (603) 545-9499

NEWS RELEASE

NH RESIDENTS AND VISITORS SHOULD PREPARE NOW FOR HURRICANE LEE

CONCORD, N.H. – The National Weather Service (NWS) in Gray, Maine, has issued a Tropical Storm Watch for coastal Rockingham County. New Hampshire Department of Safety's Division of Homeland Security and Emergency Management (HSEM) urges residents and visitors in the Granite State to be prepared for Hurricane Lee, which is expected to arrive in the Gulf of Maine on Friday.

A Tropical Storm Watch means there is the potential for wind 39 to 57 mph in the watch area within the next 48 hours.

Hurricane Lee's impacts are expected to be strongest on the Seacoast. However, NWS said all of New Hampshire has the potential to be affected by strong winds. HSEM, in coordination with other state, local and federal partners, is closely monitoring the storm.

"Residents and visitors should take time to prepare *now* for strong winds and power outages," said HSEM Director Robert Buxton. "Pay attention to local weather alerts and make sure everyone in your family knows your emergency plan and their roles. Check your emergency kit to ensure you have enough items for at least 72 hours. Secure any items outside your home, especially on the Seacoast."

The State Emergency Operations Center (SEOC) plans to activate at Enhanced Monitoring at 8 a.m. Friday to monitor the storm and support local communities.

Director Buxton offers the following safety tips:

- Sign up for NH Alerts to receive free emergency notifications including weather alerts from the National Weather Service.
- Monitor storm updates from the National Weather Service and local radio and television stations.
- Prepare your home: Keep rain gutters and downspouts clear of debris, move vehicles to a safe location, trim trees that may fall and cause damage, and prepare your generator in case you lose power.
- Tie down or bring indoors any objects that might be blown around by hurricane winds (outdoor furniture, decorations, garbage cans, display racks, signs and any other loose objects that are normally left outside).
- Follow instructions from local emergency officials and know how to safely evacuate should you be told to do so.
- Rip currents can be stronger both before and after a storm. Avoid beach activities until weather conditions improve.

For more information on what to do before, during and after a hurricane, visit ReadyNH.gov/disasters/hurricanes. Stay informed by following New Hampshire Homeland Security and Emergency Management on Facebook, X, formerly Twitter, (@NH_HSEM) and Instagram (@NH_HSEM).

###

Figure 14 - NH Dept of Safety Press Release Hurricane Lee

6.6. Qualifying Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for this event was $352,862 with a breakdown of charges in the following table:

Payroll	$30,581
Materials & Supplies	$979
Transportation	$10,240
Contractor Invoices & Other	$316,354
Less Amount Capitalized	($5,292)
Total To Storm Reserve	$352,862

7. December 18th, 2023 (Wind Storm)

7.1. Description of the Storm

On Wednesday, December 13th weather services began predicting a weather disturbance bringing heavy rain and strong hazardous winds to the region late Sunday into Monday (December 17th – 18th). The system was expected to produce significant rain (up to 3 inches) and hazardous winds with gusts predicted between 30 to 50 mph, up to 60 mph in coastal areas, resulting in high wind and flood warnings and watches being issued in New Hampshire.

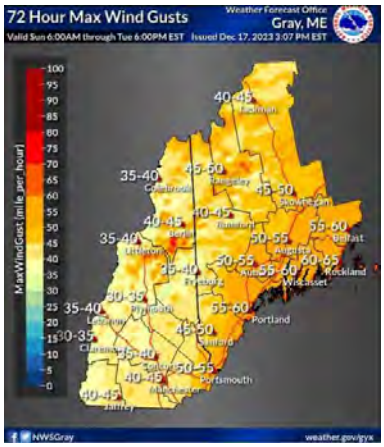

Figure 15 - NWS Peak Wind Gusts

Heavy rainfall and gusts moved into the area late on Sunday (December 17th) peaking Monday night with sustained wind speeds up to 41 mph and frequent gusts up to 54 mph across Unitil's territory. Wind speeds and gusts remained elevated throughout Wednesday (December 20th) as well.

7.2. Summary of the Extent of the Storm Damage

UES experienced moderate impacts from this event as detailed in the table below:

Region	Total # Outages	Peak # Outages	Total Customers Interrupted	Peak Customers Interrupted	Percentage Affected (Peak)
Seacoast	131	81	18,615	10,020	20.8%
Capital	27	15	2,191	1,804	5.8%

Table 7 – Wind Storm Outage Impact

7.3. Preparations

The Company began communicating internally beginning on December 14th to notify key response personnel and continued to monitor weather forecasts leading up to the event. Preparation activities such as contractor availability outreach and checking inventory, stock levels and fleet vehicles were completed prior to the storm's arrival. The Company made sure additional crews and staff were available to monitor weather/system conditions and respond to any service interruptions throughout the event.

7.4. Restoration

As noted in Section 7.2 above, moderate impacts to the Company's system occurred throughout the day on Monday (December 18th), most of which were attributed to downed limbs and large uprooted trees caused by high winds and heavy ground saturation. The Regional EOCs opened at 7:30 AM on Monday (December 18th) and worked closely with municipal officials to address public safety issues and re-allocate/dispatch repair crews to outage locations. The Seacoast

Region received the most damage, experiencing at least 11 broken poles and impacts to its sub-transmission system. Unitil held its internal crews (10), on system line contractors (11), tree crews (8) and secured additional external contractors (31) for the event with the majority of customers being restored by 5:00 PM the following day.

7.5. Exclusionary Criteria

Although this event did not reach the exclusionary criteria for preparation (weather), the impacts of the event met the exclusionary criteria (see Table 7 in Section 7.2) for restoration recovery in the Seacoast Region. Accordingly, the Company proposes to recover only the restoration costs for the Seacoast Region through the MSCR as summarized in Section 7.6 below.

7.6. Qualifying Costs Charged to the Storm Reserve

The total amount charged to the storm reserve for this event was not available at the time of this report and will be included in next year's report.

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 Energy Event Index (EEI) similar to the PDI (see Attachment B for the criteria composing the EEI). 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 EEI; however, to better align the EEI levels with the operational levels in Unitil's Emergency Response Plan (ERP), we began the EEI at Level 1, which differs from the former PDI that began at Level 0. Therefore, an EEI Level 3 is equivalent to the PDI Level 2.

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

- 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

Event Energy Index (EEI) Criteria

Forecasted Wind Speed/Wind Gusts

For "With Leaves" Period (May 1 – Nov 16)			For "No Leaves" Period (Nov 17 – Apr 30)		
Level	**Wind Speed**	**Wind Gusts**	**Level**	**Wind Speed**	**Wind Gusts**
EEI = 1	< 30 mph	< 35 mph	EEI = 1	< 40 mph	< 45 mph
EEI = 2	> = 30 mph	> = 35 mph	EEI = 2	> = 40 mph	> = 45 mph
EEI = 3	> = 45 mph	> = 50 mph	EEI = 3	> = 50 mph	> = 55 mph
EEI = 4	> = 60 mph	> = 65 mph	EEI = 4	> = 60 mph	> = 70 mph
EEI = 5	> = 70 mph	> = 75 mph	EEI = 5	> = 70 mph	> = 85 mph

Forecasted Ice Accretion (assumes "normal" wind speed)

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

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

Level	Snow
EEI = 1	< 6 inches
EEI = 2	> = 12 inches
EEI = 3	> = 18 inches
EEI = 4	> = 24 inches
EEI = 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)
EEI = 1	< 6 inches	< 4 inches
EEI = 2	> = 6 inches	> = 4 inches
EEI = 3	> = 8 inches	> = 6 inches
EEI = 4	> = 12 inches	> = 12 inches
EEI = 5	> = 24 inches	> = 24 inches

Forecast Confidence Levels

Low	Medium	High
< 30% Chance	≥ 30 ≤ 60% Chance	> 60% Chance

Attachment C

Sample Weather Forecast with EEI Table

Energy Event Index for UNITIL Your forecast administrator: ulbanj@unitil.com
Valid Time: March 1, 2019 1:00 PM EST Forecaster: jim.murphy

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	3
	Fitchburg	1	1	2
	Portland	1	1	3
	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	Medium
	Fitchburg	High	High	Medium
	Portland	High	High	Medium
	Seacoast	High	High	Medium

Energy Event Index Definition

No Leaves (Nov 17 - Apr 30)

EEI	Wind Speed	Wind/Gust	Snow	Ice
1	< 40 mph	< 45 mph	< 6 in.	< 1/10 in.
2	>= 40 mph	>= 45 mph	>= 6 in.	>= 1/10 in.
3	>= 50 mph	>= 55 mph	>= 8 in.	>= 3/8 in.
4	>= 60 mph	>= 70 mph	>= 12 in.	>= 1/2 in.
5	>= 70 mph	>= 85 mph	>= 24 in.	>= 1 in.

Confidence Level	
Low	<30% chance the most likely index level remains at that level through the event
Medium	30-60% chance the most likely index level remains at that level through the event
High	>=60% chance the most likely index 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: March 1, 2019
Time: 1:00 PM EST
Forecaster: J Murphy

Zones	SEACOAST	CAPITAL	FITCHBURG	PORTLAND
Event Starting in 30hrs				
Event Begin Time				
Event End Time				
Event Confidence				
Tstrm Wind Gusts				
Ltng Intensity				
Storm Mvmt Dir				
Rain Amount				
Snow Amount				
Snow Character				
Ice Amount				
Sustained Wind				
Wind Gust				
Temp. Extremes	36/23	35/17	35/20	35/19

UNITIL SERVICE AREA 48 HOUR OUTLOOK:

CAPITAL: This afternoon and tonight will be dry and hazard-free. A storm system will spread snow showers over the area after 7am Saturday morning and end by 11pm Saturday. Snowfall: 2-3". Snow character: Normal-wet.

Confidence: High confidence that no hazards will occur in the next 48 hours.

FITCHBURG: This afternoon and evening will be dry and hazard-free. A storm system will spread snow over the area after 3am Saturday morning and end by 11pm Saturday. Snowfall: 2-4". Snow character: Normal-wet.

Confidence: High confidence that no hazards will occur in the next 48 hours.

SEACOAST: This afternoon and evening will be dry and hazard-free. A storm system will spread snow over the area after 3am Saturday morning and end by 11pm Saturday. Snowfall: 3-5". Snow character: Normal-wet.

Confidence: High confidence that no hazards will occur in the next 48 hours. Chance of EEI-2 snow: 10%.

PORTLAND: Today and tonight will be dry and hazard-free. A storm system will spread snow showers over the area after 8am Saturday morning and end by 12am Sunday. Snowfall: 2-4". Snow character: Normal-wet.

Confidence: High confidence that no hazards will occur in the next 48 hours.

UNITIL SERVICE AREA 3-5 DAY OUTLOOK: Another stronger storm system could bring anywhere from 6-15" of additional Normal-wet snow Sunday evening into Monday, but confidence is only medium at this point due to significant model differences in track and strength. The higher snow amounts will be across Capital and Portland where up to 10-15" will be possible with 6-10" expected across Seacoast and Fitchburg. Winds will be breezy Sunday night into Monday with gusts of 30-40 mph possible. Dry and hazard-free conditions are expected on Tuesday.

Confidence: Confidence is medium on Sunday and Monday. Chance for EEI-2/3/4 snow for Sunday night into Monday: 80%/60%/30% Capital and Portland; 70%/40%/- Seacoast and Fitchburg. Confidence is high that no hazards will occur on Tuesday